URBAN WATER MANAGEMENT PLAN • 2010

County of San Bernardino

SPECIAL DISTRICTS
COUNTY SERVICE AREA 64

PREPARED BY:

RBF Consulting

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County Service Area 64

2010 URBAN WATER MANAGEMENT PLAN

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Appendix B DWR Checklist
Appendix C MWA Regional Water Management Plan "Basin Management Actions"
Appendix D DWR Bulletin 118
Appendix E County Ordinance No. SD 90-11

LIST OF REFERENCES

1. County Service Area 64 2000 UWMP, So and Associates, April 2001
2. Mojave Water Agency 2010 UWMP, June 9, 2011
3. Upper Mojave Rive Well Field and Water Supply Pipeline Project (Regional Recharge and Recovery) Basis of Design Report Draft Submittal, RBF Consulting, February 2008
4. DWR Public Water System Statistics (PWSS) Reports, County of San Bernardino Special Districts, 1995 – 2010
5. 2010 UWMP Guidebook, CA Department of Water Resources, December 21, 2010

ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
Act	Urban Water Management Planning Act of 1983
AF	Acre Feet
AFY	Acre Feet per Year
ASTM	American Society for Testing and Materials
AWAC	Alliance for Water Awareness and Conservation
AWWA	American Water Works Association

BAP	Base Annual Production
BMO	Basin Management Objective
BMP	Best Management Practices
CA	California
CDPH	California Department of Public Health
CEQA	California Environmental Quality Act
CII	Commercial, Industrial and Institutional
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
CSA	County Service Area
CUWCC	California Urban Water Conservation Council
CVP	Central Valley Project
DFG	Department of Fish and Game (California)
DWR	Department of Water Resources (California)
DMM	Demand Management Measures
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
ETo	Evapotranspiration
FPA	Free Production Allowance
GIS	Geographic Information System
GP	General Plan
gpcd	Gallons Per Capita per Day
gpd	Gallons Per Day
gpf	Gallons Per Flush
gpm	Gallons Per Minute
GWMP	Groundwater Management Plan
HET	High Efficiency Toilets
Inst	Institutional
LS	Landscape
MCL	Maximum Contaminant Level
MG	Million Gallons
MGD	Million Gallons per Day
mg/L	Milligrams Per Liter
MOU	Memorandum of Understanding
MWA	Mojave Water Agency
NPDES	National Pollution Discharge Elimination System
PSY	Production Safe Yield
PWSS	Public Water System Statistics
Res	Residential
RRR	Regional Recharge and Recovery
RWMP	Regional Water Management Plan
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SBx7-7	Senate Bill 7 of Special Extended Session 7

SCADA	Supervisory Control Data Acquisition System
SCAG	Southern California Association of Governments
SD	Special Districts
SWP	State Water Project
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
USGS	U.S. Geological Survey
UWMP	Urban Water Management Plan
VVC	Victor Valley College
VVWRA	Victor Valley Water Reclamation Authority

SECTION 1.0
URBAN WATER MANAGEMENT PLANNING ACT

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SECTION 1.0
URBAN WATER MANAGEMENT PLANNING ACT

1.1 REQUIREMENTS AND PURPOSE

The 2010 Urban Water Management Plan (UWMP) has been prepared in compliance with Assembly Bill No. 797 ("The Urban Water Planning Management Act") of the 1983-1984 Regular Session of the California Legislature (Water Code Section 10610 et. seq.). That legislation requires that an Urban Water Management Plan be prepared by all water purveyors having more than 3,000 accounts or supplying more than 3,000 acre-feet of water annually. Since its passage in 1983, several amendments have been added to the Act. Plans are required to be submitted every five years.

As with the 2005 UWMP, the 2010 UWMP incorporates the Senate Bills 610 and 221 legislation and serves as the primary source documentation for future Water Supply Assessments and Written Verifications.

The purpose of this 2010 UWMP is to update County Service Area 64's previously adopted UWMP and include the requirements of the Delta Legislation of 2009. Senate Bill 7 (SBx7-7), also known as the Water Conservation Act, is recent legislation that is required to be included with the 2010 UWMP, which specifically mandates that a water agency outline water use reduction targets and procedures for achieving those targets. It's a demand-side solution aimed at reducing overall water demands within California, which could directly result in improvements to the reliability of the State Water Project. **Appendix A** includes a copy of the Water Conservation Act.

The 2010 UWMP was prepared in accordance with state requirements. The State Department of Water Resources (DWR) published the *Guidebook to assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (March 2011) which includes a checklist to assist DWR staff in reviewing UWMPs. **Appendix B** includes a completed checklist for the 2010 UWMP.

The 2010 UWMP will serve as:

- Source documentation for Water Supply Assessments and Written Verifications
- Guidance document for water conservation
- Documentation of policy decisions and selection of water use reduction methodologies
- A long-range planning document for water supply
- A database for development of regional water plans and General Plans
- A component to Integrated Regional Water Management Plans

In addition to the Water Conservation Act, the Urban Water Management Planning Act has undergone other legislative amendments. Recent and prior amendments are summarized as follows:

- Establish baseline water demands, identify water use reduction goals, and identify water conservation programs for achieving the goals.
- Describe status of current water conservation.
- Include the additional requirements pursuant to Senate Bills 610 and 221 for the purposes of providing the additional information needed during CEQA and Tentative Map process for the Water Supply Assessments and Written Verifications.
- Identify and outline the water shortage contingency plan and stages of action triggered by varying levels of water shortage.
- Allow an agency, as signatory to the Memorandum of Understanding (MOU) regarding urban water conservation in California, to satisfy some of the Act's requirements for demand management measures by submitting its most recent California Urban Water Conservation Council (CUWCC) Best Management Practices (BMP) annual report.
- Allow utilities to recover, through utility rates, the costs incurred in preparing the plan and implementing best management practices.
- Evaluate water recycling and other water management alternatives.
- Coordinate with water agencies that share the same supply source and "encourage the active involvement of diverse social, cultural, and economic elements of the population" throughout the preparation of the Plan (Section 10642).

1.2 PUBLIC PARTICIPATION

Copies of the draft UWMP were made available for public review at least 14 days prior to the (date) Public Hearing. Upon adoption, the final 2010 Plan will be submitted to the State DWR pursuant to Section 10644, and made available to the public via hardcopy at Special Districts or Spring Valley Lake HOA offices, and through the County's website. Public meetings and the availability of draft copies were properly noticed in the *Daily Press* and *The Breeze*.

1.3 PLANNING COORDINATION

Previous UWMPs were adopted for CSA 64 in years 2000 and 2005. The preparation of this 2010 UWMP was announced in local newspapers, and Notice-of-Intent-to-Adopt was sent to Mojave Water Agency (CSA 64 water wholesaler), and the neighboring retail water purveyors of Apple Valley Ranchos Water Company, Victorville Water District and the City of Hesperia 60 days in advance of the Public Hearing. The final draft was made available at *The Breeze* offices on Spring Valley Parkway and Victorville City Library at 15100 Circle Drive. **Table 1-1** identifies the agencies that were provided a copy of the final draft 2010 UWMP and notice of County's intention to adopt the UWMP.

Table 1-1
Agency Coordination

Agency	Sent Draft Report	Sent Notice of Intention to Adopt
MWA	x	x
Apple Valley Ranchos Water Company	x	x
Victorville Water District	x	x
City of Hesperia	x	x

1.4 PLAN ADOPTION

The preparation of this 2010 UWMP was announced in local newspapers. Notification was sent to the County's Planning department, the Cities of Hesperia and Victorville, and the Mojave Water Agency a minimum of 60 days prior to the planned adoption date. The Special Districts of the County of San Bernardino adopted the 2010 Urban Water Management Plan at a noticed Public Hearing held on August 28, 2012.

Special Districts submitted a copy of the adopted CSA 64 2010 UWMP to the State library and County Planning offices, and posted the final UWMP report on the County website, within 30 days following adoption. The website posting is intended to satisfy the UWMP requirements for making the final report available following adoption.

SECTION 2.0
LAND USE, POPULATION, WATER REQUIREMENTS

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SECTION 2.0

LAND USE, POPULATION, WATER REQUIREMENTS

County Service Area 64 (Spring Valley Lake) is located in the High Desert region south of the City of Victorville, and consists of residential, commercial, retail, schools, and recreational including a golf course, Spring Valley Lake and equestrian uses. The study area of the 2010 UWMP is CSA 64's service area, which covers approximately four square miles situated in unincorporated area of San Bernardino County, as well as portions of the Cities of Victorville and Hesperia, along the upper reaches of the Mojave River. The service area is generally bounded by Bear Valley Road to the south, Ridgecrest Road to the west, and the Mojave River to the east and northeast. Some additional residential and commercial service area is located between the Mojave River and Apple Valley Road. **Figure 2-1** shows the regional vicinity of CSA 64 within the High Desert of southwest San Bernardino County. **Figure 2-2** delineates the CSA 64 boundary.

Existing and projected water demands of the service area were determined for the 2010 UWMP. Several factors affect water demand habits, which can be used to project future demands based on anticipated growth. Factors such as climate, socioeconomic characteristics, land use and population are the primary drivers of water demand. The Water Conservation Act of 2009 (Senate Bill 7) now requires water agencies that serve more than 3000 service connections or more than 3000 acre-feet per year (AFY) to achieve specific water use reduction goals by 2015 and 2020. This could alter traditional water use habits and will reduce overall per-capita water usage. CSA 64 has already begun a water conservation plan, which included installation of meters for all users (completed in 1995) and implementation of a tiered-rate structure for customer billing. The Districts' plan for achieving the water use reduction goals of CSA 64 must be identified in the 2010 UWMP. The water use reduction plan is detailed in Section 4.0.

2.1 LAND USE

CSA 64, commonly referred to as Spring Valley Lake, encompasses a total gross area of approximately 2,567 acres (4.02 square miles). Much of this is undevelopable open space at the north end or within the Mojave River. Net developed/developable area within CSA 64 is approximately 2,076 acres, and includes a combined total of 4,185 developed and undeveloped residential lots on 1,341acres. The non-residential uses include recreational uses of the golf course, lake and equestrian center. Other non-

residential uses include commercial, retail and office, as well as the institutional land uses of the Victor Valley College, and elementary, middle and high schools. **Table 2-1** summarizes the land use categories and their estimated acreages within CSA 64.

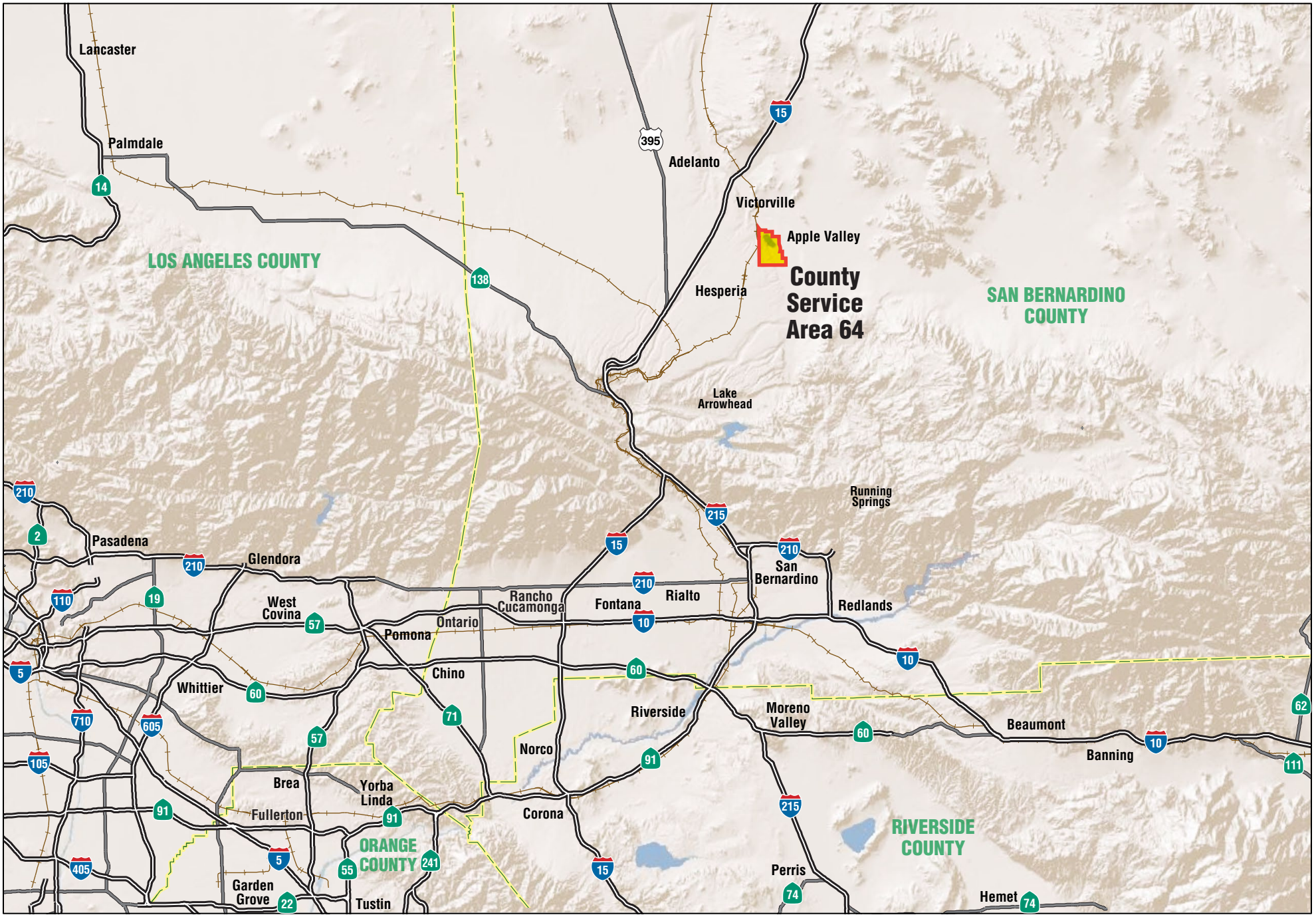
Table 2-1
Land Use Data

Land Use	Acres [1]		
	Developed	**Undeveloped**	**Total**
Residential	1,207	134	1,341
Commercial/Office	69	69	137
Public/Institutional	188	63	250
Recreational (golf, lake)	348	0	348
River, Open Space	500 [2]	0	500 [2]
Total	2,311 acres	265 acres	**2,576 acres**

[1] Total acreage is based on calculations using GIS tools, and land use acreage information obtained from *Spring Valley Lake Planning Area* as identified in the City of Victorville General Plan 2030. Developed residential land uses assumed at 90%; developed Commercial/Office land uses assumed at 50%; and developed Public/Institutional land uses at 75%.

[2] Assumed acreage for Mojave River and required setback, and dedicated open space.

The County of San Bernardino maintains land use zoning overlays as part of their on-going GIS maintenance, which were downloaded from their "portal" via the San Bernardino County website. These sources were used to develop **Figure 2-3**, which shows the extents of these land uses within the CSA 64 service area.



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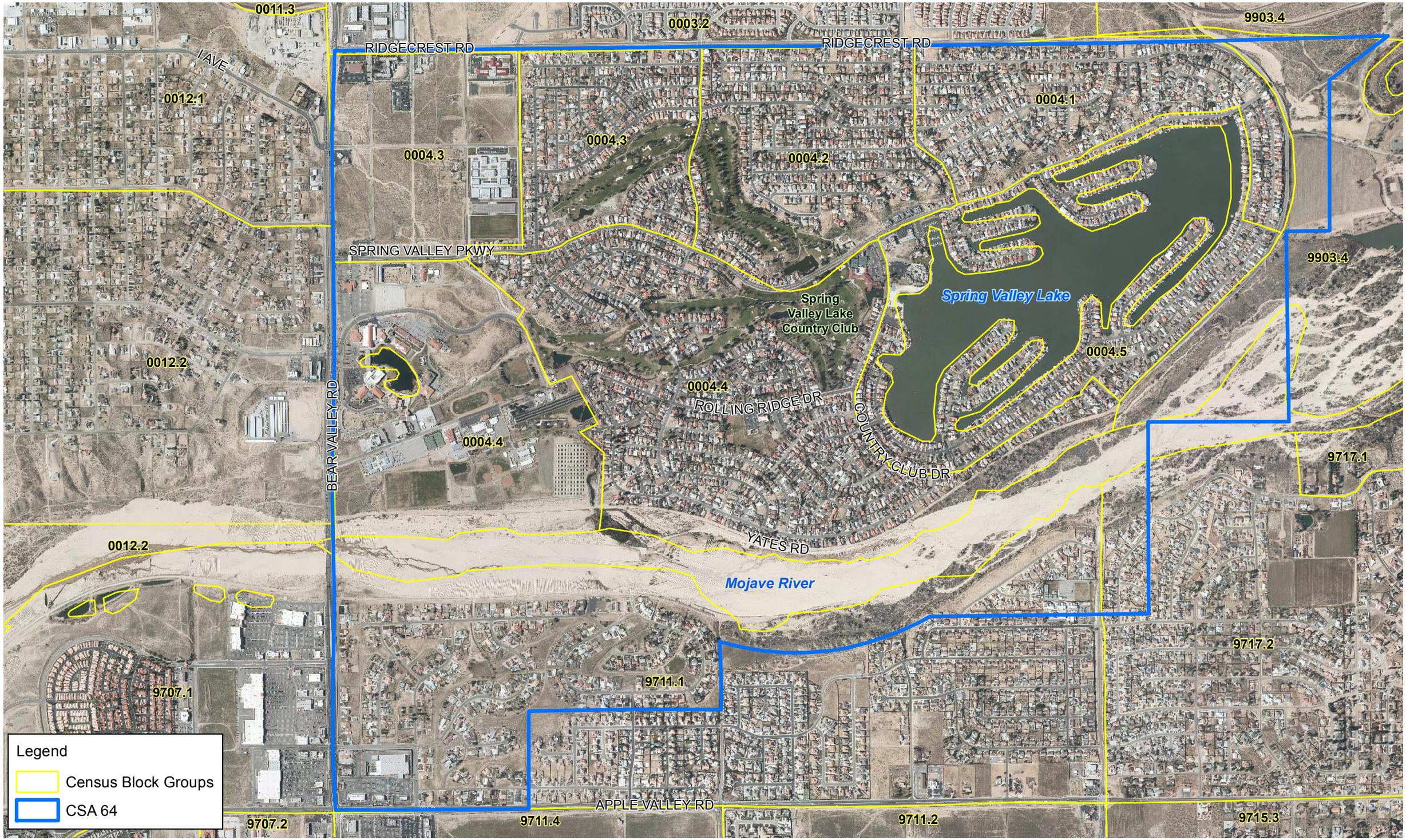
2010 UMWP • COUNTY SERVICE AREA 64

Regional Vicinity

Figure 2-1



0 600 1,200 2,400 Feet

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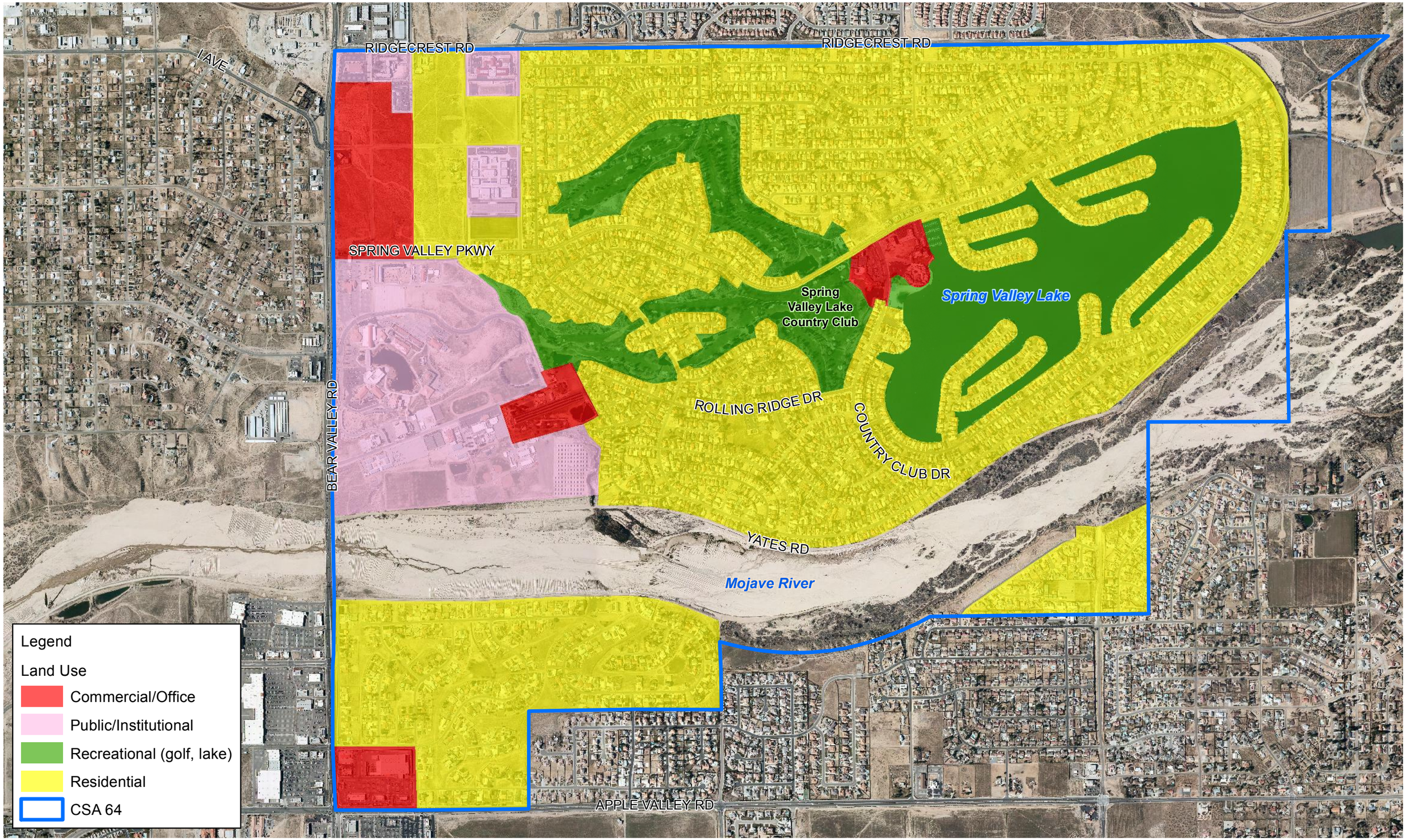
Sources: Eagle Aerial Imagery - 2011

2010 UWMP County Service Area

Study Area

Figure 2-2



2/2/2012 JN M:\Mdata\65100806\GIS\CSA_64_LandUseMap.mxd DJ/JM
Sources: Eagle Aerial Imagery - 2011

2010 UWMP County Service Area

Land Uses

Figure 2-3

2.2 GEOGRAPHICAL SETTING AND CLIMATE

The Study Area consists of rugged outcrops of basement rock surrounded by alluvium-filled basins. The area's most distinguishing feature is the Mojave River, which traverses the east side of the Study Area. The river flows throughout its length only during high runoff conditions. Much of the year, however, the river is dry although considerable groundwater moves through the river alluvium. At Victorville, it passes through a shallow granite gorge that forces the underflow to the surface. Topography of the study area is uniform throughout most of the area. Elevations within the CSA 64 study area vary from 2,900 feet in the southwesterly portion to 2,780 feet in the northeasterly portion, necessitating separation of the study area into two water pressure zones.

Climatic conditions are characterized by meager rainfall, low humidity, high summer temperatures, abundant sunshine, relatively cool winters, and frequent high winds. The frost-free is more than 204 days per year for the Victorville area. Average annual rainfall is 12 inches and annual mean temperature is 60.4 degrees (F). **Table 2-2** summarizes the average evapotranspiration rates, rainfall and temperature by month since year 2000.

Table 2-2
Average Weather [1]

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
ET_o (in)	2.24	2.86	4.91	6.36	8.12	8.97	9.43	8.87	6.66	4.53	2.79	1.74	**67.5**
Average temp. (F)	44.6	46.7	50.4	57.0	66.0	73.4	81.1	79.2	71.0	60.4	51.8	43.2	**60.4**
Precipitation (in)	0.79	5.66	1.37	0.43	0.08	0.05	0.21	0.29	0.85	0.78	0.71	0.82	**12.05**

[1] Source: http://www.cimis.water.ca.gov/cimis/monthlyReport.do, Data Shown is for Station #117 of the San Bernardino region, San Bernardino County Southern District; adjacent city is Victorville, based on averages for August 2001 to August 2011.

2.3 POPULATION

Based on MWA's 2010 Demand Projection Model, CSA 64 current (2010) residential population is 9,838 served by 3,681 water service connections. Population growth is anticipated to occur within CSA 64 service area which will impact water demand from each land use sector within CSA 64, including residential, commercial, institutional and landscape irrigation. CSA 64 percent buildout is significantly higher than percent buildout of the Mojave Water Agency's overall buildout of the Alto subarea.

MWA's population projections are based on Southern California Association of Governments 2012 Regional Transportation Plan growth forecasts. Unfortunately, the 2012 projections are only available by incorporated city, and have not yet been disaggregated into Traffic Analysis Zones (TAZ's or Census Tracts), making it difficult to accurately use SCAG projections to estimate populations for unincorporated areas such as CSA 64. For the population projections for CSA 64, Census data was strictly used. The 2000 Census data derives a Year 2000 population for CSA 64 of 7,581, which further equates to 2.4 persons per residential dwelling unit. This is a significant difference from the 3.3 persons-per-unit used by staff to project service area populations in the annual Public Water System Statistics reports submitted to DWR. **Table 2-3** summarizes the recent population estimates for CSA 64.

Table 2-3
Service Area Population

Year	Estimated Population		
	PWSS/ CDPH Reports	MWA	SBx7-7 Data Analysis
2000	10,738	8,473	7,573
2005	12,292	9,839	8,652
2006	12,481	-	9,794
2007	12,306	-	9,613
2008	-	-	9,531
2009	12,130	-	9,665
2010	12,368	9,838	9,681

Victor Valley College (VVC or College), which is also served by CSA 64, adds significantly to the total population of CSA 64. According to the VVC website, the College has a current enrollment of approximately 12,900 full-time and part-time students.

2.4 WATER REQUIREMENTS

2.4.1 Historical Water Usage and Trend

County Service Area 64 records service connections by Customer Class and their measured water consumption, as well as closely monitors well production, for a complete accounting of water produced and distributed within its system. CSA 64 submits Public Water System Statistics (PWSS), as required by

the California Department of Water Resources. The historical water consumption and production from the PWSS reports was analyzed for the 2010 UWMP, and is summarized in **Table 2-4** for the five calendar years from 2006 through 2010.

Table 2-4
Historical Water Use

Year	Number of Connections				Metered Consumption (AFY)			
	Resid	Comm/Inst	Landscape	Total	Resid.	Comm/Inst	Landscape	Total
2005				3725				3384
2006	3724	47	11	3782	3145	201	171	3517
2007	3655	40	17	3712	3002	181	176	3359
2008	3624	50	17	3691	2777	181	194	3152
2009	3676	51	16	3743	2714	195	193	3102
2010	3681	51	16	3748	2422	226	219	2867
Five-year Average	**3672**	**48**	**15**	**3,735**	**2812**	**196.8**	**190.6**	**3199 AFY**

The Water Code requires an accounting of non-revenue water. Non-revenue water includes unmetered public uses (street and sewer cleaning, fire hydrant flushing, fire fighting and fire prevention, construction, etc.). CSA 64 water use includes calculations of these "other" water uses, of which 2005 and 2006 were the only years since 2005 that records show a positive water use for this category. This indicates that the public uses are insignificant and amount to less than one-tenth of one percent of the total CSA 64 usage. Therefore, Table 2-4 represents all accounted-for water usage.

Every water system has a certain amount of unaccounted water use (line losses, fire flows, emergency repairs, system flushing, etc.). The meters installed on water production wells and customer service connections have enabled CSA 64 to establish an accurate accounting of total water usage and "unaccounted for" water (water loss). CSA 64 staff recently completed (October 2011) a total service line replacement for all services in response to observed service line leaks in a large portion of customer services and to reduce overall water system water loss. **Table 2-5** summarizes the historical water consumption and production, and resulting "unaccounted-for" water for years 2005 through 2010.

Table 2-5
Water Loss

Year	Metered Consumption (AF)	Groundwater Production (AF)	Water Loss (AF)	Water Loss Percent
2005	3384	3586	202	5.63%
2006	3517	3735	218	5.84%
2007	3359	3724	365	9.80%
2008	3152	3471	319	9.19%
2009	3102	3413	311	9.11%
2010	2867	3173	306	9.64%
5-year Average	**3199 AFY**	**3504 AFY**	**304**	**8.67% [1]**

[1] Total service line replacement was completed in October 2011, which is expected to result in decreased water loss.

2.4.2 Projected Water Usage

Total water production for CSA 64 water supply facilities (groundwater wells) must meet, at a minimum, metered consumption, unmetered public water uses and water loss. CSA 64's water use reduction plan (Section 5.0) includes programs designed to detect and quickly repair system leaks and replacement of water meters and distribution facilities at regular intervals. These programs will minimize water loss and reduce CSA 64's current water loss rate. Therefore, it is assumed that the programs will reduce water loss to the pre-2007 levels and maintain a maximum rate of six (6) percent.

The average growth within CSA 64 over the last five years is considered unusually low perhaps due to the state-wide drought (2007-10) and economic recession. Total active service connection count served by CSA 64 between 2006 and 2008 actually decreased, while it saw a nominal net increase between 2005 (3,725 services) and 2010 (3,748 services). From years 2000 to 2005, service accounts had grown by approximately 100 services annually primarily in the residential sector. It is anticipated that the current low growth trend will continue for several years. For conservative analysis, it is assumed that 50 new service connections could be added to the water system annually, for a total of 1250 new accounts through the year 2035.

Without specific general planning land uses, it is further assumed for the 2010 UWMP growth projections that the remaining vacant lots among the residential uses will be developed with single-family homes, and that much of the area adjacent to the schools at the south end of CSA 64 will be developed as multi-family residential. The remaining undeveloped area adjacent to the schools could fill in with commercial/office type uses, and with institutional uses for potential expansion of Victor Valley College. The assumed growth, and corresponding projected water demand for CSA 64, is outlined in **Table 2-6**.

Table 2-6
Projected Water Use

	Number of Connections [1]				Metered Consumption Trend (AFY) [2]			
Year	**Resid**	**Comm/Inst**	**Landscape**	**Total**	**Resid.**	**Comm/Inst**	**Landscape**	**Total**
2010	3681	51	16	3748	2,812	196.8	190.6	3,199
2015	3881	91	26	3998	2,965	351.2	309.7	3,626
2020	4081	131	36	4248	3,118	505.5	428.9	4,052
2025	4281	171	46	4498	3,270	659.9	548.0	4,478
2030	4481	211	56	4748	3,423	814.2	667.1	4,904
2035	4681	251	66	4998	3,576	968.6	786.2	5,331
Assumed Future Connections	***1000 Res***	***200 Comm/Inst***	***50 LS Irrig***	***1250 Total***				

[1] Assumes annual growth of 50 accounts/dwelling units per year consisting of 40 residential dwelling units, 8 commercial/ institutional connections, and 2 landscape irrigation connections.
[2] Excludes water loss and water use reduction pursuant to SBx7-7.

It should be noted that Table 2-6 represents projected metered consumption if the historic water use trends continued through the planning horizon, i.e.without mandatory water conservation as dictated by SBx7-7. The projections also exclude unaccounted for water losses. These two important impacts to future water production are included later in this section (Table 2-12).

The County of San Bernardino does not include any low-income housing units within CSA 64, and does not currently plan to establish low-income housing within CSA 64 within the 2010 UWMP planning horizon. Because several undeveloped acres are zoned as multi-family residential within the southwestern portion of CSA 64, County Planning potentially could consider this area for low income

housing in a future general plan update. Revised land use planning for ultimate buildout of CSA 64 could occur within the next several years and be available for refining this in the future.

The revisions to the Water Code, as a result of the 2009 Water Conservation Act legislation, require all applicable water retailers within California to reduce their per-capita water usage pursuant to prescribed optional 'targets', as described in the following sections.

2.4.3 Demand Data Analysis for SBx7-7

The 2010 UWMP Guidelines provide methodologies to use in calculating the service area population. The service area boundary does not completely match up with census tract or block group zones, and therefore population is estimated by applying factors obtained through the census data. The District service area covers all or a portion of six census block groups. The block groups in union with the service area are estimated and the corresponding percentage is applied to the census data. The Guidelines list a population analysis method that divides single family and multi-family residential units for use in estimating population during non-census years. However, the historical customer classifications have varied over time, and the customer class is predominantly single family. To account for this, a simplifying method was developed that assigns total population to the total number of residential accounts (single family and multi-family).

Block group information from the 2000 Census was obtained to quantify population, housing units, capita per housing unit, and other information. The calculation assumes even distribution across the census area. Results are summarized in **Table 2-7**.

Table 2-7
Population Analysis

Total Full 2000 Census Block Population	2000 Population in CSA 64 Service Area	2000 Number of Residential Connections	2000 Capita per Residential Connection
8,443	7,581	3,209	2.4

Note: population data from 2000 Census.

The estimated 2000 population value divided by the 2000 residential connection value provides a capita per residential connection of 2.4. The same analysis was conducted with 2010 Census data that resulted in a capita per residential connection of 2.6.

2.4.4 Baseline Demand and Target

The 20x2020 process requires that a baseline demand be calculated and then target water demands are determined. The baseline demand is taken as the 10-year average gallon per day per capita, ending no earlier than 2004. The baseline demand calculation is based on total supply into the system, and estimated service population for each year. The capita per connection value from the 2000 Census (2.4) was used for years 1995 through 2005. The capita per connection value from the 2010 Census (2.6) was used for years 2006-2010.

The population served, water supplied, and resulting gpcd are summarized in **Table 2-8**. The 10-year running average for gpcd is indicated in the right column. The UWMP Guidelines list the methodology for 20x2020 requirements, including the baseline demand analysis. The baseline demand is the 10-year period ending no earlier than 2004. A 15-year average is allowed depending on recycled water use. As there is no recycled water use, the 10-year average is used for the baseline calculations. CSA 64 is selecting the 10-year period from 1995-2004 as its baseline period, with an average gpcd of 412 gpcd.

Table 2-8
Base Daily Per Capita Use

Year	Population Served	Water Supplied, MG	Annual gpcd	10-year Running Average gpcd
1995	6,712	1,158	473	--
1996	6,839	1,134	454	--
1997	6,950	1,075	424	--
1998	7,148	954	366	--
1999	7,394	1,130	419	--
2000	7,573	1,188	430	--
2001	7,771	1,162	410	--
2002	9,395	1,246	363	--
2003	8,234	1,186	394	--
2004	8,470	1,189	385	412
2005	8,652	1,168	370	401
2006	9,794	1,217	340	390
2007	9,613	1,213	346	382
2008	9,531	1,131	325	378
2009	9,665	1,112	315	368
2010	9,681	1,034	292	354

Four optional target methodologies are defined by the DWR in the 2010 UWMP Guidelines:

1. 20 percent reduction of baseline demand.
2. Maintain demands equal to individual water budgets.
3. 95 percent of 2020 Task Force hydrologic region gpcd goal (162 gpcd for CSA 64).
4. Calculated potential savings.

Per the UWMP Guidelines, the 2020 goal must be no more than 95 percent of a five-year gpcd average ending no earlier than 2007. The 5-year gpcd average is calculated in **Table 2-9**. The 2007 five-year average of 367 gpcd is selected.

Table 2-9
5-Year Range Base GPCD (DWR Table 15)

Year	Population Served	Water Supplied, MG	Annual, gpcd	5-year Running gpcd
2003	8,234	1,186	394	--
2004	8,470	1,189	385	--
2005	8,652	1,168	370	--
2006	9,794	1,217	340	--
2007	9,613	1,213	346	367
2008	9,531	1,131	325	353
2009	9,665	1,112	315	339
2010	9,681	1,034	292	324

The County is selecting Method 1, 20 percent of baseline demand, as its 2020 goal. With a baseline demand of 412 gpcd, the 2015 goal is 371 gpcd, and the 2020 goal is 330 gpcd. The selected base year information and selected targets are summarized in **Tables 2-10 and 2-11**, respectively. **Figure 2-4** summarizes the historic data and the calculated targets.

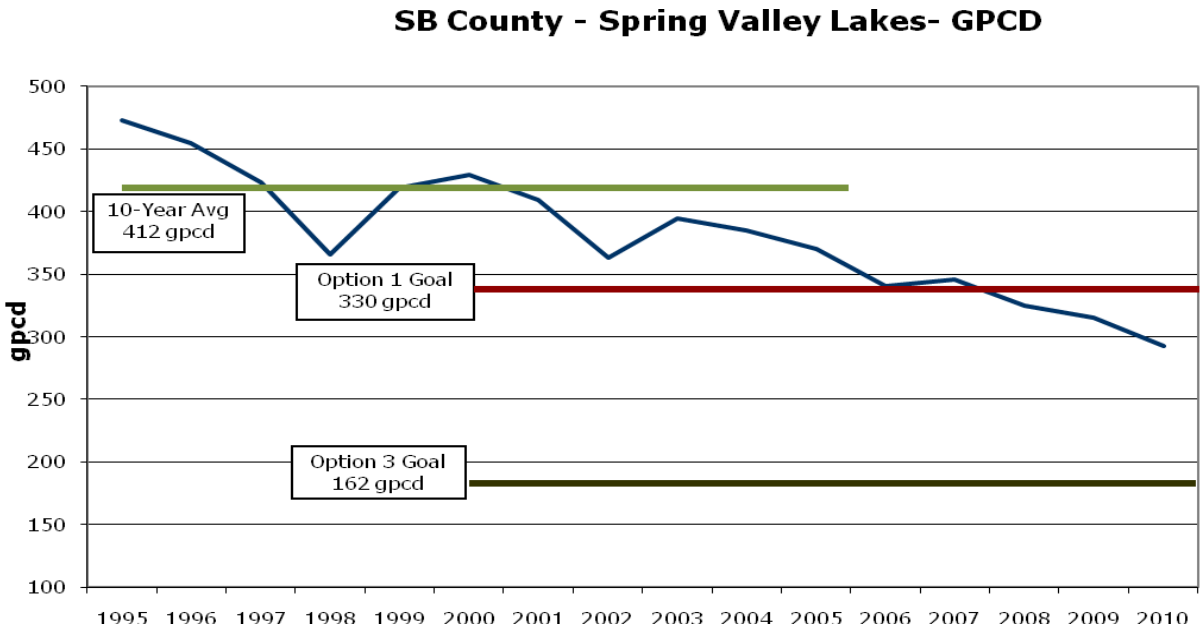
Table 2-10
Base Period Ranges (DWR Table 13)

Base	Parameter	Value
10-15-Year Base Period	2008 total water deliveries	1,131 MG
	2008 total volume recycled water delivered	0 MG
	2008 recycled water as percent of total	0 percent
	Years in base period	10 years
	Year beginning base period	1995
	Year ending base period	2004
5-Year Base Period	Years in base period	5 years
	Year beginning base period	2003
	Year ending base period	2007

Table 2-11
Water Demand Targets

Year	GPCD Target
2015	371 gpcd
2020	330 gpcd

Figure 2-4
CSA 64 GPCD Summary



As shown in Table 2-9, average per-capita usage in recent years is approximately 324 gpcd. The trend for lower per-capita usage is generally attributable to the recent economic recession and state-wide water supply drought. Although this shows that current water usage meets CSA 64's 2020 water use reduction goal, maintaining this usage level could prove challenging as rainfall increases to pre-drought levels and the economy improves. **Table 2-12** identifies the CSA's total future water requirements based on the water use reduction requirements now mandated by the Water Code, in five-year increments out to year 2035.

Table 2-12
Projected Water Requirements per Water Use Reduction Goal

Year	Total Service Connections [1]	SBx7-7 Estimated Water Use			
		Projected Population [2]	Water Use Reduction goal, Table 2-11 (gpcd)	Estimated Water Demand (MGD)	Estimated Water Demand (AFY)
2010	3,748	9,681	-	3.13 [3]	***3,504 [3]***
2015	3,998	10,201	371	3.78	***4,239***
2020	4,248	10,721	330	3.54	***3,963***
2025	4,498	11,241	330	3.71	***4,155***
2030	4,748	11,761	330	3.88	***4,347***
2035	4,998	12,281	330	4.05	***4,539***

[1] Table 2-6.

[2] Of 1250 new service connections, assumes 1000 medium high density residential (10 du/ac) at 2010 Census 'capita-per-du' of 2.6. Therefore, CSA 64 growth = 2600 by 2035, or 520 cap/5yr.

[3] Represents average water demand for years 2006 to 2010 from Table 2-5.

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SECTION 3.0
WATER SUPPLY AND QUALITY

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SECTION 3.0
WATER SUPPLY AND QUALITY

CSA 64 relies on groundwater as the primary source of supply, and it will continue to be the primary source of supply for the 2010 UWMP planning horizon. CSA 64 maintains a constant level of supply system improvements in order to replace its aging facilities and meet the growing demands of its service area. It recognizes that its demand for water may continue to grow even with state-mandated water conservation and that the groundwater basin has a limited capacity to provide long term high quality water. Therefore, CSA 64 relies on the Mojave Water Agency (MWA), as designated Watermaster, to monitor and enforce the regulations implemented by court proceedings.

A lawsuit filed by the City of Barstow in the early 1990's resulted in the entire Mojave River Basin being adjudicated, including the development of a basin wide water management plan prepared for the Mojave Water Agency. Under the court approved stipulated judgment, the shared free production allowance (safe yield) of each water producer was reduced over a four year period. Any production (pumping) of water above the "adjusted free production allowance" requires the producer to pay for replenishment water to the Mojave Area Basin Watermaster. In turn, replenishment water is purchased from the State Water Project (SWP) by the Watermaster using MWA's "Table A" allocation in the SWP. SWP water is considerably more expensive than local groundwater sources; requires additional treatment; and is an interruptible water supply source.

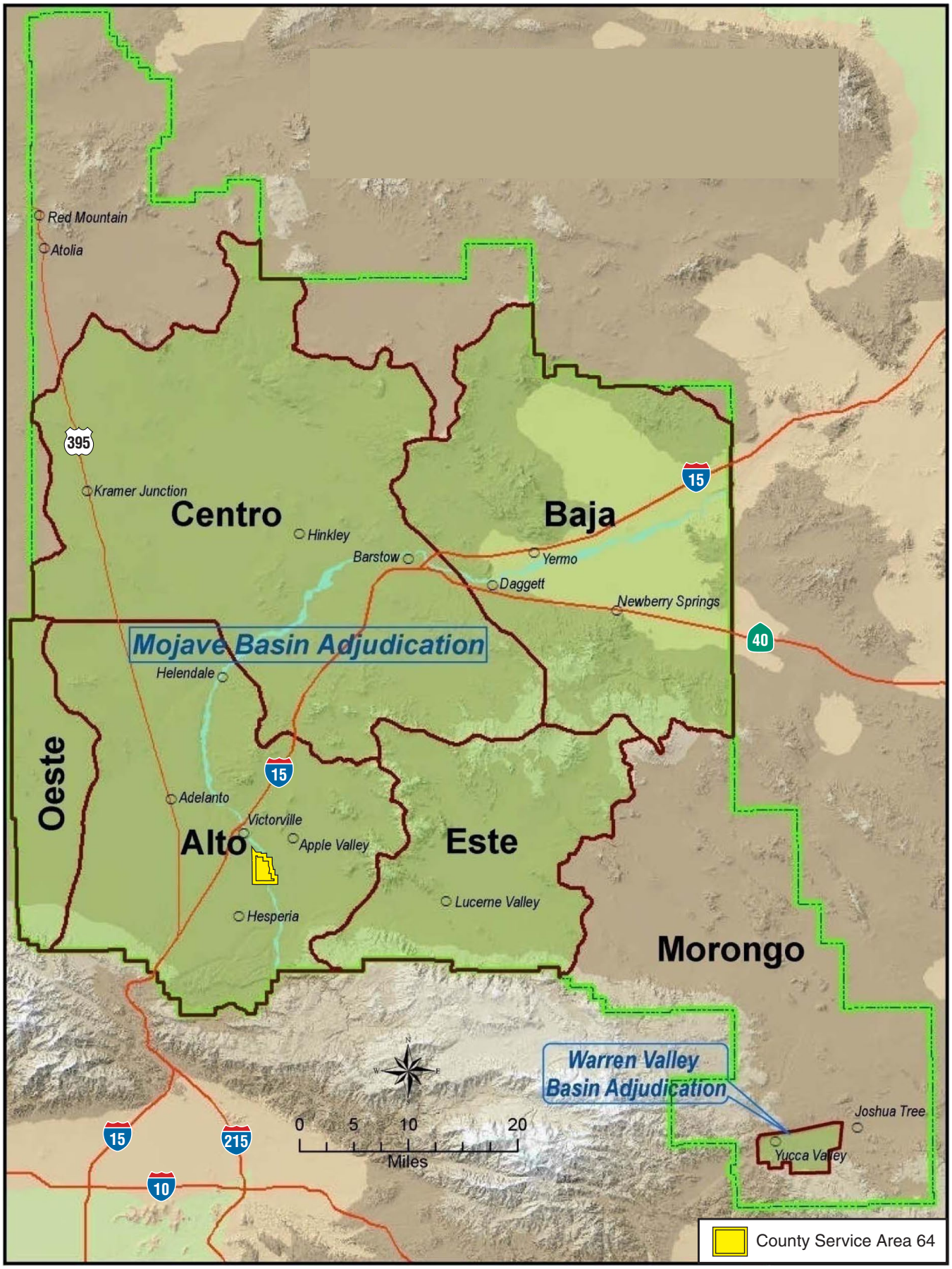
CSA 64, for its part, maintains an active water use reduction and conservation program. Senate Bill 7 (Water Conservation Act of 2009) now requires water wholesalers and retailers to define their baseline water demand and develop a water use reduction program to meet specified goals in order to achieve the mandate of the State of California to reduce its overall per-capita water use reduction goal of 20 percent by 2020. Such mandated conservation has the same effect as a new water supply source that provides an equivalent amount of capacity for an agency's growing water demands. CSA 64's water conservation plan is discussed in detail in Section 5.0.

3.1 Groundwater Basin Description

CSA 64 groundwater is pumped from the Alto Subbasin of the upper end of the Mojave River Groundwater Basin. The Mojave Water Agency is the appointed Watermaster for the basin and is responsible for monitoring its groundwater extractions, determining annual safe yields, and enforcing the rules and regulations of the Stipulated Judgment (1998) for the fair and equitable distribution of its finite supplies. The overall basin overlies two hydrologic regions defined in DWR Bulletin 118-03. The Alto sub-basin lies within the South Lahontan hydrologic region (Region 6). The vast majority of MWA's water demands are supplied by the Alto subbasin, which is shown in **Figure 3-1**.

The Mojave River Groundwater Basin encompasses 1,400 square miles as shown in Figure 3-1 (MWA 2010 UWMP, Figure 3-6), and has an estimated total water storage capacity of nearly 5 million acre-feet. According to the MWA 2010 UWMP, the Mojave River does not flow perennially under present-day conditions except at the Narrows near Victorville, downstream from the Victorville municipal wastewater treatment plant (an area known locally as the "Transition Zone"), and near Afton Canyon. Within the basin groundwater movement occurs between its separate subbasins, as well as groundwater-surface water and groundwater-atmosphere interchanges. Groundwater recharge occurs predominantly by infiltration of water from the Mojave River, which accounts for approximately 80 percent of the total basin natural recharge. Other sources of recharge include infiltration of storm runoff from the mountains and recharge from human activities such as irrigation return flows, wastewater discharge, and enhanced recharge with imported water. Over 90 percent of the basin groundwater recharge originates in the San Gabriel and San Bernardino Mountains. Groundwater is discharged from the basin primarily by well pumping, evaporation through soil, transpiration by plants, seepage into dry lakes where accumulated water evaporates, and seepage into the Mojave River.

Recent investigations by MWA, USGS, and others have resulted in an improved understanding of the geology and hydrogeology of the Mojave Basin Area. Specifically, a more refined examination of the hydrostratigraphy has allowed for differentiation between the more permeable Floodplain Aquifer that has a limited extent along the Mojave River and the more extensive but less permeable Regional Aquifer. The aerial extent of the Floodplain and Regional aquifers is shown on **Figure 3-2**. The Alto Subbasin of the Mojave Basin contains both the Floodplain Aquifer and the Regional Aquifer. The Floodplain Aquifer is composed of sand and gravel weathered from granitic rocks of the San Gabriel and the San



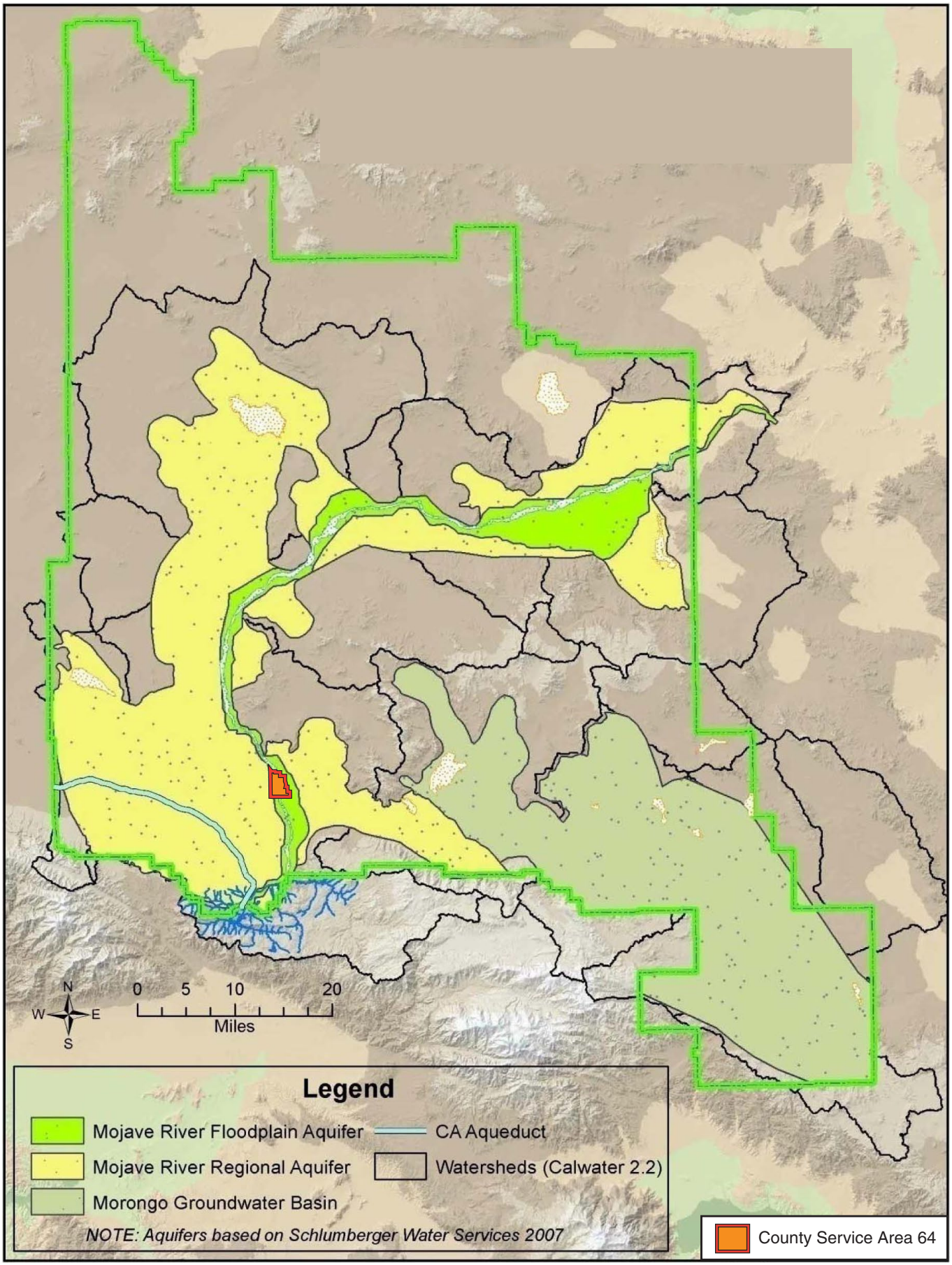
SOURCE: Mojave Water Agency - 2010 UWMP, Final. Figure 1-2.

2010 UMWP • COUNTY SERVICE AREA 64

Mojave Groundwater Basin Subareas

1/13/12 JN 65-100806-18117 MAS

Figure 3-1



SOURCE: Mojave Water Agency - 2010 UWMP, Final. Figure 3-6.

RBF A Baker Company

1/13/12 JN 65-100806-18117 MAS

2010 UMWP • COUNTY SERVICE AREA 64

Mojave Groundwater Basin Aquifers

Figure 3-2

Bernardino Mountains and deposited in a fluvial depositional environment. These highly permeable sediments can yield large quantities of water to wells. The Floodplain Aquifer is directly recharged by infiltration of surface flows from the Mojave River during the winter rainy season. Recharge is greater near the mountain front where surface flows are more frequent.

The Regional Aquifer underlies and surrounds the Floodplain Aquifer with interconnected alluvial fan and basin fill deposits that drain toward the Mojave River (Figure 3-2). In some areas, permeable deposits from the ancestral Mojave River are present, but overall the aquifer is much less permeable than the Floodplain Aquifer. The Regional Aquifer is generally recharged by groundwater movement from the Floodplain Aquifer to the Regional Aquifer, infiltration of runoff from the higher altitudes of the San Gabriel and San Bernardino Mountains, and smaller amounts of runoff from local intermittent streams and washes.

Prior to recent population growth, most of the groundwater production occurred in the Floodplain Aquifer. Groundwater production was initially developed along the Mojave River in the early 1900s. In the mid-1950's, annual groundwater production had increased to about 190,000 AF, with most of the production still occurring along the river. By 1994, about half of the total basin production came from wells located away from the Mojave River in the Regional Aquifer. The increase in water production and the re-distribution of pumping in the basin have significantly influenced the interaction between the Floodplain and Regional Aquifers. Prior to development in the area, groundwater flowed primarily from the Regional Aquifer into the Floodplain Aquifer. However, vertical groundwater gradients have been reversed in recent years, and downward flow from the Floodplain Aquifer is currently the primary recharge mechanism for the Regional Aquifer.

3.1.1 Alto Subbasin Water Levels

Alto Subbasin water levels near the Mojave River are relatively stable, exhibiting seasonal fluctuations with rising levels in winter and declining levels in summer. It is expected that under current pumping conditions and long-term average flows in the river, water levels in the Floodplain Aquifer will generally remain stable. Water levels in the western portion of Alto in the Regional Aquifer exhibit declines consistent with heavy pumping and limited local recharge. Water levels in the eastern portion of Alto indicate similar trends, although to a lesser extent, most likely due to limited pumping in the Regional

Aquifer east of the river and possibly higher localized septic return flow due to the lack of sewers in some areas. Continued pumping in depleted areas of the Regional Aquifer may result in long-term local negative impacts such as declining yields and reduced water quality. As a whole, the Alto Subbasin appears to be in regional balance although portions of the subbasin have shown continued historical declines in water levels. Localized declines in water levels may be minimized by a redistribution of groundwater production and return flows (e.g. construction of local wastewater treatment plants).

3.1.2 Available Groundwater Supply

Current and projected groundwater pumping within the Alto Subbasin of the Mojave Basin is summarized in **Table 3-1** (as defined in MWA 2010 UWMP, Table 3-6).

Table 3-1

Projected Alto Subbasin Pumping, AFY

Year	Projected Pumping Capacity
2010	84,226
2015	93,994
2020	99,440
2025	108,851
2030	118,262
2035	127,674

In the Mojave Basin, Base Annual Production (BAP) rights were assigned by the Mojave Basin Area Judgment to each producer using 10 AFY or more, based on historical production. BAP is defined as the producer's highest annual use verified for the five-year base period from 1986-90. Parties to the Judgment are assigned a variable Free Production Allowance (FPA) by the Watermaster, which is a percentage of BAP. The allocated FPA represents each producer's share of the water supply available. This FPA is reduced or "ramped-down" over time until total FPA comes into balance with available supplies.

Water levels remain stable in most areas currently because verified production is less than the available supply. Based on these recommendations, agricultural producers in Alto have an established FPA that is currently 80 percent of its BAP for the 2010-2011 water year. Alto's FPA for municipal and industrial use was set at 60 percent of its BAP.

MWA, as Watermaster of the Mojave Basin and specifically the Alto Subbasin, determines the Production Safe Yield (PSY) of the sub-basin each year. The PSY is assumed to equal the average net natural water supply plus the expected return flow from the previous year's water production. The Judgment requires that, in the event the FPA exceeds the estimated PSY by five percent or more of BAP, the Watermaster recommends a reduction in FPA equal to, but not more than, a full five percent of the aggregate subarea BAP. Any water user that pumps more than their FPA in any year is required to purchase "Replacement Water" to satisfy make-up obligations (pursuant to the Judgment) equal to the amount of production in excess of the FPA. Replacement obligations can be satisfied either by paying the Mojave Basin Area Watermaster to purchase imported water from MWA or by a temporary transfer of unused FPA capacity from another Alto Subbasin producer.

The following outlines the Alto Subbasin's groundwater production capacities for 2010-11, pursuant to MWA 2010 UWMP, Section 3.4.3.2:

- Base Annual Production (BAP) = 116,412 AFY
- 2010-11 Free Production Allowance (FPA) = 74,534 AF
- 2010-11 Production Safe Yield (PSY) = 69,862 AFY
- 2009-10 Verified Production = 78,493 AF

The FPA does not exceed the PSY by more than five percent of BAP; therefore, the Watermaster did not reduce Alto's 2010-11 FPA. Appendix B of MWA's annual Watermaster reports lists all the major Producers of the Alto Subbasin, and their calculated capacities in order to determine the assessments owed by each Producer. CSA 64's capacities for the last five fiscal years are shown in **Table 3-2**.

Table 3-2
CSA 64 - Watermaster Production Capacities

Year	Base Annual Production (AF)	Free Production Allowance		Verified Production (AF)	Replacement Water Obligation (AF)
		Percent	AF		
2005-06	3,822	60%	2,294	3,734	1,440
2006-07	3,822	60%	2,294	3,764	1,470
2007-08	3,822	60%	2,294	3,476	1,182
2008-09	3,822	60%	2,294	3,433	1,139
2009-10	3,822	60%	2,294	3,247	953
2010-11	3,822	60%	2,294	-	-

Source: Watermaster Annual Reports

3.1.3 Groundwater Management Plan

The California State Legislature passed Assembly Bill 3030 (AB 3030) during the 1992 legislative session allowing local agencies to develop Groundwater Management Plans (GWMPs). The legislation declares that groundwater is a valuable resource that should be carefully managed to ensure its safe production and quality. The legislation also encourages local agencies to work cooperatively to manage groundwater resources within their jurisdiction. Subsequent legislation was passed, (SB 1938, 2002), which made changes and additions to sections of the Water Code created by AB 3030. MWA's 2004 Regional Water Management Plan (RWMP, adopted 2005) includes the GWMP for MWA as it contains all the relevant components related to Groundwater Management Plans in California Water Code Sections 10750-10753.10., as well as the components recommended by DWR in California's 2003 Groundwater Bulletin 118. The "Basin Management Actions" Chapter of the RWMP is included as **Appendix C**, and Bulletin 118 is included as **Appendix D**.

The RWMP complements and formalizes a number of existing water supply and water resource planning and management activities for MWA's service area, including the Alto Subbasin area which encompasses CSA 64 service area. As part of the RWMP, the following Basin Management Objectives (BMOs) were established to plan water supplies through 2020:

1. Balance future water demands with available supplies recognizing the need to:

    - Stabilize the groundwater basin storage balance over long-term hydrologic cycles
    - Protect and restore riparian habitat areas as identified in the Mojave Basin Area Judgment and the Department of Fish & Game Habitat Water Supply Management Plan
    - Limit the potential for well dewatering, land subsidence, and migration of poor quality water
    - Maintain a sustainable water supply through extended drought periods
    - Select projects with the highest likelihood of being implemented

2. Maximize the overall beneficial use of water throughout MWA by:

    - Supplying water in quantity and of quality suitable to the various beneficial uses
    - Addressing issues throughout the MWA service area recognizing the interconnection and interaction between different areas
    - Distributing benefits that can be provided by MWA in an equitable and fair manner
    - Ensuring that costs incurred to meet beneficial uses provide the greatest potential return to beneficiaries of the project(s)
    - Avoiding redirected impacts

Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater basin. With groundwater storage stabilized, there will be groundwater available during surface water supply shortages and delivery interruptions. With a balanced basin, groundwater elevations will be relatively stable. This will reduce the potential for land subsidence and associated aquifer compaction.

The RWMP/GWMP also identifies several water supply projects and management actions to provide a means to achieve the BMOs. Management actions can be grouped into the following seven major elements:

1. Monitoring regional groundwater quantity and quality
2. Improve characterization of the basin
3. Continue long-term planning
4. Groundwater protection
5. Construction and implementation
6. Financing
7. Public participation

Included in the RWMP/GWMP is the assumption that the Mojave Basin adjudication will continue to be implemented. The MWA Board acts as Watermaster for administration of the Mojave Basin Area Judgment. In the Mojave Basin Area, the Mojave Basin Area Judgment requires that annual water production records be collected and verified for producers exceeding 10 AF of production within each of the five Mojave Basin Area subareas, including the Alto Subbasin. As the current Court-appointed Watermaster, much of the monitoring and studies in the Mojave Basin Area is conducted by MWA, based on the monitoring requirements described in the 1998 Judgment. Data collected are reported in the Mojave Basin Area Watermaster Annual Reports to satisfy the mandates of the monitoring requirements. The Management Actions identified neither supersede nor conflict with the Mojave Basin Area Judgment. All provisions of the Judgment are integral parts of the foundation of the GWMP.

In addition to conducting regional groundwater management, MWA works closely with the U.S. Geological Survey (USGS) in a cooperative water resources program by which the USGS assists MWA with monitoring activities in their service area. MWA currently maintains a monitoring network of approximately 900 monitoring wells for regular measurements of water levels. Many of these wells are also sampled periodically for water quality. Using these data, MWA tracks water level trends and fluctuations throughout the service area.

3.2 Groundwater Quality

Contaminants that are currently being monitored within the Alto Subbasin by the MWA include arsenic, nitrates, iron, manganese, Chromium VI, and total dissolved solids (TDS). Measurements in excess of drinking water standards have been found for many of these constituents in the Alto Subbasin. Ongoing water quality monitoring allows identification of more sensitive areas. Groundwater pumping in these areas will have to be avoided, treated or blended.

MWA is also monitoring the accumulation of salt in their groundwater basins. Because the Mojave River Basin is a closed basin, salts concentrated in the locally-generated wastewater, salts contained in the imported reclaimed wastewater, and salts in the SWP supplies have few to no natural outlets from the basin. Although SWP supply introduces salts into the system, the concentrations of key salt constituents are often less than ambient concentrations, resulting in some improvement in local water quality.

From 2005-2009, an annual average of about 4,800 AF of imported wastewater was discharged into the Mojave Basin from outside its boundary. In 2010, approximately 49,680 AF of SWP water was imported. By 2020, MWA is planning to increase its SWP utilization to 53,880 AFY. In an effort to understand potential long-term water quality changes that may occur in the basin over time due to the long-term effects of wastewater and importation of SWP water into the MWA service area, the Lahontan Regional Water Quality Control Board (RWQCB) and the MWA developed a salt balance model for the MWA service area. The model was finalized in 2007 and generally showed that the importation of SWP water mitigated the long-term effects of salt loading (TDS increases) primarily caused by population increases and the associated larger volumes of wastewater entering the Mojave Basin and its subbasins.

Over the past several years, the MWA has made efforts to greatly increase the understanding of the water quantity and quality of the groundwater basins that lie within its service area. MWA currently maintains a monitoring network of approximately 900 monitoring wells that record water levels on a regular basis. Many monitoring wells in the MWA monitoring network are sampled to analyze water quality.

3.3 Alternative Water Sources

Alternative water sources include transfer and exchange opportunities, groundwater banking, and recycled water use. MWA is the lead agency which explores these alternative sources. Therefore,

descriptions outlining their objective and benefit to CSA 64 are summarized from Mojave Water Agency's 2010 UWMP.

The MWA operates under their 2004 RWMP, which defines MWA's overall water management objectives for the period of 2004 through 2020 and identifies a variety of potential projects and programs that could balance future water demands with available supplies and maximize the beneficial use of water throughout the MWA's service area. The RWMP projected that groundwater overdraft, combined with expected growth and associated increasing demand for water, were projected to result in a substantial groundwater recharge requirement by 2020.

The RWMP notes two fundamental actions that could be taken to address groundwater overdraft and future growth/water demand: (1) Supply enhancement projects, either involving groundwater recharge or an increase in groundwater efficiency; and (2) Management actions involving conservation, storage agreements, and water transfers/water banking. The supply enhancement projects have the potential to address the key management issues related to overdraft of groundwater basins, localized water quality issues, and future growth/water demand. These projects are being planned to supplement the other groundwater recharge programs and facilities operated by MWA throughout their service area.

3.3.1 Transfers and Exchanges

Since the drought of 1987-92, the concept of water transfers has evolved into a viable supplemental source to improve supply reliability. Various laws have been enacted in recent years to help define parameters for water transfers and set up a variety of approaches through which water or water rights can be transferred among individuals or agencies.

Opportunities exist for SWP contracting agencies, such as MWA, to receive transfer capacities from agricultural uses in the Central Valley along the SWP and the Central Valley Project (CVP) project. Such voluntary transfers to urban areas, including those within MWA, can involve water sales, conjunctive use and groundwater substitution, and water sharing. The costs of a water transfer would vary depending on the type, term, and location of the transfer. The most likely voluntary water transfer programs would probably involve the Sacramento or southern San Joaquin Valley areas.

3.3.2 Groundwater Banking

MWA is currently developing 'conjunctive use' and groundwater banking projects to improve water supply reliability for its retail agencies, including CSA 64. The conjunctive use MWA is developing is based on storing surface water supplies in a local groundwater basin during times of surplus for use during dry periods when surface water supplies would likely be reduced.

MWA's SWP supply on average is still greater than the demand in its service area. MWA is able to store this water for future use when SWP supplies are not available. This allows MWA to take advantage of wet year supplies by taking it through the SWP system and discharging it into the abundant Mojave Basin groundwater storage capacity. This concept is used in the planned water supply projects, including the Regional Recharge and Recovery Project, currently under construction within the Alto Subbasin.

In 2006, MWA adopted a water banking policy to guide the Agency in determining where water will be "banked". Banking targets were established for each groundwater basin where banking may occur under this Policy to prioritize where available water will be banked. The targets are generally based on the calculation of three times the non-agricultural water demand (groundwater production) within the Subarea. The Alto Subbasin target is 261,000 acre feet. Currently (as of December 2010), MWA has stored excess SWP water in the Alto subbasin of over 87,000 acre feet.

The Regional Recharge and Recovery (RRR) Project is a conjunctive use project currently under construction that will store SWP water in the local aquifer for later recovery and distribution of the water to local retail water purveyors. The Project is part of a comprehensive solution developed by the MWA and the region's stakeholders to ensure a sustainable water supply for the region. It is an integral part of the Regional Water Management portfolio identified in MWA's 2004 RWMP.

The RRR Project will provide a new source of supply for major water providers in the Mojave Basin and offset their need to continue excessive pumping within the declining regional aquifer system. Water providers that benefit from the Project will include CSA 64, as well as other named MWA member agencies within the Alto Subbasin. Phase 1 of the project (15,000 AFY of supply) is estimated for completion in late 2012.

3.4 CSA 64 Groundwater Wells

3.4.1 Current CSA 64 Groundwater Well Capacity

The current water system operates five (5) wells with a total discharge capacity of 5,500 gallons per minute (8,800 acre-feet per year, AFY, operating full-time). Each well will require downtime for maintenance. For the purpose of establishing annual supply, it is assumed that each well could be down up to 50 percent of the time. This would equate to a reliable supply of 4,400 AFY. **Table 3-3** summarizes the total (100 percent utilization) and reliable (50 percent utilization) of the five (5) CSA 64 water supply wells.

Table 3-3
Existing CSA 64 Groundwater Capacity

Well Number	Current, gpm [1]	Current AFY	
		@ 100% Utilization	@ 50% Utilization
W-1	300	480	240
W-3	500	800	400
W-4	1,500	2,400	1,200
W-5	950	1,520	760
W-6 [2]	2,250	3,600	1,800
TOTAL	**5,500 gpm**	**8,800 AFY**	**4,400 AFY**

[1] Based on tests performed 1/23/03 and 10/6/06.
[2] W-6 pump was replaced in 2011. Production records provided by staff indicate a new rated discharge of approximately 2250 gpm.

A comparison of well capacities to current and projected water requirements for CSA 64 is shown in **Table 3-4** and indicates sufficient well pumping capacity exists to supply current and projected average water needs. Additional groundwater pumping capacity may be necessary to maintain an adequate level of redundancy during maximum-day demands.

Table 3-4
Projected Water Demand as Percent of Total Well Production

Year	Water Requirements (AFY)	Total Rated Well Capacity (AFY) [1]	Water Requirements as Percent of Well Capacity
2010	3,503	4,400	80%
2015	4,239	4,400	96%
2020	3,963	4,400	90%
2025	4,155	4,400	94%
2030	4,347	4,400	99%
2035	4,539	4,400	103%

[1] Rated capacity assumed at 50% utilization.

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SECTION 4.0
WATER FACILITIES AND SUPPLY RELIABILITY

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SECTION 4.0
WATER FACILITIES AND SUPPLY RELIABILITY

4.1 WATER FACILITIES

The existing CSA 64 water system serves an area of approximately 2,576 acres (4.0 square miles) with an estimated 3,681 residential service connections, and 67 non-residential service connections. The system is divided into two (2) pressure zones. Currently, water services in each zone are gravity fed from storage reservoirs located at higher elevations to maintain a fixed hydraulic gradient throughout the distribution via gravity.

4.1.1 Transmission and Distribution Pipeline

The majority of the distribution system consists of asbestos cement pipe ranging in size from 6-inch to 12-inch in diameter with some 4-inch diameter pipeline located in street cul-de-sacs. Transmission pipeline from the upper zone storage site to the CSA64 distribution system consists of 12-inch and 16-inch pipelines.

4.1.2 Storage Facilities

CSA 64 incorporates above-ground storage facilities for direct service to each of its two pressure zones. The Zone 1 storage site is located on Ridgecrest Road, and provides a total capacity of one (1.0) million gallons (MG). The Zone 2 storage site is located on Santa Fe Avenue East, and provides a total storage capacity of 1.65 MG. Currently, CSA 64 operates one tank at the Zone 1 site and 2 tanks at the Zone 2 site. **Table 4-1** outlines the physical characteristics of the storage facilities.

Table 4-1
Existing Storage Reservoirs

Location	No.	Zone Served	Elevation		Diameter (ft)	Height (ft)	Volume (MG)
			Base (Ft)	HWL (Ft)			
East Santa Fe	2A	Upper	3,019	3,050	60	32	0.65
East Santa Fe	2B	Upper	3,019	3,050	75	32	1.00
						Subtotal Upper Zone	1.65
Ridgecrest Rd	1	Lower	2,910	2,941	75	32	1.00
						Subtotal Lower Zone	1.00
						Total Capacity	2.65

CSA 64 proposes to add storage capacity at each site to improve reliability and increase well pumping efficiency. Staff have plans to construct new storage reservoirs with a total of six million gallons of storage, which will increase system reliability during the high demands in the summer months.

4.1.3 Supply Facilities

CSA 64 currently relies on groundwater as the primary source of supply. The water system operates five (5) wells with a total discharge capacity of approximately 5,500 gallons per minute. **Table 4-2** provides a breakdown of the active wells and their discharge capacities, as well as annual production volume based on 50 percent (12 hours/day), 75 percent (16-hours/day) and 100-percent (24 hours/day) utilization.

Table 4-2
Existing Supply from Wells

Well	Rated Discharge Capacity [1] (gpm)	Annual (AF) Production at….		
		50% Utilization	75% Utilization	100% Utilization
W-1	300	240	360	480
W-3	500	400	600	800
W-4	1,500	1200	1,800	2,400
W-5	950	760	1,140	1,520
W-6	2,250 [2]	1,800	2,700	3,600
TOTAL	**5,500**	**4,400**	**6,600**	**8,800**

[1] Based on tests performed 1/23/03 and 10/6/06.
[2] W-6 pump was replaced in 2011. Production records provided by staff indicate a new rated discharge of up to 2295 gpm.

Groundwater is projected to remain the primary source of supply for all CSA 64 water users. As detailed in Section 3.0, the MWA 2004 RWMP defines the groundwater management plan which incorporates the Mojave Groundwater Basin 1998 Stipulated Judgment and governs all significant users (referred to as Pumpers or Producers) of the basin and its subbasins including the Alto Subbasin. As further described in Section 3.0, the GWMP defines the Watermaster's (MWA) activities which are successfully returning groundwater levels to safe elevations in each of the subbasins and enhancing the overall operation of the basin for optimum reliability.

As the initial steps of the Stipulated Judgment, the Watermaster calculated each Producer's base annual production from past production records and administered a "ramp-down" period in attempt to bring the basin production to more sustainable levels. For the Alto Subbasin, this has reduced the Producers to approximately 60 percent of BAP. Thus CSA 64, and all other Producers of the Alto Subbasin dependent upon groundwater, typically requires replenishment water for safe basin operation and to sustain the basin's viability as a primary water supply. As a contract agency of the SWP, the Watermaster also acts as wholesale water provider of imported SWP water for replenishment of the Mojave Groundwater Basin. MWA incorporates a strict monitoring program that tracks all basin production (output) and recharge (input), and administers the preparation of annual groundwater reports that identify key basin parameters to calculate each Producer's share of safe basin yield for the ensuing 12-month period. Specifically, the annual reports calculate Production Safe Yield as well as each Producer's Free Production Allowance (FPA) and their verified production for the previous 12 months.

4.2 SUPPLY RELIABILITY

In any given year, the variability in weather patterns around the state may affect the availability of groundwater replenishment supplies from the SWP to MWA (and, in turn, to CSA 64). MWA's service area is typical in terms of water management in southern California; local groundwater supplies are used to a greater extent when imported supplies are less available due to dry conditions in the north, and larger amounts of imported water supplies are used during periods when northern California has wetter conditions. This pattern of "conjunctive use" has been in effect since SWP supplies first became available to CSA 64's wholesale water supplier (MWA) in 1978. SWP supplies have supplemented the overall supply of MWA's service area, which previously depended solely on local groundwater supplies.

To supplement these local groundwater supplies, MWA contracted with the California Department of Water Resources (DWR) for delivery of SWP water, providing an imported water supply to the groundwater basins. However, the variability in SWP supplies affects the ability of MWA to meet the overall water supply needs for the service area. Among MWA's available supply sources, the SWP supplies are most variable, and therefore have the largest effect on supply reliability.

MWA's 'Table A' amount identifies the maximum amount of water the Agency can request. However, the amount of SWP water actually allocated to MWA (as well as all SWP contractors) each year is dependent on a number of factors than can vary significantly from year to year. The primary factors affecting SWP supply availability include hydrologic conditions in northern California, the amount of water in SWP storage reservoirs at the beginning of the year, regulatory and operational constraints, and the total amount of water requested by the contractors. The availability of SWP supplies to MWA is generally less than their full Table A amounts and can be significantly less in very dry years.

MWA uses DWR's *State Water Project Delivery Reliability Report 2009* (August 2010), to assess the reliability of the SWP component of their overall supplies. The Report updates DWR's estimate of the current (2009) and future (2029) water delivery reliability of the SWP. The updated analysis shows that the primary component of the annual SWP deliveries (Table A) will be less under current and future conditions, when compared to the preceding report (SWP Delivery Reliability Report 2007).

In the 2009 Report, DWR presents the results of its analysis of the reliability of SWP supplies, based on model studies of SWP operations. In general, the DWR model studies show the anticipated amount of SWP supply that would be available for a given SWP water demand, given an assumed set of physical facilities and operating constraints, based on 82 years of historic hydrology. The results are interpreted as the capability of the SWP supply to meet the assumed SWP demand, over a range of hydrologic conditions, for that assumed set of physical facilities and operating constraints. In these model studies, DWR assumed existing SWP facilities and operating constraints for both 2009 and 2029. Using these studies DWR has projected future SWP delivery reliability for MWA, as a percent of their Table A amount, to be 60- to 61- percent for long-term average supply until 2035.

4.2.1 Supply and Demand Comparison

CSA 64 has historically been able to pump as much water as necessary to supply its domestic water demands. In recent years, CSA 64 has been assessed replenishment charges due to pumping in excess of its free production allowance, as described in Section 3.0. Therefore, in order to provide adequate assessment of the groundwater basin's capacity as a whole, a review of MWA's Supply and Demand analysis considering all Producer's of the Alto Subbasin is included here.

The available supplies and water demands for MWA's service area were analyzed in their 2010 UWMP to assess the region's ability to satisfy demands during (1) average water year, (2) single-dry year, and (3) multiple-dry years. **Table 4-3** presents the base years for the development of water year data.

Table 4-3
Basis of Water Year Data

Water Year Type	Base Years	Historical Sequence
Average Water Year	Average	1922-2003
Single-dry Year	1977	-
Multiple-dry Year	1931-1934	-

Source: MWA 2010 UWMP, Table 6-2.

4.2.1.1 Average Water Year

Table 4-4a summarizes MWA's water supplies available to meet demands in five-year increments to year 2035 during an average/normal year. Reliable SWP supplies are set at 60 percent of Table A as the long-term average supply until 2029, and increased to 61 percent in 2029 and beyond. MWA's water supply sources consist of imported supplies from the State Water Project for banking and replenishment obligations, and local sources for enhancement of the groundwater supplies (i.e. natural supply, agricultural depletion, return flow, and wastewater import).

Table 4-4a
Mojave Basin - Projected Average/Normal Year Supplies and Demand (AFY)

	2010	2015	2020	2025	2030	2035
Total Existing Supplies	181,674	189,113	195,194	201,001	207,698	213,490
Total Estimated Demands	151,885	163,161	170,496	181,740	192,969	204,181

Source: MWA 2010 UWMP, Table 6-3.

Thus, during a normal rainfall year, MWA can meet the groundwater replenishment needs for CSA 64 and all other Producer's of the Alto Subbasin.

The supplies and demands for the various drought scenarios for the projected planning period of 2010-2035 in five year increments, as defined in the MWA 2010 UWMP, are presented below. **Table 4-4b** outlines CSA 64's component demands and required portion of the overall regional supply in order to meet its projected demands in the same five-year increments to year 2035 during an average/normal year.

Table 4-4b
Normal Year Supply and Demand Comparison, AFY

Demand	Current [1]	2015 [2]	2020 [2]	2025	2030	2035
Residential	2,812	2,965	3,118	3,270	3,423	3,576
Non-Residential	197	351	506	660	814	969
Landscape	191	310	429	548	667	786
Water Loss [3]	304	272	243	269	294	320
Total Demand	**3,504**	**3,898**	**4,296**	**4,747**	**5,198**	**5,651**
TARGET (20x2020) DEMAND	**3,504**	**4,239**	**3,963**	**4,155**	**4,347**	**4,539**

Supply						
Watermaster FPA [4]	2,294	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water	1,210	1,945	1,669	1,861	2,053	2,245
Groundwater Banking	0	0	0	0	0	0
Non-Potable / Recycled Water	0	0	0	0	0	0
SUPPLY FOR TARGET DEMAND	**3,504**	**4,239**	**3,963**	**4,155**	**4,347**	**4,539**

[1] Current demand represents average demand for years 2006 through 2010.
[2] Assumes even distribution of water demand increase between the land use categories.
[3] Goal is to reduce water loss to 6 percent by 2020.
[4] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

4.2.1.2 Single-Dry Water Year

Table 4-5a outlines MWA's water supplies available to meet demands in five-year increments to year 2035 during single- and multiple-dry year scenarios, similar to the droughts that occurred in California in 1977 and 1931-34, respectively.

Table 4-5a
Mojave Basin - Projected Single- and Multiple-Dry Year Supplies and Demand (AFY)

	2010	2015	2020	2025	2030	2035
Total Existing Supplies	167,074	179,477	187,546	199,914	212,266	224,599
Total Estimated Demands	167,074	179,477	187,546	199,914	212,266	224,599

Source: MWA 2010 UWMP, Table 6-4.

During these dry year scenarios, SWP availability was anticipated to be reduced to seven (7) percent in 2009 and 11 percent in 2029. Although the percent of Table A amounts available are projected to be higher for multiple-dry years (34 percent in 2009 and 35 percent in 2029), the demand by its member agencies, including CSA 64, are projected to be the same in each scenario. Therefore, projected production (supply) need not exceed demand. **Table 4-5b** through **Table 4-5g** outlines CSA 64's component demands and required portion of the overall regional supply in order to meet its projected increased demands for dry year scenarios during each future five-year span out to year 2035. The demand during these dry year scenarios is assumed to increase by 10 percent due to increased irrigation needs. The water supply shortfall is expected to be made up from groundwater banking to match the anticipated demands.

Table 4-5b
Dry Year Supply and Demand Comparison - 2010

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2011	2012	2013
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	1,210	85	85	411	411
Groundwater Banking	0	1,476	1,476	802	455
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**3,504**	**3,854**	**3,854**	**3,507**	**3,160**
Total (20x2020) Demand [1]	**3,504**	**3,854**	**3,854**	**3,507**	**3,160**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

Table 4-5c
Dry Year Supply and Demand Comparison - 2015

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2016	2017	2018
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	1,945	136	136	661	661
Groundwater Banking	0	2,233	2,233	1,287	867
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**4,239**	**4,663**	**4,663**	**4,242**	**3,822**
Total (20x2020) Demand [1]	**4,239**	**4,663**	**4,663**	**4,242**	**3,822**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

Table 4-5d
Dry Year Supply and Demand Comparison - 2020

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2021	2022	2023
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	1,669	117	117	567	567
Groundwater Banking	0	1,948	1,948	1,105	712
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**3,963**	**4,359**	**4,359**	**3,966**	**3,574**
Total (20x2020) Demand [1]	**3,963**	**4,359**	**4,359**	**3,966**	**3,574**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

Table 4-5e
Dry Year Supply and Demand Comparison - 2025

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2026	2027	2028
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	1,861	130	130	633	633
Groundwater Banking	0	2,146	2,146	1,232	820
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**4,155**	**4,571**	**4,571**	**4,158**	**3,746**
Total (20x2020) Demand [1]	**4,155**	**4,571**	**4,571**	**4,158**	**3,746**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

Table 4-5f
Dry Year Supply and Demand Comparison - 2030

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2031	2032	2033
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	2,053	144	144	698	698
Groundwater Banking	0	2,344	2,344	1,358	927
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**4,347**	**4,782**	**4,782**	**4,350**	**3,919**
Total (20x2020) Demand [1]	**4,347**	**4,782**	**4,782**	**4,350**	**3,919**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

Table 4-5g
Dry Year Supply and Demand Comparison - 2035

Water Supply	Normal (AF)	Single-Dry Year (AF)	Multiple Dry Years (AF)		
			2036	2037	2038
Watermaster FPA [2]	2,294	2,294	2,294	2,294	2,294
Purchased Replenishment Water [3]	2,245	157	157	763	763
Groundwater Banking	0	2,542	2,542	1,485	1,035
Non-Potable / Recycled Water	0	0	0	0	0
Total supply	**4,539**	**4,993**	**4,993**	**4,542**	**4,092**
Total (20x2020) Demand [1]	**4,539**	**4,993**	**4,993**	**4,542**	**4,092**

[1] Assumes 10% increase in demand for first year of dry year conditions, and 10% decrease for 3rd year of multi-dry year conditions.

[2] Assumes the currently set portion of Base Annual Production (60%) will continue to define the Free Production Allowance from the Alto Subbasin.

[3] Based on MWA defined SWP supplies during dry years: Single-dry year = 7% of Table A amount to 2029, and 11% of Table A amount thereafter; Multi-dry year = 34% of Table A amount to 2029, and 35% of Table A amount thereafter.

SECTION 5.0
WATER CONSERVATION MEASURES

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SECTION 5.0
WATER CONSERVATION MEASURES

5.1 CONSERVATION AND DEMAND MANAGEMENT

The County's conservation program for CSA 64 is based on the 14 Demand Management Measures (DMMs) listed in the DWR UWMP Guidebook. CSA 64 is not a member of the California Urban Water Conservation Council (CUWCC). However, CSA 64 is a member of the Alliance for Water Awareness and Conservation (AWAC) organization, which provides conservation program support to member agencies throughout the Mojave Water Agency service area.

The County's conservation and demand management program goals are to increase water use efficiency and meet the 20x2020 gpcd targets. The program is divided into foundational and programmatic measures, in line with the CUWCC, as shown in **Table 5-1**. Foundational measures address County operational practices that enhance water measurement and management and support efforts to improve water use efficiency. The County does not estimate or track water savings for the foundational measures, as each measure is an unquantifiable measure per the CUWCC. Programmatic BMPs will be evaluated for effectiveness by tracking customer participation and response to the programs. Although potential water savings can be theoretically calculated for programmatic BMPs, the County will instead track overall gpcd values. The County will track overall production, customer usage, and gpcd to determine the effectiveness of the overall program and help refine the program as needed to maintain gpcd target goals. The County will develop a gpcd tracking tool for internal demand management use and for use as an external communications tool to notify customers of target progress. The tool will track monthly production data, bi-monthly meter read data, population data, and weather-based correction factors to develop a monthly gpcd value and compare the value to the target goal.

Table 5-1
CSA 64 Conservation Program

BMP	Title	Type
1	Residential Water Use Survey	Programmatic
2	Residential Plumbing Retrofit	Programmatic
3	System Audit and Leak Repair	Foundational
4	Metering with Commodity Rates	Foundational
5	Large Landscape Programs	Programmatic
6	Washing Machine Rebate	Programmatic
7	Public Information Programs	Foundational
8	School Education Programs	Foundational
9	Commercial, Institutional, Industrial Programs	Programmatic
10	Wholesaler programs – not applicable	Foundational
11	Conservation Rates	Foundational
12	Conservation Coordinator	Foundational
13	Water Waste Prohibition Ordinance	Foundational
14	High Efficiency Toilet Rebates	Programmatic

BMP 1: Water Survey Programs for Single-Family and Multiple-Family Residential Customers

The County offers water use audits to all of its customers. Depending on customer request, the survey may include an irrigation system review, meter calibration, meter replacement if older than ten years, leak detection, and landscape review and information. The County does not conduct indoor water audits, but will be adding a customer indoor questionnaire to the audit procedures. The indoor questionnaire will ask the customer to quantify number and type of toilets, washing machines, showerheads, and faucet aerators, as well as other water use information. The customer will be offered information on the County's indoor conservation programs and information on water efficient devices and practices.

The County will use the indoor survey results to inform and support its conservation program analysis and review so that the most efficient program can be offered to its customers.

BMP 2: Residential Plumbing Retrofit

The County is planning to implement this DMM within the next budget cycle and is currently developing the program requirements and budget. The County will purchase retrofit kits for distribution to customers during a water survey audit (DMM 1), or for pickup at the County's office. The County may also distribute retrofit kits during public outreach events depending on the ability to identify and verify its own customers at these larger, valley-wide outreach events. The County will work with the AWAC to investigate partnering opportunities to standardize a retrofit kit program amongst all of the AWAC members.

The retrofit kits could contain WaterSense compliant faucet aerators and low flow showerheads, hose sprayers with automatic shutoff, toilet leak detection kits, information, or other items, depending on the kit selected. The program budget will evaluate staff efforts and costs, alternative kits, and maximum annual expenses. It is anticipated that budget will only be available for a fixed number of kits per year. Once all kits are distributed in a given budget year, additional kits will become available in the next budget year.

BMP 3: System Water Audits, Leak Detection and Repair

The County continually evaluates its system for unaccounted for water. The County monitors the system through SCADA, field crew observations, customer reports, and visual inspection by employees and crews who can react quickly to repair a detected or reported leak. Staff also checks the meter box for leaks when conducting meter maintenance and either repairs leaks on the County's side, or notifies the customer of leaks on the customer's side of the meter. Water main leaks are typically repaired within the same day and field staff prepares a leak repair report. These reports are reviewed and tabulated by management staff including plotting of leak locations and frequency on a water distribution map. From these records, short and long-term plans are developed for replacement of chronically leaking infrastructure.

The County completed a $2 million service connection replacement program in October 2011, which replaced all CSA 64 customer service lines. The program was identified as a priority based on operations and maintenance data, observations of high numbers of service line leaks, and overall system water loss.

The County is actively working to increase its leak detection and repair, and non-revenue water monitoring efforts. Operations and maintenance staff have been trained on leak detection methods through the California Rural Water Association. The County is budgeting for leak detection equipment in the next budget cycle. The County also plans on using the AWWA Water Audit model to track and identify non-revenue water components. This data will be used to focus the non-revenue water reduction efforts on the appropriate elements.

The County is also upgrading its production meters to improve meter performance and accuracy. In addition, meters will be added to the well lube lines to account for pumping water use. This improved tracing and accounting of actual water production will increase the non-revenue water analysis accuracy and support the gpcd tracking and compliance efforts.

BMP 4: Metering with Commodity Rates for all New Connections and Retrofit of Existing

The CSA 64 service area is 100 percent metered. All customers are billed bi-monthly based on commodity rates, including a three-tier price structure. All new customers are metered and billed on the metered rate.

The County is currently budgeting for a meter replacement program that includes installation of a tower-based automatic meter reading system. The County installed meters on all of its customer connections from approximately 1994 to 1995. Therefore, most of the customer meters are nearing the end of their expected life and should be replaced. The meter replacement program will replace the older meters and add a radio transmitter to allow automatic meter reading. A radio tower will be installed to receive the meter reads. The radio read system will include computer hardware and software that translates the meter read data and works through the customer database interface to support customer billing. The program will also include database query tools and reports to allow County staff to investigate daily, or even hourly, customer demands in order to identify potential leaks and develop demand management programs to cost effectively meet the gpcd compliance requirements.

BMP 5: Large Landscape Conservation Programs and Incentives

The County and AWAC provide extensive landscape education materials to all its customers. Materials include information on desert landscape designs and recommended plantings. The program has developed six prototype landscape designs to educate customers on landscape and planting options.

The program also provides a cash-for-grass rebate when funding is available. AWAC currently relies on grant funding for the cash for grass program. The current program (November 2010 through March 1, 2011) provides up to $0.50 per square foot to remove turf and replace with lower water using plants or materials. Each customer can receive up to a maximum of $3,000.

The County is preparing a program and budget to provide landscape surveys and water budgets to its large landscape customers. The program will be offered to non-residential customers. County staff will measure the landscape area, catalog the irrigation system, develop a landscape water budget, develop recommendations for planting or irrigation system improvements, and provide the findings in a report to the customer. The program will also provide recommendations and informational assistance to convert mixed-use meters to landscape meters. The water budget will show at least monthly watering requirements and procedures for the customer to check actual water use versus budget values.

The County Land Use Services Department is responsible for land use planning and ordinances. The Department adopted the State Model Efficient Landscape Ordinance on January 1, 2001 per State statute. The County CSA will work with the County Land Use Department to implement the Landscape Ordinance requirements for each of its water service areas.

BMP 6: High-Efficiency Washing Machine Rebate Program

The AWAC implements a rebate program available to County customers. The program provides rebates for the purchase of high-efficiency washing machines when funding is available. AWAC relies on grants to fund the program. Currently, the previous grant funding the program has been expended, and the program is not offering rebates at this time. AWAC will continue to apply to grants to re-fund the program. The County will work with AWAC to identify and apply for grant opportunities.

BMP 7: Public Information Programs

The County provides information on its water conservation program and on water conservation to the public through its own efforts and through AWAC. The public information program includes informational materials, community event participation, speakers bureau, print and radio advertisements and public service announcements, newsletters, and other efforts.

The AWAC annually participates in over 15 community events such as festivals, home and garden shows, and fairs. AWAC provides a booth and staff to answer questions, handout information and literature, and raise water use awareness. County staff participate in the AWAC booths and presentations. An annual calendar is published that provides month-specific water use tips and conservation information. Newsletters and special newspaper inserts provide information on conservation programs and resources. Specific public workshops are offered to provide information on high desert plant species, indoor and outdoor water conservation, planning and operating water efficient irrigations systems, planning and maintaining water efficient landscape, water system winterizing, and other topics. A plant of the month is identified and promoted each month through the various media such as print, radio, website, and special events. The County also promotes these events and opportunities to its customers through its website, bill stuffers, and other advertising. Most of the printed material is available to customers at the County's office.

BMP 8: School Education Programs

The County is budgeting to implement a school education program. The program will include purchasing grade-specific water efficiency educational materials for distribution to teachers and schools in the County's service area. County staff will develop school presentations and promote the program to the local schools. A strategic implementation plan will identify educational materials to purchase, presentation training and development, school and teacher outreach plan, schedule, and required budget. The County will also coordinate with AWAC to identify program elements that could be implemented through AWAC on a valley-wide basis.

BMP 9: Conservation Programs for Commercial, Industrial and Institutional (CII) Accounts

The County is currently developing a conservation program for its CII customers. CSA 64 has relatively few CII connections (51 out of the total 3,748 connections). The CSA also maintains 16 landscape irrigation connections that are mostly attributed to CII accounts. Of the total CII and Landscape connections, there are only 67 customers, as many customers have multiple connections. Most of the CII customers are schools or retail business. The County is developing a program to better understand the CII customer water uses in order to provide relevant water efficiency programs.

The program will conduct a CII and Landscape connection analysis by reviewing account information and grouping connections together for the same customer. All connections with indoor and outdoor usage will be identified. Meter water use per customer will be developed to establish historic baselines. The water use analysis will be conducted in parallel with DMM 5, Large Landscape Programs, and will include the water budgets developed under DMM 5.

The County will develop and offer a water use survey program for its CII customers. The survey will identify water using practices, fixtures, and equipment, in addition to the landscape survey elements from DMM 5. A survey report will be developed for the customer identifying findings and recommendations for improving water efficiency. The County will use the survey findings coupled with the ongoing customer water use data analysis to determine which, if any, specific implementation and/or informational programs to offer its CII customers.

BMP 10: Wholesale Agency Assistance Programs

The County CSA 64 is a retail water agency and, as such, DMM 10 is not applicable. However, as a member of AWAC, the County does coordinate with conservation efforts provided by the Mojave Water Agency and AWAC.

BMP 11: Conservation Pricing

All CSA 64 connections are metered and charged on a three-tiered metered rate. The metered rates consist of two parts; facility charge and volumetric charge. Each customer is charged a facility charge based on meter size. The three-tiered water rate structure contains increasing volumetric prices and is applicable to all customers. Meters are read bi-monthly and customers are billed bi-monthly.

BMP 12: Conservation Coordinator

The County's deputy director serves as the conservation coordinator. Specific programs and/or tasks are delegated to the appropriate operations and maintenance, customer service, or outreach staff. The County also coordinates with the fulltime staff at AWAC who implement extensive public outreach efforts, information programs, and rebate programs. The County conservation coordinator duties include coordination and oversight of conservation program and BMP implementation, and coordination and participation in AWAC programs and AWAC committees.

BMP 13: Water Waste Prohibition

The County's Water Conservation Ordinance SD 90-11 (**Appendix E**) prohibits water waste and is an ongoing component of the water conservation program. SD 90-11 includes the following water waste prohibitions:

- Water shall be confined to the customer's property and shall not be allowed to run-off to adjoining properties or to the roadside ditch or gutter. Care shall be taken not to water past the point of saturation.
- Washing streets, parking lots, driveways, sidewalks, or buildings, except as necessary for health, esthetic, or sanitary purposes, is prohibited.
- Landscape irrigation is only allowed during certain times of the day, depending on annual season.
- Non-commercial vehicle washing only allowed with automatic shutoff device on hose.
- Only recycled water is allowed for use in decorative fountains.
- Water shall not be allowed to leak, leaks must be repaired in a timely manner.

- Restaurants only provide water upon request.
- Construction water must be used in an efficient manner.
- All new construction must be equipped with low flow devices.
- All new model home and commercial construction landscape must use native or drought-tolerant plantings and must use highly efficient irrigation systems.
- Cooling systems must use recycled water to the extent possible.
- All new pools and spas must be covered.
- Hotels/motels inform customers to conserve water.
- Current customers encouraged to install flow reduces and faucet aerators.
- Parks, golf courses, cemeteries, and school grounds only irrigate between 9:00 PM and 3:00 AM.

The water waste prohibition program is implemented as part of the County's water shortage contingency plan. Penalties for violations include installation of flow restrictor device or service shutoff, with customer responsible for all costs. Depending on hydrologic or supply conditions, additional constraints on water use are enforced by the County through additional violation notices and fines.

BMP 14: Residential Toilet Replacement Program

The County is developing a toilet replacement rebate program for inclusion in the 2012/2013 budget. The program will offer rebates for customer to replace existing 1.7 gallon per flush or larger toilets with high efficiency toilets (HET). Program implementation will include promotional material describing the program and enrollment information. Information will be provided on the County's website, in customer bills, at public outreach events, and at the County office. Customers receiving rebates will be required to complete the water audit and indoor water use survey to maximize the overall water efficiency potential for each customer. Survey information will be collected and analyzed to help the County improve and focus its conservation program to maintain gpcd compliance.

The rebate program will be funded on an annual basis at a set amount. Once the budget is expended for the fiscal year, additional rebates will not be available until funding is provided in the next fiscal budget

cycle. Depending on each annual budget, the County may adjust the rebate amount to better match customer participation and coverage potential. The County will also pursue additional funding and potential development of a regional program through coordination with the AWAC.

5.2 WATER SHORTAGE CONTINGENCY

County Service Area 64 has legal responsibility to provide for the water needs of the community to meet health and safety standards. In order to minimize the social and economic impact of water shortages, CSA 64 will manage its water supply prudently. This plan is designed to maintain a minimum of 50 percent of normal supply during a severe or extended water shortage. For CSA 64, the 50 percent normal per capita supply equates to 100% supply at some of the desert communities. The following demand reduction program triggering levels are established for consideration by the County Board of Supervisors to ensure that CSA 64 will continue to meet its water supply obligations.

CSA 64's water source is groundwater. The various stages of demand reduction could be triggered by unforeseen shortages (multiple breakdown of wells at any time).

5.2.1 Stages of Action

Ordinance No. SD 90-11 (Appendix E) established water conservation measures during periods of water supply shortages and emergencies. The ordinance provides for prohibitions on wasteful water uses and permits daily irrigation of landscape or vegetated areas only during specified hours. The Ordinance provides for a single stage of water reduction utilizing a combination of voluntary and mandatory conservation measures. **Table 5-2** represents a four-tiered set of reduction goals.

Table 5-2
Shortage Triggers and Reduction Goals

Shortage	Demand Reduction Goal	Type Program
up to 10%	10% reduction	Voluntary/Mandatory Conservation
11-20%	20% reduction	Voluntary/Mandatory Conservation
21-35%	35% reduction	Voluntary/Mandatory Conservation
36-50%	50%+ reduction	Voluntary/Mandatory Conservation

Priorities for use of available water for this shortage contingency plan are:

1. Health & Safety - interior residential and fire fighting;
2. Commercial, Industrial & Municipal (in-office use) - maintain jobs & economic base;
3. Existing Landscaping - especially trees and shrubs;
4. New Demand - project under construction when shortage is declared

Consumers will be notified of the specific percentage reductions requested at each level of shortage as presented in Table 5-2. If further water usage reduction beyond the request of 10 percent is warranted, CSA 64 staff will inform consumers of the need for greater conservation. If reduction goals cannot be met by Ordinance SD 90-11, the County Board of Supervisors must take appropriate actions (after public hearings) which are supported by thorough engineering evaluations.

County Service Area 64 has established the following restriction on specific uses and other conservation measures.

(a) Lawns, trees, shrubs, and other landscaping shall not be excessively watered at any time, and water shall not be permitted to run off private property onto streets or adjacent lands.

(b) Sidewalks, walkways, driveways, parking areas, patios, porches or verandas shall not be washed off with hoses. The exception to this shall be flammable or other similar dangerous substances that require direct hose flushing.

(c) Watering, sprinkling, aerial watering or irrigation of any landscaped or vegetated areas, including lawns, trees, shrubs, grass, ground cover, plants, vine gardens, vegetables, flowers, or other landscaping shall not occur between the hours of 6:00 a.m. and 9:00 p.m. during the high use season (April 1 through October 31 of each year). In the low use season (November 1 through March 31), such watering shall not occur between the hours of 1:00 p.m. and 8:00a.m. These restrictions shall not apply to hand-held hose or drip irrigation systems.

(d) Non-commercial washing of privately owned vehicles, trailers, motor homes, busses, boats and mobile homes is prohibited except from bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse.

(e) Water shall not be used to clean, fill, operate or maintain levels in decorative fountains, unless such water is part of a recycling system.

(f) Water shall not be permitted to leak from any water line, faucet or other facility on any premises. Any leak shall be repaired in a timely manner.

(g) Restaurants or other public places where food is served shall not routinely provide glasses of drinking water to customers unless specifically requested.

(h) Water for construction purposes, including, but not limited to, debrushing of vacant land, compaction of fills and pads, trench backfill and other construction uses, shall be in an efficient manner. The use of "rainbird" type sprinklers is not recommended between the hours of 6:00 a.m. and 6:00 p.m.

(i) The use of water for any purpose shall not result in flooding or runoff onto gutters, driveways, streets or adjacent lands.

(j) All new construction, including residential, commercial and industrial, shall be equipped with low flow toilets with a maximum tank size or flush capacity of 3 gallons, and showerheads with a maximum flow capacity of 2 gallons per minute.

(k) All new model homes and commercial and industrial development, when landscaped, shall include low water use, drought-tolerant or native plant material, and matched precipitation rate, low-volume sprinkler heads, bubblers, drip irrigation and timing devices. Timing devices should include soil moisture sensors. Before any permit may be issued for new construction, the applicant shall submit a landscape plan for review and approval by the Director of San Bernardino County's Department of Land Management.

(l) Water use for cooling systems must be recycled to the extent possible.

(m) Evaporation resistant covers are required for all new swimming pools and hot tubs and are encouraged for existing pools. Safety covers required by this ordinance shall, at the time of purchase, installation and all subsequent maintenance, meet or exceed current standards and specifications for swimming pools, spa and hot tub covers adopted by the American Society for Testing and Materials (ASTM).

(n) Hotels/motels are required to post notices urging guests to conserve water.

(o) All current water customers are encouraged to install flow reducers and faucet aerators.

(p) Parks, golf courses, cemeteries, and school grounds which use water provided by the District, shall irrigate between the hours of 9:00 p.m. and 3:00 a.m.

5.2.2 Penalties or Charges for Excessive Use

A customer who violates any provisions of this water shortage contingency plan or Ordinance No. SD 90-11 will be subject to the following penalties as identified in Ordinance SD 90-11. For a first violation, the District shall issue a written Notice of Violation. For a customer who has a second violation or who fails to comply with the Notice of Violation, the District may, at its option, install a flow restricting device. All costs of installing/removing the flow restrictor or of disconnection/reconnection shall be paid by the owner of the property.

5.2.3 Analysis of Revenue and Expenditure Impacts

Based on information provided by County Service Area 64 staff and brief review of the CSA 64 operations indicates that reduced water sales due to demand reduction will impact the District's revenues. However, with the reduced per capita water consumption, it will also reduce water replenishment payment to the Mojave Basin Area Watermaster.

The annual CSA 64 budget depends upon water sales for over 50 percent of the total annual revenue. As demand reduction goals are met, water sales will decrease and actual consumption related costs are anticipated to increase due to more difficult pumping conditions.

Subsequent analysis by staff (based on review of other County service areas) resulted in the adjustment of water rate schedules to more align with the fixed costs. Minimum monthly charges would more closely cover the actual fixed costs and water rates would reflect actual production and delivery costs. Under the adjusted fixed cost water rate structure, the impact of reduced water sales on the overall District revenues will not be as significant.

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SECTION 6.0
WATER RECYCLING

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SECTION 6.0

WATER RECYCLING

6.1 WASTEWATER COLLECTION AND TREATMENT

Currently, wastewater within the service boundary of County Service Area 64 is collected via the collection sewer system owned and operated by CSA 64. The collection system includes three sewage lift stations. Total wastewater flow discharges to a regional interceptor sewer (CSA 64 Outfall) and then to the Regional Wastewater Treatment Plant owned and operated by the Victor Valley Wastewater Reclamation Authority (VVWRA). **Table 6-1** summarizes CSA 64 historic average flows through the CSA 64 outfall, and compared to metered water consumption.

Table 6-1
CSA 64 Wastewater Flows

		2006	2007	2008	2009	2010
CSA 64 Wastewater Generation	MGD	0.756	0.815	0.585	0.714	0.745
	AFY	847	913	655	800	835
CSA 64 Metered Water Consumption	AFY	3,517	3,359	3,152	3,102	2,867
Wastewater Flow as percent of Metered Water Consumption	-	24.1%	27.2%	20.8%	25.8%	29.1%

The VVWRA serves portions of Victorville, Hesperia, Apple Valley, and CSA 64. VVWRA has been discussing plans to construct subregional water reclamation plants which would make fully-complaint Title 22 water available for area uses. **Table 6-2** projects the average Regional Plant flows and the estimated average contributing flows from CSA 64.

Table 6-2
Projected Wastewater Flows at VVWRA Plant

		2015	2020	2025	2030	2035
VVWRA Flows [1]	**MGD**	14.80	17.00	19.50	22.30	25.50
	AFY	16,576	19,040	21,841	24,977	28,561
CSA 64 Contribution [2]	**MGD**	0.81	0.90	1.00	1.09	1.19
	AFY	907	1,013	1,120	1,226	1,333

[1] Source: MWA 2010 UWMP, Table 4-3.

[2] Based on Table 6-1, average wastewater flow from CSA 64 is approximately 25% of metered water demands.

6.2 VVWRA DISPOSAL AND CURRENT USES

VVWRA conveys wastewater using 41.5 miles of interceptor sewer and two pump stations to its Regional Wastewater Treatment Plant (Regional Plant). The Regional Plant is located adjacent to the Southern California Logistics Airport (SCLA) approximately nine miles north of CSA 64. Approximately 12.6 MGD was treated at the VVWRA facility in 2009, which has a current treatment capacity of approximately 14 MGD, and a total hydraulic capacity of 18.0 MGD. Processes used at the Plant include screening, grit removal, primary clarification, biological oxidation of wastes with complete nitrification and partial denitrification, secondary clarification, coagulation, flocculation, filtration, and disinfection. Dissolved air flotation thickening and anaerobic digestion stabilizes biosolids that are then dewatered and dried prior to disposal via direct agricultural land application or by mixing with finished compost for agricultural markets. The treated wastewater effluent is discharged directly into the Mojave River channel downstream from the Lower Narrows or percolated into ponds in the Floodplain Aquifer.

In 2002, VVWRA submitted an application to the Lahontan Regional Water Quality Control Board (RWQCB) for a master water recycling permit in order to use up to 1,680 acre-feet per year (AFY) of recycled water for irrigation of the Westwinds Golf Course at the SCLA. At the time, the Golf Course utilized potable groundwater from the underlying Mojave Basin aquifer.

The California Department of Fish and Game (DFG) objected to the use of recycled water at the golf course as it would reduce stream flow, decrease the flow necessary to maintain riparian habitat in the Alto Transition Zone and decrease the amount of water that could be extracted from the overdrafted Mojave groundwater basin. However, the RWQCB approved Order R6V-2003-028 (June 2003), which allowed for specific recycled water uses for VVWRA, Victorville Water District, and Westwinds Golf Course.

In order to assure the viability of the riparian area in the Transition Zone, the DFG and VVWRA entered into a Memorandum of Understanding (MOU) regarding VVWRA current and future discharges into the Mojave River Transition Zone. The general terms of the MOU are that DFG will not appeal or challenge the RWQCB's Order. In turn, VVWRA will continue to discharge 9,000 AFY from the Regional Plant and will also discharge not less than 20 percent of the amount of treated wastewater resulting from any future increases in the amount of daily influent wastewater flow to the Regional Plant.

The Regional Plant is currently capable of treating a portion of the flow to a tertiary level and the remaining flow to a secondary level for percolation. A majority of the tertiary treated wastewater is discharged into the Mojave River Basin and a smaller amount is currently used to irrigate landscaping at the Regional Plant site and the nearby Westwinds Golf Course. The hydraulic capacity of the Regional Plant was increased to its current 18.0 MGD in 2009. Also, the RWQCB Order R6V-2008-004, along with the National Pollutant Discharge Elimination System (NPDES) Permit No. CA0102822, allows the facility to discharge up to 14.0 MGD of tertiary-treated effluent to the Mojave River.

6.3 VVWRA PLANS FOR SUB-REGIONAL PLANTS

VVWRA is planning to construct sub-regional wastewater treatment plants in the town of Apple Valley, the City of Hesperia. These smaller plants will recycle water for local landscape irrigation near the site of treatment. In turn, this will reduce the treatment demand on the Regional Plant. Moreover, the Hesperia and South Apple Valley interceptors are reaching capacity and the sub-regional plants will provide a long-term solution for extending the interceptor capacities. Constructing sub-regional treatment plants to capture and treat wastewater in Hesperia and Apple Valley would free up capacity for future flow from CSA 64 and other areas within Victorville. The sub-regional plants will likely require the same level of regulatory requirements regarding nitrogen as the Regional Plant. The estimated completion date of the sub-regional plants is unknown at this time. The County plans to perform further studies regarding

recycled water use feasibility when VVWRA completes a preliminary siting study for the sub-regional plants.

The conceptual details of the sub-regional plants and related facilities are as follows:

- **Town of Apple Valley** – 1.0 MGD facility located in the Town, adjacent to the Otoe Road Pump Station in the southwest corner of Brewster Park. The facility will initially have a capacity to treat 1.0 MGD, expandable to 4.0 MGD, providing recycled water to the public parks.
- **City of Hesperia** – 1.0 MGD facility located in the City, on city-owned property northwest of the intersection of Interstate 15 and Main Street. The facility will initially have a capacity to treat 1.0 MGD, expandable to 4.0 MGD, providing recycled water to the residential communities and commercial businesses along the I-15 corridor.
- **City of Hesperia** – 2.0 MGD pump station and 3-mile force main located in the City beginning near the intersection of Mauna Loa Street and Maple Avenue.

6.4 RECYCLED WATER USE OPPORTUNITIES FOR CSA 64

CSA 64 includes irrigation and recreational uses that could be served by non-domestic (recycled) water. It includes a regulation 18-hole golf course and lake for recreational use. Full Title 22 compliant recycled water is currently produced at the Regional Plant, and could potentially be produced from the sub-regional plant(s). Until such time more definitive siting studies are performed for the sub-regional plants, recycled water will be economically available to CSA 64. Current (2010) irrigation uses within CSA 64 are 219 AFY, or approximately nine (9) percent of total metered consumption.

APPENDIX A

Water Conservation Act (Senate Bill No. 7)

RBF CONSULTING
14725 Alton Parkway
Irvine, California 92618-2027

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Senate Bill No. 7

CHAPTER 4

An act to amend and repeal Section 10631.5 of, to add Part 2.55 (commencing with Section 10608) to Division 6 of, and to repeal and add Part 2.8 (commencing with Section 10800) of Division 6 of, the Water Code, relating to water.

[Approved by Governor November 10, 2009. Filed with Secretary of State November 10, 2009.]

LEGISLATIVE COUNSEL'S DIGEST

SB 7, Steinberg. Water conservation.

(1) Existing law requires the Department of Water Resources to convene an independent technical panel to provide information to the department and the Legislature on new demand management measures, technologies, and approaches. "Demand management measures" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

This bill would require the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020. The state would be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015. The bill would require each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements. The bill would require agricultural water suppliers to implement efficient water management practices. The bill would require the department, in consultation with other state agencies, to develop a single standardized water use reporting form. The bill, with certain exceptions, would provide that urban retail water suppliers, on and after July 1, 2016, and agricultural water suppliers, on and after July 1, 2013, are not eligible for state water grants or loans unless they comply with the water conservation requirements established by the bill. The bill would repeal, on July 1, 2016, an existing requirement that conditions eligibility for certain water management grants or loans to an urban water supplier on the implementation of certain water demand management measures.

(2) Existing law, until January 1, 1993, and thereafter only as specified, requires certain agricultural water suppliers to prepare and adopt water management plans.

This bill would revise existing law relating to agricultural water management planning to require agricultural water suppliers to prepare and adopt agricultural water management plans with specified components on or before December 31, 2012, and update those plans on or before December

31, 2015, and on or before December 31 every 5 years thereafter. An agricultural water supplier that becomes an agricultural water supplier after December 31, 2012, would be required to prepare and adopt an agricultural water management plan within one year after becoming an agricultural water supplier. The agricultural water supplier would be required to notify each city or county within which the supplier provides water supplies with regard to the preparation or review of the plan. The bill would require the agricultural water supplier to submit copies of the plan to the department and other specified entities. The bill would provide that an agricultural water supplier is not eligible for state water grants or loans unless the supplier complies with the water management planning requirements established by the bill.

(3) The bill would take effect only if SB 1 and SB 6 of the 2009–10 7th Extraordinary Session of the Legislature are enacted and become effective.

The people of the State of California do enact as follows:

SECTION 1. Part 2.55 (commencing with Section 10608) is added to Division 6 of the Water Code, to read:

PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION

Chapter 1. General Declarations and Policy

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an

administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

Chapter 2. Definitions

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

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

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

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of

a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

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

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(*l*) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and

water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

Chapter 3. Urban Retail Water Suppliers

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in subdivision (a) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies

available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (*l*) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) An urban retail water supplier shall be granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

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

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the United States Department of Defense military installation's requirements under federal Executive Order 13423.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

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

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. The department shall review the 2015 urban water management plans and report to the Legislature by December 31, 2016, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets in order to achieve

the 20-percent reduction and to reflect updated efficiency information and technology changes.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use on facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

Chapter 4. Agricultural Water Suppliers

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier's pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

Chapter 5. Sustainable Water Management

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

Chapter 6. Standardized Data Collection

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

Chapter 7. Funding Provisions

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the

Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

Chapter 8. Quantifying Agricultural Water Use Efficiency

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

SEC. 2. Section 10631.5 of the Water Code is amended to read:

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

SEC. 3. Part 2.8 (commencing with Section 10800) of Division 6 of the Water Code is repealed.

SEC. 4. Part 2.8 (commencing with Section 10800) is added to Division 6 of the Water Code, to read:

PART 2.8. AGRICULTURAL WATER MANAGEMENT PLANNING

Chapter 1. General Declarations and Policy

10800. This part shall be known and may be cited as the Agricultural Water Management Planning Act.

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) Urban water districts are required to adopt water management plans.

(d) The conservation of agricultural water supplies is of great statewide concern.

(e) There is a great amount of reuse of delivered water, both inside and outside the water service areas.

(f) Significant noncrop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat.

(g) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(h) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(i) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(j) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The conservation of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve conservation of water.

Chapter 2. Definitions

10810. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this part.

10811. "Agricultural water management plan" or "plan" means an agricultural water management plan prepared pursuant to this part.

10812. "Agricultural water supplier" has the same meaning as defined in Section 10608.12.

10813. "Customer" means a purchaser of water from a water supplier who uses water for agricultural purposes.

10814. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of that entity.

10815. "Public agency" means any city, county, city and county, special district, or other public entity.

10816. "Urban water supplier" has the same meaning as set forth in Section 10617.

10817. "Water conservation" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

Chapter 3. Agricultural Water Management Plans

Article 1. General Provisions

10820. (a) An agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015, and on or before December 31 every five years thereafter.

(b) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(c) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

10821. (a) An agricultural water supplier required to prepare a plan pursuant to this part shall notify each city or county within which the supplier provides water supplies that the agricultural water supplier will be preparing the plan or reviewing the plan and considering amendments or changes to the plan. The agricultural water supplier may consult with, and obtain comments from, each city or county that receives notice pursuant to this subdivision.

(b) The amendments to, or changes in, the plan shall be adopted and submitted in the manner set forth in Article 3 (commencing with Section 10840).

Article 2. Contents of Plans

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water conservation programs or practices that are not locally cost effective.

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.
(6) Water delivery measurements or calculations.
(7) Water rate schedules and billing.
(8) Water shortage allocation policies.
(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:
(1) Surface water supply.
(2) Groundwater supply.
(3) Other water supplies.
(4) Source water quality monitoring practices.
(5) Water uses within the agricultural water supplier's service area, including all of the following:
(A) Agricultural.
(B) Environmental.
(C) Recreational.
(D) Municipal and industrial.
(E) Groundwater recharge.
(F) Transfers and exchanges.
(G) Other water uses.
(6) Drainage from the water supplier's service area.
(7) Water accounting, including all of the following:
(A) Quantifying the water supplier's water supplies.
(B) Tabulating water uses.
(C) Overall water budget.
(8) Water supply reliability.
(c) Include an analysis, based on available information, of the effect of climate change on future water supplies.
(d) Describe previous water management activities.
(e) Include in the plan the water use efficiency information required pursuant to Section 10608.48.

10827. Agricultural water suppliers that are members of the Agricultural Water Management Council, and that submit water management plans to that council in accordance with the "Memorandum of Understanding Regarding Efficient Water Management Practices By Agricultural Water Suppliers In California," dated January 1, 1999, may submit the water management plans identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10826.

10828. (a) Agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, may submit those water conservation plans to satisfy the requirements of Section 10826, if both of the following apply:
(1) The agricultural water supplier has adopted and submitted the water conservation plan to the United States Bureau of Reclamation within the previous four years.

(2) The United States Bureau of Reclamation has accepted the water conservation plan as adequate.

(b) This part does not require agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, to prepare and adopt water conservation plans according to a schedule that is different from that required by the United States Bureau of Reclamation.

10829. An agricultural water supplier may satisfy the requirements of this part by adopting an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) or by participation in areawide, regional, watershed, or basinwide water management planning if those plans meet or exceed the requirements of this part.

Article 3. Adoption and Implementation of Plans

10840. Every agricultural water supplier shall prepare its plan pursuant to Article 2 (commencing with Section 10825).

10841. Prior to adopting a plan, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned agricultural water supplier pursuant to Section 6066 of the Government Code. A privately owned agricultural water supplier shall provide an equivalent notice within its service area and shall provide a reasonably equivalent opportunity that would otherwise be afforded through a public hearing process for interested parties to provide input on the plan. After the hearing, the plan shall be adopted as prepared or as modified during or after the hearing.

10842. An agricultural water supplier shall implement the plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after the adoption of the plan. Copies of amendments or changes to the plans shall be submitted to the entities identified in subdivision (b) within 30 days after the adoption of the amendments or changes.

(b) An agricultural water supplier shall submit a copy of its plan and amendments or changes to the plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.

(5) Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.

(6) The California State Library.

(7) Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.

10844. (a) Not later than 30 days after the date of adopting its plan, the agricultural water supplier shall make the plan available for public review on the agricultural water supplier's Internet Web site.

(b) An agricultural water supplier that does not have an Internet Web site shall submit to the department, not later than 30 days after the date of adopting its plan, a copy of the adopted plan in an electronic format. The department shall make the plan available for public review on the department's Internet Web site.

10845. (a) The department shall prepare and submit to the Legislature, on or before December 31, 2013, and thereafter in the years ending in six and years ending in one, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

Chapter 4. Miscellaneous Provisions

10850. (a) Any action or proceeding to attack, review, set aside, void, or annul the acts or decisions of an agricultural water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(1) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(2) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 120 days after submitting the plan or amendments to the plan to entities in accordance with Section 10844 or the taking of that action.

(b) In an action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an agricultural water supplier, on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse

of discretion is established if the agricultural water supplier has not proceeded in a manner required by law, or if the action by the agricultural water supplier is not supported by substantial evidence.

10851. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part. This part does not exempt projects for implementation of the plan or for expanded or additional water supplies from the California Environmental Quality Act.

10852. An agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

10853. No agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall be required to implement the requirements of this part or Part 2.55 (commencing with Section 10608) unless sufficient funding has specifically been provided to that water supplier for these purposes.

SEC. 5. This act shall take effect only if Senate Bill 1 and Senate Bill 6 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

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APPENDIX B

California Department of Water Resources
UWMP Checklist

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Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
CONTINGENCY [b]				
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		*Section 5.2, pg 5-10*
36	Provide 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.	10632(b)		*Table 4-5b, pg 4-8*
37	Identify 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.	10632(c)		*Section 5.2.1, pg 5-10*
38	Identify 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.	10632(d)		*Section 5.2.1, pg 5-11*
39	Specify 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.	10632(e)		*Section 5.2.1, pg 5-11*
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		*Section 5.2.2, pg 5-13*
41	Provide 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.	10632(g)		*Section 5.2.3, pg 5-13*
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		*Section 5.2, pg 5-10*
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		*BMP 4, pg 5-4*
DMMs				
26	Describe how each water demand management measure is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	*Section 5.1, pg 5-1*
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		*Section ___, pg ____*

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		*N/A*
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	*N/A*
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the biannual reports are deemed compliant with Items 28 and 29.	*N/A*
EXTERNAL COORDINATION AND OUTREACH				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		*Section 1.3, pg 1-3*
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		*Section 1.3, pg 1-3*
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		*Section 1.4, pg 1-3*
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		*Section 1.3, pg 1-3*
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		*Section 1.2, pg 1-3*
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		*Section 1.2, pg 1-3*
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		*Section 1.4, pg 1-3*
59	Provide supporting documentation that the urban water supplier has submitted this UWMP to the State Library and any city or county within which the supplier provides water supplies no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		*Section 1.3, pg 1-3*

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		*Section 1.4, pg 1-3*
RECYCLED WATER				
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		*Section 6.3, pg 6-3*
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		*Section 6.1, pg 6-1*
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		*Section 6.2, pg 6-2*
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		*N/A*
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		*Section 6.4, pg 6-4*
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		*N/A*
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		*N/A*
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		*N/A*
RELIABILITY				
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		*Section 4.2.1, pg 4-5*
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		*N/A*

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		*Section 4.2, pg 4-5*
SERVICE AREA				
8	Describe the water supplier service area.	10631(a)		*Section 2.0, pg 2-1*
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		*Section 2.2, pg 2-6*
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use". See Section M.	*Section 2.3, pg 2-7*
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	*Section 2.4.4, pg 2-16*
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		*Section 2.0, pg 2-1*
WATER CONSERVATION				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		*Section 2.4.4, pg 2-12*
2	Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions.	10608.36		*Section 5.1, pg 5-1*
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		*N/A*
WATER DEMANDS				
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	*Section 2.4.1, pg 2-7*

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		*Section 2.4.2, pg 2-10*
WATER SUPPLY				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		*Section 3.1.3, pg 3-8*
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	*Section 4.2.1.1, pg 4-5*
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	*Section 4.2.1.1, pg 4-5*
15	Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		*Section 3.1.3, pg 3-8, Appendix C*
16	Describe the groundwater basin.	10631(b)(2)		*Section 3.1, pg 3-2*
17	Indicate whether the groundwater basin is adjudicated. Include a copy of the court order or decree.	10631(b)(2)		*Section 3.0, pg 3-1*
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		*Section 3.1.2, pg 3-8, Table 3-2*
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate "not applicable" in the UWMP location column.	10631(b)(2)		*N/A*
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		*Section 3.1.2, pg 3-8*
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	*Section 3.4.1, pg 3-15*
24	Describe the opportunities for exchanges or transfers of water on a short term or long-term basis.	10631(d)		*Section 3.3.1, pg 3-12*
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand	10631(h)		*Section 3.3, pg 3-11, Section 4.2.1.1, pg 4-5*

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
	management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.			
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		*N/A*
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	*N/A*
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	*Section 3.2, pg 3-11*

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review for completeness.

APPENDIX C

MWA Regional Water Management Plan
"Basin Management Actions"

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10

MANAGEMENT ACTIONS

This chapter describes the Management Actions for Mojave Water Agency's implementation of the 2004 Regional Water Management Plan. These actions will be taken to help achieve the Basin Management Objectives described in Chapter 9 of this Plan.

The Management Actions neither supercede nor conflict with the Mojave Basin Judgment or the Warren Valley Judgment. All provisions of these Judgments are integral parts of the foundation of this Plan.

Inter-agency coordination and collaboration during development of this Plan took place through the Mojave Technical Advisory Committee (TAC). Committee members had an opportunity to review and comment on elements of the Plan including the Management Actions presented here. More information on the TAC is included in Chapter 8 of this Plan. The Agency is committed to continued inter-agency coordination as Plan elements are put into action both independently and by implementing agencies.

Management Authority

The California State Legislature authorized the formation of the Mojave Water Agency (MWA) in 1959 for the purpose of managing declining groundwater levels in the Mojave Basin Area, El Mirage Basin, and Lucerne Basin. The Legislature's act required the vote of residents within the boundaries of the proposed agency, which would finalize the creation of the agency. With the vote of the people, MWA was formed on July 21, 1960. MWA was expanded by annexation in 1965 to include the Johnson Valley and Morongo Basin areas.

The enabling act authorizes MWA to do "any and every act necessary, so that sufficient water may be available for any present or future beneficial use of the lands and inhabitants within MWA's jurisdiction." To fulfill this objective, the Agency currently performs the following:

- MWA acts as the wholesale administrator of State Water Project water delivered to parties within the MWA service area
- MWA is the current Court-appointed Watermaster for the Mojave Basin Area Judgment
- Monitoring programs and special studies throughout the Mojave Water Agency territory
- MWA has prepared this Regional Water Management Plan to plan water supplies and use in the Agency through 2020

As discussed in this Plan, the management authority of MWA is considerable in scope and areal extent, and extends to areas outside of the Court-administered judgments. The Mojave Basin Area Judgment requires that annual water production records be collected and verified by producers exceeding 10 acre-feet per year of production within each of the five subareas. Production outside the judgments includes groundwater use by several large landowners in the basin who were not parties to the Judgment and producers whose extractions are less than 10 acre-feet per year. More information on Minimal Producers can be found in the *Extraction Sites/Consumption* section later in this Chapter. MWA Ordinance 11 may provide a water charge structure for Minimal Producers. The Court has continuing jurisdiction and could order other controls in the future. The Warren Valley Basin is subject to a Court judgment that is administered by the Hi-Desert Water District acting as the Court-appointed Watermaster. Annual reports are developed by the Watermaster on water levels and matters that may impact safe yield.

Management Actions

The Management Actions consist of 60 specific actions that can be grouped into the following seven elements:

1. Monitoring
2. Improve characterization of the basin
3. Continue long-term planning
4. Groundwater protection
5. Construction and implementation
6. Financing
7. Public participation

The specific actions as grouped into these seven elements are presented below:

1) Monitoring

As regional groundwater manager, MWA has the authority for monitoring regional groundwater quantity and quality, and has implemented programs to accomplish this. The State Water

Resources Control Board is the primary State agency responsible for water quality management issues in California. Much of the responsibility for implementation of the SWRCB's policies is delegated to nine Regional Water Quality Control Boards. The Lahontan RWQCB and Colorado River RWQCB overlie MWA. Court-ordered requirements compel collection of data focused on components of the water balance, which the Agency measures, compiles, and disseminates. Cooperators in monitoring efforts include local water agencies, independent well owners, and the U.S. Geological Survey. Information collected or compiled by the Agency is utilized by local water managers and the Watermasters.

Role of the Mojave Basin Area Watermaster

By order of the Mojave Basin Area Judgment, the Mojave Basin Area Watermaster reports and interprets monitoring data to ensure that the mandates of the Judgment are enforced. The MWA Board acts as the Watermaster. Monitoring requirements are described in the Judgment After Trial (1996) and in the Mojave Basin Area Watermaster Annual Reports. Some components of the water budget called for in the Judgment, such as flows across subarea boundaries, must be estimated from collected data. The Watermaster is currently responsible for reporting the following types of data in the Mojave Basin Area:

- Verification of reported groundwater production
- Mojave River flows
- Precipitation
- Wastewater discharges
- Subsurface flow
- State Water Project and wastewater imports
- Groundwater levels
- Ungaged surface water inflows
- Consumptive use

A more detailed description of the Watermaster's monitoring activities can be found in Appendix H.

Action: MWA and the Watermaster will continue to perform monitoring activities prescribed by the Judgment, and will endeavor to improve methodologies to quantify components of the water budget and to facilitate integration of collected information with the MWA data set.

Groundwater Levels

MWA has several programs for groundwater level monitoring, and has been increasing in-house staff efforts for collection, compilation, and archiving an increasing quantity of collected data. This work is supplemented by efforts of the U.S. Geological Survey (USGS) as part of a cooperative water services program with MWA. There are 121 monitoring wells within the Mojave Basin Area from which water level and water quality samples are taken.

These include 53 wells from which the samples are taken annually and 46 wells from which samples are taken semi-annually. Monitoring wells are concentrated primarily near existing areas of production. Figure 10 - 1 shows the location of 191 wells with known well construction data including depth and perforation intervals collected from USGS and other sources.

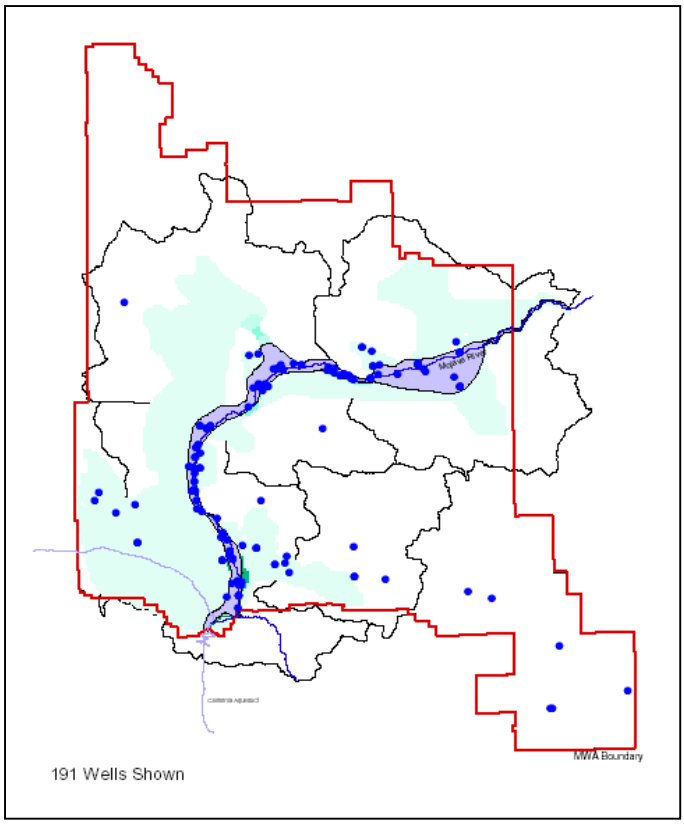


Figure 10-1: Well locations with known construction data

The Riverside County Superior Court Judgment After Trial of January 10, 1996[44] (the Judgment) ordered certain parties in the litigation to undertake certain actions. The Judgment requires the Watermaster to establish a Biological Resources Trust Fund for the benefit of the riparian habitat areas and species identified in the Judgment. The Judgment also refers to a Habitat Water Supply Management Plan (Conservation Plan) to be prepared by the CDFG for the benefit of these riparian habitat areas and species identified in the Judgment. These riparian habitat areas and species are listed in Exhibit H of the Judgment. The Conservation Plan was released in June 2004.

Groundwater levels were established in Exhibit H of the Judgment for key wells in the Mojave River floodplain. These wells, and their associated groundwater level target as measured from the ground surface to standing water are:

[44] City of Barstow et al v. City of Adelanto, Riverside County Superior Court. Case No. 208568

- wells H1-1 and H1-2 in the Victorville/Alto Zone (upper Narrows area) are to be maintained at 7 feet
- well H2-1 in the Lower Narrows/Transition zone is to be maintained at 10 feet
- well H3-1 in the Harvard/Eastern Baja Riparian Forest Habitat (Camp Cady area) is to be maintained at 7 feet. Well H3-2, also in the Camp Cady area, is to be maintained at 1 foot above ground surface to ensure adequate surface water habitat

Of these wells, only H3-1 has been installed; other monitoring is accomplished using surrogate wells or gaging stations.[45] If these water levels are not maintained, funds from the Biological Trust Fund will be expended on mitigation activities. MWA is continuing to coordinate with DFG, to further final well siting and installations.

MWA is working to increase use of water level measurements to better quantify the movement and storage of groundwater, and to effectively increase understanding of the ground water basins. This effort will include improvements to existing data collection programs through improved use of technology, including automated data collection processes and use of spatial database software. These processes should provide consistent data collection, a more geographically representative range of data, and measurements that are more discrete at depth and over time. Current efforts are focused on development of the Agency's Key Well program and a computerized geographic information database system. SCADA telemetry technologies are also being developed to obtain real-time data and control of the Agency's pipeline facilities and to minimize travel time of field staff.

Action: MWA will ensure that sufficient monitoring wells are installed around each recharge site to provide information needed to determine vertical and horizontal groundwater flow conditions and potential groundwater mounding in the vicinity of each site. In general, this means that monitoring points will be established around each recharge site, depending upon local conditions. Sites with complex geology may require multiple completion wells to monitor water levels in all affected strata. Movement of recharged water will be tracked to monitor recharge effectiveness.

Action: Existing monitoring wells will be maintained and gaps in data identified. The need for additional monitoring wells will be assessed and a plan developed for construction of additional wells if necessary. This assessment could lead to the identification and elimination of some superfluous measurement points.

[45] N. Caouette, personal communication, November 26, 2003

Action: MWA will work with the California Department of Fish and Game to continue development of wells needed for monitoring of biological resources at key locations.

Water Quality

MWA has initiated a monitoring effort to greatly enhance the cooperative water services program between MWA and USGS described above, which includes 65 wells from which the water quality samples are taken. Water quality samples are collected once a year from 23 water quality wells located in the floodplain aquifer and once every two years in 42 water quality wells located in the regional aquifer. Individual water purveyors monitor drinking water quality. Water quality enforcement responsibilities reside with the RWQCBs and the State Department of Health Services. MWA has initiated a concerted effort to expand its monitoring efforts in the Este Subarea through its basin conceptual model and Key Well Program. This program includes water level measurement and water quality testing at multiple locations across the subbasin. Such efforts will continue basin by basin throughout the MWA service area over the next several years.

Action: MWA will continue water quality monitoring efforts and will collect and summarize drinking water quality data from cities, coordinating these efforts with other entities including USGS, the State Department of Health Services, the Lahontan and Colorado River Regional Water Quality Control Boards, the State Department of Water Resources, and others. MWA will explore the viability of acting as a regional clearinghouse for this data. Data will be compiled, compared and tracked in a data management system. All data will be made available to area water purveyors. Needs for additional water quality sampling will be determined.

Action: MWA will begin implementation of a regional water quality model to be used as a predictive tool to manage the recharge of imported water. This is envisioned to be a multi-year effort, with the initial phases focused on data compilation, assessment, and conceptual model development.

Several state, regional and county agencies have jurisdiction and responsibility for monitoring water quality and contaminant sites. Programs administered by these agencies include contaminant cleanup, public outreach, and emergency spill response. The agencies include the Department of Toxic Substances, Department of Health Services, Regional Water Quality Control Board, U.S. Environmental Protection Agency and the County Division of Environmental Health. Much of the data is stored in publicly available databases.

MWA has commenced a project to develop a groundwater quality analysis system for the entire MWA service area. The project will include an evaluation of existing groundwater data and identification of data needs, the development of an information management system that will allow MWA to collect, reconcile, analyze, and access water quality information, and the development of a water quality and analysis system to meet MWA's long-term water quality objectives.

Once the system is developed it can be used in conjunction with regulatory agency databases to help identify areas with water quality problems and support efforts to remediate them.

Action: MWA will continue or begin coordination and data exchange with state, regional and county agencies to support efforts to ensure groundwater quality concerns are understood by the agencies and can be appropriately addressed. MWA will compile all reasonably available data including data on areas with known contaminants and/or poor quality groundwater and perform a trend analysis. This data, and the future modeling tool, will be used to site recharge and extraction facilities to maximize protection of water supplies.

Water Supply Measurement

Supply components of the water balance include streamflow, subsurface flow across subarea boundaries, and imported water supplies. As part of the cooperative water services program with MWA, the USGS operates and maintains the following gaging stations on the Mojave River:

- Deep Creek near Hesperia
- Mojave River at Lower Narrows near Victorville
- Mojave River near Barstow
- Mojave River at Afton

Flows from these gaging stations and the West Fork of the Mojave River (cooperatively funded by the U.S. Army Corps of Engineers) are reported to the Mojave Basin Area Watermaster and are used to determine annual water balances within each subarea as described in Chapter 11. Interflow between basins is estimated in this process. Flow from the Transition Zone into the Centro Subarea is a key part of the Watermaster's water balance. At one time, an additional gaging station was placed in the vicinity of the Transition Zone/Centro boundary. However, it was not possible to obtain reliable flow measurement at this station because of a lack of hydraulic control and shifting riverbed conditions. The Watermaster currently assumes the Mojave River flow at this location is equal to the base flow determined at the Lower Narrows plus the amount of reclaimed water discharged into the Mojave River by VVWRA.

Action: Because a reliable gaging station closer to the Alto/Centro boundary would improve the estimates of flow at that location, MWA will work to identify and maintain the most reliable measurement method practicable.

Action: MWA will assess current methods for estimating subsurface flow across subarea boundaries, and will develop additional monitoring points, follow through with plans to automate inventory of water supply components, or take other appropriate measures to improve the accuracy of these estimates.

Action: MWA will continue to account for and report quantities of water imported for groundwater replenishment. A data base application will also be developed to enhance current ability to inventory and value water within MWA storage programs.

Population Growth and Development

As reported in Chapter 5, MWA's population is expected to grow from about 321,000 in 2000 to about 541,500 in 2020. Water to meet the demands of most of this growth will be supplied by existing purveyors, importation of State Water Project water, or through purchase of Free Production Allowance under the terms of the Mojave Area Judgment. According to Mojave Water Agency Ordinance 11, new Minimal Producers who pump less than 10 acre-feet per year and who do not have a Free Production Allowance will be assessed the Replacement Water cost by the Mojave Water Agency for one acre-foot. The Agency would then import State Water Project water to replace the pumped water. However, Ordinance 11 is under review by the Court and has not yet been implemented pending a decision.

MWA will take the following steps to track the expected growth and ensure consistency with projected planned growth:

Action:MWA will work with cities, San Bernardino County, and water agencies to track building permits in order to monitor the pace of growth as compared to that projected in this Plan. This comparison will be made at least every five years. If actual growth varies significantly from the Plan benchmark, the pace of Plan implementainon will be adjusted or revisited.

Action:Under Senate Bills 221 and 610, the developers of new housing developments with 500 or more housing units, or commercial and industrial development with with equivalent demands, must receive written verification from the local water supply agency that a sufficient water supply exists to provide the needs of the new development. The Mojave Water Agency will provide information regarding regional water balances and avilability of supplemental supply to

local purveyors to allow them to reach appropriate conclusions regarding the sufficiency of supply.

Action: New developments for which Free Production Allowance rights are acquired will have their production monitored by the Watermaster. Other developments will be assessed the Replacement Water cost by the Watermaster, who will request MWA to import State Water Project water to replace the pumped water.

Action:MWA will work with local planning agencies to ensure that areas that should be set aside to recharge the groundwater basin are reserved for that purpose and are not subject to development.

Effectiveness of Water Conservation Measures

There are numerous reasons for evaluating water conservation measures:

- to provide a review or the program in context of its intended goals
- to allow for modification of programs that are not meeting intended goals
- better projection of water demands
- to document performance of pilot programs and for design of full-scale programs.

The Alliance for Water Awareness and Conservation (AWAC) was formed to help develop and implement a united regional water conservation program to maximize water use efficiency. As discussed in Chapter 7, the Alliance was formed in August 2003 and is composed of 24 local cities, water suppliers, and institutions, as well as regional resource management agencies. Goals of the Alliance are to:

1. Educate the local communities on the importance of water conservation.
2. Provide the local communities with the tools to effectively reduce per capita consumption to targeted goals.

Alliance for Water Awareness and Conservation Participants

City of Adelanto
Apple Valley Country Club
Town of Apple Valley
Apple Valley Ranchos Water Company
Baldy Mesa Water District
City of Barstow
Barstow College
Bighorn-Desert View Water Agency
Bureau of Land Management
Bureau of Reclamation
Copper Mountain College
City of Hesperia
Hi-Desert Water District
Mojave Desert & Mountain Waste Management JPA
Mohave Desert Resource Conservation District
Mojave Water Agency
Mojave Weed Management Area
San Bernardino County Special Districts, Water/Sanitation Division
Southern California Water Company
Victor Valley College
Victor Valley Wastewater Reclamation Authority
Victor Valley Water District
City of Victorville
Town of Yucca Valley

3. Reduce regional water use by 10 percent gross per capita by 2010 and 15 percent gross per capita by 2015 (5 percent in the Morongo Basin by 2015) to achieve a sustainable, reliable supply to meet regional water demands.

Action: MWA will work with the Alliance for Water Awareness and Conservation (AWAC) and serve as a clearinghouse for water conservation measures and performance data. Water conservation programs will be evaluated through the AWAC and actions taken as needed. Evaluation will include at least the following:

- Summarize baseline water usage for water purveyors' 2000 Urban Water Management Plans
- Establish and summarize Demand Management Measures
- Track implementation of Demand Management Measures
- Tabulate per capita water use by member agency and subarea annually or at a reporting interval deemed appropriate by the Alliance

Action: Increased water conservation efforts will be identified and plans developed for implementation of cost effective demand management measures based on the reports on effectiveness.

Evapotranspiration

The Mojave Water Agency maintains a network of 14 weather stations collecting various weather data including temperature and precipitation. Approximately six of these stations have Class A evaporation pans that provide data on evaporation for the entire region. This provides information on both evaporation from open bodies of water and soil surfaces, and transpiration from the soil by plants. These evaporative processes are together referred to as "evapotranspiration", an important component in the overall water balance. MWA is planning to improve and supplement this part of local water use information by utilizing two technologies:

- the California Irrigation Management Information System (CIMIS)
- the Surface Energy Balance Algorithm for Land (SEBAL)

The California Irrigation Management Information System (CIMIS) is a repository of meteorological data collected from an integrated network of over 100 computerized weather stations located in key agricultural and municipal sites throughout the state. The system helps growers and turf managers in determining when to irrigate and how much water to apply.

The Surface Energy Balance Algorithm for Land (SEBAL) is a system that uses data from satellite-based sensors to compute energy balance to provide a refined estimate of evapotranspiration, a key component of the water balance.

Each of these technologies is described in more detail in Appendix H.

Action: MWA will review the adequacy of the existing evapotranspiration network and expand the number of measuring stations as necessary.

Action: MWA will continue to collect data on evapotranspiration and characterize its seasonal and areal distribution.

Action: MWA will work to improve the accuracy of areal evapotranspiration estimates through use of SEBAL or other appropriate technologies.

Action: MWA will make collected data available to agricultural and large urban landscape irrigators to encourage and facilitate the use of evapotranspiration data to increase irrigation efficiency.

Regional Water Level Changes and Land Subsidence

The USGS performed a study of land subsidence in the following four study areas using Interferometric Synthetic Aperture Radar (InSAR) methods[46]:

- El Mirage area (Oeste)
- Lockhart-Harper Lake area (Centro)
- Newberry Springs area (Baja)
- Lucerne Valley area (Este)

The study was performed as part of a cooperative program with the USGS. Results of the study indicate land subsidence has occurred in the area, which generally occurs during initial dewatering of compressible sediments.

Action: MWA will continue its cooperative land subsidence program, expanded to determine the relationship between groundwater levels and land surface elevation changes. Additional scrutiny should be given to areas where subsidence has occurred and where the depth to groundwater decreases below historic low levels.

[46] Sneed et al. 2003

Data Management

MWA has numerous data management systems existing or in development to support its various monitoring programs. It is imperative for the Agency to implement a data management system as a means to store, archive, and access data in a timely, unambiguous way meaningful to decision makers.

In its role as Mojave Basin Area Watermaster, MWA maintains records of producers, production wells, and annual production from stipulating parties' wells within the Mojave Basin Area. The Hi-Desert Water District performs these functions in its role of Warren Basin Watermaster. In cooperation with MWA, the USGS maintains a database to store river flow, water quality and water level data collected by MWA and USGS staff. Significant additional information is anticipated to be collected as part of this Plan to better characterize the groundwater system and the performance of recharge projects.

Action: MWA will continue development of a data management system based on a relational database structure to efficiently compile, store, archive, and access collected data. The system will be designed to provide data for a geographic information system and to accommodate data from additional collection efforts developed through implementation of this Plan.

Action: MWA will begin implementation of a regional water quality model. The project will include development of an information management system that will allow MWA to collect, reconcile, analyze, and access water quality information.

Action: MWA will make compiled data available to local water suppliers.

Extraction Sites/Consumption

In its role as Mojave Basin Area Watermaster, MWA collects and verifies production data within the Mojave Basin Area, with Hi-Desert Water District performing this role as Warren Basin Watermaster. The Judgment requires that annual water production records be collected and verified by producers exceeding 10 acre-feet per year of production within each of the five subareas. These records are used to document water usage and to determine Replacement Water and Makeup Water Obligations.

In addition, the MWA tracks well production as part of the Minimal Producer Program. Minimal Producers are defined as those producers who have an annual production of less than 10 acre-feet and are not subject to the Judgment. MWA estimates total production by Minimal Producers in each subarea of the Mojave Basin Area.

Action: Additional production wells will be constructed in the future to accommodate the expected increase in population. The Watermasters and MWA will collect data and verify the location and production from these new wells in addition to existing well production.

2) Improving Basin Understanding

Infiltration Rates

Numerous groundwater recharge projects will be required to meet the water balance objectives of this Plan. In order to understand the feasibility of, and best locations for, these projects, more data is needed as to the infiltration rates in different areas of the aquifer system. A pilot test project at the Oro Grande recharge site is already underway.

Action: MWA will expand infiltration pilot testing to identify suitable recharge sites capable of recharging groundwater at a rate adequate to meet forecasted needs.

Aquifer Characterization

Recharging the large quantities of water projected in this Plan will require extensive investigation of aquifer properties and storage capacities. Means to effect this aquifer characterization include geophysical testing, aquifer stress tests, and expanded monitoring networks. Methods for geophysical testing include surface geophysical methods such as seismic reflection and refraction, gravity surveys and resistivity imaging, and down-well methods such as electronic logging, pump testing, and other methods. These methods are used to develop a mapping of the aquifer flow system that can be used to optimize the interaction of groundwater recharge and extraction activities. New down-well technologies are available that can provide refined, depth-specific aquifer properties cost-effectively. MWA has employed many of these techniques in its exploration for suitable recharge sites.

Action: MWA will expand its aquifer characterization program to improve understanding of basin conditions, leading to more effective recharge project operations. Geophysical methods will be employed as appropriate to identify the sites most appropriate for groundwater recharge.

Action: MWA will employ new technologies that can develop high resolution, depth-specific aquifer characterization in the most cost-effective manner.

Action: MWA will expand its monitoring well network as appropriate to track aquifer response from pilot and full-scale groundwater recharge and production facilities.

Action: Data collected will be compatible and integrated with regional modeling and data management efforts.

Modeling

To date, three models of MWA's groundwater basins have been developed to aid in management of the water system:

- A groundwater simulation model of the Mojave River Basin developed in Modflow by the USGS[47]
- A groundwater simulation model of a portion of the Warren Basin by the USGS
- A screening model developed in Stella as part of this RWMP Update to estimate the effects of implementation of proposed projects and management actions

Modeling of the groundwater basin can be useful to help determine the best locations for recharge or extraction sites and to help optimize operation of the groundwater basin. The existing models described above provide insight into these questions, but have significant limitations. The existing models are appropriate for conceptual regional planning efforts, but more refined models will be necessary for in-depth analysis of a large-scale recharge system, or for site-specific analysis. The initial focus should be on additional data collection to support the detailed effort.

MWA is considering a multi-year effort to develop a more detailed flow model that incorporates considerations of water quality, in particular the effects of salinity on the groundwater basin.

Action: MWA will begin development of a regional water quality model. The initial efforts of this modeling program will be focused on data compilation, assessment, and conceptual model development. The model will make use of data contained in the existing models, and will be compatible with and integrated with data collected in the geophysical aquifer testing efforts.

[47] Stamos et al. 2001

Update Water Budget

The water budgets prepared annually by the Watermaster include groundwater flow, ungaged surface water inflows, deep percolation of precipitation estimates, and phreatophyte use in the riparian area. Each of these components are fixed estimates which could be improved with new information.

Action: MWA will develop improved estimates of water budget components to provide a refined assessment of subbasin interactions and water supply obligations under the Mojave Basin Area Judgment. A likely initial focus is improvement of evapotranspiration and consumptive use using the technologies discussed above in the Monitoring element. Improved groundwater level monitoring and modeling to provide a better estimate of subsurface flow is another component that might be implemented near-term.

Action: MWA will utilize their data systems to develop and produce annual Agency-wide progress reports on key water budget components including water inflows, outflows, and change in storage by subarea and make recommendations on how these quantities can be better measured.

3) Continue Long-Term Planning

Since its inception in the 1960s, the MWA has been developing and updating plans to guide the Agency as it carries out its mission to ensure sufficient water availability for present or future beneficial uses within the Agency's jurisdiction. The Agency will continue its commitment to long-term planning. The following section describes the planning efforts the Agency is focusing on.

Vulnerability Assessment

The California Department of Health Services has prepared a checklist of security measures for water utilities. According the checklist, recommended actions to better secure water related facilities include the following:

1. At offices, well houses, treatment plants and vaults, make it a rule that doors are locked and alarms set
2. Tell employees to ask questions of strangers at facilities
3. Limit access to facilities. Indicate restricted areas by posting “Employees Only” signs
4. Increase lighting in parking lots, treatment bays and other areas with limited staffing
5. Remove keys for equipment
6. Invite local law enforcement to become familiar with facilities and establish a protocol for reporting and responding to threats

7. Discuss detection, response, and notification issues with public health officials and establish a protocol
8. Establish a chain of command and emergency call list in case of emergencies
9. Provide copies of operational procedures to law enforcement and emergency management personnel
10. Limit access to water supply reservoirs
11. Fence and lock vulnerable areas

Action: MWA will inform and work cooperatively with groundwater purveyors in their efforts to ensure that minimum water security measures are in place. Additional security measures will be identified and implemented as necessary. MWA will implement these measures on its facilities where appropriate.

Review Land Use Plans

Land use plans in the basin are developed by a number of different entities including the county and each of the cities through their General Plans, General Plan Amendments and Public Facilities Element amendments.

Action: MWA will coordinate with local planning agencies to ensure that growth projections, proposed land use changes, and types of proposed developments are consistent with water planning efforts, as required by SB 221 and SB 610. Significant deviations from projected growth and water needs will be noted and corrective action taken. Corrective actions could include securing additional sources of water, or making a finding pursuant to SB221 or SB 610 that an adequate water supply does not exist and notifying the water purveyor.

Identify Post 2020 Water Supply

MWA has a State Water Project water contract for up to 75,800 acre-feet per year. The water supply-demand analysis performed as part of this Plan (Chapter 5) indicates that, assuming municipal conservation of 10 percent, the full available SWP supply will be needed by 2020. Preliminary estimates of future water demand, assuming current trends continue, indicate that an additional 60,000 to 100,000 acre-feet per year will be needed by 2050. MWA has initiated efforts to determine sources where this additional supply might be obtained. Potential options include pre-banking of existing supplies, new appropriations, water banking or exchange arrangements, water transfers, developing water conservation or desalination credits, and aggressive management of existing supplies, including exploring higher levels of conservation. MWA has recently negotiated a short-term groundwater banking arrangement with the

Metropolitan Water District, and discussions for a larger, long-term banking project are underway. The feasibility of the post-2020 options has yet to be examined.

Action: MWA will continue to research options for meeting post-2020 water needs, categorize and prioritize the options, and examine and implement the higher-priority options.

State Water Project

MWA has an annual State Water Project entitlement of 75,800 acre-feet per year. According to the Final State Water Project Reliability Report (DWR 2002), MWA should expect to receive an average of about 58,400 acre-feet per year each year if they request their full entitlement. As indicated in Chapter 5, MWA will need to utilize their entire SWP entitlement in order to bring the groundwater basin into balance in 2020.

Action: MWA will stay actively involved in State Water Project planning processes that are conducted by the Department of Water Resources and other water planning agencies. The expected reliability of State Water Project could be affected by changes in system operation or by modifications in planning models that are used to project SWP deliveries. MWA will advocate for operations that enhance its supply, track changes in SWP reliability, and adjust its plans accordingly.

Transportation Infrastructure

Future transportation facilities will need to be developed to handle the needs of a growing population. As facility needs are identified, their planning should be coordinated with the MWA to ensure that groundwater recharge areas are protected. MWA will work with the Southern California Association of Governments (SCAG) to this end.

SCAG is mandated by the federal government to develop plans for, among other things, transportation and growth management. One of the foremost activities of SCAG is the development of a comprehensive and coordinated Regional Transportation Plan. SCAG's Water Policy Task Force provides planning advice on water supply and water quality on issues affecting the long-term sustainability of communities and industry. Among its duties, the Task Force provides SCAG committees with water quality assessment information for regionally-significant transportation projects planned for future implementation. The Task Force is composed of officials (both elected and appointed) who participate actively in local government and in organizations concerned with water policy, planning and management.[48]

[48] SCAG web site

Action: MWA will work with the Water Policy Task Force to ensure that there is maximum coordination in order to protect high priority recharge sites from impervious surfaces and potential contaminating activities, and to plan for a sustainable water supply to support future development.

Regular Updates

This Regional Water Management Plan contains elements that address several planning procedures, including an Integrated Water Management Plan, an Urban Water Management Plan (UWMP) and Groundwater Management Plan. As required by the Urban Water Management Planning Act, California Water Code, Section 10610 et seq., the UWMP plan must be updated every five years in years ending in zero and five. Additionally, MWA will prepare biennial updates on the status of completion of the various aspects of the Groundwater Management Plan. These summary reports will be coordinated with, and tied to, the Agency's Capital Improvement Plan process. Updates on many of these activities are included in the Annual Reports of the Mojave Basin Area Watermaster.

MWA will produce the biennial updates on the other activities contained in these Management Actions. The information contained in the biennial updates should be used to evaluate how often it will be necessary to update the Groundwater Management Plan.

Action: MWA will produce a biennial report summarizing progress made in achieving Plan Actions for the previous two years, considering monitored performance of the water management system. Minor adjustments to planning assumptions, operations, or Actions will be adopted as necessary. If significant deviations from the Plan are determined to exist, the Plan will be revised in its entirety.

Action: MWA will perform a comprehensive update revision of the Regional Water Management Plan at least every ten years. The performance of implemented projects will be compared to original project objectives to ensure objectives were met.

Action: MWA will supplement the sections of the Regional Water Management Plan required for its Urban Water Management Plan every five years, in years ending in zero or five, consistent with law.

4) Groundwater Protection

The general goal of groundwater protection activities is to maintain the groundwater and the aquifer to ensure a reliable high quality supply. Activities to meet this goal include continued and increased monitoring, data sharing, education and coordination with other agencies that have local or regional authority or programs. MWA currently has no groundwater production wells that it operates, but could in the future. To increase its groundwater protection activities, MWA will take action as presented below.

Recharge Site Management Activities

Management activities for protection of recharge sites include:

- establishing Site Control Zones to protect the area immediately surrounding the site from potentially contaminating activities
- controlling access to recharge zones
- Well and recharge facility contruction standards
- researching and mapping pollution sites to minimize siting and operational conflicts

A more detailed description of recharge site activities is included in Chapter 3 of this Plan.

The Drinking Water Source Assessment and Protection (DWSAP) program was developed by the California Department of Health Services to meet requirements in amendments to the Safe Drinking Water Act. All wells providing public drinking water supplies must comply with this program. The DWSAP program is intended to address assessments and facilitate the development of protection programs for ground and surface waters. The Department of Health Services and larger water utilities perform these assessments for pre-2002 wells. The well owner is generally required to perform the assessment for newer wells. The DWSAP consists of the following:

- delineating the two-, five-, and ten-year time of travel capture zones for wells
- inventorying possible contaminating activities
- determining vulnerability of wells to potential contaminants

Action: For probable recharge locations, MWA will perform an inventory and map potential sources of contamination including toxic investigation sites, industrial sites, gas stations, dairies, and sites investigated by the RWQCBs, and use this information in selecting recharge sites and in planning recharge site operation in order to minimize the potential for water supply contamination. MWA will

compile existing DWSAP reports developed for existing wells to aid in mapping potentially contaminating activities.

Action: MWA will coordinate with regional water quality agencies, including the U.S. EPA, California EPA, Lahontan and Colorado River RWQCBs, the California Department of Health Services, and San Bernardino County Health Services to identify potential water quality threats to candidate recharge sites, and compile this information into a data management system for use in selection of recharge sites.

Identification and Destruction of Abandoned Wells

The presence of abandoned groundwater wells represents a potential hazard to the quality of the groundwater basin. Abandoned and improperly destroyed wells can act as conduits for contaminants to reach drinking water supplies. It is vital for the long-term protection of the basin that abandoned wells be located and destroyed. Well records kept by the Agency and the Mojave Basin Area Watermaster can help in the process of identifying existing abandoned wells and in identifying wells that are abandoned (stop production) in the future.

While it is the landowner's responsibility to destroy an abandoned well, local water agencies should be proactive about making sure that abandoned wells are in fact destroyed. The destruction of abandoned groundwater wells should be performed in accordance with state standards. California Water Code Section 13750.5 requires that those responsible for the destruction of water wells possess a C-57 Water Well Contractor's License. Whenever a water well is destroyed, a report of completion must be filed with the California Department of Water Resources within 60 days of the completion of the work. The San Bernardino County Department of Public Health, Division of Environmental Health Services is responsible for permitting and inspecting construction and destruction of wells.

Action: MWA will work with the County to develop a plan to identify and destroy abandoned wells. Federal and State grants will be sought for these purposes, as appropriate. MWA will encourage local water agencies to actively search for existing abandoned wells in their service areas so that they can be destroyed. Consideration will be given to developing ordinances requiring protocols for identification of abandoned wells upon sale or transfer of property.

Hazardous Materials Response

Currently, city and county hazardous materials teams handle responses to hazardous materials incidents. Increased coordination between MWA and hazardous materials teams will allow for assessment of the potential for chemical spills to impact groundwater and recharge sites.

Action: MWA will establish notification protocols with hazardous materials response agencies so that the Agency can be immediately informed of a threat to vulnerable areas, and to delineate any potentially threatened water facilities to the responders.

Protection of Recharge Areas

Only a small portion (approximately 4%) of groundwater recharge in the MWA territory is from direct percolation of rainfall. Over 89 percent is from percolation in the Mojave River channel, ephemeral washes, and mountain fronts. The following efforts will be undertaken to protect recharge areas:

Action: Through review of General Plans and other land use plans, the MWA will identify potential projects that may have a significant impact on the quality or quantity of water supplies entering the basin through recharge sites, establish buffer zones, and provide this information to the planning agency. MWA will identify sites with high potential for recharge and proactively identify them to land use planning agencies. More information on land use planning efforts is provided in the Monitoring section of this chapter.

Action: MWA will continue to coordinate with watershed related entities including the Lahontan and Colorado River Regional Water Quality Control Boards, Mojave Desert Resource Conservation District and the U. S. Bureau of Land Management.

5) Construction and Implementation

Construction of projects by MWA within its service area is necessary to build, operate, maintain and replace the State Water Project facilities to which MWA is contractually obligated. These projects are necessary to fulfill MWA's contractual obligations with the State of California and to insure water availability to all of its residents.

Table 9-9 in the previous chapter shows the recommended priority of each project and management action. The projects that have the highest priority include implementing municipal conservation, VVWRA wastewater reclamation, Alto subarea wellhead treatment, a new water

supply for Pioneertown, and the recharge of SWP water into the Warren Valley aquifer and into the Floodplain, West Regional, and Mid-Regional aquifers in the Alto subarea. Municipal conservation is considered to have the highest priority because measures will need to be initiated immediately in order to achieve 10 percent conservation by 2020. Recharge of SWP water into the Alto Floodplain, West Regional, and Mid-Regional aquifers will require feasibility studies to determine the optimal locations for building the necessary recharge facilities.

Projects and management actions with a high priority are those expected to begin implementation within the next five years. Those with a moderate priority are those expected to begin implementation within the next five to ten years, and those with lower priority will be pursued within a ten to twenty year timeframe.

Action: MWA will identify implementing agencies for high priority projects and management actions, and will coordinate with those agencies in putting them into service. High priority projects and management actions are those expected to begin implementation within the next five years, and include:

- Municipal conservation of 10 percent of consumptive use in the Mojave River Basin and 5 percent in Morongo Basin/Johnson Valley
- Wastewater reclamation in the Alto subarea
- Wellhead treatment in the Alto subarea
- Groundwater recharge in the Alto Floodplain aquifer
- Groundwater recharge in the Alto Mid-Regional aquifer
- Groundwater recharge in the Alto West-Regional aquifer
- Developing an alternative supply for Pioneertown
- Groundwater recharge in the Warren Valley
- Continue development of regional water banking arrangements

Action: MWA will identify implementing agencies for moderate priority projects and management actions, and will coordinate with those agencies in putting them into service. Moderate priority projects and management actions are those expected to begin implementation within the next five to ten years, and include:

- continued implementation of high priority projects and actions
- construction of a regional water treatment plant in the Alto subarea
- groundwater recharge in the Alto East-Regional aquifer
- direct or in-lieu groundwater recharge in the Transition Zone Floodplain aquifer

- groundwater recharge and/or stormwater retention in the Baja Floodplain aquifer
- address municipal water supply issues in the Hinkley area of the Centro Regional aquifer
- groundwater recharge and/or stormwater retention in the Este Regional aquifer
- groundwater recharge in the Oeste Regional aquifer
- groundwater recharge in the Copper Mountain Valley
- groundwater recharge in the Means/Ames Valleys

Action: MWA will identify implementing agencies for lower priority projects and management actions, and coordinate in putting them into service. Lower priority projects and management actions are those expected to begin implementation within the next ten to twenty years, and include:

- continued implementation of high and moderate priority projects and actions
- groundwater recharge in the Lucerne Valley

6) Financing

Implementing the Regional Water Management Plan (RWMP) will require an array of financing mechanisms, such as bonds, grants, or low interest loans. The Mojave Basin Area Judgment provides a revenue steam for purchasing imported water. Cost savings may be incurred through implementation of conservation and water reuse projects. In addition, cooperative funding agreements between MWA and other water managers in the MWA service area or cost-share agreements between MWA and local, state, or federal agencies may also provide funding for RWMP projects and management actions.

Action: As project and management actions in the RWMP are defined in more detail, MWA will conduct a review of federal, state, and regional funding sources as well as potential assessments, fees, and charges to develop a financing plan that comprises an array of financing mechanisms appropriate for each RWMP project or management action, including bond funding, low-interest loans and grants, and cooperative cost-share agreements.

Action: MWA will develop a multi-year Capital Improvement Program (CIP) using the RWMP as its basis. The plan will include a schedule, priority and cost for implementation.

Action: MWA will research and pursue grants, with an emphasis on Proposition 50 funds, and identify potential Federal funds to be used for CIP implementation.

Action: MWA will identify local cost-sharing partners among the benefiting entities and determine the best mix of debt, fees and charges for implementing projects and management actions.

7) Public Participation/Community Outreach

MWA formed a Technical Advisory Committee (TAC) comprised of local stakeholders and water purveyors. The TAC met regularly during development of the Regional Water Management Plan, reviewing and providing comments and suggestions on the Plan. TAC members are listed in Chapter 8. MWA will continue to consult with the TAC on project implementation and financing.

MWA is a member of the Alliance for Water Awareness and Conservation, a group of local water purveyors who are collaborating on demand management measures. MWA has also signed seven cooperation agreements or Memoranda of Understanding with local public entities to promote water conservation, as described in Chapter 7.

Action: MWA will continue to coordinate, participate in, and implement recommendations of the Alliance.

MWA has organized and held three water symposia with local water leaders and regulators in Victorville, Morongo Basin, and Lucerne Valley in 2003 and early 2004.

Action: The Agency plans to make the water symposium an annual event.

Action: MWA will continue its outreach and education efforts through continued funding of the Community Liaison Officer.

The Panorama, the newsletter of the MWA is published regularly and mailed to those on its growing distribution list. Regular updates on the development of the Regional Water Management Plan have been included. A copy of Volume 3, Issue 1 published in the winter of 2003 is included in Appendix F.

Action: MWA will continue to develop and publish its newsletter, *The Panorama*.

MWA has an established Speakers Bureau which provides Board members and Agency staff to address water related topics with local audiences.

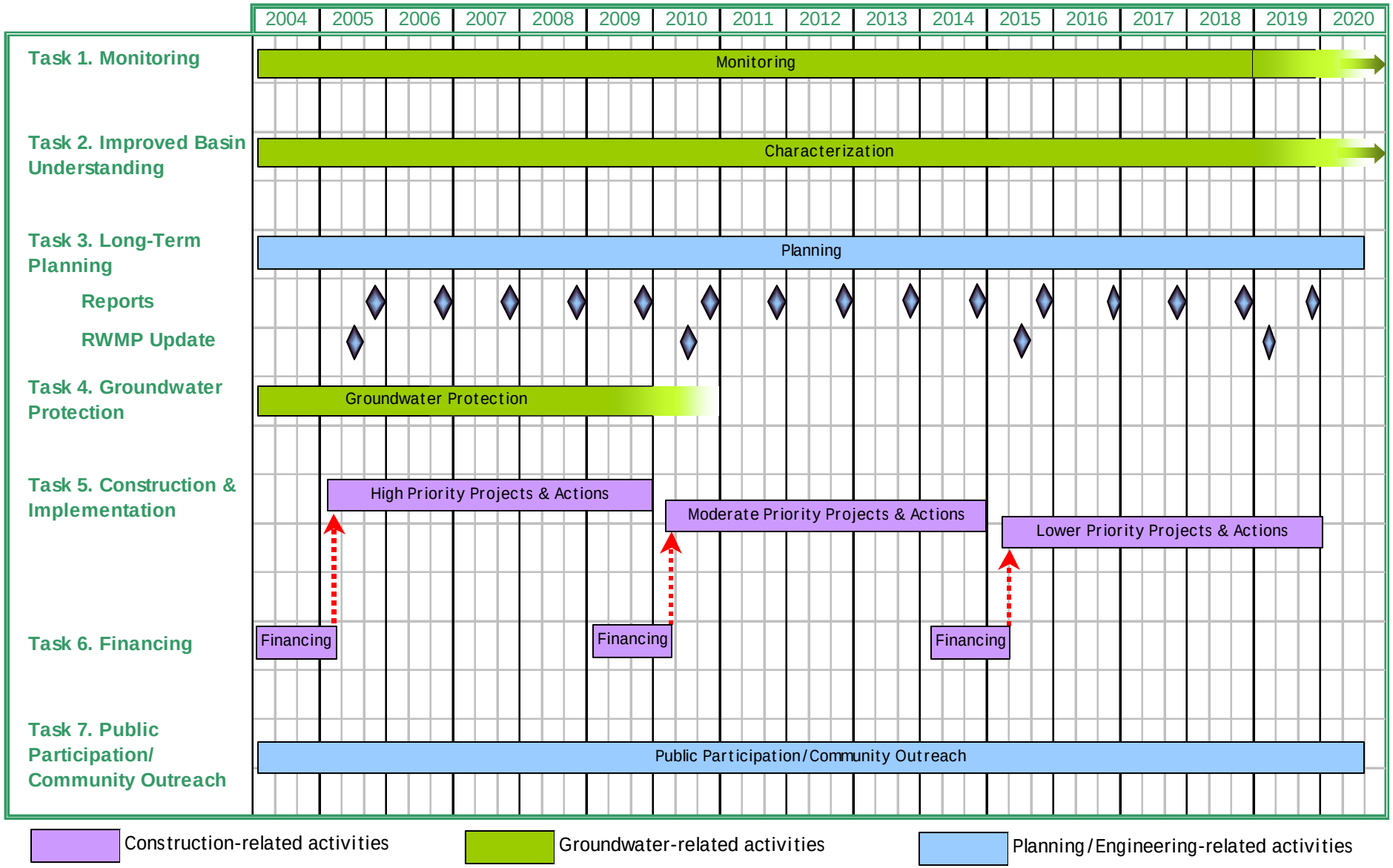
Action:MWA will maintain its Speakers Bureau to provide timely water related information to the public.

Action:MWA's web site (http://www.mojavewater.org/) contains information on MWA projects, water supplies and resources, water education, Watermaster, Agency publications, a calendar of events, meeting agendas, and general information about MWA. MWA will continue to provide this service.

Implementation Schedule

A schedule for implementation of the Management Action Plan is provided in Figure 10-2.

Figure 10 - 2. Master Schedule for MWA Management Action Plan



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APPENDIX D

California's Groundwater Bulletin 118, South Lahontan
Upper Mojave River Groundwater Basin

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Upper Mojave River Valley Groundwater Basin

- Groundwater Basin Number: 6-42
- County: San Bernardino
- Surface Area: 413,000 acres (645 square miles)

Basin Boundaries and Hydrology

The Upper Mojave River Valley Groundwater Basin underlies an elongate north-south valley, with the Mojave River flowing (occasionally) through the valley from the San Bernardino Mountains on the south, northward into the Middle Mojave River Valley Groundwater Basin at the town of Helendale. The groundwater basin is bounded on the north by a roughly east-west line from basement rock outcrops near Helendale to those in the Shadow Mountains. The southern boundary is the contact between Quaternary sedimentary deposits and unconsolidated basement rocks of the San Bernardino Mountains. The basin is bounded on the southeast by the Helendale fault and on the east by basement exposures of the mountains surrounding Apple Valley. In the west, the boundary is marked by a surface drainage divide between this basin and El Mirage Valley Basin, and a contact between alluvium and basement rocks that form the Shadow Mountains. Average precipitation varies across the basin from 5 to 36 inches with the average for the basin near 12 inches (USDA 1999).

Hydrogeologic Information

Water Bearing Formations

The two primary water-bearing units within the Mojave River Valley Basin system consist of regional Pliocene and younger alluvial fan deposits (fan unit) and of overlying Pleistocene and younger river channel and floodplain deposits, which have been called the floodplain unit (DWR 1967), or the floodplain aquifer (Lines 1996; Stamos and others 2001). Other potential, but not regionally significant, water-bearing units include older alluvium, old fan deposits, old lake and lakeshore deposits, and dune sand deposits (DWR 1967). Water-bearing deposits in this basin are predominantly unconfined, though some perched water appears near Adelanto. Well yields typically range from 100 to 2000 gpm (Hardt 1969; Lines 1996; Stamos and others 2001) with an average of about 630 gpm for all units (BEE 1994).

Pleistocene and Younger Floodplain Unit. The floodplain unit is the more productive and extensively studied of the two units and extends 50 to 200 feet deep in this basin, but is restricted to within about 1 mile of the active Mojave River channel (Stamos and others 2001). The average thickness is estimated to be about 150 feet through this basin. Specific yield for this unit ranges from 23 to 39 percent (Lines 1996) and the average specific yield for this unit is about 27 percent in this basin (DWR 1967; Lines 1996).

Pliocene and Younger Fan Unit. The regional fan unit is composed of late Tertiary and younger unconsolidated to partially consolidated alluvial fan deposits up to 1,000 feet thick (Stamos and Predmore 1995; Lines 1996). The permeability of these deposits decreases with depth (Stamos and others 2001). Estimated average effective thickness in the Upper Mojave River

Valley Groundwater Basin is about 300 feet thick (DWR 1967). Available information is indicates that specific yields and well yields are generally less for the fan unit compared to the floodplain unit, but suggest generally higher well yields for younger fan deposits and lower well yields for older fan deposits (DWR 1967). The specific yields for this unit range from 4 percent to 25 percent with an estimated average of 10 percent (DWR 1967).

Restrictive Structures

This groundwater basin is bounded on the northeast by the Helendale fault zone which forms a barrier to groundwater flow in the regional fan unit, but does not appear to be a barrier to groundwater flow in the floodplain unit (Stamos and Predmore 1995; Stamos and others 2001). The fault zone causes an eastward lowering of the water table across the southeastern boundary into the Lucerne Valley Basin in the fan unit deposits (Stamos and Predmore 1995; Lines 1996). Stamos and others (2001) also interpret unexposed faults acting as barriers to cause steep groundwater gradients between Victorville and Adelanto.

In the southern portion of the basin, bedrock constriction causes water to rise to the surface of the Mojave River at the Upper and Lower Narrows (Lines 1996; Stamos and others 2001). Historically, such locations have been used for camping and watering spots, such as Lane's Crossing just north of the Lower Narrows (Lines 1996).

Recharge Areas

Natural recharge of the basin is from direct precipitation, ephemeral stream flow, infrequent surface flow of the Mojave River, and underflow of the Mojave River into the basin from the southwest (Eccles 1981; Stamos and Predmore 1995; Lines 1996). Treated wastewater effluent, septic tank effluent, effluent from two fish hatchery operations, and irrigation waters are allowed to percolate into the ground and recharge the groundwater system (Eccles 1981; Lines 1996). A large, but sporadic contribution to recharge occurs when the Mojave River is flowing, with 40 feet of rise in the water table observed during 1969 and 16 to 48 feet of rise observed in 1993 (Hardt 1969; Robson 1974; Lines 1996). The general groundwater flow is toward the active channel of the Mojave River and then it follows the course of the river through the valley (Stamos and Predmore 1995; Lines 1996). The Helendale fault forms a barrier to groundwater flow in the southeast corner of the basin. This barrier causes groundwater to flow northwestward under a surface drainage divide into the Mojave River drainage instead of northeastward into Lucerne Lake (dry) in the Lucerne Valley Basin.

Groundwater Level Trends

Groundwater levels in wells in the floodplain unit near the Mojave River tend to vary in concert with rainfall and runoff rates, whereas groundwater levels in the fan unit do not show significant changes due to local rainfall (MWA 1999). The general trend in this basin is for declining groundwater levels, particularly in the fan unit. Three of the ten highest precipitation years over a 60-year base period occurred during 1991 through 1999 (MWA 1999). Infiltration of the runoff from this relatively abundant precipitation has produced an increase in groundwater level (and groundwater storage) in the

floodplain unit near the Mojave River (MWA 1999). A hydrograph for a well near Adelanto shows a gentle decline of about 25 feet during 1955 through 1985 and a faster decline of about 35 feet since about 1985. Another well near Victorville in the fan unit shows a range of about 30 feet in water level over the last 20 years, with a decrease in water level of about 10 feet (MWA 1999).

Groundwater Storage

Groundwater Storage Capacity. Published total storage capacity for the Upper Mojave River Valley Groundwater Basin varies. The boundaries of the Upper Mojave River Valley Groundwater Basin of this report correspond closely to the Upper Mojave River Basin and Fifteen Mile storage units discussed by DWR (1967). DWR (1967) calculated the total storage capacity for these storage units using the base of water-bearing materials, an average of about 300 feet. The total storage for the Upper Mojave River Basin and Fifteen Mile storage units is 27,839,000 af (DWR 1967). The Upper Mojave River Valley Groundwater Basin also roughly underlies the Alto subarea and about one-third of the Este subarea under the administration of the Mojave Water Agency (MWA 1999). The MWA uses an economic pumping depth of 100 feet as a limit for effective basin depth, and calculates a total effective storage capacity of 2,086,000 af for the Alto subarea and 530,000 af for the Este subarea (BEE, 1994). Using an overlying area of about 413,000 acres, an average thickness of about 300 feet, and an average specific yield of about 10.5 percent indicates a total storage capacity of about 13,000,000 af.

Groundwater in Storage. MWA (1999) calculated the available stored groundwater underlying the Alto subarea at the end of 1998 was 960,000 af and the available storage space was 1,126,000 af. MWA (1999) calculated the available stored groundwater in the Este subarea at the end of 1998 was 420,000 af and the available storage space was 110,000 af. The basin is considered to be effectively full when 1930 water level elevations are reached (BEE, 1994). Assuming an overlying area of about 413,000 acres, a saturated thickness of about 250 feet, and a specific yield of 10.5 percent indicates about 10,800,000 af of stored groundwater at the end of 1998. This amount indicates that about 2,200,000 af of additional storage space was available.

Groundwater Budget (Type A)

Not enough data exist to compile a detailed groundwater budget for the basin. However, MWA monitors groundwater extraction and reports extractions of 58,300 af for urban uses, 7,800 af for agriculture, and 11,900 af for industrial and recreational uses in the 1997-1998 water year (MWA 1999). In addition to the extraction data, several other components of the water budget have been reported. For the 1997-1998 water year, MWA (1999) estimated natural recharge at 105,000 af, artificial recharge at 16,350 af, and applied water recharge at 3,900 af. Subsurface inflow and outflow averages are estimated by DWR (1967) at 950 af inflow and 2,000 af outflow. Bookman-Edmonston Engineering (1994) set the average inflow at about 1,000 af and the average outflow at 2,000 af. Stamos and others (2001) an estimate that 5,000 to 6,000 afy flows through the floodplain unit into the Middle Mojave River Valley Groundwater Basin near the Helendale fault.

Groundwater Quality

Characterization. Calcium bicarbonate character waters are found near the San Bernardino Mountains and near the Mojave River channel. Sodium bicarbonate waters are found near Victorville. Sodium bicarbonate-sulfate waters are found near Adelanto. Sodium-calcium sulfate waters occur west of Victorville. Sodium chloride waters are found in Apple Valley. Small areas of calcium-sodium sulfate and calcium-sodium bicarbonate also occur in this basin (DWR 1967). Total dissolved solids content typically is less than 500 mg/L (BEE 1994), but concentrations up to 1,105 mg/L were found near Apple Valley (DWR 1967). Electrical Conductivity readings range as high as 1,529 μmhos, with lower values of 650 μmhos found near Apple Valley, and 550 μmhos found near Adelanto (DWR 1967).

Impairments. High nitrate concentrations occur in the southern portion of the basin and high iron and manganese concentrations are found near Oro Grande. Groundwater has been contaminated with trichloroethane (TCE) at the former George Air Force Base, now a federal Superfund site (BEE 1994). Leaking underground storage tanks in and around Victorville have introduced fuel additives benzene, toluene, ethlybenzene, xylene, and methyl tertiary butyl ether (MTBE) into groundwater (BEE 1994; MWA 1999).

Water Quality in Public Supply Wells

Constituent Group[1]	Number of wells sampled[2]	Number of wells with a concentration above an MCL[3]
Inorganics – Primary	122	9
Radiological	115	2
Nitrates	125	2
Pesticides	117	0
VOCs and SVOCs	120	0
Inorganics – Secondary	122	11

[1] A description of each member in the constituent groups and a generalized discussion of the relevance of these groups are included in *California's Groundwater – Bulletin 118* by DWR (2003).
[2] Represents distinct number of wells sampled as required under DHS Title 22 program from 1994 through 2000.
[3] Each well reported with a concentration above an MCL was confirmed with a second detection above an MCL. This information is intended as an indicator of the types of activities that cause contamination in a given basin. It represents the water quality at the sample location. It does not indicate the water quality delivered to the consumer. More detailed drinking water quality information can be obtained from the local water purveyor and its annual Consumer Confidence Report.

Well Production Characteristics

	Well yields (gal/min)	
Municipal/Irrigation	Range: to 5,500 gal/min	Average: 1,030 gal/min Median: 980 (130 Well Completion Reports)
	100-2,000 gal/min for floodplain unit (Hardt 1969; Lines 1996)	Average = 630 gal/min for all units (BEE 1994)
	Total depths (ft)	
Domestic	Range: 22-1,140 ft	Average: 250 ft Median: 210 ft (1,188 Well Completion Reports)
Municipal/Irrigation	Range: 50-1,970 ft	Average: 360ft Median: 300 ft (326 Well Completion Reports)

Active Monitoring Data

Agency	Parameter	Number of wells /measurement frequency
US Geological Survey	Water level	120/ Annually
US Geological Survey	Water Quality	22/ Annually
Department of Health Services	Title 22 Water Quality	153/ Annually

Basin Management

Groundwater management	The Upper Mojave River Valley Groundwater Basin is a portion of an area adjudicated in 1996 setting the Mojave Water Agency as watermaster. MWA has proposed three basic management strategy alternatives that would reduce and eliminate overdraft in the basin: water conservation, water supply enhancement, and water allocation. These alternatives will likely be implemented together in the final management strategy adopted by MWA (BEE 1994).
Water agencies	
Public	Mojave Water Agency, Victor Valley Water District, Thunderbird County Water District, Juniper Riveria County Water District, Mariana Ranchos County Water District, Hesperia Water District, Baldy Mesa Water District, County Service Area Number 64, Apple Valley Heights County Water District, Apple Valley Foothill County Water District
Private	Apple Valley Ranchos Water Company, Southern California Water Company, Rancheritos Mutual Water Company

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Errata

Substantive changes made to the basin description will be noted here.

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APPENDIX E

County of San Bernardino
Ordinance No. SD 90-11

RBF CONSULTING
14725 Alton Parkway
Irvine, California 92618-2027

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MINUTES OF THE BOARD OF SUPERVISORS
OF SAN BERNARDINO COUNTY, CALIFORNIA

OCTOBER 15, 1990

ORDINANCE SD 90-11: COUNTY SERVICE AREAS 42, 64 AND 70, IMPROVEMENT ZONES C, F, G, J, L, W-1, W-3 AND W-4: WATER CONSERVATION: ADOPT:

The Board of Supervisors considers adoption of a water conservation ordinance on behalf of County Service Areas 42, 64 and 70, Improvement Zones C, F, G, J, L, W-1, W-3 and W-4. This item has been deferred for discussion.

Supervisor Mikels states that when this item first came up, he expressed reservations about the penalty provisions and says he still has some serious concerns about putting someone in jail for a violation of the ordinance. He says a severe fine for wasting water is more appropriate and recommends that the portion about imprisonment in the County jail be taken out of the ordinance.

County Counsel Alan Marks states they are proceeding under the provisions of the Water Code which provide that a violation is a misdemeanor and is punishable by fine or imprisonment and that they believe that language has to be included. He says if a district believes it is not appropriate to pursue a jail sentence, that can be communicated to the prosecutors and the courts. He says even if it is not included, State law will still impose the penalty; he indicates the Code provides for not more than 30 days imprisonment rather than six months. He says his concern in deleting half of the penalty provision is that it might mislead someone into believing that, if they violate the ordinance, they won't be subject to imprisonment when they are.

Supervisor Walker suggests that the reference to fines and imprisonment be taken out and that they indicate that penalties would be as imposed by State law.

Supervisor Mikels asks that staff come back with a policy that the Board of Supervisors recommends to any court considering a case under this ordinance that jail time is not recommended by the Board.

On motion by Supervisor Mikels, seconded by Supervisor Turoci and carried, the Board of Supervisors adopts Ordinance SD 90-11, with the revised wording in the Penalty provision, as the same is set forth in full in Special Districts Ordinance Book No. 4 and is entitled:

> "AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACTING IN ITS CAPACITY AS THE GOVERNING BODY OF NAMED COUNTY SERVICE AREAS AND IMPROVEMENT ZONES THEREOF, ESTABLISHING WATER CONSERVATION MEASURES".

14-9607A-103

MINUTES OF THE BOARD OF SUPERVISORS
OF SAN BERNARDINO COUNTY, CALIFORNIA

OCTOBER 15, 1990

ORDINANCE SD 90-11: COUNTY SERVICE AREAS 42, 64 AND 70, IMPROVEMENT ZONES C, F, G, J, L, W-1, W-3 AND W-4: WATER CONSERVATION: ADOPT: (CONTINUED, PAGE 2):

By the same motion, the Board of Supervisors further directs that the Assistant Administrative Officer for Special Districts bring back to the Board an agenda item for a statement of policy that it is the Board of Supervisors' intent that imprisonment for violations of any of the provisions of Ordinance SD 90-11 be discouraged and that violations be handled through administrative enforcement.

PASSED AND ADOPTED by the Board of Supervisors of the County of San Bernardino, State of California, by the following vote:

AYES: SUPERVISORS: Turoci, Mikels, Hammock, Walker, Riordan

NOES: SUPERVISORS: None

ABSENT: SUPERVISORS: None

* * * * * *

STATE OF CALIFORNIA
COUNTY OF SAN BERNARDINO } ss.

I, EARLENE SPROAT, Clerk of the Board of Supervisors of the County of San Bernardino, State of California, hereby certify the foregoing to be a full, true and correct copy of the record of the action taken by said Board of Supervisors, by vote of the members present, as the same appears in the Official Minutes of said Board at its meeting of October 15, 1990. dm #87

cc: Supervisor Mikels; Supervisor Turoci; Special Districts-Bangert; County Counsel-Krahelski; CSA's: 42, 64, & 70: Zones: C, F, J, L, W-1, W-3 & W-4; File

EARLENE SPROAT
Clerk of the Board

By _____ Deputy

14-836-103 Rev. 9/89

10/15/90 dm #87

14-9507A-103

ORDINANCE NO. SD 90-11

AN ORDINANCE OF THE BOARD OF SUPERVISORS OF THE COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, ACTING IN ITS CAPACITY AS THE GOVERNING BODY OF NAMED COUNTY SERVICE AREAS AND IMPROVEMENT ZONES THEREOF, ESTABLISHING WATER CONSERVATION MEASURES

The Board of Supervisors of the County of San Bernardino, State of California, acting in its capacity as the governing body of the county service areas and improvement zones named in Section 1(a) of this ordinance, ordains as follows:

SECTION 1. The Board of Supervisors of the County of San Bernardino hereby finds and determines:

(a) That from and after the effective date of this ordinance, it shall be in full force and effect within the following county service areas and improvement zones:

County Service Area 42
County Service Area 64
County Service Area 70
- Improvement Zone C
- Improvement Zone F
- Improvement Zone G
- Improvement Zone J
- Improvement Zone L
- Improvement Zone W-1
- Improvement Zone W-3
- Improvement Zone W-4

(b) That a drought condition has existed within the above-named county service areas and improvement zones ("Districts", or individually, the "District") during the past four years and such condition poses a substantial, current threat to the water supply within these areas;

(c) That it is necessary to preserve the water supply for the greatest public benefit within these Districts;

(d) That in order to preserve the health and safety of the people within these Districts, water conservation measures are

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necessary;

(e) That all water users in these Districts shall be subject to the water conservation measures and related provisions established herein;

(f) That in order to conserve the water supply for the greatest public benefit, with particular regard to domestic use, sanitation and fire protection of consumers, it is necessary to restrict the use of water within each District's service area.

SECTION 2. In order to conserve the water supply within these Districts and pursuant to Water Code Sections 375-377, the following water conservation measures are hereby established:

(a) Lawns, trees, shrubs, and other landscaping shall not be excessively watered at any time, and water shall not be permitted to run off private property onto streets or adjacent lands.

(b) Sidewalks, walkways, driveways, parking areas, patios, porches or verandas shall not be washed off with hoses. The exception to this shall be flammable or other similar dangerous substances that require direct hose flushing.

(c) Watering, sprinkling, aerial watering or irrigating of any landscaped or vegetated areas, including lawns, trees, shrubs, grass, ground cover, plants, vine gardens, vegetables, flowers, or other landscaping shall not occur between the hours of 6:00 a.m. and 9:00 p.m. during the high use season (April 1 through October 31 of each year). In the low use season (November 1 through March 31), such watering shall not occur between the hours of 1:00 p.m. and 8:00 a.m. These restrictions shall not apply to a hand-held hose or drip irrigation systems.

(d) Noncommercial washing of privately owned vehicles, trailers, motor homes, buses, boats and mobile homes is prohibited except from bucket and except that a hose equipped with a shut-off nozzle may be used for a quick rinse.

(e) Water shall not be used to clean, fill, operate or maintain levels in decorative fountains, unless such water is part of a recycling system.

(f) Water shall not be permitted to leak from any water line, faucet or other facility on any premises. Any leak shall be repaired in a timely manner.

(g) Restaurants or other public places where food is served shall not routinely provide glasses of drinking water to customers unless specifically requested.

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15-13579-161 Rev. 5/84

(h) Water for construction purposes, including but not limited to debrushing of vacant land, compaction of fills and pads, trench backfill and other construction uses, shall be used in an efficient manner. The use of "rainbird" type sprinklers is not recommended between the hours of 6:00 a.m. and 6:00 p.m.

(i) The use of water for any purpose shall not result in flooding or runoff onto gutters, driveways, streets or adjacent lands.

(j) All new construction, including residential, commercial and industrial, shall be equipped with low flow toilets with a maximum tank size or flush capacity of 3 gallons, and showerheads with a maximum flow capacity of 2 gallons per minute.

(k) All new model homes and commercial and industrial development, when landscaped, shall include low water use, drought-tolerant or native plant material, and matched precipitation rate, low-gallonage sprinkler heads, bubblers, drip irrigation and timing devices. Timing devices should include soil moisture sensors. Before any permit may be issued for new construction, the applicant shall submit a landscape plan for review and approval by the Director of San Bernardino County's Department of Land Management.

(l) Water used for cooling systems must be recycled to the extent possible.

(m) Evaporation resistant covers are required for all new swimming pools and hot tubs and are encouraged for existing pools. Safety covers required by this ordinance shall, at the time of purchase, installation and all subsequent maintenance, meet or exceed current standards and specifications for swimming pool, spa and hot tub covers adopted by the American Society for Testing and Materials (ASTM).

(n) Hotels/motels are required to post notices urging guests to conserve water.

(o) All current water customers are encouraged to install flow reducers and faucet aerators.

(p) Parks, golf courses, cemeteries, and school grounds which use water provided by the Districts, shall irrigate between the hours of 9:00 p.m. and 3:00 a.m.

SECTION 3. The following provisions shall pertain to the enforcement of this ordinance, violations of the measures established herein and the penalties for such violations:

(a) Violations unlawful. It is unlawful for any person within the District to violate the water conservation measures and provisions established in this ordinance and such violation shall

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be subject to the penalties hereinafter set forth and as may be otherwise provided by law.

(b) Violations. Any person found to be violating any provision of this ordinance or any rule or regulation of the District shall be served by the District with written notice stating the nature of the violation and providing a reasonable time limit for the correction thereof. Such notice may be personally served or may be given by certified mail. The person shall, within the time limit stated in the notice, cease all violations.

(c) Civil Enforcement. For second violations or continuing violations, as additional methods of civil enforcement of this ordinance, the District may install a flow restrictor device at the user's water meter or may disconnect the user from the District's water system, following notice of intent to disconnect. All costs of installing/removing the flow restrictor or of disconnection/ reconnection shall be paid by the owner of the property.

(d) Suspension or Modification. When any person, by reason of special circumstances, believes that a suspension or modification of a provision of this ordinance is necessary to avoid substantial detriment to the person's property or facilities, that person may file a written application with the District Manager and with the Special Districts Department, stating the special circumstances, citing the provision involved and requesting suspension or modification of that provision. The Director of the Special Districts Department may suspend or modify the provision for a specified period of time or during the period of the special circumstances upon finding that the enforcement of the provision will cause substantial detriment to the person and that the suspension or modification of the provision will not unreasonably jeopardize the District's water supply.

(e) General Penalty. Pursuant to Water Code Section 377, any person violating any of the provisions of this ordinance and failing to correct such violation within the time provided shall be guilty of a misdemeanor. Such misdemeanor shall be punishable in accordance with the provisions of State law.

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SECTION 4. This ordinance and the various parts, sentences, paragraphs, sections and clauses are hereby declared to be severable. If any such part, sentence, paragraph, section or clause is adjudged unconstitutional or invalid, the remainder of this ordinance shall not be affected. The Board hereby declares that it would have passed the ordinance and each part thereof regardless of the fact that one or more parts might be declared unconstitutional or invalid.

SECTION 5. Ordinance No. SD 90-7 is hereby repealed.

SECTION 6. Pursuant to Water Code Section 376, this ordinance is effective upon adoption.

Barbara Cram Riordan

BARBARA CRAM RIORDAN, Chairman
Board of Supervisors

SIGNED AND CERTIFIED THAT A COPY
OF THIS DOCUMENT HAS BEEN DELIVERED
TO THE CHAIRMAN OF THE BOARD

EARLENE SPROAT, Clerk of the
Board of Supervisors

Earlene Sproat

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN BERNARDINO)

I, EARLENE SPROAT, Clerk of the Board of Supervisors of the County of San Bernardino, State of California, hereby certify that at a regular meeting of the Board of Supervisors of said County and State, held on the 15th day of October, 1990, at which meeting were present Supervisors: Marsha Turoci, Jon D. Mikels, Larry Walker, Robert L. Hammock, Barbara Cram Riordan

and the Clerk, the foregoing ordinance was passed and adopted by the following vote, to wit:

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3579-161 Rev. 6/84

AYES: SUPERVISORS: Turoci, Mikels, Walker, Hammock, Riordan

NOES: SUPERVISORS: None

ABSENT: SUPERVISORS: None

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the official seal of the Board of Supervisors this 15th day of October, 1990.

EARLENE SPROAT, Clerk of the
Board of Supervisors of the
County of San Bernardino,
State of California

Nelley Mallery
Deputy

APPROVED AS TO FORM

ALAN K. MARKS
County Counsel

By L. Thomas Krakelski
Deputy County Counsel

Date: October 17, 1990

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