

## Appendix A - UWMP Checklist

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<b>CWC Section</b>	<b>UWMP Requirement</b>	<b>Subject</b>	<b>Guidebook Location</b>	<b>UWMP Location (Optional Column for Agency Use)</b>
<b>10620(b)</b>	Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.	Plan Preparation	Section 2.1	<b>1.3.2</b>
<b>10620(d)(2)</b>	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.	Plan Preparation	Section 2.5.2	<b>1.3.1</b>
<b>10642</b>	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.	Plan Preparation	Section 2.5.2	<b>1.3.3, 7.4, 7.5, 7.6, 7.7</b>
<b>10631(a)</b>	Describe the water supplier service area.	System Description	Section 3.1	<b>1.4.1, 1.4.2</b>
<b>10631(a)</b>	Describe the climate of the service area of the supplier.	System Description	Section 3.3	<b>1.5</b>
<b>10631(a)</b>	Provide population projections for 2020, 2025, 2030, and 2035.	System Description	Section 3.4	<b>2.2</b>
<b>10631(a)</b>	Describe other demographic factors affecting the supplier's water management planning.	System Description	Section 3.4	<b>1.6, 1.7</b>
<b>10631(a)</b>	Indicate the current population of the service area.	System Description and Baselines and Targets	Sections 3.4 and 5.4	<b>2.2</b>

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<b>10631(e)(1)</b>	Quantify past, current, and projected water use, identifying the uses among water use sectors.	System Water Use	Section 4.2	<b>2.3, 2.4</b>
<b>10631(e)(3)(A)</b>	Report the distribution system water loss for the most recent 12-month period available.	System Water Use	Section 4.3	<b>N/A</b>
<b>10631.1(a)</b>	Include projected water use needed for lower income housing projected in the service area of the supplier.	System Water Use	Section 4.5	<b>N/A</b>
<b>10608.20(b)</b>	Retail suppliers shall adopt a 2020 water use target using one of four methods.	Baselines and Targets	Section 5.7 and App E	<b>N/A</b>
<b>10608.20(e)</b>	Retail suppliers shall 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.	Baselines and Targets	Chapter 5 and App E	<b>N/A</b>
<b>10608.22</b>	Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply if the suppliers base GPCD is at or below 100.	Baselines and Targets	Section 5.7.2	<b>N/A</b>
<b>10608.24(a)</b>	Retail suppliers shall meet their interim target by December 31, 2015.	Baselines and Targets	Section 5.8 and App E	<b>N/A</b>
<b>10608.24(d)(2)</b>	If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data	Baselines and Targets	Section 5.8.2	<b>N/A</b>

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	supporting the adjustment.			
<b>10608.36</b>	Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions.	Baselines and Targets	Section 5.1	<b>7.7</b>
<b>10608.40</b>	Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form.	Baselines and Targets	Section 5.8 and App E	<b>N/A</b>
<b>10631(b)</b>	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035.	System Supplies	Chapter 6	<b>Table 3-1</b>
<b>10631(b)</b>	Indicate whether groundwater is an existing or planned source of water available to the supplier.	System Supplies	Section 6.2	<b>3.1</b>
<b>10631(b)(1)</b>	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.	System Supplies	Section 6.2.2	<b>3.4.2</b>
<b>10631(b)(2)</b>	Describe the groundwater basin.	System Supplies	Section 6.2.1	<b>3.4.1, 3.4.3, 3.4.4</b>
<b>10631(b)(2)</b>	Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump.	System Supplies	Section 6.2.2	<b>1.4.2, Appendix D, Appendix E</b>
<b>10631(b)(2)</b>	For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or	System Supplies	Section 6.2.3	<b>3.4.4.1</b>

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	projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition.			
<b>10631(b)(3)</b>	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	System Supplies	Section 6.2.4	<b>3.4.4.1</b>
<b>10631(b)(4)</b>	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	System Supplies	Sections 6.2 and 6.9	<b>3.4.3.2, 3.4.4.1</b>
<b>10631(d)</b>	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	System Supplies	Section 6.7	<b>3.5.1, 3.5.2</b>
<b>10631(g)</b>	Describe the expected future 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.	System Supplies	Section 6.8	<b>3.6</b>
<b>10631(h)</b>	Describe desalinated water project opportunities for long-term supply.	System Supplies	Section 6.6	<b>3.7</b>
<b>10631(j)</b>	Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source.	System Supplies	Section 2.5.1	<b>N/A</b>
<b>10631(j)</b>	Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during	System Supplies	Section 2.5.1	<b>1.3.1</b>

<b>CWC Section</b>	<b>UWMP Requirement</b>	<b>Subject</b>	<b>Guidebook Location</b>	<b>UWMP Location (Optional Column for Agency Use)</b>
	various water year types.			
<b>10633</b>	For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.1	<b>4.2</b>
<b>10633(a)</b>	Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	System Supplies (Recycled Water)	Section 6.5.2	<b>4.3</b>
<b>10633(b)</b>	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.	System Supplies (Recycled Water)	Section 6.5.2.2	<b>4.3.4</b>
<b>10633(c)</b>	Describe the recycled water currently being used in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.3 and 6.5.4	<b>4.4.1</b>
<b>10633(d)</b>	Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses.	System Supplies (Recycled Water)	Section 6.5.4	<b>4.4.2</b>
<b>10633(e)</b>	Describe 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.	System Supplies (Recycled Water)	Section 6.5.4	<b>4.4.2, 4.4.3, 4.4.4</b>
<b>10633(f)</b>	Describe the actions which may be taken to encourage the use of recycled water and the projected results of these	System Supplies (Recycled Water)	Section 6.5.5	<b>4.5</b>

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	actions in terms of acre-feet of recycled water used per year.	Water)		
<b>10633(g)</b>	Provide a plan for optimizing the use of recycled water in the supplier's service area.	System Supplies (Recycled Water)	Section 6.5.5	<b>4.5</b>
<b>10620(f)</b>	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	Water Supply Reliability Assessment	Section 7.4	<b>3.6, 6.4.5</b>
<b>10631(c)(1)</b>	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage.	Water Supply Reliability Assessment	Section 7.1	<b>6.2</b>
<b>10631(c)(1)</b>	Provide data for an average water year, a single dry water year, and multiple dry water years	Water Supply Reliability Assessment	Section 7.2	<b>3.4.3.2, 3.4.4.1, 6.4</b>
<b>10631(c)(2)</b>	For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source.	Water Supply Reliability Assessment	Section 7.1	<b>6.3.2, 6.3.3</b>
<b>10634</b>	Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability	Water Supply Reliability Assessment	Section 7.1	<b>Section 5</b>
<b>10635(a)</b>	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.	Water Supply Reliability Assessment	Section 7.3	<b>6.4</b>
<b>10632(a) and</b>	Provide an urban water shortage	Water	Section 8.1	<b>8.2.1</b>

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<b>10632(a)(1)</b>	contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage.	Shortage Contingency Planning		
<b>10632(a)(2)</b>	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.	Water Shortage Contingency Planning	Section 8.9	<b>8.3</b>
<b>10632(a)(3)</b>	Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies.	Water Shortage Contingency Planning	Section 8.8	<b>8.4</b>
<b>10632(a)(4)</b>	Identify mandatory prohibitions against specific water use practices during water shortages.	Water Shortage Contingency Planning	Section 8.2	<b>8.5</b>
<b>10632(a)(5)</b>	Specify consumption reduction methods in the most restrictive stages.	Water Shortage Contingency Planning	Section 8.4	<b>8.6</b>
<b>10632(a)(6)</b>	Indicated penalties or charges for excessive use, where applicable.	Water Shortage Contingency Planning	Section 8.3	<b>8.7</b>
<b>10632(a)(7)</b>	Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts.	Water Shortage Contingency Planning	Section 8.6	<b>8.8</b>
<b>10632(a)(8)</b>	Provide a draft water shortage contingency resolution or ordinance.	Water Shortage Contingency Planning	Section 8.7	<b>8.9</b>
<b>10632(a)(9)</b>	Indicate a mechanism for	Water	Section 8.5	<b>8.10</b>



<b>CWC Section</b>	<b>UWMP Requirement</b>	<b>Subject</b>	<b>Guidebook Location</b>	<b>UWMP Location (Optional Column for Agency Use)</b>
	determining actual reductions in water use pursuant to the water shortage contingency analysis.	Shortage Contingency Planning		
<b>10631(f)(1)</b>	Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code.	Demand Management Measures	Sections 9.2 and 9.3	<b>N/A</b>
<b>10631(f)(2)</b>	Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program.	Demand Management Measures	Sections 9.1 and 9.3	<b>Section 7</b>
<b>10631(i)</b>	CUWCC members may submit their 2013-2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU.	Demand Management Measures	Section 9.5	<b>N/A</b>
<b>10608.26(a)</b>	Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets.	Plan Adoption, Submittal, and Implementation	Section 10.3	<b>N/A</b>
<b>10621(b)</b>	Notify, at least 60 days prior to the public hearing, 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.	Plan Adoption, Submittal, and Implementation	Section 10.2.1	<b>1.3.2</b>

<b>CWC Section</b>	<b>UWMP Requirement</b>	<b>Subject</b>	<b>Guidebook Location</b>	<b>UWMP Location (Optional Column for Agency Use)</b>
<b>10621(d)</b>	Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.	Plan Adoption, Submittal, and Implementation	Sections 10.3.1 and 10.4	<b>1.3.2</b>
<b>10635(b)</b>	Provide supporting documentation that Water Shortage Contingency 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 the plan to DWR.	Plan Adoption, Submittal, and Implementation	Section 10.4.4	<b>N/A</b>
<b>10642</b>	Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan.	Plan Adoption, Submittal, and Implementation	Sections 10.2.2, 10.3, and 10.5	<b>Appendix C</b>
<b>10642</b>	The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water.	Plan Adoption, Submittal, and Implementation	Sections 10.2.1	<b>Appendix C</b>
<b>10642</b>	Provide supporting documentation that the plan has been adopted as prepared or modified.	Plan Adoption, Submittal, and Implementation	Section 10.3.1	<b>1.3.2</b>
<b>10644(a)</b>	Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library.	Plan Adoption, Submittal, and Implementation	Section 10.4.3	<b>1.3.2</b>
<b>10644(a)(1)</b>	Provide supporting documentation that the urban	Plan Adoption,	Section 10.4.4	<b>1.3.2</b>

<b>CWC Section</b>	<b>UWMP Requirement</b>	<b>Subject</b>	<b>Guidebook Location</b>	<b>UWMP Location</b> <i>(Optional Column for Agency Use)</i>
	water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption.	Submittal, and Implementation		
<b>10644(a)(2)</b>	The plan, or amendments to the plan, submitted to the department shall be submitted electronically.	Plan Adoption, Submittal, and Implementation	Sections 10.4.1 and 10.4.2	<b>N/A</b>
<b>10645</b>	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours.	Plan Adoption, Submittal, and Implementation	Section 10.5	<b>N/A</b>

## Appendix B – DWR Standardized Tables

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**Table 2-2: Plan Identification**

Select Only One	Type of Plan	Name of RUWMP or Regional Alliance <i>if applicable drop down list</i>
<input checked="" type="checkbox"/>	<b>Individual UWMP</b>	
	<input type="checkbox"/>	Water Supplier is also a member of a RUWMP
	<input type="checkbox"/>	Water Supplier is also a member of a Regional Alliance
<input type="checkbox"/>	<b>Regional Urban Water Management Plan (RUWMP)</b>	

NOTES: "The Regional Urban Water Management Plan" The Metropolitan Water District of Southern California

Table 2-3: Agency Identification	
Type of Agency (select one or both)	
<input checked="" type="checkbox"/>	Agency is a wholesaler
<input type="checkbox"/>	Agency is a retailer
Fiscal or Calendar Year (select one)	
<input checked="" type="checkbox"/>	UWMP Tables Are in Calendar Years
<input type="checkbox"/>	UWMP Tables Are in Fiscal Years
If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd)	
Units of Measure Used in UWMP (select from Drop down)	
Unit	AF
NOTES:	

**Table 2-4 Wholesale: Water Supplier Information Exchange (select one)**

<input checked="" type="checkbox"/>	Supplier has informed more than 10 other water suppliers of water supplies available in accordance with CWC 10631. Completion of the table below is optional. If not completed include a list of the water suppliers that were informed.
<b>Provide page number for location of the list.</b>	
<input type="checkbox"/>	Supplier has informed 10 or fewer other water suppliers of water supplies available in accordance with CWC 10631. <b>Complete the table below.</b>

<i>Water Supplier Name (Add additional rows as needed)</i>	
City of Adelanto	
Apple Valley Ranchos Water Company's (AVRWC's)	
CSA 64	
CSA 70J	
Golden State Water Company's (GSWC)	
Hesperia Water District	
Hi-Desert Water District	
Joshua Basin Water District	
Phelan Piñon Hills CSD	
Victorville Water District	
<p>NOTES: The MWA service area includes the service areas of forty-five (45) local retail water agencies, with ten being required to prepare an individual UWMP because they provide water to more than 3,000 service connections or supply more than 3,000 acre-feet (af) of water annually. The ten retail water purveyors within MWA's service area that are required to prepare their own UWMP are detailed above.</p>	

**Table 3-1 Wholesale: Population - Current and Projected**

Total Population Served	2015	2020	2025	2030	2035	2040
	469,551	499,967	543,265	593,809	646,489	695,647

NOTES: Source: Beacon Economics, Mojave Water Agency Population Forecast, December 2015



**Table 4-1 Wholesale: Demands for Potable and Raw Water - Actual**

Use Type <i>(Add additional rows as needed)</i>	2015 Actual		
<i>Drop down list</i> <i>May select each use multiple times</i> <i>These are the only use types that will be recognized</i> <i>by the WUE data online submittal tool</i>	Additional Description <i>(as needed)</i>	Level of Treatment When Delivered <i>Drop down list</i>	Volume
Sales to other agencies	Demand for all sub-areas	Raw Water	138,009
<b>TOTAL</b>			138,009
NOTES: See 2015 Urban Water Management Plan Section 2.3			

**Table 4-2 Wholesale: Demands for Potable and Raw Water - Projected**

Use Type <i>(Add additional rows as needed)</i>	Additional Description <i>(as needed)</i>	Projected Water Use <i>Report To the Extent that Records are Available</i>				
<i>Drop down list</i> <i>May select each use multiple times</i> <i>These are the only Use Types that will be recognized by the WUEdata online submittal tool.</i>		2020	2025	2030	2035	2040
Sales to other agencies		148,366	153,186	159,079	165,164	170,700
<b>TOTAL</b>		148,366	153,186	159,079	165,164	170,700

NOTES: See 2015 Urban Water Management Plan Section 2.4

**Table 4-3 Wholesale: Total Water Demands**

	2015	2020	2025	2030	2035	2040(opt)
Potable and Raw Water <i>From Tables 4-1 and 4-2</i>	138,009	148,366	153,186	159,079	165,164	170,700
Recycled Water Demand* <i>From Table 6-4</i>	0	0	0	0	0	0
<b>TOTAL WATER DEMAND</b>	138,009	148,366	153,186	159,079	165,164	170,700

*\*Recycled water demand fields will be blank until Table 6-4 is complete.*

NOTES:

**Table 4-4 Wholesale: 12 Month Water Loss Audit Reporting**

Reporting Period Start Date (mm/yyyy)	Volume of Water Loss*
N/A	N/A

*\* Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.*

NOTES: This requirement is not applicable because MWA does not own or operate a distribution system. The water received from the State Water Project goes directly into groundwater recharge without treatment or distribution.

**Table 6-1 Wholesale: Groundwater Volume Pumped**

<input type="checkbox"/>	Supplier does not pump groundwater. The supplier will not complete the table below.					
Groundwater Type <i>Drop Down List</i> <i>May use each category multiple times</i>	Location or Basin Name	2011	2012	2013	2014	2015
Alluvial Basin	Alto	76,500	79,900	81,400	81,100	71,300
Alluvial Basin	Baja	26,600	31,400	30,600	30,100	29,700
Alluvial Basin	Centro	22,700	22,900	20,800	21,200	20,100
Alluvial Basin	Este	6,000	6,400	6,600	6,700	6,800
Alluvial Basin	Oeste	4,600	4,800	3,500	3,600	3,600
Alluvial Basin	Morongo Area	5,185	5,367	5,979	5,999	6,509
<b>TOTAL</b>		141,585	150,767	148,879	148,699	138,009
NOTES: See 2015 Urban Water Management Plan Section 2.3						

Table 6-3 Wholesale: Wastewater Treatment and Discharge Within Service Area in 2015											
<input checked="" type="checkbox"/>	Wholesale supplier neither distributes nor provides supplemental treatment to recycled water. The supplier will not complete the table below.										
Wastewater Treatment Plant Name	Discharge Location Name or Identifier	Discharge Location Description	Wastewater Discharge ID Number (optional)	Method of Disposal <i>Drop down list</i>	Does This Plant Treat Wastewater Generated Outside the Service Area?	Treatment Level <i>Drop down list</i>	2015 volumes				
							Wastewater Treated	Discharged Treated Wastewater	Recycled Within Service Area	Recycled Outside of Service Area	
<i>Add additional rows as needed</i>							<b>Total</b>	38,080.0	0.0	0.0	0.0

**Table 6-4 Wholesale: Current and Projected Retailers Provided Recycled Water Within Service Area**

<input checked="" type="checkbox"/>	Recycled water is not directly treated or distributed by the supplier. The supplier will not complete the table below.
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Name of Receiving Supplier or Direct Use by Wholesaler	Level of Treatment <i>Drop down list</i>	2015	2020	2025	2030	2035	2040 <i>(opt)</i>
<i>Add additional rows as needed</i>							
<b>Total</b>		0	0	0	0	0	0

NOTES:

**Table 6-5 Wholesale: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual**

<input checked="" type="checkbox"/>	Recycled water was not used or distributed by the supplier in 2010, nor projected for use or distribution in 2015. The wholesale supplier will not complete the table below.	
Name of Receiving Supplier or Direct Use by Wholesaler	2010 Projection for 2015	2015 actual use
<i>Add additional rows as needed</i>		
<b>Total</b>	0	0
NOTES:		



**Table 6-7 Wholesale: Expected Future Water Supply Projects or Programs**

☐	No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below.					
☐	Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format.					
	Provide page location of narrative in the UWMP					
Name of Future Projects or Programs	Joint Project with other agencies?		Description <i>(if needed)</i>	Planned Implementation Year	Planned for Use in Year Type <i>Drop Down list</i>	Expected Increase in Water Supply to Agency
	<i>Drop Down Menu</i>	<i>If Yes, Agency Name</i>				
<i>Add additional rows as needed</i>						
Ames/Reche Groundwater Storage and Recovery Program - Phase II Expansion	Yes	Bighorn-Desert View Water Agency	Expand the Ames/Reche Recharge Facility to accommodate the maximum potential delivery capacity of 3,000 acre-feet per year (AFY) (currently permitted for 1,500 AFY)	Conceptual	All Year Types	1,000+ acre-feet (AF) groundwater recharge
Deep Creek Off-River Recharge And Storage Basins	No		Off River recharge and storage basins on the Deep Creek Properties: In conjunction with current recharge in the Mojave River, off river basins could be constructed that can be filled from the Morongo basin pipeline.	Conceptual Design	All Year Types	N/A
Oro Grande Wash Groundwater Recharge Project	No		This project (Phase 2 of the Oro Grande Wash Project) is to construct a second pipeline to the Wash and to another groundwater recharge area between Amethyst and Bear Valley Road.	Implementable Project	All Year Types	Increased groundwater recharge
Alto Subarea Regional Aquifer Storage and Restoration (ASR2)	No		Project would use water from the Mojave Water Agency R-Cubed infrastructure to inject potable water into existing municipal wells in the regional aquifer.	Conceptual; Implementable Project	All Year Types	Improves water banking; enhances flood control and riparian restoration
Regional Aquifer Recharge Capacity	No		MWA needs to be able to accept a large quantity of water in a relatively short (wet) period. This could be accomplished through a variety of infrastructure.	Conceptual	All Year Types	1-100 AF groundwater recharge; reduction in flood damage
State Water Project Utilization & Efficiency Strategy	No		Conceptual program with an overall goal to make the best use of the Region's State Water Project resources for maximum benefit to the Region	Conceptual	All Year Types	1,000+ AF new water supply; 1,000+ AF groundwater recharge
State Water Project Water Treatment Plant in conjunction with R3 project	No		Construct a Water treatment plant to treat State Water Project Water and deliver directly into the potable R3 water delivery system. This can be done instead of pumping groundwater wells.	Conceptual	All Year Types	1,000+ AF new water supply; 1,000+ AF groundwater recharge
Wrightwood Imported Water Project	Yes	Golden State Water Co - Wrightwood	Installation of a well near Desert Front Road, including a pump station and transmission main to import water from the lower elevations south of the town into the higher elevations in the north.	Study, Design, Construction	All Year Types	N/A
Lucerne Valley Recharge Ponds	No		Recharge sites have been contemplated both east and west of the Helendale Fault. The 1994 RWMP recommended constructing a facility east of the fault because the majority of pumping occurs east of fault. MWA has purchased land for a recharge facility, prepared preliminary construction plans, and performed the necessary environmental reviews.	Implementable Project	All Year Types	1,000+ AF new water supply; 1,000+ AF groundwater recharge
Sheep Creek Recharge Basin and Two Wells	Yes	Phelan Piñon Hills Community Services District	This project consists of the construction of a recharge basin along with 2 pumping wells. The District is looking at utilizing the Sheep Creek California Aqueduct turn-out to extract State Water Project water to recharge the proposed basin utilizing the proposed pipeline. The two proposed wells will be used to pump water into our distribution system and will serve to monitor static and pumping levels of the ground water.	Conceptual	All Year Types	1,000+ AF new recycled water supply; 1,000+ AF groundwater recharge

Replacement Water Supply for Perchlorate/Nitrate Affected Groundwater - Barstow Area	Yes	Lahanton RWQCB/DPH grant	Perform a feasibility study to determine the most cost effective and sustainable manner to design, construct and operate an alternative water supply for residents adversely affected by perchlorate and nitrate polluted groundwater in an unincorporated area northeast of Barstow	Feasibility Study	All Year Types	1-100 AF new water supply
R-Cubed Enhanced Purveyor Supply System	No		Design and install conveyance from R-Cubed to purveyors not currently connected to R-Cubed.	Conceptual	All Year Types	Increased water supply and reliability
Antelope Valley Wash / Rancho Basin Recharge Ponds	Yes	City of Hesperia	The Ponds would provide groundwater recharge upgradient from Hesperia Water District wells. In addition to storm water detention, the site would be able to accommodate groundwater recharge.	Conceptual Design	All Year Types	1,000+ AF groundwater recharge; reduction in flood damage
Cedar Street / Bandicoot Detention Basin	Yes	City of Hesperia	The Basin would provide groundwater recharge upgradient from Hesperia Water District wells. In addition to storm water detention, the site would be able to accommodate groundwater recharge.	Conceptual Design	All Year Types	1,000+ AF groundwater recharge; reduction in flood damage.
NOTES: Source: Mojave Region IRWM Plan "Potential Projects"						

**Table 6-8 Wholesale: Water Supplies — Actual**

Table 6-8 Wholesale: Water Supplies — Actual				
Water Supply	Additional Detail on Water Supply	2015		
<i>Drop down list</i> <i>May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool</i>		Actual Volume	Water Quality <i>Drop Down List</i>	Total Right or Safe Yield <i>(optional)</i>
<i>Add additional rows as needed</i>				
Purchased or Imported Water	SWP	53,196	Raw Water	
Surface water	Net Natural Supply	57,349	Raw Water	
Groundwater	Return Flow	47,825	Raw Water	
Purchased or Imported Water	Wastewater Import	2,773	Recycled Water	
<b>Total</b>		161,143		0
NOTES: See 2015 Urban Water Management Plan Section 3.1				

**Table 6-9 Wholesale: Water Supplies — Projected**

Water Supply	Additional Detail on Water Supply	Projected Water Supply <i>Report To the Extent Practicable</i>									
		2020		2025		2030		2035		2040 (opt)	
		Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)	Reasonably Available Volume	Total Right or Safe Yield (optional)
<i>Add additional rows as needed</i>											
Purchased or Imported Water	SWP	55,676		55,676		55,676		55,676		55,676	
Purchased or Imported Water	Yuba Accord Water	600		600		600		600		600	
Surface water	Net Natural Supply	57,349		57,349		57,349		57,349		57,349	
Groundwater	Return Flow	52,356		54,471		57,057		59,727		62,157	
Purchased or Imported Water	Wastewater Import	2,800		2,800		2,800		2,800		2,800	
<b>Total</b>		168,781	0	170,896	0	173,482	0	176,152	0	178,582	0

NOTES: See 2015 Urban Water Management Plan Section 3.1

**Table 7-1 Wholesale: Basis of Water Year Data**

Year Type	Base Year <i>If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000</i>	Available Supplies if Year Type Repeats	
		<input checked="" type="checkbox"/>	Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location: Section 6.4 "Supply and Demand Comparisons"
		<input type="checkbox"/>	Quantification of available supplies is provided in this table as either volume only, percent only, or both.
		Volume Available	% of Average Supply
Average Year			100%
Single-Dry Year			
Multiple-Dry Years 1st Year			
Multiple-Dry Years 2nd Year			
Multiple-Dry Years 3rd Year			
Multiple-Dry Years 4th Year <i>Optional</i>			
Multiple-Dry Years 5th Year <i>Optional</i>			
Multiple-Dry Years 6th Year <i>Optional</i>			
Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. Suppliers may create an additional worksheet for the additional tables.			
NOTES:			

**Table 7-2 Wholesale: Normal Year Supply and Demand Comparison**

	2020	2025	2030	2035	2040 <i>(Opt)</i>
Supply totals <i>(autofill from Table 6-9)</i>	168,781	170,896	173,482	176,152	178,582
Demand totals <i>(autofill fm Table 4-3)</i>	148,366	153,186	159,079	165,164	170,700
Difference	20,415	17,710	14,403	10,988	7,882

NOTES:

**Table 7-3 Wholesale: Single Dry Year Supply and Demand Comparison**

	2020	2025	2030	2035	2040 (Opt)
Supply totals	148,366	153,186	159,079	165,164	170,700
Demand totals	148,366	153,186	159,079	165,164	170,700
Difference	0	0	0	0	0

NOTES: See 2015 Urban Water Management Plan Table 6-4: Projected 1977 Single-Dry Year Supplies and Demand (AFY)

**Table 7-4 Wholesale: Multiple Dry Years Supply and Demand Comparison**

		2020	2025	2030	2035	2040 (Opt)
First year	Supply totals	148,366	153,186	159,079	165,164	170,700
	Demand totals	148,366	153,186	159,079	165,164	170,700
	Difference	0	0	0	0	0
Second year	Supply totals	148,366	153,186	159,079	165,164	170,700
	Demand totals	148,366	153,186	159,079	165,164	170,700
	Difference	0	0	0	0	0
Third year	Supply totals	148,366	153,186	159,079	165,164	170,700
	Demand totals	148,366	153,186	159,079	165,164	170,700
	Difference	0	0	0	0	0
Fourth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Fifth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0
Sixth year <i>(optional)</i>	Supply totals					
	Demand totals					
	Difference	0	0	0	0	0

NOTES: See 2015 Urban Water Management Plan Table 6-6: Projected Multiple-Dry Year Supplies and Demand (AFY)



**Table 8-1 Wholesale  
Stages of Water Shortage Contingency Plan**

Stage	Complete Both	
	Supply Reduction <sup>1</sup>	Water Supply Condition (Narrative description)
<i>Add additional rows as needed</i>		
N/A	N/A	N/A

<sup>1</sup> One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.

NOTES: All of the retail potable water agencies within MWA boundaries that are required to complete their own individual 2015 UWMPs have Water Shortage Contingency Plans included in their 2015 UWMPs. As a wholesale agency, MWA does not have the authority to impose mandatory restrictions on retail customers due to water shortages. Therefore, this level of contingency planning is conducted by the retail water agencies.

**Table 8-4 Wholesale: Minimum Supply Next Three Years**

	2016	2017	2018
Available Water Supply	140,080	142,152	144,223

NOTES: See 2015 Urban Water Management Plan Table 8-1: Estimate of Minimum Supply for the Next Three Years

**Table 10-1 Wholesale: Notification to Cities and Counties (select one)**

<input checked="" type="checkbox"/>	Supplier has notified more than 10 cities or counties in accordance with CWC 10621 (b) and 10642. <b>Completion of the table below is not required. Provide a separate list of the cities and counties that were notified.</b>
-------------------------------------	---

	Provide the page or location of this list in the UWMP.
--	--

<input type="checkbox"/>	Supplier has notified 10 or fewer cities or counties. <b>Complete the table below.</b>
--------------------------	---

City Name	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

County Name <i>Drop Down List</i>	60 Day Notice	Notice of Public Hearing
<i>Add additional rows as needed</i>		
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	<input type="checkbox"/>

NOTES: See 2015 Urban Water Management Plan Section 1.3 Implementation of the Plan

## Appendix C – Public Outreach Materials

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State Water Project

Planning

IRWM Plan

SNM Plan

CASGEM

UWM Plan

Facilities

Mojave River

RFPs and Bids

## 2015 Urban Water Management Plan



### **PUBLIC NOTICE** *(Revised)*

The Mojave Water Agency (MWA) is in the process of preparing a 2015 Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period **beginning May 12, 2016** and ending on May 26, 2016. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The **Public Hearing** will be held on **Thursday, May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:

Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Dr. James Hart  
City Manager  
City of Adelanto  
PO Box 10  
Adelanto, CA 92301

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Dr. Hart,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
Beginning at 4:30 p.m.**

**Mojave Water Agency Boardroom  
22450 Headquarters Drive  
Apple Valley, CA 92307**

The UWMP is a planning document which anticipates future water demands and supplies through the year 2040 for the communities within MWA boundaries, pursuant to the requirements in the Urban Water Management Planning Act (Division 6, Part 2.6 of the CA Water Code).

A draft document will be available for review 30 days prior to the hearing. Public agencies and members of the public are invited to provide comments on the draft UWMP, either during the hearing or in writing prior to the hearing. Please address written correspondence to Tim Gobler, Water Resources Planning Analyst, or you may contact me at (760) 946-7046 or [tgobler@mojavewater.org](mailto:tgobler@mojavewater.org).

Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. Frank Robinson  
Town Manager  
Town of Apple Valley  
14955 Dale Evans Parkway  
Apple Valley, CA 92307

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Robinson,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
Beginning at 4:30 p.m.**

**Mojave Water Agency Boardroom  
22450 Headquarters Drive  
Apple Valley, CA 92307**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. Curt Mitchell  
City Manager  
City of Barstow  
220 E Mountain View  
Barstow, CA 92311

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Mitchell,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
Beginning at 4:30 p.m.**

**Mojave Water Agency Boardroom  
22450 Headquarters Drive  
Apple Valley, CA 92307**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst





[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. Mike Podegracz  
City Manager  
City of Hesperia  
9700 Seventh Ave  
Hesperia, CA 92345

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Podegracz,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

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Beginning at 4:30 p.m.**

**Mojave Water Agency Boardroom  
22450 Headquarters Drive  
Apple Valley, CA 92307**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. James Cox  
City Manager  
City of Victorville  
14343 Civic Drive  
Victorville, CA 92392

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Cox,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
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Apple Valley, CA 92307**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20Apple%20Valley%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. Gregory Devereaux  
County Administrative Officer  
County of San Bernardino  
385 North Arrowhead, Fifth Floor  
San Bernardino, CA 92415-0120

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Devereaux,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
Beginning at 4:30 p.m.**

**Mojave Water Agency Boardroom  
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Apple Valley, CA 92307**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst



[22450 Headquarters Drive ♦ Apple Valley, California 92307](http://22450%20Headquarters%20Drive%20-%20Apple%20Valley,%20California%2092307)  
Phone (760) 946-7000 ♦ Fax (760) 240-2642 ♦ [www.mojavewater.org](http://www.mojavewater.org)

February 17, 2016

Mr. Mark Nuaimi  
Town Manager  
Town of Yucca Valley  
57090 29 Palms Highway  
Yucca Valley, CA 92284

**NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF  
MOJAVE WATER AGENCY'S 2010 URBAN WATER MANAGEMENT PLAN**

Dear Mr. Nuaimi,

The Mojave Water Agency (MWA) will be holding a public hearing regarding the preparation of its 2015 Urban Water Management Plan (UWMP). The hearing is tentatively scheduled for Thursday, May 26, 2016, during MWA's regular Board of Directors meeting:

**Thursday, May 26, 2016  
Beginning at 4:30 p.m.**

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Sincerely,

Timothy E. Gobler  
Water Resources Planning Analyst

# NOTICE OF PUBLIC HEARING REGARDING THE PREPARATION OF **The Mojave Water Agency's 2015 Urban Water Management Plan**

***Project Background:*** The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (“Act”). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

***Public Review and Public Hearing:*** MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP is available for review at the MWA office located at the address shown below, on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Victorville, Barstow, Hesperia, Apple Valley, Lucerne Valley and Yucca Valley). In accordance with California Government Code and the Act, comments will be accepted during a 30-day review period beginning **April 26, 2016** and ending on **May 26, 2016**. Please send your comments to the address shown below. Please include a return address and contact name with your comments. A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP.

**The Public Hearing will be held during the regular meeting of the Mojave Water Agency Board of Directors on Thursday May 26, 2016, at 4:30 pm, in the MWA Board Room located at 22450 Headquarters Drive, Apple Valley, CA 92307.**

Address:  
Mojave Water Agency  
22450 Headquarters Drive  
Apple Valley, CA 92307  
Attn: Tim Gobler

## PUBLIC NOTICE

The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act (“Act”). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

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A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on **Thursday May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Chambers located at 22450 Headquarters Dr., Apple Valley, CA 92307.

Address:  
Mojave Water Agency  
22450 Headquarters Drive  
Apple Valley, CA 92307  
Attn: Tim Gobler

**CRAZYEST DEALS 866-3456**

**90 PUBLIC NOTICES**

**AMOUNT DUE.** Trustor(s): **Craig V. Johansen and Nancy J. Johansen**, husband and wife Recorded: 4/28/2006 as Instrument No. 2006-0288981 of Official Records in the office of the Recorder of SAN BERNARDINO County, California; **Date of Sale: 6/9/2016 at 9:00 AM Place of Sale: At the Ontario Convention Center, 2000 East Convention Center Way, Ontario, CA 91764, in the Auction.com Room** Amount of unpaid balance and other charges: **\$371,845.51** The purported property address is: **42729 HAUPSTRASSE DRIVE, BIG BEAR LAKE, CA 92315** Assessor's Parcel No.: 2328-441-17-0-000 **NOTICE TO POTENTIAL BIDDERS:** If you are considering bidding on this property lien, you should understand that there are risks involved in bidding at a trustee auction. You will be bidding on a lien, not on the property itself. Placing the highest bid at a trustee auction does not automatically entitle you to free and clear ownership of the property. You should also be aware that the lien being auctioned off may be a junior lien. If you are the highest bidder at the auction, you are or may be responsible for paying off all liens senior to the lien being auctioned off, before you can receive clear title to the property. You are encouraged to investigate the existence, priority, and size of outstanding liens that may exist on this property by contacting the county recorder's office or a title insurance company, either of which may charge you a fee for this information. If you consult either of these resources, you should be aware that the same lender may hold more than one mortgage or deed of trust on the property. **NOTICE TO PROPERTY OWNER:** The sale date shown on this notice of sale may be postponed one or more times by the mortgagee, beneficiary, trustee, or a court, pursuant to Section 2924g of the California Civil Code. The law requires that information about trustee sale postponements be made available to you and to the public, as a courtesy to those not present at the sale. If you wish to learn whether your sale date has been postponed, and, if applicable, the rescheduled time and date for the sale of this property, you may call 800-280-2832 for information regarding the trustee's sale or visit this Internet Web site <http://www.qualityloan.com>, using the file number assigned to this foreclosure by the Trustee: CA-15-695593-BF. Information about postponements that are very short in duration or that occur close in time to the scheduled sale may not immediately be reflected in the telephone information or on the Internet Web site. The best way to verify postponement information is to attend the scheduled sale. The undersigned Trustee disclaims any liability for any incorrectness of the property address or other common designation, if any, shown herein. If no street address or other common designation is shown, directions to the location of the property may be obtained by sending a written request to the beneficiary within 10 days of the date of first publication of this Notice of Sale. If the Trustee is unable to convey title for any reason, the successful bidder's sole and exclusive remedy shall be the return of monies paid to the Trustee, and the successful bidder shall have no further recourse. If the sale is set aside for any reason, the Purchaser at the sale shall be entitled only to a return of the deposit paid. The Purchaser shall have no further recourse against the Mortgagor, the Mortgagee, or the Mortgagee's Attorney. If you have previously been discharged through bankruptcy, you may have been released of personal liability for this loan in which case this letter is intended to exercise the note holders right's against the real property only. As required by law, you are hereby notified that a negative credit report reflecting on your credit record may be submitted to a credit report agency if you fail to fulfill the terms of your credit obligations. **QUALITY MAY BE CONSIDERED A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT AND ANY INFORMATION OBTAINED WILL BE USED FOR THAT PURPOSE.** Date: Quality Loan Service Corporation 411 Ivy Street San Diego, CA 92101 619-645-7711 For NON SALE information only Sale Line: 800-280-2832 Or Login to: <http://www.qualityloan.com> Reinstatement Line: (866) 645-7711 Ext 5318 Quality Loan Service Corp. TS No.: CA-15-695593-BF

**IDSPub #0106419 Publish: 5/4/2016, 5/11/2016, 5/18/2016 |**

**90 PUBLIC NOTICES**

**PUBLIC NOTICE (Revised)**

**The Mojave Water Agency (MWA)** has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period beginning May 12, 2016 and ending on May 26, 2016. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on Thursday, May 26, 2016 at 4:30 PM during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

**Address:**  
Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart  
**Publish: May 4 & May 11, 2016 |**



**NOTICE IS HEREBY GIVEN** that at 5:00 p.m. on May 2, 2016, the Board of Directors (Directors) of the Big Bear City Community Service District (District) introduced Proposed Ordinance 2016-05.

**NOTICE IS ALSO HEREBY GIVEN** that at 5:00 p.m. on May 16, 2016, the Directors of the District will hold a public hearing at the District's Office located at 139 East Big Bear Blvd, Big Bear City, California.

At the May 16, 2016 public hearing, the Directors will consider adoption of Proposed Ordinance 2016-05 which repeals Ordinance 2014-06 and adopts rules restricting water use. The proposed ordinance updates the District's Drought Contingency Plan.

All persons are invited to attend and provide oral or written testimony and comments to the Board of Directors concerning the proposed ordinance. You are hereby advised that should you desire to legally challenge any action taken by the Directors with respect to the proposed ordinances, you may be limited to raising only those issues and objections which you or someone else raised at or prior to the time of the public hearings.

A complete copy of the proposed ordinance is available at the District office.

**LEGAL PUBLISHING ON: May 4, 2016 and May 11, 2016 |**

**APN: 0315-082-10-0-000 TS No: CA05001858-15-1 NOTICE OF 150338618-CA-DMI NOTICE OF TRUSTEE'S SALE**

**YOU ARE IN DEFAULT UNDER A DEED OF TRUST DATED** November 15, 2004. **UNLESS YOU TAKE ACTION TO PROTECT YOUR PROPERTY, IT MAY BE SOLD AT A PUBLIC SALE. IF YOU NEED AN EXPLANATION OF THE NATURE OF THE PROCEEDINGS AGAINST YOU, YOU SHOULD CONTACT A LAWYER.** **On July 12, 2016 at 02:00 PM, on the Southside of the main entrance to the Chino Public Library, 13180 Central Avenue, Chino, CA 91710,** MTC Financial Inc. dba Trustee Corps, as the duly Appointed Trustee, under and pursuant to the power of sale con-

**90 PUBLIC NOTICES**

tained in that certain Deed of Trust recorded on December 2, 2004, as Instrument No. 2004-0887830, of official records in the Office of the Recorder of San Bernardino County, California, executed by **WILLIAM E. DICKINSON, A MARRIED MAN AS HIS SOLE AND SEPARATE PROPERTY**, as Trustor(s), in favor of **FINANCIAL FREEDOM SENIOR FUNDING CORPORATION, A SUBSIDIARY OF INDYMAC BANK, F.S.B.** as Beneficiary, **WILL SELL AT PUBLIC AUCTION TO THE HIGHEST BIDDER**, in lawful money of the United States, all payable at the time of sale, that certain property situated in said County, California describing the land therein as: **AS MORE FULLY DESCRIBED IN SAID DEED OF TRUST** The property heretofore described is being sold "as is". The street address and other common designation, if any, of the real property described above is purported to be: **2074 5th Lane, Big Bear City, CA 92314** The undersigned Trustee disclaims any liability for any incorrectness of the street address and other common designation, if any, shown herein. Said sale will be made without covenant or warranty, express or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the Note(s) secured by said Deed of Trust, with interest thereon, as provided in said Note(s), advances if any, under the terms of the Deed of Trust, estimated fees, charges and expenses of the Trustee and of the trusts created by said Deed of Trust. The total amount of the unpaid balance of the obligations secured by the property to be sold and reasonable estimated costs, expenses and advances at the time of the initial publication of this Notice of Trustee's Sale is estimated to be **\$241,780.87** (Estimated). However, prepayment premiums, accrued interest and advances will increase this figure prior to sale. Beneficiary's bid at said sale may include all or part of said amount. In addition to cash, the Trustee will accept a cashier's check drawn on a state or national bank, a check drawn by a state or federal credit union or a check drawn by a state or federal savings and loan association, savings association or savings bank specified in Section 5102 of the California Financial Code and authorized to do business in California, or other such funds as may be acceptable to the Trustee. In the event tender other than cash is accepted, the Trustee may withhold the issuance of the Trustee's Deed Upon Sale until funds become available to the payee or endorsee as a matter of right. The property offered for sale excludes all funds held on account by the property receiver, if applicable. If the Trustee is unable to convey title for any reason, the successful bidder's sole and exclusive remedy shall be the return of monies paid to the Trustee and the successful bidder shall have no further recourse. Notice to Potential Bidders If you are considering bidding on this property lien, you should understand that there are risks involved in bidding at a Trustee auction. You will be bidding on a lien, not on the property itself. Placing the highest bid at a Trustee auction does not automatically entitle you to free and clear ownership of the property. You should also be aware that the lien being auctioned off may be a junior lien. If you are the highest bidder at the auction, you are or may be responsible for paying off all liens senior to the lien being auctioned off, before you can receive clear title to the property. You are encouraged to investigate the existence, priority, and size of outstanding liens that may exist on this property by contacting the county recorder's office or a title insurance company, either of which may charge you a fee for this information. If you consult either of these resources, you should be aware that the same Lender may hold more than one mortgage or Deed of Trust on the property. Notice to Property Owner The sale date shown on this Notice of Sale may be postponed one or more times by the Mortgagee, Beneficiary, Trustee, or a court, pursuant to Section 2924g of the California Civil Code. The law requires that information about Trustee Sale postponements be made available to you and to the public, as a courtesy to those not present at the sale. If you wish to learn whether your sale date has been postponed, and, if applicable, the rescheduled time and date for the sale of this property, you may call In Source Logic at for informa-

**90 PUBLIC NOTICES**

tion regarding the Trustee's Sale or visit the Internet Web site address listed below for information regarding the sale of this property, using the file number assigned to this case, CA05001858-15-1. Information about postponements that are very short in duration or that occur close in time to the scheduled sale may not immediately be reflected in the telephone information or on the Internet Web site. The best way to verify postponement information is to attend the scheduled sale. Date: May 3, 2016 MTC Financial Inc. dba Trustee Corps TS No. CA05001858-15-1 17100 Gillette Ave Irvine, CA 92614 949-252-8300 TDD: 866-660-4288 Miguel Ochoa, Authorized Signatory **SALE INFORMATION CAN**

**T.S. No.: 2014-07075-CA A.P.N.:0307-027-10-0-000 Property Address: 39590 Lake Drive, Big Bear Lake, CA 92315**

**NOTICE OF TRUSTEE'S SALE**

PURSUANT TO CIVIL CODE § 2923.3(a), THE SUMMARY OF INFORMATION REFERRED TO BELOW IS NOT ATTACHED TO THE RECORDED COPY OF THIS DOCUMENT BUT ONLY TO THE COPIES PROVIDED TO THE TRUSTOR.

**NOTE: THERE IS A SUMMARY OF THE INFORMATION IN THIS DOCUMENT ATTACHED**

注：本文件包含一个信息摘要 참고 사항：본 첨부 문서에 정보 요약서가 있습니다 **NOTA: SE ADJUNTA UN RESUMEN DE LA INFORMACIÓN DE ESTE DOCUMENTO TALA: MAYROONG BUOD NG IMPORMASYON SA DOKUMENTONG ITO NA NAKALAKIP LUU Y: KEM THEO ĐẦY LÀ BẢN TRINH BAY TOM LƯOC VE THONG TIN TRONG TAI LIEU NAY**

**IMPORTANT NOTICE TO PROPERTY OWNER: YOU ARE IN DEFAULT UNDER A DEED OF TRUST DATED 11/02/2004. UNLESS YOU TAKE ACTION TO PROTECT YOUR PROPERTY, IT MAY BE SOLD AT A PUBLIC SALE. IF YOU NEED AN EXPLANATION OF THE NATURE OF THE PROCEEDING AGAINST YOU, YOU SHOULD CONTACT A LAWYER.**

Trustor: **KENT A FUQUA, AND PRETAM K FUQUA, HUSBAND AND WIFE AS JOINT TENANTS** Duly Appointed Trustee: Western Progressive, LLC

Recorded 11/08/2004 as Instrument No. 2004-0811862 in book --, page-- and of Official Records in the office of the Recorder of San Bernardino County, California, **Date of Sale: 05/25/2016 at 01:00 PM**

**Place of Sale: NEAR THE FRONT STEPS LEADING UP TO THE CITY OF CHINO CIVIC CENTER, 13220 CENTRAL AVENUE, CHINO, CA 91710**

Estimated amount of unpaid balance and other charges: **\$590,299.75**

**NOTICE OF TRUSTEE'S SALE**

**WILL SELL AT PUBLIC AUCTION TO HIGHEST BIDDER FOR CASH, CASHIER'S CHECK DRAWN ON A STATE OR NATIONAL BANK, A CHECK DRAWN BY A STATE OR FEDERAL CREDIT UNION, OR A CHECK DRAWN BY A STATE OR FEDERAL SAVINGS AND LOAN ASSOCIATION, A SAVINGS ASSOCIATION OR SAVINGS BANK SPECIFIED IN SECTION 5102 OF THE FINANCIAL CODE AND AUTHORIZED TO DO BUSINESS IN THIS STATE:**

All right, title, and interest conveyed to and now held by the trustee in the hereinafter described property under and pursuant to a Deed of Trust described as:

More fully described in said Deed of Trust.

Street Address or other common designation of real property: **39590 Lake Drive, Big Bear Lake, CA 92315 A.P.N.: 0307-027-10-0-000**

The undersigned Trustee disclaims any liability for any incorrectness of the street address or other common designation, if any, shown above.

The sale will be made, but without covenant or warranty, expressed or implied, regarding title, possession, or encumbrances, to pay the remaining principal sum of the note(s) secured by the Deed of Trust. The total amount of the unpaid balance of the obligation secured by the property to be sold

**90 PUBLIC NOTICES**

BE OBTAINED ON LINE AT [www.insourcelogic.com](http://www.insourcelogic.com) FOR AUTOMATED SALES INFORMATION PLEASE CALL: In Source Logic AT MTC Financial Inc. dba Trustee Corps MAY BE ACTING AS A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT. ANY INFORMATION OBTAINED MAY BE USED FOR THAT PURPOSE.

**ORDER NO. CA16-001513-1, PUB DATES: 05/11/2016, 05/18/2016, 05/25/2016 |**

**Deadline For Your Classified Ad Is 4:00pm Monday Prior To Publication**

and reasonable estimated costs, expenses and advances at the time of the initial publication of the Notice of Sale is: **\$590,299.75.**

If the Trustee is unable to convey title for any reason, the successful bidder's sole and exclusive remedy shall be the return of monies paid to the Trustee, and the successful bidder shall have no further recourse.

The beneficiary of the Deed of Trust has executed and delivered to the undersigned a written request to commence foreclosure, and the undersigned caused a Notice of Default and Election to Sell to be recorded in the county where the real property is located.

**NOTICE TO POTENTIAL BIDDERS:** If you are considering bidding on this property lien, you should understand that there are risks involved in bidding at a trustee auction. You will be bidding on a lien, not on the property itself. Placing the highest bid at a trustee auction does not automatically entitle you to free and clear ownership of the property. You should also be aware that the lien being auctioned off may be a junior lien. If you are the highest bidder at the auction, you are or may be responsible for paying off all liens senior to the lien being auctioned off, before you can receive clear title to the property. You are encouraged to investigate the existence, priority, and size of outstanding liens that may exist on this property by contacting the county recorder's office or a title insurance company, either of which may charge you a fee for this information. If you consult either of these resources, you should be aware that the same lender may hold more than one mortgage or deed of trust on this property.

**NOTICE OF TRUSTEE'S SALE**

Note: Because the Beneficiary reserves the right to bid less than the total debt owed, it is possible that at the time of the sale the opening bid may be less than the total debt

**NOTICE TO PROPERTY OWNER:** The sale date shown on this notice of sale may be postponed one or more times by the mortgagee, beneficiary, trustee, or a court, pursuant to Section 2924g of the California Civil Code. The law requires that information about trustee sale postponements be made available to you and to the public, as a courtesy to those not present at the sale. If you wish to learn whether your sale date has been postponed, and, if applicable, the rescheduled time and date for the sale of this property, you may call (866)-960-8299 or visit this Internet Web site <http://www.altisource.com/MortgageServices/DefaultManagement/TrusteeServices.aspx> using the file number assigned to this case 2014-07075-CA. Information about postponements that are very short in duration or that occur close in time to the scheduled sale may not immediately be reflected in the telephone information or on the Internet Web site. The best way to verify postponement information is to attend the scheduled sale.

Date: April 18, 2016 Western Progressive, LLC, as Trustee for beneficiary C/o 30 Corporate Park, Suite 450 Irvine, CA 92606 Automated Sale Information Line: (866) 960-8299 <http://www.altisource.com/MortgageServices/DefaultManagement/TrusteeServices.aspx> For Non-Automated Sale Information, call: (866) 240-3530

Trustee Sale Assistant

**WESTERN PROGRESSIVE, LLC MAY BE ACTING AS A DEBT COLLECTOR ATTEMPTING TO COLLECT A DEBT. ANY INFORMATION OBTAINED MAY BE USED FOR THAT PURPOSE.**

**TS 2014-07075-CA Publish: 4/27, 5/4, 5/11**

**PROOF OF PUBLICATION**

(2015.5 C.C.P.)

**STATE OF CALIFORNIA,  
County of San Bernardino**

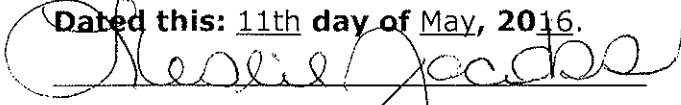
I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the publisher of the DAILY PRESS, a newspaper of general circulation, published in the City of Victorville, County of San Bernardino, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under the date of November 21, 1938, Case number 43096, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

May 4 and 11

**All in the year 2016.**

**I certify (or declare) under penalty of perjury that the foregoing is true and correct.**

**Dated this: 11th day of May, 2016.**



**Signature**

Leslie Jacobs

**This space is the County Clerk's Filing Stamp**

**Proof of Publication of  
PUBLIC NOTICE  
(REVISED)**

**PUBLIC NOTICE  
(Revised)**

The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period beginning May 12, 2016 and ending on **May 26, 2016**. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on **Thursday, May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:  
Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart

Published in the  
Daily Press  
May 4, 11, 2016  
(W-13)



# PROOF OF PUBLICATION

(2015.5 C.C.P.)

**STATE OF CALIFORNIA,  
County of San Bernardino**

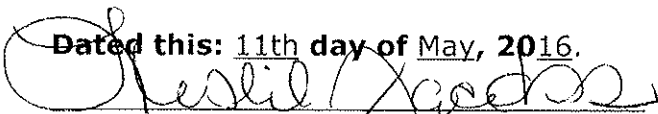
I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the publisher of the DESERT DISPATCH, a newspaper of general circulation, published in the City of Barstow, County of San Bernardino, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under the date of February 27, 1996, Case Number BVC 02359, that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

May 4 and 11

**All in the year 2016.**

**I certify (or declare) under penalty of perjury that the foregoing is true and correct.**

**Dated this: 11th day of May, 2016.**



**Signature**

Leslie Jacobs

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**This space is the County Clerk's Filing Stamp**

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## **Proof of Publication of PUBLIC NOTICE (REVISED)**

### **PUBLIC NOTICE (Revised)**

The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period beginning May 12, 2016 and ending on **May 26, 2016**. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on **Thursday, May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:  
Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart

Published in the  
Desert Dispatch  
May 4, 11, 2016  
(W-31)

**PROOF OF PUBLICATION**

(2015.5 C.C.P.)

**STATE OF CALIFORNIA,  
County of San Bernardino**

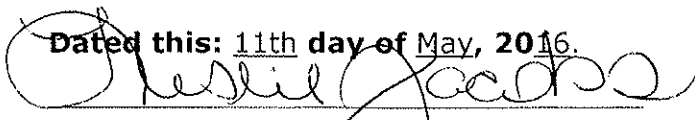
I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the publisher of the LUCERNE VALLEY LEADER, a newspaper of general circulation, published in the Unincorporated Area of Lucerne Valley, County of San Bernardino, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under the date of February 1, 1957, Case number 187845; that the notice, of which the annexed is a printed copy (set in type not smaller than nonpareil), has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

May 4 and 11

**All in the year 2016.**

**I certify (or declare) under penalty of perjury that the foregoing is true and correct.**

**Dated this: 11th day of May, 2016.**



**Signature**

Leslie Jacobs

**This space is the County Clerk's Filing Stamp**

**Proof of Publication of  
PUBLIC NOTICE  
(REVISED)**

**PUBLIC NOTICE  
(Revised)**

The Mojave Water Agency (MWA) has prepared a Draft 2015-Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojawewater.org](http://www.mojawewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period beginning May 12, 2016 and ending on **May 26, 2016**. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on **Thursday, May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:  
Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart

Published in the  
Lucerne Valley Leader  
May 4, 11, 2016  
(L-01)

## PUBLIC NOTICE

The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP is available for review at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during a 30-day review period beginning April 26, 2016 and ending on **May 26, 2016**. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on **Thursday, May 26, 2016 at 4:30 PM** during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:

Mojave Water Agency  
13846 Conference Center  
Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart  
**(PUB: S. 03/24, 03/31/2016)**

# PROOF OF PUBLICATION

(2015.5 C.C.P.)

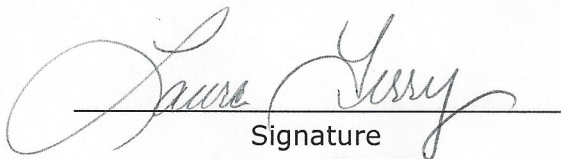
## STATE OF CALIFORNIA COUNTY OF SAN BERNARDINO,

**I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years,**

and not a party to or interested in the above entitled matter. I am the principal clerk of **Mountain News**, a newspaper of general circulation, published by Hi Desert Publishing Co. Inc., in the unincorporated area of Lake Arrowhead, County of San Bernardino, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court of the County of San Bernardino, State of California, under date of October 5, 1950, Case Number 67902; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates to-wit: May 5 and 12,

**All in the year 2016**

**I certify (or declare) under penalty of perjury that the fore going is true and correct.**

  
Signature

**Laura Terry**

5/12/16 Lake Arrowhead, CA  
Date and Place

**This Space is for the Stamp.**

**PROOF OF PUBLICATION**

### Public Notice: (Revised)

The Mojave Water Agency (MWA) has prepared a Draft 2015 Urban Water Management Plan (UWMP), pursuant to the California Urban Water Management Planning Act ("Act"). The 2015 UWMP evaluates water demands and supplies through the year 2040 for the communities within MWA boundaries, and will replace the previous UWMP completed in 2010.

MWA is soliciting comments from interested persons and agencies on the Draft UWMP. The Draft UWMP will be available for review by May 12, 2016, at the MWA office located at the address shown below, or on the MWA website ([www.mojavewater.org](http://www.mojavewater.org)), and at six public County Libraries (Apple Valley, Barstow, Hesperia, Joshua Tree, Lucerne Valley, and Yucca Valley).

In accordance with California Government Code and the Act, comments will be accepted during the review period beginning May 12, 2016 and ending on May 26, 2016. Please send your comments to the address shown below. Please include a return address and contact name with your comments.

A Public Hearing will be held to receive public comments and suggestions on the Draft UWMP. The Public Hearing will be held on Thursday, May 26, 2016 at 4:30 PM during the regular meeting of the Mojave Water Agency Board of Directors in the MWA Board Room, located at 13846 Conference Center Drive, Apple Valley, CA.

Address:

Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart



Published in the *Mountain News* May 5 & 12, 2016.

**SAN BERNARDINO COUNTY SUN**

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GLORIA GOLIKE  
MOJAVE WATER AGENCY  
13846 CONFERENCE CENTER DRIVE  
APPLE VALLEY, CA - 92307-4309

SB #: 2875624

**PROOF OF PUBLICATION**

(2015.5 C.C.P.)

State of California )  
County of SAN BERNARDINO ) ss

Notice Type: GPN - GOVT PUBLIC NOTICE

Ad Description:

Draft 2015 Urban Water Management Plan (UWMP)

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the SAN BERNARDINO COUNTY SUN, a newspaper published in the English language in the city of SAN BERNARDINO, county of SAN BERNARDINO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN BERNARDINO, State of California, under date 06/27/1952, Case No. 73081. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

05/02/2016, 05/09/2016

Executed on: 05/09/2016  
At Riverside, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

  
Signature

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Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attn: Lance Eckhart  
5/2, 5/9/16

SBS-2875624#



## Appendix D – Yuba Accord

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**STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES**

**AGREEMENT FOR THE SUPPLY AND CONVEYANCE OF WATER  
BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA  
TO THE PARTICIPATING STATE WATER PROJECT CONTRACTORS  
UNDER  
THE DRY YEAR WATER PURCHASE PROGRAM  
SWPAO NO. 08-827**

THIS AGREEMENT is entered into as of the \_\_\_\_\_ day of \_\_\_\_\_, 2014, pursuant to the provisions of the California Water Resources Development Bond Act, the State Central Valley Project Act, and other applicable laws of the State of California, between the Department of Water Resources of the State of California, herein referred to as "DWR," and Mojave Water Agency, a public agency in the State of California, herein referred to as the "AGENCY." DWR and the AGENCY are herein referred to separately as the "Party" and collectively as the "Parties."

**RECITALS**

A. In 2008 and probably for several years to come, because of hydrologic conditions and/or regulatory constraints, the operation of the State Water Project ("SWP") by DWR and the operation of the Central Valley Project ("CVP") by the United States Bureau of Reclamation ("Reclamation") may result in less water being made available to the south-of-Delta CVP water service contractors and the SWP contractors. In anticipation of such potential conditions, DWR is initiating a dry year water purchase program to acquire water from voluntary sellers to augment the water supplies.

- B. The Yuba County Water Agency (“Yuba”) is engaged in the Yuba River Accord initiative (“Yuba River Accord”) to resolve issues associated with operation of the Yuba Project in a way that protects lower Yuba River fisheries and local water-supply reliability, while providing revenues for local flood control projects, water to use for protection and restoration of Delta fisheries, and improvements in state-wide water supply management.
- C. The Yuba River Accord includes three major elements, all of which must be in place for the Yuba River Accord to become effective: (1) the Fisheries Agreement (dated November 3, 2007) to provide higher flows for fish in the lower Yuba River under certain conditions, (2) Conjunctive Use Agreements between Yuba and water districts within Yuba County for implementing a conjunctive use and water use efficiency program; and (3) the “Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources” (dated December 4, 2007) (“Yuba Water Purchase Agreement”).
- D. DWR and Yuba entered into the Yuba Water Purchase Agreement as part of the Yuba River Accord to purchase specified Components of water for the benefit of the EWA, the SWP contractors, and the member agencies of the San Luis & Delta-Mendota Water Authority (“Authority”) to resolve potential conflicts concerning the accounting for water that Yuba will release pursuant to the Fisheries Agreement.
- E. Reclamation determined to not be a party to the Yuba Water Purchase Agreement. Yuba and DWR will amend the Yuba Water Purchase Agreement at such time as Reclamation is willing to become a party thereto, subject to Reclamation and DWR



entering into a separate agreement for the allocation of, and payment for, water under the Yuba Water Purchase Agreement.

- F. Consistent with the Yuba Water Purchase Agreement, when Yuba makes water available to DWR under the Yuba River Accord for benefit of the SWP contractors and the Authority, DWR intends to offer the water under the dry year water purchase program to the Participating SWP Contractors and to the Authority as set forth herein.
- G. The SWP contractors and the Authority invested significant resources to assist DWR and Yuba with the development of the Yuba River Accord, the Yuba Water Purchase Agreement, and supporting documentation.
- H. The Parties desire to enter into this water supply and conveyance agreement whereby DWR will purchase water under the Yuba River Accord for the dry year water purchase program to make available for purchase by the SWP contractors, including the AGENCY, and the Authority.

## **AGREEMENT**

**Now Therefore**, in accordance with the Recitals and in consideration of the terms and conditions herein, the Parties agree to the following:

### **1. DEFINITIONS**

When used in this Agreement, the following definitions will apply:

**“Balanced Conditions”** means the hydrologic condition of the Delta as defined in the November 24, 1986 “Agreement between the United States of America and the State of California for Coordinated Operations of the Central Valley Project and the State Water Project.”

**“Banks Pumping Plant”** means a SWP facility in the south Delta owned and operated by DWR.

**“CALFED”** means the joint federal and California program intended to develop and implement a long-term comprehensive plan that will, among other purposes, restore ecological health of the Bay-Delta System and improve water project management.

**“Carriage Water”** means the water losses due to increased Delta outflow necessary to maintain baseline Delta salinity conditions as determined by DWR, that are associated with Delivered Transfer Water or Stored Released Transfer Water that is exported by CVP or SWP Delta pumping facilities.

**“Component 1 Water”** means the water supplies available to DWR pursuant to Section 5 of the Yuba Water Purchase Agreement.

**“Component 2 Water”** means the water supplies available to DWR pursuant to Section 6 of the Yuba Water Purchase Agreement.

**“Component 3 Water”** means the water supplies available to DWR pursuant to Section 7 of the Yuba Water Purchase Agreement.

**“Component 4 Water”** means the water supplies available to DWR pursuant to Section 8 of the Yuba Water Purchase Agreement.

**“Conference Year”** means a Water Year for which the North Yuba Index is less than 500,000 acre-feet, calculated according to the procedures and formulas set forth in Exhibits 4 and 5 of the Fisheries Agreement, and using the latest available forecasts for the Water Year.

**“Delivered Transfer Water”** means Released Transfer Water from Yuba that is accounted as being exported by the SWP and the CVP, or contributing to exports, as described in Section 5 of Exhibit 1 of the Yuba Water Purchase Agreement.

**"EWA"** means the Environmental Water Account program described in the CALFED Record of Decision and the EWA Operating Principles Agreement (August 28, 2000, as extended in September 2004), as extended by amendment and supplemental approvals, or a long-term environmental water account program.

**“Fisheries Agreement”** means the agreement among Yuba, the California Department of Fish and Game, and other parties, which is part of the Yuba River

Accord, and under which Yuba operates the Yuba Project to provide higher flows in the lower Yuba River under certain conditions to improve fisheries protection.

**“Final Classification”** means the year-type classification for the Sacramento River region in the May issue of DWR’s Bulletin 120.

**“Management Committee”** means the committee, consisting of one representative each from Yuba, DWR, Reclamation, the CALFED fishery agencies on behalf of EWA, SWP contractors, and the Authority, established under Section 14 (“Technical Committee and Management Committee”) of the Yuba Water Purchase Agreement.

**“Participating SWP Contractors”** means all SWP contractors that have executed an “Agreement for the Supply and Conveyance of Water By the Department of Water Resources of the State of California to the Participating SWP Contractors Under the Dry Year Water Purchase Program” on or before April 1, 2008.

**“Purchased Water”** means the supply of Component 1 Water that is not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water that has been delivered by Yuba to DWR that is accounted for as Delivered Transfer Water in the manner set forth in Exhibit 1 (“Scheduling and Accounting Principles”) of the Yuba Water Purchase Agreement

and made available for the dry year water purchase program. Purchased Water includes Carriage Water or water used as Delta outflow when the Export/Inflow ratio is controlling in the time period of July 1 to January 31.

**“SWP Long-Term Water Supply Contract”** means the long-term water supply contract between the Parties, as amended.

**"Technical Committee"** means the committee, consisting of technical representatives from Yuba, DWR, Reclamation, the CALFED fishery agencies on behalf of EWA, SWP contractors, and the San Luis & Delta-Mendota Water Authority, established under Section 14 ("Technical Committee and Management Committee") of the Yuba Water Purchase Agreement.

**"Water Accounting Year"** means the twelve-month period commencing January 1 through December 31.

**"Water Year"** means the twelve-month period from October 1 of one year through September 30 of the following year. For this Agreement, each Water Year will be classified: (1) as "Wet," "Above-Normal," "Below-Normal," "Dry" or "Critical," based on the Sacramento Valley Water Year Hydrologic Classification in Figure 1 on page 188 of the State Water Resources Control Board's March 15, 2000, Revised Water-Right Decision 1641; or (2) as a "Conference Year."

**"Yuba Project"** means the Yuba River Development Project, including New Bullards Bar Dam and Reservoir on the North Yuba River.

**"Yuba River Accord"** means Yuba's initiative as described in Recitals B and C of this Agreement.

**"Yuba Water Purchase Agreement"** means the Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources, which is attached hereto as Exhibit A.

## **2. TERM OF AGREEMENT**

A. This Agreement will become effective upon execution by the Parties and will terminate on December 31, 2025, provided, however, the Parties may terminate this Agreement on December 31, 2015, if the Parties fail to amend this Agreement pursuant to Section 3.B.5 below and as necessary to address amendments made to the Yuba Water Purchase Agreement regarding the quantity and pricing of water pursuant to Section 15 thereof; provided further that this Agreement shall remain in effect beyond the termination dates set forth above to the extent required to enable the parties to satisfy all obligations then existing or outstanding.

## **3. PURCHASED WATER**

A. METHODS FOR ESTABLISHING ALLOCATIONS AND SHARING OF WATER

1. DWR will make available to the Participating SWP Contractors, as a group, fifty percent of the following types of water: Component 1 Water that is not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water.
2. If the AGENCY does not take some or all of the water made available to it pursuant to Section 3.A.1, then DWR will make the water not taken by the AGENCY available first to the other Participating SWP Contractors pursuant to 3.A.4 and then to the Authority pursuant to Section 3.A.5; provided, that the AGENCY will purchase all Delivered Transfer Water DWR is required to purchase from Yuba and that is made available to the AGENCY pursuant to Sections 3.A.1. through 3.A.4 if said water is not purchased by the Participating SWP Contractors or the Authority.
3. DWR will make available to the Participating SWP Contractors and the Participating SWP Contractors may accept and purchase Component 1 Water that is not used by EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water that is made available to the Authority, if the Authority elects to not take said water.
4. All water made available to the Participating SWP Contractors pursuant to Sections 3.A.1 through 3.A.3 shall be allocated among the Participating SWP Contractors as follows:

- a) DWR will allocate to the AGENCY its share of Water that is made available to the Participating SWP Contractors under Sections 3.A.1 through 3.A.3 above based on the AGENCY'S maximum Table A amount in its SWP Long-Term Water Supply Contract as a proportion of the total Table A amounts provided under the Long-Term Water Supply Contracts of the Participating SWP Contractors.
  - b) If any Participating SWP Contractor does not request some or any of its share of the water made available pursuant to Section 3.A.3.a above, the remaining Participating SWP Contractors will have the first right to that water, and DWR will allocate that water among the remaining Participating SWP Contractors, but excluding from the calculation the maximum Table A amount of the Participating SWP Contractor(s) not requesting their full allocation. This process will repeat until all water made available pursuant to this Section 3.A.3 is allocated or no Participating SWP Contractor requests the remaining water made available.
5. DWR will offer to the Authority any Component 1 Water that is not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water made available pursuant to this Section and remaining unrequested after completing the allocation processes set forth above in Sections 3.A.4.



B. TYPES AND PRICES OF PURCHASED WATER

The AGENCY shall pay for Delivered Transfer Water made available to and accepted by the AGENCY under section 3.A above in accordance with the following sections:

1. COMPONENT 1 WATER

- a) While the EWA is in effect, if the EWA does not use all of the Component 1 Water, Component 1 Water unused by the EWA will be allocated and made available by DWR to the AGENCY pursuant to Section 3.A above. The AGENCY will pay for Component 1 Water that is made available to it and accounted for as Purchased Water at the same price per acre-foot as Component 4 Water.
- b) If EWA terminates and Yuba remains obligated to provide Component 1 Water, the Parties agree that Component 1 Water remaining to be delivered under the Yuba Water Purchase Agreement will be managed annually, as follows: (1) Component 1 Water in any year will be used to enhance water supply reliability of the Delta export facilities by off-setting new mandatory restrictions imposed on the CVP and SWP, including those being imposed by the federal court order in *NRDC v. Kempthorne*, or through a subsequent biological opinion for the conservation or protection of fish, and (2) if any Component 1 Water remains after off-setting the restrictions set forth in subsection (1) above, then the remaining Component 1 Water will be used as determined by DWR in

close coordination with the California Department of Fish and Game  
consistent with the water supply reliability project requirements of the  
funding source from which this water was purchased (Chapter 7(d) of  
Proposition 50, California Water Code Section 79550(d)).

2. COMPONENT 2 WATER

- a) For Component 2 Water that is accounted for as Purchased Water and made available in a Water Year that has a Final Classification as Dry, the AGENCY will pay \$75.00 per acre-foot.
- b) For Component 2 Water that is accounted for as Purchased Water and made available in a Water Year that has a Final Classification as Critical, the AGENCY will pay \$93.75 per acre-foot.

3. COMPONENT 3 WATER

For Component 3 Water that is accounted for as Purchased Water and made available to the AGENCY, the AGENCY will pay:

- a. \$25.00 per acre-foot in a Wet Year;
- b. \$50.00 per acre-foot in an Above-Normal Year;
- c. \$75.00 per acre-foot in a Below-Normal Year;
- d. \$100.00 per acre-foot in a Dry Year;
- e. \$125.00 per acre-foot in a Critical Year.

4. COMPONENT 4 WATER

For Component 4 Water that is accounted for as Purchased Water and made available to the AGENCY, the AGENCY will pay:

- a. \$25.00 per acre-foot in a Wet Year;
- b. \$50.00 per acre-foot in an Above-Normal Year;
- c. \$75.00 per acre-foot in a Below-Normal Year;
- d. \$100.00 per acre-foot in a Dry Year;
- e. \$125.00 per acre-foot in a Critical Year.

5. POSSIBLE FUTURE ADJUSTMENTS TO QUANTITIES AND PRICES.

If the provisions of Section 15 of the Yuba Water Purchase Agreement require changes to the quantity or pricing of water available therein, the Parties agree that amendment of this agreement for such purposes will be a condition precedent of any amendment of the Yuba Water Purchase Agreement pursuant to Section 15 thereof. The Parties agree to meet and confer and negotiate in good faith potential changes to this Agreement.

6. UNCOMMITTED WATER

- a. If Yuba notifies DWR of the availability of uncommitted Delivered Transfer Water prior to accounting for the water in the Holding Account, as set forth in Section 7.4 of Exhibit 1 (“Scheduling and Accounting Principles”) of the Yuba Water Purchase Agreement, DWR will notify the AGENCY, the Participating SWP Contractors, and the Authority of the availability of such water by September 30 of that year. Such water will be offered to the Participating SWP Contractors and to the Authority consistent with Section 3.A.

- i. Within 30 days of such notice, the AGENCY will notify DWR of its request for an amount of the uncommitted water that it will purchase, if any.
  - ii. The amount of this water actually purchased by the AGENCY, the Participating SWP Contractors, and the Authority will be based on requests for this water by the AGENCY, the Participating SWP Contractors, and the Authority, and will not exceed the amount of water made available by Yuba. The Purchased Water that DWR will allocate to the AGENCY will be the lesser of the amount of water requested by the AGENCY or the amount allocated to the AGENCY in the manner set forth in Section 3.A above.
  - iii. The AGENCY will pay DWR the applicable purchase price for the water determined by the Water Year in which the water is accounted for as Delivered Transfer Water at prices set forth in Section 3.B above.
- b. If Yuba has credited uncommitted Delivered Transfer Water to the Holding Account as set forth in Section 7.4 of Exhibit 1 (“Scheduling and Accounting Principles”) of the Yuba Water Purchase Agreement and the water remains in storage until the subsequent Water Accounting Year, then DWR will offer the water in the Holding Account to the Participating SWP Contractors and the Authority consistent with Section 3.A.

- i. In the year that the AGENCY elects to take water from the Holding Account, that water will be credited toward the AGENCY's prorata share of the Component 3 Water with any additional deliveries credited as Component 4 Water that is accounted for as Purchased Water for the AGENCY.
- ii. The AGENCY will pay DWR the applicable purchase price for the water determined by the Water Year in which the water was accounted for as Delivered Transfer Water as set forth in Exhibit 1 of the Yuba Water Purchase Agreement and at prices set forth in Section 3.B above.

**4. REQUESTS, SCHEDULING AND CONVEYANCE**

Scheduling and conveyance is subject to DWR's determination of conveyance capacity in SWP facilities. Scheduling and conveyance will be dependent on releases by Yuba, including the flow schedule for the lower Yuba River as provided for in the Fisheries Agreement, the North Yuba Index or the Yuba River Index, capacity of CVP and SWP facilities, and Bay-Delta conditions. In order to meet the goals of Section 6, the Parties may modify in writing the dates established in this Section 4 without amending this Agreement.

**A. Requests and Scheduling**

1. On or before April 11 of each Water Accounting Year, DWR will inform the AGENCY of the potential quantity of Component 1 Water if not used by the

EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water that is available to the Agency.

2. On or about April 11 of each Water Accounting Year, or as soon thereafter as practicable, the AGENCY will submit an initial request to DWR for delivery of Component 1 Water if not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water and an initial monthly schedule for delivery of the requested water. That initial monthly schedule will include the quantity of each component of water the AGENCY would like to purchase from DWR.
3. DWR and the AGENCY will, between April 11 and May 19, confer on the allocation of water under Section 3A.
4. Within 5 business days of notice from DWR that there has been a change in the amount of water available, but no later than May 19, the AGENCY will provide DWR with its modified request for each component of water.
5. No later than May 19, DWR will notify the AGENCY of the quantity of Component 1 Water if not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water that has been allocated to the Agency and that the AGENCY will schedule pursuant to Section 4.A.7 below.
6. The Parties recognize that no later than May 15 DWR must notify Yuba of the quantity of Component 4 Water that DWR will purchase from Yuba.

7. On or about May 20 of each Water Accounting Year, or as soon thereafter as practicable, the AGENCY and DWR will agree upon a final monthly schedule for delivery of Component 1 Water if not used by the EWA as provided in Section 3.B.1.a, Component 2 Water, Component 3 Water, and Component 4 Water that has been allocated to the Agency. The final schedule will be updated to accommodate any changes that affect the delivery of water as provided in Section 9 (“Scheduling of Water”) of the Yuba Water Purchase Agreement. The final monthly schedule will include, pursuant to Section 3.A above, the quantity of each component of Purchased Water the AGENCY will purchase and that the AGENCY requests be delivered each month of the Water Accounting Year.
8. The final monthly schedule may be modified by mutual agreement. The AGENCY will submit copies of any proposed modifications to the final monthly schedule to DWR’s State Water Project Analysis Office (SWPAO) Chief of Water Supply and Transfers Branch, and Chief of Water Deliveries Section, both at FAX number (916) 653-9628. SWPAO will coordinate with the DWR Operations Control Office in determining whether the proposed modifications to the final monthly schedule can be accommodated by DWR.
9. After DWR approves the final monthly schedule, during any week when DWR is conveying water for the AGENCY, the AGENCY will submit weekly schedules to the DWR Operations Control Office: one to the Chief, Pre-Scheduling Section, FAX (916) 574-2782, and one to the Chief, Operations

Scheduling Section, FAX (916) 574-2785. The weekly schedules will be consistent with the final monthly schedule.

10. The scheduling of Purchased Water, and any adjustments to the schedule, will be in accordance with the Exhibit 1 (“Scheduling and Accounting Principles”) of the Yuba Water Purchase Agreement.

11. DWR’s approval of the schedule will be subject to Section 4.B, below.

B. Conveyance

The conveyance of water under this Agreement to the AGENCY's delivery structures from the SWP facilities is subject to the terms and conditions of this Agreement, Article 55 of the AGENCY’s Water Supply Contract, and applicable laws. Use of Purchased Water under this Agreement shall be restricted to the service area of the SWP. Delivery priorities shall be determined in accordance with Article 12(f) of the AGENCY’s SWP Long-Term Water Supply Contract, with Purchased Water being classified as non-project water.

5. **INVOICING AND PAYMENTS**

DWR will invoice the AGENCY and the AGENCY will submit payment to DWR based on each invoice as provided below.

A. **INVOICING AND PAYMENT OF PURCHASED WATER**

1. On or after June 10 (or within 9 days of the date that DWR receives an invoice from Yuba), DWR will invoice the AGENCY for fifty percent of the payment for the estimated amount of water that the AGENCY scheduled as



Purchased Water for that calendar year minus fifty percent of any credits due to the AGENCY as provided in Section 5.C below.

2. On January 17 of the next calendar year (or within 9 days of the date that DWR receives an invoice from Yuba), DWR will invoice the AGENCY for the remaining unpaid cost for Purchased Water, including Purchased Water available pursuant to Section 3.B.6, above, purchased by the AGENCY minus the remaining credits due to the AGENCY as provided in Section 6.C below.
3. Invoices will itemize any prior payments and credits, the total due, less any additional credits.

**B. INVOICE FOR CONVEYANCE, DELIVERY, ADMINISTRATIVE COSTS**

1. DWR will invoice the AGENCY monthly for conveyance charges in accordance with Article 55 of the SWP Long-Term Water Supply contract. Specifically, the AGENCY shall pay the power resources (including on-aqueduct, off-aqueduct, and any other power) incurred in the conveyance of such water from the Delta for the year in which the Purchased Water is conveyed.
2. Upon execution, DWR will invoice the AGENCY a one-time administrative fee of \$3,000 for preparation of this Agreement.

**C. PAYMENT FOR FIXED ANNUAL COSTS AND CREDIT AGAINST  
PURCHASED WATER.**

1. On or before February 11, or within 10 days of DWR's receipt of Yuba's invoice, each year DWR will invoice the AGENCY its share of Yuba's fixed annual costs as provided in Section 12.B of the Yuba Water Purchase Agreement. The AGENCY's payment of these fixed annual costs will be its share of up to \$125,000 prorated among the Participating SWP Contractors calculated in the manner as provided in Section 3.A of this Agreement.
2. As provided in Section 5.A above, for all payments made by the AGENCY under this Subsection, DWR will provide to the AGENCY a credit against future payments due to DWR for Purchased Water, excluding Component 1 Water. If necessary, DWR will record and accrue these credits from year to year until DWR makes Purchased Water, excluding Component 1 Water, available to the AGENCY, at which time such credits will be applied toward payments due.

D. PAYMENTS FOR YUBA DIESEL CONVERSION OF GROUNDWATER  
PUMPS.

Within 30 days of DWR's receipt of a reviewed and verified invoice from Yuba of its conversion of pumps from diesel as provided under Section 12.A of the Yuba Water Purchase Agreement, DWR will invoice the AGENCY for up to one-half of the amount of the Yuba invoice. The AGENCY's share of Yuba's total costs for diesel conversion will not be more than its share of \$500,000 prorated among the Participating SWP Contractors calculated in the manner as provided in Section 3.A of this Agreement.

E. PAYMENTS FOR ADJUSTMENTS TO GROUNDWATER O&M COSTS.

In accordance with the timing of invoices required by Section 5.A above, DWR will invoice the AGENCY for its share of Yuba's costs for any annual increases above actual 2006 Groundwater O&M Costs, as provided in Section 12.C of the Yuba Water Purchase Agreement. The AGENCY's share of Yuba's costs will be based upon the proportion of the total amount of Purchased Water delivered to the AGENCY to the total amount of water delivered to the Participating SWP Contractors and the Authority in the year that the invoice covers. If no Purchased Water is delivered in the year that the invoice covers, the Participating SWP Contractors and the Authority shall share equally the costs invoiced by Yuba to DWR and AGENCY will pay its share, which share shall be calculated in the manner as provided in Section 3.A of this Agreement.

F. PAYMENTS FOR COSTS ATTRIBUTABLE TO YUBA WATER PURCHASE AGREEMENT

The Parties agree that costs that DWR is obligated to pay to Yuba pursuant to the Yuba Water Purchase Agreement as attached hereto and that have not been identified by this Agreement, will be an obligation of the Participating SWP Contractors and the Authority. If necessary, the Parties will amend this Agreement to provide for invoicing and payment of such costs if not provided for herein.

G. TIMING OF PAYMENTS.

1. The AGENCY will pay DWR within 32 days after the AGENCY's receipt of an invoice from DWR.
2. Payment made after 32 days of receipt of invoice will be considered delinquent and interest will accrue at a rate of one percent per month for all delinquencies from the due date until paid.
3. If the AGENCY disputes a cost on an invoice, the AGENCY will make payment based on the invoice received, but will submit a notice to DWR identifying the disputed cost within 60 days of receipt of the invoice. Within 21 days after DWR receives notice of the disputed cost, the Parties will meet and confer, and if appropriate, obtain assistance from the Technical Committee and Management Committee to resolve the error or discrepancy. If the Parties resolve the dispute in a manner that recognizes a payment by the AGENCY that exceeds what is required under this Agreement, the amount of the excessive payment will be reflected by DWR pursuant to Section 6.A as a credit against future payments due from the AGENCY. DWR will reflect the credit on the next subsequent invoice it provides to the AGENCY. If the Parties cannot resolve the dispute, they will follow the dispute resolution process described in Section 10 below.

**6. EFFORTS TO MAXIMIZE THE BENEFICIAL USE OF WATER**

DWR will use all reasonable efforts to maximize the amount of Purchased Water available to the Participating SWP Contractors, including the AGENCY, and the

Authority. Those efforts will include, but are not limited to fully exercising its rights and obligations under the Yuba Water Purchase Agreement, coordinating with Reclamation on the operations of the SWP and CVP, and storing water in SWP facilities when Delta pumping is constrained, as provided in Section 4.3 of Exhibit 1 to the Yuba Water Purchase Agreement.

**7. MEMBERSHIP ON COMMITTEES**

DWR agrees that a representative of the Participating SWP Contractors will be a member of the Management Committee and Technical Committee.

**8. CONFERENCE YEAR PRINCIPLES**

During any Conference Year, the Parties will meet with Yuba and the other parties to the Fisheries Agreement and the Conjunctive Use Agreements to: (1) determine how to address the circumstances, and (2) discuss the operation of the Yuba Project during that Water Accounting Year. During a Conference Year, if Yuba reduces or does not deliver any Component 2, 3, or 4 Water, the AGENCY's and the Participating SWP Contractors' obligation to schedule or purchase any quantity of Purchased Water will be reduced or eliminated accordingly.

**9. LIABILITY**

A. DWR will not assert that the AGENCY, its directors, officers, agents or employees, are liable for damages of any nature whatsoever arising out of any

actions or omissions by DWR, its Director, officers, agents or employees, related to DWR's performance of this Agreement, where such liability is caused by an act, error or omission of DWR, its Director, officers, agents or employees.

B. The AGENCY will not assert that DWR, its Director, officers, agents or employees, are liable for damages of any nature whatsoever arising out of any actions or omissions by the AGENCY, its directors, officers, agents or employees, related to the AGENCY's performance of this Agreement, where such liability is caused by an act, error or omission of the AGENCY, its director, officers, agents or employees.

C. To the extent permitted by California law, the AGENCY will indemnify, defend and hold DWR, its Director, officers, agents and its employees safe and harmless from any and all, claims, judgments, damages, penalties, costs, liabilities and losses (including without limitation, sums paid in settlement of claims, actual attorney's fees paralegal fees, consultant fees, engineering fees, expert fees, and any other professional fees) that arise from or are related in any way to the AGENCY's activities or performance under this Agreement that are under the exclusive control of the AGENCY, including but not limited to the release, conveyance, use or distribution of water by the AGENCY for purposes of this Agreement.

D. To the extent permitted by California law, DWR will indemnify, defend and hold the AGENCY, its directors, officers, agents and its employees safe and harmless from any and all, claims, judgments, damages, penalties, costs,

liabilities and losses (including without limitation, sums paid in settlement of claims, actual attorney's fees, paralegal fees, consultant fees, engineering fees, expert fees, and any other professional fees) that arise from or are related in any way to DWR's activities or performance under this Agreement that are under the exclusive control of DWR, including but not limited to the release, conveyance, use or distribution of water by DWR for purposes of this Agreement.

**10. DISPUTE RESOLUTION**

- A. Should any material disputes arise concerning any provision of this Agreement, or the rights and obligations of the Parties hereunder, including those involving possible termination or those that might cause the initiation of any administrative or judicial proceeding to enforce or interpret this Agreement, the Party that believes a dispute exists will notify the other Party, and the Parties will promptly meet and confer to attempt to resolve the perceived dispute.
- B. If the Process described in the preceding subsection fails to resolve the dispute within thirty days, the Parties will submit the dispute to a mediator who has experience in water-related disputes. The costs of any such mediation will be borne equally by the Parties. Initiation of this mediation process will be through written notice by one Party to the other Party. The Parties reserve all of their other remedies that may be provided by law or equity in the event that such mediation fails to resolve a dispute. The Parties, in consultation with the

mediator, will use their best efforts to resolve the dispute within thirty days.

Under no circumstances, however, will mediation under this Section result in a requirement that diminishes, limits or contravenes the discretion, authority or any delegated authority of the Director of DWR or the AGENCY under State law.

- C. If mediation fails to resolve the dispute, and prior to commencing any legal action to resolve the dispute, the Party proposing to commence legal action will provide the other Party thirty days' written notice of such action, provided that such notice will not be required where a delay in commencing an action would prejudice the interests of the Party that intends to file suit. During the thirty-day notice period, the Parties will continue to attempt to resolve the dispute.

**11. NOT A PRECEDENT**

The terms and conditions set forth in this Agreement are not intended to set a precedent for any future contractual arrangements for conveying non-SWP water by DWR to the AGENCY.

**12. PAYMENTS, NOTICES OR OTHER COMMUNICATIONS**

The time for providing any payments, notices, or other communications specified in this Agreement may be extended within the term of this Agreement with the consent of the Parties, confirmed in writing, without requiring an amendment to this Agreement. All payments, notices, or other communications required under this



Agreement will be in writing, and will be deemed to have been duly given upon the date of service, if: (a) served personally on the Party to whom notice is to be given; (b) sent by electronic mail, and the Party to whom notice is to be given confirms receipt; or (c) on the third day after mailing, if mailed to the Party to whom payment, notice or other communication is directed, by first-class mail, postage prepaid, and properly addressed to the designated representative(s) of the Party set forth below.

DWR: Mr. Carl A. Torgersen  
Chief of State Water Project Operations Office  
Department of Water Resources  
3310 El Camino Avenue  
Post Office Box 219000  
Sacramento, California 95821-9000,

And

Mr. Robert Cooke  
Chief of State Water Project Analysis Office  
Department of Water Resources  
1416 Ninth Street, Room 1620  
Post Office Box 942836  
Sacramento, California 94236-0001

AGENCY: Mr. Kirby Brill, General Manager  
Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, California 92307-4377  
(760) 946-7000

A Party may notify the other Party in writing of a change in its designated representatives, without requiring an amendment to this Agreement. Unless other timing is specified within this Agreement, DWR will provide to the AGENCY copies of any and all payments, notices or other communications it sends or receives

pursuant to the terms of the Yuba Water Purchase Agreement as soon as possible, but no later than 14 days after DWR receives, or sends, such payments, notices or other communications to Yuba and/or the Authority and/or other Participating SWP Contractors.

**13. SIGNATORIES' AUTHORITY**

The signatories to this Agreement represent that they have authority to execute this Agreement and to bind the Party on whose behalf they execute this Agreement.

**14. COUNTERPARTS OF THIS AGREEMENT**

This Agreement may be signed in any number of counterparts by the Parties, each of which will be deemed to be an original, and all of which together will be deemed to one and the same instrument. This Agreement, if executed in counterparts, will be valid and binding on a Party as if fully executed all in one copy.

**15. BINDING ON SUCCESSORS/ASSIGNMENT**

This Agreement will bind and inure to the benefit of the respective successors and assigns of the Party, except that, none of the obligations of the Parties set forth in this Agreement will be assigned without the prior, written approval of the other Party, which approval will not unreasonably be withheld.

**16. NO THIRD-PARTY BENEFICIARIES**

This Agreement will not be construed to create any third-party beneficiaries, except as set forth in this section. This Agreement is for the sole benefit of the Parties, their respective successors and assigns, and no other person or entity will be entitled to rely on or receive any benefit from this Agreement or any of its terms.

**17. AMENDMENTS**

- A. This Agreement may be amended or modified only by written agreement approved and executed by the Parties.
- B. Prior to any amendment of this Agreement, the Parties will meet and confer with the other Participating SWP Contractors and the Authority. The Parties will not agree to any amendment to this Agreement that would adversely affect the rights and obligations of the Participating SWP Contractors under each of their respective “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the Participating SWP Contractors under the Dry Year Water Purchase Program” or the Authority under its “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the San Luis & Delta-Mendota Water Authority under the Dry Year Water Purchase Program.”
- C. Prior to any amendment of any “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the Participating SWP Contractors Under the Dry Year Water Purchase Program”,

DWR will meet and confer with the AGENCY. DWR will not agree to any amendments to any “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the Participating SWP Contractors Under the Dry Year Water Purchase Program” or the “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the San Luis & Delta-Mendota Water Authority under the Dry Year Water Purchase Program” that would adversely affect the rights and obligations under this Agreement.

- D. DWR will meet and confer with the AGENCY, the other Participating SWP Contractors and the Authority before agreeing to any proposed changes, amendments, or supplements to the Yuba Water Purchase Agreement. DWR will not agree to any changes, amendments, or supplements to the Yuba Water Purchase Agreement or its Exhibits that would be inconsistent with or adversely affect the Parties’ rights and obligations under this Agreement, any other “Agreement for the Supply and Conveyance of Water By the Department of Water Resources of the State of California to the Participating SWP Contractors Under the Dry Year Water Purchase Program” or under the “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California to the San Luis & Delta-Mendota Water Authority under the Dry Year Water Purchase Program.”

**18. OPINIONS AND DETERMINATIONS**

Where the terms of this Agreement provide for action to be based upon the opinion, determination, approval or review of either Party, such terms are not intended to be, and will not be construed as permitting such actions to be arbitrary, capricious or unreasonable. Any opinion, determination, approval or review required of a Party under this Agreement will be provided in a timely manner.

**19. REASONABLE COOPERATION**

The Parties will reasonably cooperate with each other, including the execution of all necessary documents and providing assistance in obtaining approvals and permits from regulatory agencies required to perform the obligations under this Agreement and to carry out the purpose and intent of this Agreement.

**20. CONSTRUCTION AND INTERPRETATION**

This Agreement is entered into freely and voluntarily. This Agreement has been arrived at through negotiation, and each Party has had a full and fair opportunity to revise the terms of this Agreement. Consequently, the normal rule of construction that any ambiguities are to be resolved against the drafting party will not apply in construing or interpreting this Agreement.

**21. COMPLETE CONTRACT**

This Agreement constitutes the sole, final, complete, exclusive and integrated expression and statement of the terms of this Agreement among the Parties

concerning the subject matter, and supersedes all prior negotiations, representations or agreement, either oral or written, that may be related to the subject matter of this Agreement, except as to those other agreements that are expressly referred to in this Agreement.

**22. DETERMINATION OF UNENFORCEABLE PROVISIONS**

If any term or provision of this Agreement is deemed invalid or unenforceable by any court of final jurisdiction, the Parties will meet and attempt to address this situation pursuant to the provisions of Section 10 of this Agreement.

**23. WAIVER**

The waiver at any time by a Party of its rights with respect to a default or other matter arising in connection with this Agreement will not be deemed a waiver with respect to any other default or matter.

**24. TIME**

Time is of the essence in this Agreement. Any date specified in this Agreement may be changed with the written consent of the Parties.

**25. APPLICABLE LAW**

This Agreement will be construed under and will be deemed to be governed by the laws of the State of California.

**26. VENUE**

Any appropriate County under California law will be venue for any state court litigation concerning the enforcement or interpretation of this Agreement.

**27. REMEDIES NOT EXCLUSIVE**

The remedies provided in this Agreement are cumulative and not exclusive, and are in addition to any other remedies that may be provided by law or equity. The exercise by the Party of any remedy under this Agreement will be without prejudice to the enforcement of any other remedy.

**28. OFFICIALS NOT TO BENEFIT**

No member or delegate to Congress, Resident Commissioner, or Federal or State official will be admitted to any share or part of this Agreement or to any benefit that may arise therefrom.

**29. STANDARD CLAUSES**

With respect to the mutual obligations of the Parties under this Agreement, the Parties will comply with the Standard Clauses as shown on Exhibit B ("State of California Standard Clauses") to this Agreement for the State of California, Contracts with Public Entities.

**30. EXHIBITS INCORPORATED**

Each exhibit to which reference is made is deemed incorporated in this Agreement,  
whether or not actually attached.



SUPPLY OF WATER AND CONVEYANCE BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA TO PARTICIPATING SWP CONTRACTORS UNDER THE DRY YEAR WATER  
PURCHASE PROGRAM

**IN WITNESS WHEREOF**, the Parties hereto, by their authorized representatives, have  
executed this Agreement on the last date set forth below.

Approved as to legal form  
and sufficiency:

STATE OF CALIFORNIA  
DEPARTMENT OF WATER RESOURCES

\_\_\_\_\_  
Chief Counsel

\_\_\_\_\_  
Mark Cowin, Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Approved as to legal form  
and sufficiency:

Mojave Water Agency

\_\_\_\_\_  
General Counsel

\_\_\_\_\_  
General Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

SUPPLY OF WATER AND CONVEYANCE BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA TO PARTICIPATING SWP CONTRACTORS UNDER THE DRY YEAR WATER  
PURCHASE PROGRAM

Attachments:

Exhibit A: Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources (December 4, 2007)

Exhibit B: DWR Standard Clauses

**EXHIBIT A**

**AGREEMENT FOR THE LONG-TERM PURCHASE OF WATER FROM YUBA  
COUNTY WATER AGENCY BY THE DEPARTMENT OF WATER RESOURCES**

EXHIBIT B

DEPARTMENT OF WATER RESOURCES STANDARD CLAUSES  
FOR  
AGREEMENT FOR THE SUPPLY AND CONVEYANCE OF WATER  
BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA  
TO THE AGENCY  
UNDER  
THE DRY YEAR WATER PURCHASE PROGRAM

**Worker's Compensation Clause.** Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employee to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of work under this Agreement.

**Nondiscrimination Clause.** During the performance of this Agreement, Contractor and its subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave. Contractor and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) et seq.) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other Agreement.

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

**Compliance with Laws, Regulations, Permit Requirements.** Contractor shall at all times comply with, and require its contractors and subcontractors to comply with, all applicable federal and State laws, rules and regulations, permits and all applicable local ordinances, specifically including but not limited to environmental, procurement and safety laws, rules, regulations, permits and ordinances.

**Availability of Funds.** Work to be performed under this contract is subject to the availability of funds through the State's normal budget process.

**Audit Clause.** For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after the final payment under the contract (Government Code Section 8546.7).

**Payment Retention Clause.** Ten percent of any progress payments that may be provided under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

**Reimbursement Clause.** If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: The address of the AGENCY as shown in Section 12 of this Agreement.

**Drug-Free Workplace Certification.** By signing this contract, the Contractor or grantee hereby certifies under penalty of perjury under the laws of the State of California that the Contractor or grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) and will provide a drug-free workplace by taking the following actions:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
2. Establish a Drug-Free Awareness Program to inform employees about all of the following:
  - a) The dangers of drug abuse in the workplace,

- b) The person's or organization's policy of maintaining a drug-free workplace,
  - c) Any available counseling, rehabilitation, and employee assistance programs; and
  - d) Penalties that may be imposed upon employees for drug abuse violations.
3. Every employee who works on the proposed contract or grant:
- a) Will receive a copy of the company's drug-free policy statement, and
  - b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract or grant.

This contract or grant may be subject to suspension of payments or termination, or both, and the contractor or grantee may be subject to debarment if the Department determines that: 1) the Contractor or grantee has made a false certification, or 2) the Contractor or grantee violates the certification by failing to carry out the requirements noted above.

**Americans with Disabilities Act.** By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, 942 U.S.C.12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

**Conflict of Interest.** Current State Employees: a) No officer or employee shall engage in any employment activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity or enterprise is required as a condition of regular State employment. b) No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.

**Former State Employees:** a) For the two year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

**Child Support Compliance Act.** For any agreement in excess of \$100,000, the Contractor acknowledges in accordance herewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall fully comply with all applicable State and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earning assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the Employment Development Department.

**Air or Water Pollution Violation.** Under the State laws, the Contractor shall not be: 1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; 2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or 3) finally determined to be in violation of federal law relating to air or water pollution.

**Union Organizing.** For all contracts, except fixed price contracts of \$50,000 or less, the Contractor acknowledges that: by signing this Agreement the Contractor hereby acknowledges the applicability of Government Code Section 16645 through Section 16649 to this Agreement and agrees to the following:

1. Contractor will not assist, promote or deter union organizing by employees performing work on a State service contract, including a public works contract.
2. No State funds received under this Agreement will be used to assist, promote or deter union organizing.
3. Contractor will not, for any business conducted under this Agreement, use any State property to hold meetings with employees or supervisors, if the purpose of such meetings is to assist, promote or deter union organizing,

unless the State property is equally available to the general public for holding meetings.

4. If Contractor incurs costs or makes expenditures to assist, promote or deter union or organizing, Contractor will maintain records sufficient to show that no reimbursement from State funds has been sought for these costs, and that the Contractor shall provide those records to the Attorney General upon request.

**Recycling Certification.** Contractor shall certify in writing under penalty of perjury, the maximum, if not exact, percentage of recycled content, both post consumer water and secondary waste as defined in Public Contract Code, Section 12161 and 12200, in materials, goods, or supplies offered or products used in the performance of this Agreement, regardless of whether the product meets the required recycled product percentage as defined in Public Contract Code, Sections 12161 and 12200. Contractor may certify that the product contains zero content. (PCC 10233, 10308.5, 10354)



**STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES**

**AMENDMENT NO. 1 TO THE  
AGREEMENT FOR THE SUPPLY AND CONVEYANCE OF WATER  
BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA  
TO THE PARTICIPATING STATE WATER PROJECT CONTRACTORS  
UNDER  
THE DRY YEAR WATER PURCHASE PROGRAM  
SWPAO NO. 09-827**

THIS AMENDMENT NO. 1 (“Amendment”) to the \_\_\_\_\_, 2014  
“Agreement for the Supply and Conveyance of Water by the Department of Water  
Resources of the State of California to the Participating State Water Project Contractors  
under the Dry Year Water Purchase Program” (“Agreement”) is entered into as of the  
\_\_\_\_ day of \_\_\_\_\_, 2014, pursuant to the provisions of the California Water  
Resources Development Bond Act, the State Central Valley Project Act, and other  
applicable laws of the State of California, between the Department of Water Resources  
of the State of California, herein referred to as “DWR,” and the Mojave Water Agency, a  
public agency in the State of California, herein referred to as the “AGENCY.” DWR and  
the AGENCY are herein referred to separately as the “Party” and collectively as the  
“Parties.”

The Parties hereby amend the Agreement as follows:

1. Item no. 9 (at page 55) Section 1 (“General Principles”) of Exhibit 2 (“Reservoir Refill Accounting Provisions”) of Exhibit A (“Long-Term Purchase of water from Yuba County Water Agency by the Department of water Resources”) is revised to read as follows:

“If the Transfer Amount Account is not zero on September 30, then the remaining balance of the account will be carried forward to the subsequent water year and the impact accounting will continue until the outstanding balance is eliminated. Exception: If the difference in storage between the Actual Storage and the maximum baseline storage, on September 30th is less than the remaining balance of the previous year plus the Base Transfer (see item 1 above), then the transfer amount account will be reset to the difference between actual storage and the maximum baseline storage amount.”

2. All remaining provisions of the Agreement will remain in full force and effect.

AMENDMENT NO. 1 TO THE  
AGREEMENT FOR THE SUPPLY AND CONVEYANCE OF WATER BY THE DEPARTMENT OF WATER  
RESOURCES OF THE STATE OF CALIFORNIA TO PARTICIPATING STATE WATER PROJECT CONTRACTORS  
UNDER THE DRY YEAR WATER PURCHASE PROGRAM

The foregoing is hereby agreed to by the Parties.

**IN WITNESS WHEREOF**, the Parties hereto, by their authorized representatives, have executed this Agreement on the last date set forth below.

Approved as to legal form  
and sufficiency:

STATE OF CALIFORNIA  
DEPARTMENT OF WATER RESOURCES

\_\_\_\_\_  
Cathy Crothers, Chief Counsel

\_\_\_\_\_  
Mark W. Cowin, Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Approved as to legal form  
And sufficiency:

Mojave Water Agency

\_\_\_\_\_

\_\_\_\_\_  
Mr. Kirby Brill, General Manager

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

**Exhibit for Notice to Contractors**

**Memo Justifying Proposed Change in Exhibit 2 “Reservoir Refill Accounting Provisions”**

## MEMO

DATE: October 20, 2008  
FROM: Technical Committee - Lower Yuba River Accord Water Purchase Agreement  
TO: Management Committee - Lower Yuba River Accord Water Purchase Agreement  
RE: Proposed Change in Exhibit 2 "Reservoir Refill Accounting Provisions"

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The 2008 water transfer is the first year of the long term water transfer between Yuba County Water Agency (YCWA) and the Department of Water Resources (DWR). In 2007 YCWA and DWR completed a transfer to the Environmental Water Account (EWA) under a pilot program. The 2007 transfer resulted in the delivery of 125 TAF of stored water from New Bullards Bar Reservoir to DWR. According to the long term transfer water purchase agreement (Agreement), the storage space in New Bullards Bar Reservoir evacuated as a result of the release of transfer water must be refilled at a time of excess Delta conditions, or an impact is accounted for and the impact volume must be repaid through the release of additional transfer water at a later date. Exhibit 2 of the Agreement contains the accounting steps for determining if a refill impact has occurred. Exhibit 1 of the Agreement contains the procedures for determining the daily transfer flows. According to the refill accounting procedures of Exhibit 2, none of the 125TAF of transfer water from 2007 was refilled in the winter of 2008. As described in more detail below, the accounting of water releases under Exhibit 1 showed that some of the 2007 transfer had actually been refilled. The Technical Committee believes that an additional accounting step is required in Exhibit 2. If Exhibit 2 refill accounting were to remain without the proposed changes of this memo, the accounting in Exhibit 2 would differ from the accounting in Exhibit 1 as of October 1, 2008.

The accounting in Exhibit 1 is accomplished by tracking two sets of daily flows and storage amounts; 1) the actual flows in the Yuba River and storage of New Bullards Bar Reservoir and 2) a determination of the daily flows and resulting storage that would have occurred absent the Agreement and the Lower Yuba River Accord Fisheries Agreement (the Baseline). The primary purpose of Exhibit 1 is to account for the amount of transfer water that is delivered to DWR from the Yuba River. This is accomplished by tracking the actual daily flows and comparing them with computed Baseline daily flows. Since this process must be continuous, it also provides an accounting of the Baseline New Bullards Bar storage and the resulting reduction in flows in the Yuba River due to refilling New Bullards Bar storage in the winter. The determination of transfer flows is tracked through a number of accounting controls to assure DWR that increased releases for transfer are actually occurring. However, in the wintertime, in moderate weather years the ability to determine the exact volume of release that would have occurred under the Baseline is less precise, since this is typically not a transfer time period, and the

ability of DWR to verify these flows is limited, and to a degree affected by YCWA wintertime power production/hydrology risk real-time operations determination. This lack of precision and verification of wintertime operations is the reason Exhibit 2 is in place.

The procedures of Exhibit 2 determine the volume of impact to the Projects due to refill (refill impact) by setting a Target Storage Line that is a “maximum storage operation”. If Baseline storage in New Bullards Bar Reservoir, calculated by adding actual storage and unrefilled transfer amount, is above the Target Line, the unrefilled transfer amount is reduced by the volume above the Target Line. And, if the Delta is in balanced conditions, a refill impact of that volume is determined. This system works well as a verifiable method for determining a refill impact for a single year transfer. However, since the reduction of unrefilled transfer volume is only taken when baseline storage is at the Target Line, which is a maximum storage operation, no reduction in the unrefilled transfer volume occurs when New Bullards Bar reservoir is refilling, but baseline storage is below the Target Line. This occurred in the winter of 2008 and is expected to occur in years that are moderately dry. The procedures of Exhibit 2 are to a degree affected by YCWA wintertime power production/hydrology risk real-time operations determination.

As previously stated, Exhibit 1 accounting is computed on a daily basis throughout the year, including a determination of Baseline storage and releases from New Bullards Bar Reservoir. By extension, Exhibit 1 also includes refill of the New Bullards Bar storage, and the effect of that refill on Yuba River flows. The method for refill tracking in Exhibit 2 is different from the method in Exhibit 1, and in dryer year conditions, such as the conditions seen in 2008, results in a difference in the amount of transfer water yet to be refilled between the two accounting methods. The difference results because Exhibit 2 does not have a procedure for adjusting the unfilled amount from a previous year’s transfer when the previous year is moderately dry. The Technical Committee has developed a straightforward change to the accounting procedures in Exhibit 2 that would adjust the previous years’ remaining refill volume of moderately dry years to be used in the determination of refill impacts.

The Technical Committee has recognized a need to adjust the accounting procedures and had discussed it during several operations-coordination conference calls during the spring and early summer. A meeting at the Joint Operations Center (JOC) was held on June 15<sup>th</sup> 2008 to review the issue in detail and to come to agreement on a solution. The meeting attendees were John Lehigh and Andy Chu from DWR, Jeff Sandberg from USBR and Steve Grinnell and Jeff Weaver for YCWA. Following a detailed discussion of the issues and possible measures to be added to the accounting, it became clear that the best method was to include a “reset” of the previous years’ transfer amount in Exhibit 2. The proposed solution is to modify Exhibit 2 by adding a limit on the amount of previous year transfer volume at the start of the refill period, October 1, to the lesser of; 1) the unrefilled transfer volume from the previous year plus the current year transfer as currently described in Exhibit 2, or 2) the difference in storage between actual storage and baseline storage on September 30.

The proposed change to Exhibit 2 is to change item 9 on page 55 from;

“9) If the Transfer Amount Account is not zero on September 30, then the remaining balance of the account will be carried forward to the subsequent water year and the impact accounting will continue until the outstanding balance is eliminated.”

to;

“9) If the Transfer Amount Account is not zero on September 30, then the remaining balance of the account will be carried forward to the subsequent water year and the impact accounting will continue until the outstanding balance is eliminated. *Exception: If the difference in storage between the Actual Storage and the maximum baseline storage, on September 30th is less than the remaining balance of the previous year plus the Base Transfer (see item 1 above), then the transfer amount account will be reset to the difference between actual storage and the maximum baseline storage amount.*

The practical result of this adjustment is that refill accounting under the Agreement will continue to have the static, verifiable refill accounting of Exhibit 2, while recognizing that the accounting of Exhibit 1 is more precise in determining day to day differences in flows and storage between the accounting Baseline and actual flows and storage during moderate conditions for the purpose of accounting the amount of transfer water.

The technical committee, in examining this issue has also recognized that this addition to Exhibit 2 may not cover all circumstances that might arise due to the complexity of YCWA operations and the complexity of the accounting. It was unanimously agreed that although this solution will address the previous year’s unrefilled amount in the Exhibit 2 refill accounting, further adjustments might be needed in the future to address unique and rare circumstances.

The Technical Committee requests that the Management Committee review the proposed change and incorporate it into Exhibit 2 of the Water Purchase Agreement.

**STATE OF CALIFORNIA**

**THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES**

**AMENDMENT 5 TO THE  
AGREEMENT FOR THE SUPPLY AND CONVEYANCE OF WATER  
BY THE DEPARTMENT OF WATER RESOURCES  
OF THE STATE OF CALIFORNIA  
TO THE PARTICIPATING STATE WATER PROJECT CONTRACTORS  
UNDER  
THE DRY YEAR WATER PURCHASE PROGRAM  
SWPAO NO. 14-827**

THIS AMENDMENT 5 (Amendment) to the \_\_\_\_\_, 2014 “Agreement for the Supply and Conveyance of Water by the Department of Water Resources of the State of California Under the Dry Year Water Purchase Program” (Participation Agreement, or Agreement) is entered into as of the \_\_\_\_\_ day of \_\_\_\_\_, 2014 pursuant to the provisions of the California Water Resources Development Bond Act, the State Central Valley Project Act, and other applicable laws of the State of California, between the Department of Water Resources of the State of California, herein referred to as “DWR,” and the Mojave Water Agency, a public agency in the State of California, herein referred to as the “AGENCY.” DWR and the AGENCY are herein referred to separately as the “Party” and collectively as the “Parties.” Unless otherwise provided in this Amendment, the definitions in the Agreement, the Yuba Water Purchase Agreement, and the exhibits to that agreement shall apply to this Amendment.



## RECITALS

- A. Under the December 4, 2007 “Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources” (Yuba Water Purchase Agreement), Yuba County Water Agency (Yuba) makes surface water available for delivery and purchase by DWR, some of which is made available through substitution of groundwater for surface flows that would otherwise be used by a number of water districts within Yuba County (Member Units).
- B. In 2007 and 2008, 21 State Water Project (SWP) Contractors and the San Luis & Delta-Mendota Water Authority (“AUTHORITY”) entered into agreements with DWR for the purchase and delivery of the water made available under the Yuba Water Purchase Agreement (cumulatively referred to as the Participation Agreements). The Participating SWP Contractors and the AUTHORITY are jointly referred to as “Participating Contractors”.
- C. In 2009, the parties to the Yuba Water Purchase Agreement executed the first amendment to the Yuba Water Purchase Agreement to address a technical reservoir refill accounting provision in Section 1 of Exhibit 2. DWR and the Participating Contractors executed conforming amendments (Amendment Number 1) to each of the Participation Agreements. This amendment is still in effect.
- D. In 2009 and 2010, the parties to the Yuba Water Purchase Agreement executed the second and third amendments to the Yuba Water Purchase Agreement to make groundwater substitution water available to DWR for purchase as Component 4 Water at mutually agreed upon pricing. DWR and the Participating Contractors executed conforming amendments to each of the Participation Agreements. Both the second and third amendments have since expired.
- E. On January 6, 2012, the parties to the Yuba Water Purchase Agreement executed the fourth amendment to the Yuba Water Purchase Agreement providing for annual pricing negotiations for surface flows made available from groundwater substitution. DWR and the Participating Contractors executed conforming amendments (Amendment Number 4) to each of the Participation Agreements. Amendment 4 expires on December 31, 2015.
- F. The term of the Yuba Water Purchase Agreement is through December 31, 2025, or when all obligations thereunder have been satisfied, whichever is later, unless it is terminated earlier.
- G. Under Section 15 of the Yuba Water Purchase Agreement, a new amendment is needed to establish prices for water made available after September 30, 2015.

- H. In accordance with Section 15 of the Yuba Water Purchase Agreement, DWR and Yuba, in coordination with representatives of the Participating Contractors, have negotiated a new pricing agreement that will be incorporated into the Yuba Water Purchase Agreement by the fifth amendment to that agreement. The fifth amendment reflects changes in market conditions since the initial pricing schedule was proposed in 2004, as well as amending other provisions of that agreement.
- I. In light of the new pricing agreement reflected in the fifth amendment to the Yuba Water Purchase Agreement, the parties to the Participation Agreements desire to amend their respective Participation Agreements to conform with changes made by that amendment. This fifth amendment to the Participation Agreement shall be referred to in this Amendment as "Amendment 5".

**AMENDMENT 5 to the Participation Agreement**

**Now Therefore**, the Parties hereby amend the Participation Agreement as follows:

**1. SECTION 1 , "DEFINITIONS", is amended as follows:**

**(a) By adding at the end the following new definition:**

“**Contributing Participating Contractor**” means any Participating Contractor that elects to contribute money towards the \$20,000,000 deposit for purchases of Water from Yuba as described in Section 25 of the Yuba Water Purchase Agreement.”

**(b) By amending the definition of Participating SWP Contractors to read as follows:**

“**Participating SWP Contractors**” means all SWP contractors that have executed a Participation Agreement, Amendment 1 conforming the Participation Agreement to the first amendment to the Yuba Water Purchase Agreement, and Amendment 5 conforming the Participation Agreement to the fifth amendment to the Yuba Water Purchase Agreement. However, a contractor that executes this Amendment 5 will not be considered a Participating SWP Contractor beyond December 31, 2020 if that contractor does not agree to amend its Participation Agreement prior to December 31, 2020.”

**(c) By amending the definition of Yuba Water Purchase Agreement by adding after “Exhibit A”: “, and as amended”.**

**2. EFFECTIVE DATE OF AMENDMENT**

Amendment 5 to the Participation Agreement shall take effect when all of the following have occurred: (i) execution by the Parties; (ii) execution of the same or substantively similar amendments by DWR and all other Participating Contractors that elect to participate beyond December 31, 2015; and (iii) execution of the fifth amendment to the Yuba Water Purchase Agreement by DWR and Yuba.

**3. SECTION 2, “TERM OF THE AGREEMENT”, is amended by adding at the end the following new subparagraphs :**

“B. Notwithstanding Subparagraph A, the Parties may terminate the Participation Agreement on December 31, 2020, if they fail to amend the Participation Agreement pursuant to Section 3.B.5 and as necessary to address amendments made to the Yuba Water Purchase Agreement regarding the quantity and pricing of Water to be made available by Yuba after September 30, 2020 pursuant to Section 15 of the Yuba Water Purchase Agreement.

C. Notwithstanding Subparagraphs A and B, the Agreement shall remain in effect beyond the termination dates set forth above to the extent required to enable the Parties to satisfy all payment and water delivery obligations then existing or outstanding at the time of termination.”

**4. CHANGES TO SECTION 3, “PURCHASED WATER”**

**a. Section 3.B.1.a, “COMPONENT 1 WATER”, is amended to read as follows:**

“a. For Component 1 Water that is accounted for as Purchased Water and made available to the AGENCY, the AGENCY will pay:

- i. \$50 per acre-foot in a Wet Year;
- ii. \$100 per acre-foot in an Above Normal Year;
- iii. \$150 per acre-foot in a Below Normal Year;
- iv. \$200 per acre-foot in a Dry Year, except as provided in subsection vi;
- v. \$300 per acre-foot in a Critical Year, except as provided in subsection vi;
- vi. \$350 per acre-foot in two or more consecutive Final Classification Dry Years (or a Dry Year following a Critical Year) or in two or more consecutive Final Classification Critical Years.
- vii. Notwithstanding subsections i-vi, in any year in which Yuba’s Third-Party Transfer of up to 10,000 acre-feet of Storage Component water under

Section 11 of the Yuba Water Purchase Agreement reduces the quantity of Component 2 Water available to the AGENCY, the price for Component 1 Water will reflect the reductions specified in Section 11.F.2 of such agreement.”

**b. Section 3.B.2, “COMPONENT 2 WATER”, is amended to read as follows:**

“For Component 2 Water that is accounted for as Purchased Water and made available to the AGENCY, the AGENCY will pay:

- a. \$160 per acre-foot in a Dry Year, except as provided in subsection c;
- b. \$200 per acre-foot in a Critical Year, except as provided in subsection c;
- c. \$280 per acre-foot in two or more consecutive Final Classification Dry Years (or a Dry Year following a Critical Year) or in two or more consecutive Final Classification Critical Years.”

**c. Section 3.B.3, “COMPONENT 3 WATER”, is amended to read as follows:**

“For Component 3 Water that is accounted for as Purchased Water and made available to the AGENCY, the AGENCY will pay:

- a. \$50 per acre-foot in a Wet Year;
- b. \$100 per acre-foot in an Above Normal Year;
- c. \$150 per acre-foot in a Below Normal Year;
- d. \$200 per acre-foot in a Dry Year, except as provided in subsection f;
- e. \$300 per acre-foot in a Critical Year, except as provided in subsection f;
- f. \$350 per acre-foot in two or more consecutive Final Classification Dry Years (or a Dry Year following a Critical Year) or in two or more consecutive Final Classification Critical Years.”

**d. Section 3.B.4, “COMPONENT 4 WATER”, is amended to read as follows:**

“a. Notwithstanding any other provision to the contrary of the Yuba Water Purchase Agreement, the following provisions shall apply to Groundwater Substitution Component water and Accrued Groundwater Substitution Component water made available by Yuba, through DWR, to the AGENCY beginning on January 1, 2016 and continuing through the term of this Agreement.

b. Component 4 water shall be comprised solely of Groundwater Substitution Component water. All Groundwater Substitution Component water shall be accounted for as Component 4 Water. Except as otherwise provided herein, Groundwater Substitution Component water and Accrued Groundwater Substitution Component water will be accounted for in accordance with the provisions of the Yuba Water Purchase Agreement.

c. In every year within the term of this Agreement when one or more Participating Contractor(s) desire to purchase Accrued Groundwater Substitution Component water from Yuba through DWR, the Management Committee representatives of DWR, Yuba, and the Participating Contractors will convene by February 15 and conclude by March 31 to negotiate the price per acre-foot of Accrued Groundwater Substitution Component water, any provisions for the Delta export priority for such water, and any other terms applicable to the Accrued Groundwater Substitution Component water.

d. In every Water Accounting Year when: (1) one or more Participating Contractor(s) desire to purchase Accrued Groundwater Substitution Component water; (2) the annual negotiations referenced in Section 3.B.4.c have reached a successful conclusion calling for the purchase of such water that year; (3) the Management Committee representatives for Yuba, the AUTHORITY, and the Participating SWP Contractors have agreed as to the terms of, and each of these representatives has recommended in writing said terms and the approval of, a letter agreement between Yuba and DWR establishing the price per acre-foot and any modified terms that will be applicable to the Accrued Groundwater Substitution Component water for that Water Accounting Year; and (4) DWR and Yuba have executed said letter agreement, DWR will offer in writing to the AGENCY the opportunity to purchase Accrued Groundwater Substitution Component water at the price and terms as provided in the letter agreement between DWR and Yuba.”

**5. CHANGES TO SECTION 4, “REQUESTS, SCHEDULING AND CONVEYANCE”**

**a. Section 4.A.1 is amended to read as follows:**

“1. On or before April 1 of each year during the term of this Agreement DWR will notify the AGENCY of the quantity of Accrued Groundwater Substitution Component water that Yuba will make available during the Water Accounting Year and the terms of such water, including the price per acre-foot, and any other applicable terms. On or before April 11 of each Water Accounting Year, DWR will inform the AGENCY of the potential quantity of Component 1 Water, Component 2 Water, and Component 3 Water that is available to the AGENCY.”

**b. Section 4.A.2 is amended by striking** “if not used by the EWA, as provided in Section 3.B.1a”.

**c. Section 4.A.3 is amended to read as follows:**

- “3. DWR and the AGENCY will, between April 11 and May 14, confer on the allocation of water under Section 3A. By April 13, the AGENCY will notify DWR of the quantity of Accrued Groundwater Substitution Component water it commits to purchase based on the price and terms for Groundwater Substitution Component water for that year. The AGENCY may adjust the quantity of water, up or down, on or before May 14, and on May 14 the AGENCY will commit to the final quantity of Accrued Groundwater Substitution Component water to be purchased during the Water Accounting Year, but such amount will not be less than the actual amount of Accrued Groundwater Substitution Component water made available between April 1 and May 15 for Groundwater Substitution Component water in accordance with the accounting provisions for Groundwater Substitution Component water set forth in Exhibit 1 of the Yuba Water Purchase Agreement. This provision is intended to be consistent with, and not modify, provisions of Section 4.A.5. If necessary, the dates herein may be adjusted if approved in writing by Yuba and DWR with written notice to the AGENCY to allow the Yuba Member Units to maximize the quantities of groundwater substitution pumping program water that could be made available during each year.”

**d. Section 4.A.4 is amended to read as follows:**

- “4. No later than May 19, DWR will notify the AGENCY of the quantity of Component 1 Water, Component 2 Water, and Component 3 Water that has been allocated to the AGENCY and that the AGENCY will schedule pursuant to Section 4.A.7.”

**e. Section 4.A.5 is amended to read as follows:**

- “5. The AGENCY will provide DWR not less than 24 hours notification for suspension or termination of groundwater pumping due to limitations on the ability of the AGENCY to divert the Groundwater Substitution Component water. In the event of such a suspension or termination of Groundwater Substitution Component water, the AGENCY will pay for its allocated share of the quantity of Accrued Groundwater Substitution Component water, up to and including through a 72-hour period commencing after DWR notifies Yuba to suspend or terminate pumping related to the amount of Groundwater Substitution Component water requested by the AGENCY unless another Participating Contractor purchases that Accrued Groundwater Substitution Component water.”

**f. Section 4.A.6 is amended to read as follows:**

“6. Pursuant to the negotiations described in Section 3.B.4.c in which a letter agreement has been executed as provided in Section 3.B.4.d, the AGENCY will comply with Delta conveyance priority, as determined by the Management Committee representatives as provided in Section 3.B.4.c, for any Groundwater Substitution Component water requested under the Agreement, relative to any other transfer water that DWR conveys at the Harvey O. Banks Pumping Plant for the AGENCY, provided that the Groundwater Substitution Component water will not have a higher priority than Storage Component water provided under the Agreement.”

**g. Section 4.A.7 is amended by striking** “if not used by the EWA, as provided in Section 3.B.1.a”.

**h. Section 4.A. is further amended by adding at the end the following new paragraph 12:**

“12. In the event that Yuba notifies DWR on or before September 1 to not back a specified quantity of Released Transfer Water into Project storage after September 30 of a Water Accounting Year, DWR will notify the AGENCY within five business days and provide an opportunity for the AGENCY to guarantee, no later than September 15, purchase of that portion of such water allocated to the AGENCY in accordance with Section 3.A at the current year pricing regardless of whether it becomes Delivered Transfer Water. Such water, when stored in Project storage, will be released in a subsequent year to the AGENCY provided it was stored in Project storage and not spilled by flood control releases before its scheduled release.”

**6. CHANGES TO SECTION 5, “INVOICING AND PAYMENTS”**

**a. Section 5.A.1 is amended to read as follows:**

**“A. Invoicing and Payment of Purchased Water**

1. On or about May 22 (or within 9 days of the date that DWR receives an invoice from Yuba), DWR will invoice the AGENCY for fifty percent of the payment for the estimated amount of Storage Component water that the AGENCY scheduled as Purchased Water for that calendar year minus any credits due to the AGENCY as provided in Sections 5.C and 5.D. DWR will simultaneously invoice the AGENCY for 50 percent of the amount of Accrued Groundwater Substitution Component water that the AGENCY has committed to purchase under Section 4.A.3. Within 32 days of the date that

the AGENCY receives an invoice from DWR, the AGENCY will submit payment to DWR.”

**b. Section 5.A. is amended further by: redesignating Section 5.A.2 as 5.A.3, Section 5.A.3 as 5.A.4, and adding a new Section 5.A.2 as follows:**

- “2. a. The AGENCY will pay DWR the per acre foot price for the quantity of Accrued Groundwater Substitution Component water that the AGENCY has committed to purchase pursuant to Section 4.A.3, unless this amount is reduced pursuant to Sections 4.A.5 or 5.A.2.b or is reduced because the Yuba Member Units do not pump the requested quantity of groundwater substitution pumping program water for the Groundwater Substitution Component water.
- b. The Parties acknowledge that Section 5.1.8 of the Yuba Accord Fisheries Agreement allows the River Management Team to schedule the release of a portion of Groundwater Substitution Component water at a time when it might not be transferable. The AGENCY will not be required to pay for the portion (if any) of Groundwater Substitution Component water that is scheduled for release in accordance with the provisions of Section 5.1.8 of the Yuba Accord Fisheries Agreement to the extent that this quantity of Groundwater Substitution Component water is not transferable under the accounting provisions set forth in Exhibit 1 of the Yuba Water Purchase Agreement.
- c. On or about August 30 in each year that the AGENCY has agreed to purchase Accrued Groundwater Substitution Component water, DWR will submit an invoice to the AGENCY for 90 percent of the amount of Accrued Groundwater Substitution Component water the AGENCY has committed to purchase in Section 4.A.3 or that is otherwise payable under this Agreement during the current Water Accounting Year, less the amount of prior invoices for such Accrued Groundwater Substitution Component water during the current Water Accounting Year. Within 32 days of the date that the AGENCY receives an invoice from DWR, the AGENCY will submit payment to DWR.
- d. Approximately 30 days after the end of the release of Accrued Groundwater Substitution Component water from New Bullards Bar Reservoir, after confirmation of the amount of Groundwater Substitution Component water released has been completed, after Yuba and DWR have reached agreement on the final accounting, and Yuba has provided to DWR a final invoice that is undisputed and as required under the Yuba Water Purchase Agreement, DWR will invoice the AGENCY for final payment for Accrued Groundwater Substitution Component water



provided under this Amendment. The AGENCY will submit payment to DWR within 32 days of invoicing by DWR.

- e. The final payment for Accrued Groundwater Substitution Component water will reflect any adjustments necessary to account for the total quantity of Accrued Groundwater Substitution Component water payable under this Agreement and any adjustments due pursuant to Sections 4.A.5 or 5.A.2.b.
- f. The Agreement provides for a Participating Contractor to pay interest on delinquent payments at the rate of 1 percent per month from the due date until paid in full. DWR will assess such interest on the AGENCY if payments to DWR for invoices pursuant to this Agreement are delinquent. The AGENCY agrees to pay such interest, and DWR will pay such interest collected along with the payments on invoices to Yuba.”

**c. Section 5.A is further amended by adding at the end the following new subsection 5.A.5:**

“5. In the event that the AGENCY has guaranteed the purchase of Water allocated in accordance with Section 3.A that Yuba had notified DWR to not back into Project storage, DWR will invoice the AGENCY for the amount of Water the AGENCY has guaranteed in accordance with Section 4.A.12 to purchase at the current year pricing regardless of whether it becomes Delivered Transfer Water.”

**d. Section 5.C, PAYMENT OF FIXED ANNUAL COSTS AND CREDIT AGAINST PURCHASED WATER, is amended to read as follows:**

**“C. PAYMENTS AND CREDITS FOR TIME VALUE OF DEPOSIT FUNDS**

- 1. The AGENCY shall make an annual payment to DWR for the purpose of compensating Contributing Participating Contractors for the time value of the money, computed as a compounded interest rate of 2.25 percent on the outstanding balance, that Contributing Participating Contractors contribute by about December 31, 2014 to comprise the \$20,000,000 of deposit funds that serve to guarantee the five-year pricing reflected in the fifth amendment to the Yuba Water Purchase Agreement. On or about May 22 each year, DWR will invoice the AGENCY its share of the annual charge to pay the interest costs on the deposit funds provided by Contributing Participating Contractors providing deposit funds as provided in Section 5.E. The AGENCY’s payment of these fixed annual costs will be its share of \$175,000 prorated among the Participating SWP Contractors calculated in the manner as provided in Section 3.A. This payment may be offset with any applicable credits due the AGENCY under the Agreement. This annual

payment will be discontinued once the total interest charges have been paid to the Contributing Participating Contractors that fund the deposit after the \$20,000,000 deposit has been fully credited to Storage Component water purchases by the Participating Contractors. This annual charge may be reduced in the final year(s) of payment to assure complete payment of the interest without overcharging the Participating Contractors.

2. All charges invoiced to the Participating Contractors for interest as provided in Section 5.C.1 shall be credited by DWR to Water purchases in the same Water Accounting Year by the Contributing Participating Contractors, in proportion to the amount of money each Contributing Participating Contractor contributed to the deposit described in Section 5.E. DWR will compute the actual amount of interest due to the AGENCY, if it is a Contributing Participating Contractor, based on the 2.25 percent interest rate and the deposit balances outstanding during the term of this Agreement. DWR shall credit or pay to AGENCY its proportionate share of the interest amount until the full amount of such interest due has been paid.”

**e. Section 5.E. PAYMENTS FOR ADJUSTMENTS TO GROUNDWATER O&M COSTS is amended to read as follows:**

“E. PROVISION OF DEPOSIT FUNDS TO SECURE PRICING GUARANTEE

1. An AGENCY that has elected to be a Contributing Participating Contractor shall deposit money with DWR towards the \$20,000,000 deposit for purchases of Water from Yuba.
  - a. The AGENCY shall pay a deposit of \$0 to DWR within 10 working days of executing Amendment 5 to the Agreement as its share of the \$20,000,000 deposit towards all purchases of Storage Component water by all Participating Contractors beginning after September 30, 2015. DWR will remit these deposit funds to Yuba by December 31, 2014 as part of the \$20,000,000 deposit as provided in the Yuba Water Purchase Agreement.
  - b. As Yuba credits the deposit funds to Storage Component water purchases by all Participating Contractors, if the AGENCY is a Contributing Participating Contractor, DWR will, in turn, credit these deposit credits to all purchases of Water by the AGENCY beginning October 1, 2015 in proportion to the AGENCY’s contribution to the deposit until the entire deposit has been credited and the AGENCY has received full credit for or repayment of its deposit amount during the term of the Agreement as provided herein. In the event that the AGENCY’s purchases of Water in any Water Accounting Year are less than the credits available to the AGENCY under the Agreement, DWR

will pay such credit amounts to the AGENCY upon receipt of an invoice.

- c. By June 10 each year and by January 17 of the following year, DWR will provide the AGENCY with an accounting of all purchases of Water by Participating Contractors setting forth the amount and cost of Storage Component and Groundwater Substitution Component water purchased by the AGENCY, charges for the AGENCY's proportional share of interest payments, credits for the AGENCY's share of interest on the deposit if any, credits for repayment of deposit funds to the AGENCY from purchases of Storage Component water if any, and any other applicable credits and charges provided in this Agreement. If funds are due from DWR to the AGENCY, the AGENCY shall promptly invoice DWR, and DWR will pay the AGENCY within 30 days. DWR will compute the deposit balance attributable to the AGENCY and compute the interest amounts earned and credited or paid, and provide the AGENCY with detailed accounting of these balances. DWR will adjust the deposit balance attributable to the AGENCY's contribution to the deposit accordingly until the deposit is fully credited.
2. In the event that there are AGENCY deposit funds that have not been fully credited for Storage Component water that has been accounted for as Delivered Transfer Water that is made available through September 30, 2020, then these remaining deposit funds will be: (1) applied to future payments due by the AGENCY to DWR for Storage Component Delivered Transfer Water delivered on or after October 1, 2020 under a subsequent amendment between the Parties at the prices provided in Section 26 of the Yuba Water Purchase Agreement; or (2) if there is no such amendment, refunded by DWR to the AGENCY upon receipt of Prepayment funds from Yuba as provided in Section 25.A of the Yuba Water Purchase Agreement."

**7. YUBA WATER SALES TO THIRD PARTIES**

**The Agreement is amended by adding at the end the following new section:**

**"31. SALES TO THIRD PARTIES**

Amendment 5 to the Yuba Water Purchase Agreement provides for the sale of water to third parties under the terms outlined in Section 11.F of that agreement. In accordance with Sections 11.F.3 and 4 of the Yuba Water Purchase Agreement, so long as a transfer is carried out consistent with the transfer water accounting provisions of Exhibit 1 for Released Transfer Water during Balanced Conditions, the AGENCY will not object based on the use of the transfer water accounting provisions of Exhibit 1 to such a transfer as not protective of DWR and the AGENCY as legal users of water during the time the AGENCY remains a Participating Contractor. The

AGENCY also agrees that while a Participating Contractor, it will not purchase water from Yuba other than through the Yuba Water Purchase Agreement.”

**8. NO OTHER CHANGES**

All remaining provisions of the Agreement that are not changed by this Amendment will remain in full force and effect.

**9. COUNTERPARTS OF THE AGREEMENT**

This Amendment may be signed in any number of counterparts by the Parties, each of which will be deemed to be an original, and all of which together will be deemed to one and the same instrument. This Amendment, if executed in counterparts, will be valid and binding on a Party as if fully executed all in one copy.

**IN WITNESS WHEREOF**, the Parties hereto, by their authorized representatives,  
have executed this Amendment on the last date set forth below.

Approved as to legal form  
and sufficiency:

STATE OF CALIFORNIA  
DEPARTMENT OF WATER RESOURCES

\_\_\_\_\_  
Cathy Crothers  
Chief Counsel

\_\_\_\_\_  
Mark W. Cowin  
Director

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

Approved as to legal form  
and sufficiency:

Mojave Water Agency

\_\_\_\_\_  
Counsel

\_\_\_\_\_  
Title

\_\_\_\_\_  
Date

\_\_\_\_\_  
Date

**STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES  
AND  
YUBA COUNTY WATER AGENCY**

**AGREEMENT FOR THE LONG-TERM PURCHASE OF WATER FROM YUBA  
COUNTY WATER AGENCY BY THE DEPARTMENT OF WATER  
RESOURCES**

This Agreement is entered into as of December 4, 2007 between the Department of Water Resources of the State of California, pursuant to the provisions of the California Water Resources Development Bond Act, the Central Valley Project Act and other applicable laws of the State of California, and Yuba County Water Agency, pursuant to the Yuba Act (California Statutes 1959, Chapter 788, as amended) and other applicable laws of the State of California. Defined terms are set forth in section 1 of this Agreement.

**RECITALS**

A. DWR operates and maintains the SWP pursuant to the laws of the State of California, involving the development and conveyance of water supplies to water supply agencies throughout the State of California.

B. Reclamation has constructed and is operating the CVP for the diversion, storage, carriage, and distribution of waters of the State of California for irrigation, municipal, domestic, industrial water supplies, for fish and wildlife mitigation, protection and restoration, and for generation and distribution of electric energy, salinity control, navigation, flood control, recreation and other beneficial uses.

C. Yuba is a public agency created and existing pursuant to the provisions of the Yuba Act. Yuba owns and operates the Yuba River Development Project, including the Yuba Project.

D. Yuba is engaged in the Yuba River Accord initiative to resolve issues associated with operation of the Yuba Project in a way that protects lower Yuba River fisheries and local water-supply reliability, while providing revenues for local flood control projects, water to use for protection and restoration of Delta fisheries, and improvements in state-wide water supply management.

E. The Yuba River Accord includes three major elements, all of which must be in place for the Yuba River Accord to become effective: (1) the Fisheries Agreement, under which Yuba would revise the operations of the Yuba Project to provide higher flows in the lower Yuba River under certain conditions to improve fisheries protection and enhancement; (2) the Conjunctive Use Agreements between Yuba and water districts within Yuba County for implementing a conjunctive use and water use efficiency program; and (3) this Agreement between Yuba and DWR, pursuant to which DWR will have rights to beneficially use water flows made available by Yuba through the Fisheries Agreement, the Conjunctive Use Agreements, and additional water releases from the Yuba Project, which Yuba asserts it would not and could not make available from the Yuba Project in the absence of the Yuba River Accord and without the revenues provided to Yuba under this Agreement.

F. DWR supports the Yuba River Accord, and is willing to enter into this Agreement because it will enable the Yuba River Accord to become effective, thereby improving fishery conditions on the Yuba River and improving water supplies to DWR for: (1) the EWA; (2) the SWP contractors pursuant to DWR's dry-year supplemental water supply programs; and (3) the members of the San Luis & Delta-Mendota Water Authority pursuant to DWR's dry-year supplemental water supply programs.

G. The Parties believe that this Agreement is consistent with: (1) Yuba's commitments to utilize water management tools (such as conjunctive use of groundwater), to create operational efficiencies, and manage water shortage risks in new ways that would benefit the fisheries and augment water supplies for downstream users; and (2) the Projects' need for additional water supplies.

H. Yuba is authorized under the Yuba Act to enter into long-term contracts to sell water for use outside of Yuba County, subject to the provision of Section 5.2 of the Yuba Act. Yuba has determined, after compliance with the procedures set forth in Section 5.2 of the Yuba Act, that the water subject to sale or disposition under this Agreement will not be needed during the term of this Agreement by or for the Member Units of Yuba. Yuba has further determined that Yuba is willing, in exchange for the consideration described in this Agreement, to enter into this Agreement.

I. The Parties, in coordination and consultation with Reclamation, the SWP contractors and the San Luis & Delta-Mendota Water Authority, carried out pilot water transfer programs during the 2006 and 2007 Water Accounting Years, and, based on the success of these pilot programs, desire to move forward with this Agreement, as part of the Yuba River Accord.

J. A portion of the Water delivered under this Agreement will be paid for with funds appropriated pursuant to Chapter 7(d) of Proposition 50, California Water Code Section 79550(d).

K. DWR will enter into separate agreements with the SWP contractors and the San Luis & Delta-Mendota Water Authority for the allocation of, and payment for, the Water to the extent determined necessary by DWR to satisfy payment obligations of this Agreement. Reclamation has

determined to not be a party to this Agreement. Yuba and DWR will amend this Agreement at such time as Reclamation is willing to become a party, subject to Reclamation and DWR entering into a separate agreement for the allocation of, and payment for, Water under this Agreement.

L. The Parties have determined that this Agreement does not conflict with Section 25 of the Short-Term Phase 8 Settlement Agreement.

M. In consideration of potential changes that may occur in SWP and CVP Delta operations and implementation of this Agreement related to orders of the United States District Court in *NRDC v. Kempthorne* (Case no. 05-CV-01207, OWW, E.D. Cal.): (1) Yuba revised the environmental analyses in the Yuba River Accord final environmental impact report/environmental impact statement to consider potential effects of the orders from the United States District Court; and (2) the Parties revised the payment provisions for Component 2 Water in Section 6B1 of this Agreement (to \$75 per acre foot in a Water Year that has a Final Classification as Dry, instead of \$50 per acre foot, and to \$93.75 per acre foot in a Water Year that has a Final Classification as Critical, instead of \$62.50 per acre foot).

## **AGREEMENT**

The Parties agree as follows:

1. Definitions.

When used herein, the term:

"Buyer" means DWR.

"CALFED" means the joint federal and California program, intended to develop and implement a long-term comprehensive plan that will, among other purposes, restore ecological health of the Bay-Delta System and improve water project management..

"CEQA" means the California Environmental Quality Act.

"Component 1 Water" means the water supplies described in Section 5 of this Agreement.

"Component 2 Water" means the water supplies described in Section 6 of this Agreement.

"Component 3 Water" means the water supplies described in Section 7 of this Agreement.



"Component 4 Water" means the water supplies described in Section 8 of this Agreement.

"Conference Year" means a Water Year for which the North Yuba Index is less than 500,000 acre-feet, calculated according to the procedures and formulas set forth in Exhibits 4 and 5 of the Fisheries Agreement, and using the latest available forecasts for the Water Year.

"Conjunctive Use Agreements" means those agreements (if any) for implementing a conjunctive use and water use efficiency program between Yuba and a sufficient number of Member Units that Yuba determines is satisfactory for Yuba to meet Yuba's obligations under this Agreement, the Fisheries Agreement, and the Yuba Act.

"CVP" means the Central Valley Project, operated by Reclamation.

"Decision 1644" means Revised Water-Right Decision 1644 of the State Board, adopted on July 16, 2003.

"DWR" means the Department of Water Resources of the State of California.

"Effective Date" means the date that this Agreement will take effect, as provided in Section 3 ("Effective Date").

"ESA" means the federal Endangered Species Act of 1973, as amended (16 U.S.C. sections 1531-1544).

"EWA" means the environmental water account program described in the CALFED Record of Decision and the EWA Operating Principles Agreement (August 28, 2000, as extended in September 2004), as extended by amendment and supplemental approvals, or a long-term environmental water account program.

"Feather River Diversion Facility" means an intake structure, pumping facilities, a fish screen that meets State and Federal fish screen criteria, and related facilities that Yuba may consider constructing at some future time at or below the confluence of the Yuba River and the Feather River for the diversion of water under Yuba's existing water rights for use within Yuba County. Yuba has no current plans to develop or construct the Feather River Diversion facility. If this project were developed, the Feather River Diversion Facility would be added as a point of re-diversion under Yuba's existing water rights. On a real-time basis, diversions by Yuba at the Feather River Diversion Facility: (1) would not exceed the quantity of water that would have been available to Yuba for diversion from Yuba River flows upstream of its confluence with the Feather River; (2) when added to the quantity of water diverted by Yuba at Yuba's Daguerre Point of Diversion, would not exceed the quantities of water under Yuba's water rights that Yuba had diverted to beneficial use under applicable provisions of law (including Chapter 1 of Part 1 of Division 2 of the Water Code)

prior to the initiation of water diversions at the Feather River Diversion Facility; and (3) would not cause adverse impacts to, or interfere with, DWR or Reclamation's operations of the SWP and CVP, or cause DWR or Reclamation to have to modify operations of their respective SWP or CVP facilities.

"FERC" means the Federal Energy Regulatory Commission.

"FERC License" means the license, as amended, issued to Yuba by FERC for the operation of the power facilities of the Yuba Project, the term of which expires on April 30, 2016.

"FERC Annual License" means one or more annual licenses issued to Yuba by FERC for the operation of the power facilities of the Yuba Project following the expiration of the term of the FERC License.

"FERC Long-Term License" means the long-term license issued to Yuba by FERC for the operation of the power facilities of the Yuba Project following the expiration of the term of the FERC License and the last FERC Annual License.

"Final Classification" means the year-type classification for the Sacramento River region in the May issue of DWR's Bulletin 120.

"Fisheries Agreement" means the agreement among Yuba, the California Department of Fish and Game, and other parties, under which Yuba operates the Yuba Project to provide higher flows in the lower Yuba River under certain conditions to improve fisheries protection.

"*Force Majeure Event*" means any: (1) flood; (2) earthquake; (3) failure of the California Aqueduct, the Delta-Mendota Canal, levees, other conveyance facilities, or other major components of the SWP, CVP or the Yuba Project; (4) act of God (other than drought); or (5) any other event (other than a Regulatory Action) beyond the reasonable control of DWR, Reclamation, or Yuba that significantly affects the ability to divert or use Water delivered by Yuba under this Agreement, or that significantly affects Yuba's ability to deliver Water under this Agreement while also meeting its obligations to its Member Units or its obligations under the Fisheries Agreement.

"Groundwater O&M Costs" means the costs related to pumping groundwater as described in Section 12 ("Other Payments to Yuba by Buyers") of this Agreement.

"Groundwater Substitution Transfer Monitoring and Operations Program" means the program, set forth in Exhibit 3 to this Agreement, pursuant to which Yuba will monitor and report groundwater pumping to implement this Agreement.

"Management Committee" means the committee, consisting of one representative each from Yuba, DWR, Reclamation, the CALFED fishery agencies on behalf of EWA, SWP contractors, and the San Luis & Delta-Mendota Water Authority, established under Section 14 ("Technical Committee and Management Committee") of this Agreement.

"Member Units" means a "Member Unit" as defined in Section 2(g) of the Yuba Act.

"NEPA" means the National Environmental Policy Act.

"Parties" means DWR and Yuba.

"PG&E" means Pacific Gas and Electric Company.

"PG&E Power Contract" means the power purchase contract between Yuba and PG&E related to the operation of the Yuba Project for the generation of hydroelectric power, dated May 13, 1966.

"Projects" means the SWP and the CVP.

"Reclamation" means the United States Department of the Interior, Bureau of Reclamation.

"Regulatory Action" means a court order, regulatory action or change in applicable law that significantly affects the Parties' or Reclamation's ability to divert or use Water, or that significantly affects Yuba's ability to deliver Water while also meeting its obligations to its Member Units or its obligations under the Fisheries Agreement.

"Short-Term Phase 8 Settlement Agreement" means the "Short-Term Agreement to Guide Implementation of Short-Term Water Management Actions to Meet Local Water Supply Needs and to Make Water Available to the SWP and CVP to Assist in Meeting the Requirements of the 1995 Water Quality Control Plan and to Resolve Phase 8 Issues" (effective date March 24, 2003).

"State Board" means the California State Water Resources Control Board.

"SWP" means the State Water Project operated by DWR. The SWP is also known as the State Water Facilities, as defined in California Water Code section 12934(d).

"Technical Committee" means the committee, consisting of technical representatives from Yuba, DWR, Reclamation, the CALFED fishery agencies on behalf of EWA,

SWP contractors and the San Luis & Delta-Mendota Water Authority, established under Section 14 ("Technical Committee and Management Committee") of this Agreement.

"Water" means Component 1 Water through Component 4 Water delivered by Yuba in a manner consistent with the provisions of Section 11 ("General Provisions Applicable to Water") of this Agreement.

"Water Accounting Year" means the twelve-month period from January 1 to December 31. The Water Accounting Year will be used to account for Water.

"Water Year" means the twelve-month period from October 1 of one year through September 30 of the following year. For this Agreement, each Water Year will be classified: (1) as "Wet," "Above-Normal," "Below-Normal," "Dry" or "Critical," based on the Sacramento Valley Water Year Hydrologic Classification in Figure 1 on page 188 of the State Board's March 15, 2000, Revised Water-Right Decision 1641; or (2) as a "Conference Year," based on the procedures and formulas set forth in Exhibits 4 and 5 of the Fisheries Agreement, using the latest available forecast for the Water Year.

"Yuba" means the Yuba County Water Agency.

"Yuba Act" means the Yuba County Water Agency Act, California Statutes 1959, Chapter 788, as amended.

"Yuba Project" means the Yuba River Development Project, including New Bullards Bar Dam and Reservoir on the North Yuba River.

"Yuba River Accord" means Yuba's initiative as described in Recitals D and E of this Agreement.

## 2. Term of Agreement.

This Agreement will terminate on December 31, 2025, or when all obligations under this Agreement have been satisfied, whichever is later, unless this Agreement is terminated earlier as provided herein.

## 3. Effective Date.

This Agreement will become effective when all of the following have occurred: (1) full execution of this Agreement; (2) full execution of the Fisheries Agreement; (3) full execution of the Conjunctive Use Agreements (if any, unless Yuba provides DWR written notification of Yuba's waiver of this condition); (4) full execution of an agreement between Yuba and PG&E to amend provisions of the PG&E Power Contract, and approval of the California Public Utilities Commission

of such an amendment, if determined necessary by Yuba (unless Yuba provides DWR written notification of Yuba's waiver of this condition); (5) receipt of all State Board approvals that may be necessary to enable the Fisheries Agreement and this Agreement to be fully implemented; and (6) full execution of the agreements between DWR and one or more SWP contractors, and an agreement between DWR and the San Luis & Delta-Mendota Water Authority, referred to in Recital K of this Agreement. The Parties will support the actions described in this section.

4. Actions Taken by Yuba to Make Water Available.

A. In accordance with Section 5.2 of the Yuba Act, all sales of Water are subject to the prior right to the use of such water or Yuba facilities by or for the Member Units. Yuba has taken the following measures to assure that the quantities of Water will be available to DWR during all Water Year types, as provided in this Agreement, for the term of this Agreement:

1. Yuba has entered into the Conjunctive Use Agreements (if any) under which the contracting Member Units have agreed to provide groundwater supplies in substitution for surface water supplies to assist Yuba in implementing this Agreement, to the extent (if any) determined by Yuba to be satisfactory for Yuba to meet Yuba's obligations under this Agreement, the Fisheries Agreement, and the Yuba Act; and

2. Yuba is implementing a groundwater monitoring program within its service area to ensure that the groundwater supply developed pursuant to the Conjunctive Use Agreements (if any) is within the long-term safe yield of the affected aquifer; and

3. The Board of Directors of Yuba has adopted a resolution making findings concerning Yuba's compliance with Section 5.2 of the Yuba Act, and determining that the Water exceeds the needs of its Member Units and that Yuba can and will perform its obligations under this Agreement.

B. In addition, Yuba may consider the installation and operation of the Feather River Diversion Facility at some future time in the event that Yuba determines that operation of the Feather River Diversion Facility would assist Yuba in making water supplies available within Yuba County. Subject to Yuba agreeing to operate this facility in the manner described in the definition of Feather River Diversion Facility, DWR will not oppose the installation and operation of the Feather River Diversion Facility for this purpose, and will not object to Yuba obtaining regulatory permits and approvals for the Feather River Diversion Facility.

5. Component 1 Water

A. Component 1 Water Quantity.

1. In each of the first eight Water Accounting Years of this Agreement (January 1, 2008 through December 31, 2015), Yuba will deliver to the Buyer, for use by the EWA, and the Buyer will pay for, 60,000 acre-feet of Component 1 Water, subject to Section 11 ("General Provisions Applicable to Water") of this Agreement. The total quantity of Component 1 Water that Yuba will deliver to the Buyer during the first eight Water Accounting Years of this Agreement will be 480,000 acre-feet, subject to extending the delivery period beyond the eight years if needed pursuant to subsection 2 below and Section 11G. Unless conditions under Section 23D ("As to Termination of the EWA Program") apply, Component 1 Water will be used to support continued implementation of EWA.

2. In certain years, and pursuant to the accounting principles set forth in Exhibit 1, operational limitations of the Yuba Project, the CVP, and/or the SWP may cause the quantity of Component 1 Water that Yuba can deliver to the Buyer to be reduced below 60,000 acre-feet during a Water Accounting Year. Under those circumstances, unless the Parties agree otherwise, Yuba will deliver the undelivered Component 1 Water so that the remaining quantity of the 480,000 acre-feet will be delivered during subsequent years under the following conditions: (a) during the next Water Accounting Year that is not a Dry or Critical Water Year; (b) when such make-up water can be delivered from Yuba's available surface-water supply; and (c) on a schedule that is acceptable to the Buyer and Yuba that would not impair the ability of Yuba to make Components 2 through Components 4 Water available, as provided in this Agreement.

3. The Buyer and Yuba will schedule Component 1 Water pursuant to Section 9 ("Scheduling of Water") of this Agreement.

4. In all Water Accounting Years that include all or part of the term of any FERC Annual License, Yuba will deliver to the Buyer, and the Buyer will pay for, 60,000 acre-feet of Component 1 Water, subject to Sections 15A(2) and 15B of this Agreement.

5. The quantities of Component 1 Water delivered by Yuba to the Buyer during all Water Accounting Years that include the term of the FERC Long-Term License, and do not include any part of the term of any FERC Annual License, will be subject to Sections 15A(3) and 15C of this Agreement.

#### B. Component 1 Water Pricing.

1. As full compensation to Yuba for making Component 1 Water in Section 5A available during each of the first eight Water Accounting Years of this Agreement, or in subsequent years under Section 5A2 and 11G, the Buyer will pay Yuba \$30,900,000. This payment will be made as described in Section 5C and Section 10 ("Invoicing") of this Agreement.

2. The pricing provisions applicable to additional Component 1 Water delivered by Yuba to the Buyer during all Water Accounting Years after the first eight Water

Accounting Years will be those set forth in Section 15 ("Quantities of and Pricing Provisions for Water During a FERC Annual License and During the FERC Long-Term License") of this Agreement.

C. Component 1 Water Payment Provisions.

In accordance with Section 10 ("Invoicing") of this Agreement, Yuba will, within thirty days of the Effective Date, submit an invoice to DWR for the payment of \$30,900,000 for the 480,000 acre-feet Component 1 Water. DWR will make payment to Yuba within sixty days of the date the invoice has been received by both the DWR Contract Manager and the Accounting Office.

6. Component 2 Water.

A. Component 2 Water Quantity.

1. In addition to Component 1, 3, or 4 Water, Yuba will deliver to the Buyer, subject to Section 11 ("General Provisions Applicable to Water") of this Agreement, and the Buyer will pay for:

a. In any Water Year that has a Final Classification as Dry, 15,000 acre-feet of Component 2 Water; and

b. In any Water Year that has a Final Classification as Critical, 30,000 acre-feet of Component 2 Water.

2. The Buyer and Yuba will schedule Component 2 Water pursuant to Section 9 ("Scheduling of Water") of this Agreement.

3. In all Water Accounting Years that include all or part of the term of any FERC Annual License, Yuba will deliver to the Buyer Component 2 Water, subject to Sections 15A(2) and 15B of this Agreement.

4. The quantities of Component 2 Water delivered by Yuba to the Buyer during all Water Accounting Years that include the term of the FERC Long-Term License, and do not include any part of the term of any FERC Annual License, will be subject to Sections 15A(3) and 15C of this Agreement.

B. Component 2 Water Pricing.

1. The Buyer will pay Yuba for Component 2 Water as follows:

\$75.00 per acre-foot;

a. In any Water Year that has a Final Classification as Dry,

\$93.75 per acre-foot; and

b. In any Water Year that has a Final Classification as Critical,

c. The payment adjustments (if any) provided for in Section 12C of this Agreement.

2. The Buyer will pay Yuba for Component 2 Water pursuant to Section 6C and Section 10 ("Invoicing") of this Agreement.

3. The pricing provisions applicable to Component 2 Water delivered by Yuba to Buyer during all Water Accounting Years that include all or part of the term of any FERC Annual License or the term of the FERC Long-Term License are set forth in Section 15 ("Quantities of and Pricing Provisions for Water During a FERC Annual License and During the FERC Long-Term License") of this Agreement.

C. Component 2 Payment Provisions.

1. For each Water Year that Component 2 Water is being delivered to the Buyer, Yuba will submit an invoice to the Buyer on or after June 1 for fifty percent of the amount due for Component 2 Water scheduled to be delivered to the Buyer pursuant to this Agreement, adjusted by an amount equal to fifty percent of any credits due from Yuba to the Buyer. By January 7 of the subsequent year, Yuba will submit an invoice to the Buyer for the remaining fifty percent of the amount due for Component 2 Water scheduled to be delivered to the Buyer pursuant to this Agreement, less the remaining amount of any credits due the Buyer. The invoices will contain all of the information and be transmitted to Buyer as set forth in Section 10 ("Invoicing") of this Agreement.

2. DWR will pay Yuba within sixty days of the date that both the DWR Contract Manager and the Accounting Office receive invoices containing all of the information required by Section 10(B) of this Agreement. With respect to the first invoice from Yuba, the Buyer will pay Yuba an amount equal to fifty percent of the price for the Component 2 Water that has been scheduled for delivery during the current Water Accounting Year in accordance with Section 9 ("Scheduling of Water") of this Agreement, minus fifty percent of any credit due from Yuba to the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement. With respect to the second invoice from Yuba, the Buyer will pay the remaining amount due to Yuba for Component 2 Water, based on an accounting of actual Water deliveries in the previous Water Accounting Year, less the remaining amount of any credit due the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement. With respect to both invoices from Yuba, DWR will pay Yuba within sixty days of the date both the DWR Contract Manager and the



Accounting Office have received the appropriate invoices containing all of the information required by Section 10(B) of this Agreement.

7. Component 3 Water.

A. Component 3 Water Quantity.

1. In addition to Component 1, 2, or 4 Water, and subject to Section 11 ("General Provisions Applicable to Water") of this Agreement:

a. When the allocations as of April 21:

(i) For CVP South of Delta agricultural contractors are at or below thirty-five percent of their CVP contractual entitlements, and for SWP contractors are at or below forty percent of their SWP water supply contract Table A Amounts, Yuba will deliver to the Buyer, and the Buyer will pay for, 40,000 acre-feet of Component 3 Water; or

(ii) For CVP South of Delta agricultural contractors are at or below forty-five percent and above thirty-five percent of their CVP contractual entitlements, or for SWP contractors are at or below sixty percent and above forty percent of their SWP water supply contract Table A Amounts the Buyer, on or before April 21, the Buyer may request that Yuba deliver up to 40,000 acre-feet of Component 3 Water, and Yuba will deliver to Buyer the quantity of Component 3 Water requested.

2. The Buyer and Yuba will schedule Component 3 Water pursuant to Section 9 ("Scheduling of Water") of this Agreement. In addition:

a. If after April 21, but prior to May 21, allocations to CVP South of Delta agricultural contractors or SWP contractors decrease, then:

(i) if section 7A(1)(a)(ii) of this Agreement remains applicable notwithstanding the decreased allocation(s), the Buyer will have the right to call for Component 3 Water or additional Component 3 Water up to the maximum amount authorized by section 7A(1)(a)(ii); provided, however, that the quantity or increased quantity of Component 3 Water Yuba is required to deliver will be reduced to reflect any reduction in the amount of groundwater pumping availability between April 21 and May 21.

(ii) if section 7A(1)(a)(i) of this Agreement becomes applicable due to the decreased allocations, and the Buyer had opted to have less than 40,000 acre feet of Component 3 Water delivered, Yuba will deliver to the Buyer, and the Buyer will pay for 40,000 acre feet of Component 3 Water reduced by an amount that reflects any reduction in the amount of groundwater pumping availability between April 21 and May 21.

b. If after April 21, but prior to May 21, allocations to CVP South of Delta agricultural contractors or SWP contractors increase, then the Buyer may, on or before May 21, reduce their request for Component 3 Water to the greater of zero or the quantity of water already delivered by Yuba plus the quantity of water already stored by Yuba through the substitution of groundwater for surface water in anticipation of Component 3 Water deliveries originally requested by the Buyer. This section will not apply to circumstances where, notwithstanding an increase in the Buyer's May water supply allocations, Section 7(A)(1)(a)(i) of this Agreement remains applicable.

3. In all Water Accounting Years that include all or part of the term of any FERC Annual License, Yuba will deliver to the Buyer, and the Buyer will pay for, Component 3 Water, subject to Section 15B of this Agreement.

4. The quantities of Component 3 Water delivered by Yuba to the Buyer during Water Accounting Years that include the term of the FERC Long-Term License, and do not include any part of the term of any FERC Annual License, will be subject to Section 15C of this Agreement.

B. Component 3 Water Pricing.

1. The Buyer will pay Yuba for Component 3 Water as follows:

a. In any Water Year that has a Final Classification as Wet, \$25.00 per acre-foot;

b. In any Water Year that has a Final Classification as Above-Normal, \$50.00 per acre-foot;

c. In any Water Year that has a Final Classification as Below-Normal, \$75.00 per acre-foot;

d. In any Water Year that has a Final Classification as Dry, \$100.00 per acre-foot;

e. In any Water Year that has a Final Classification as Critical, \$125.00 per acre-foot; and

f. The payment adjustments (if any) provided for in Section 12C ("Payments for Adjustments in Groundwater O&M Costs) of this Agreement.

2. The Buyer will pay Yuba for Component 3 Water pursuant to Section 7C and Section 10 ("Invoicing") of this Agreement.

3. The pricing provisions applicable to Component 3 Water delivered by Yuba to Buyer during all Water Accounting Years that include all or part of the term of any FERC Annual License or the term of the FERC Long-Term License are set forth in Sections 15B and C of this Agreement.

C. Component 3 Payment Provisions

1. In accordance with Section 10 ("Invoicing") of this Agreement, Yuba will submit an invoice to the Buyer on or after June 1 each Water Accounting Year for fifty percent of the amount due for Component 3 Water scheduled to be delivered to the Buyer pursuant to this Agreement, adjusted by an amount equal to fifty percent of any credits due from Yuba to the Buyer. By January 7 of the subsequent year, Yuba will submit an invoice to the Buyer for the remaining fifty percent of the amount due for Component 3 Water scheduled to be delivered to the Buyer pursuant to this Agreement, less the remaining amount of any credits due the Buyer.

2. In accordance with Section 10 ("Invoicing") of this Agreement, DWR will pay Yuba within sixty days of the date that both the DWR Contract Manager and the Accounting Office receive the appropriate invoices and verification that the amount of Component 3 Water specified therein has been scheduled in accordance with Section 9 ("Scheduling of Water") of this Agreement. The Buyer will pay Yuba an amount equal to fifty percent of the price for the Component 3 Water that has been scheduled for delivery during the current Water Accounting Year in accordance with Section 9 ("Scheduling of Water") of this Agreement, minus fifty percent of any credit due from Yuba to the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement. On or before March 7 of the subsequent year, the Buyer will pay the remaining amount due to Yuba for Component 3 Water, based on an accounting of actual Water deliveries in the previous Water Accounting Year, less the remaining amount of any credit due the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement.

8. Component 4 Water.

A. Component 4 Water Quantity.

1. In addition to Component 1, 2, or 3 Water, Yuba will provide to the Buyer, subject to Section 11 ("General Provisions Applicable to Water") of this Agreement, Component 4 Water as follows:

a. On or before April 10 of each year, Yuba will inform the Buyer of the quantity of Component 4 Water that Yuba could make available from Yuba's available surface and groundwater that Water Accounting Year.

b. By May 15 the Buyer will notify Yuba if it will take delivery of any or all of the Component 4 Water that Yuba informed the Buyer that Yuba will make available.

2. The Buyer and Yuba will schedule Component 4 Water pursuant to Section 9 ("Scheduling of Water") of this Agreement.

3. In all Water Accounting Years that include all or a part of the term of any FERC Annual License, Yuba will deliver to the Buyer, and the Buyer will pay for, Component 4 Water pursuant to Section 15B of this Agreement.

4. The quantities of Component 4 Water delivered by Yuba to the Buyer during all Water Accounting Years that include the term of the FERC Long-Term License, and do not include any part of the term of any FERC Annual License, will be subject to Section 15C of this Agreement.

B. Component 4 Water Pricing.

1. The Buyer will pay Yuba for Component 4 Water as follows:

a. In any Water Year that has a Final Classification as Wet, \$25.00 per acre-foot;

b. In any Water Year that has a Final Classification as Above-Normal, \$50.00 per acre-foot;

c. In any Water Year that has a Final Classification as Below-Normal, \$75.00 per acre-foot;

d. In any Water Year that has a Final Classification as Dry, \$100.00 per acre-foot;

e. In any Water Year that has a Final Classification as Critical, \$125.00 per acre-foot

f. The payment adjustments (if any) provided for in Section 12C ("Payments for Adjustments in Groundwater O&M Costs") of this Agreement.

2. The Buyer will pay Yuba for Component 4 Water pursuant to the payment and invoicing provisions of this Section.

3. The pricing provisions applicable to Component 4 Water delivered by Yuba to Buyer during all Water Accounting Years that include all or part of the term of any FERC

Annual License or the term of the FERC Long-Term License are set forth in Sections 15B and C of this Agreement.

C. Component 4 Payment Provisions.

1. In accordance with Section 10 ("Invoicing") of this Agreement, Yuba will submit an invoice to the Buyer on or after June 1 each Water Accounting Year for fifty percent of the amount due for Component 4 Water scheduled to be delivered to the Buyer pursuant to this Agreement, adjusted by an amount equal to fifty percent of any credits due from Yuba to the Buyer. By January 7 of the subsequent year, Yuba will submit an invoice to the Buyer for the remaining fifty percent of the amount due for Component 4 Water scheduled to be delivered to the Buyer pursuant to this Agreement, less the remaining amount of any credits due the Buyer.

2. In accordance with Section 10 ("Invoicing") of this Agreement, DWR will pay Yuba within sixty days of the date that both the DWR Contract Manager and the Accounting Office receive the appropriate invoices and verification that the amount of Component 4 Water specified therein has been scheduled in accordance with Section 9 ("Scheduling of Water") of this Agreement. The Buyer will pay Yuba an amount equal to fifty percent of the price for the Component 4 Water that has been scheduled for delivery during the current Water Accounting Year in accordance with Section 9 ("Scheduling of Water") of this Agreement, minus fifty percent of any credit due from Yuba to the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement. On or before March 7 of the subsequent year, the Buyer will pay the remaining amount due to Yuba for Component 4 Water, based on an accounting of actual Water deliveries in the previous Water Accounting Year, less the remaining amount of any credit due the Buyer pursuant to Section 12 ("Payments for Fixed Annual Costs") of this Agreement.

9. Scheduling of Water.

On or about April 10 of each Water Accounting Year, or as soon thereafter as practicable, the Parties will agree on a proposed delivery schedule for Component 1, 2, 3 and 4 Water. The proposed schedule may be revised periodically thereafter, and the Parties will agree on a final schedule no later than May 21. The final schedule will be updated to accommodate any changes in the North Yuba Index or the Yuba River Index and may be adjusted to account for changes in Bay-Delta conditions, including hydrologic or regulatory conditions, that affect the delivery of Water, and for changes in the flow schedule for the lower Yuba River as provided for in the Fisheries Agreement. The proposed and final schedules will also show the scheduling of water delivered by Yuba under the Short-Term Phase 8 Settlement Agreement. The scheduling of Water, and any adjustments to the schedule, will be in accordance with the water scheduling and accounting provisions set forth in Exhibit 1 ("Scheduling and Accounting Principles") of this Agreement.

10. Invoicing.

A. Reserved.

B. Yuba's invoices to DWR will contain the following information:

- i) Federal and State Agreement numbers;
- ii) Yuba's Taxpayer Identification Number;
- iii) remittance address;
- iv) point of contact;
- v) for estimated payments, verification that the Water has been scheduled in accordance with Section 9 ("Scheduling of Water") of this Agreement; and
- vi) for year-end payments, certification that the Water has been delivered.

C. Yuba will submit, at the same time, two copies of each invoice to DWR State Water Project Analysis Office and one copy to DWR Accounting office at the following addresses:

Department of Water Resources  
Chief, State Water Project Analysis Office  
1416 Ninth Street  
Post Office Box 942836  
Sacramento, California 94236-0001

Department of Water Resources  
Accounting Office, Contracts Payable Unit  
Post Office Box 942836  
Sacramento, California 94236-0001

11. General Provisions Applicable to Water.

A. Accounting for Water.

Water delivered by Yuba to the Buyer will be accounted for in the manner set forth in Exhibit 1 ("Scheduling and Accounting Principles") of this Agreement. To the extent a conflict exists between the provisions of this Agreement and Exhibit 1, the provisions of this Agreement will control. Notwithstanding any other provision of this Agreement, the Buyer will only pay for water delivered by Yuba to the Buyer that is accounted for as Delivered Transfer Water pursuant to Exhibit 1.

B. Reservoir Refill Impact Accounting.

Yuba will provide assurance to the Buyer and Reclamation that the refilling of reservoir storage in the Yuba Project resulting from the delivery of Water under this Agreement will not adversely impact the Projects. Yuba will avoid adverse impacts to the Projects by complying with the

provisions of Exhibit 2 ("Reservoir Refill Accounting Provisions") of this Agreement. The provisions of Exhibit 2 will not apply to Water made available as a result of Yuba delivering groundwater instead of surface water to its Member Units to implement this Agreement.

C. Yuba's Conjunctive Use Program.

To the extent that Yuba delivers groundwater instead of surface water to its Member Units in order to deliver Water to the Buyer pursuant to this Agreement, Yuba will comply with the provisions of Exhibit 3 ("Groundwater Substitution Transfer Monitoring and Operations Program") of this Agreement.

D. Conference Year Principles.

During any Conference Year, the Parties will meet (along with the parties to the Fisheries Agreement and the Conjunctive Use Agreements) to determine how to address the circumstances, and to discuss the operation of the Yuba Project during that Water Accounting Year. During a Conference Year: (1) Yuba will have no obligation to deliver any quantity of Components 1 through 4 Water; (2) Yuba will not have to refund any part of the payment received for Component 1 Water; and (3) Yuba will deliver in a subsequent Water Accounting Year on a schedule that is acceptable to the Buyer and Yuba the quantity of Component 1 Water that was not delivered during the Conference Year.

E. Efforts to Maximize the Beneficial Use of Water.

Yuba will optimize to the extent feasible the operation of the Yuba Project to meet Yuba's obligations to supply Water under this Agreement. DWR will coordinate with Reclamation in the operation of the Projects to maximize the beneficial use of Water released by Yuba under this Agreement, including without limitation using all reasonable efforts to store water in Project facilities when Delta pumping is constrained and to avoid spills of water stored as result of the release of Water.

F. Sale to Third Parties.

To the extent the Water is otherwise transferable under California law, in those years when Yuba offers Components 3 or 4 Water, but the Buyer decline to take all of the Water offered, Yuba may sell the Water not taken by Buyer to a third party, provided that such sale to the third party will not impair Yuba's ability to meet its obligations to deliver Components 1 through 4 Water in the current or any future Water Accounting Year. In addition, to the extent the water is otherwise transferable under California law, Yuba may sell to a third party any quantity of Components 1, 3 or 4 Water released by Yuba that would have been accounted for as Water except for the inability of the Buyer to take delivery (e.g., during times when the Bay-Delta was out of balance). Yuba will provide the Buyer ten days' advance notice of a sale to a third party under this section.

G. Periodic Accounting of Water Delivered by Yuba.

After the first eight years of operations under this Agreement, and as appropriate thereafter, the Parties, with the assistance of the Technical Committee and the Management Committee, will develop a comprehensive accounting of all Water delivered under this Agreement. If it is determined that less than the quantities of Water required to be delivered during the first eight years have been delivered, and the Buyer has paid for quantities of Water that have not been delivered, then Yuba will deliver supplies of Water to the Buyer to make up for such deficiencies, on a schedule that is acceptable to the Buyer and Yuba that would not impair the ability of Yuba to make other deliveries of Water under this Agreement.

12. Other Payments to Yuba by the Buyer.

A. Diesel Conversions.

In furtherance of the mitigation of potential impacts to air quality from implementation of the Accord, Yuba has implemented a program to convert certain pumps used to pump groundwater from diesel to electric, or to other forms of energy that reduce air quality impacts. Conversion of pumps to electricity or other forms of energy that reduce air quality impacts has been and will be performed by Yuba for purposes of this Agreement. Prior to submitting invoices under this section to the Buyer under Section 10 ("Invoicing") of this Agreement, Yuba will: (1) submit to the Technical Committee for review documentation of the diesel conversion work performed and costs incurred from and after September 1, 2004 for purposes of this Agreement and the Accord; and (2) confirm to the Management Committee that the work performed and costs incurred were in furtherance of mitigation of potential impacts on air quality from implementation of the Accord. Subject to receipt of such information and concurrence by the Management Committee, the Buyer will pay Yuba the amount of such invoices, but not more than a total of \$1,000,000.00.

B. Payments for Fixed Annual Costs and for Environmental Compliance.

1. During the term of this Agreement, on or before April 1 each year, the Buyer will pay to Yuba up to \$250,000.00 to pay a portion of Yuba's annual costs for implementing the Yuba River Accord. On or before February 1, Yuba will submit to DWR invoices with documentation of costs incurred by Yuba to implement the Yuba River Accord, up to \$250,000 per year. The Buyer will pay Yuba the amount of such invoice, but not more than \$250,000 per year, pursuant to this Section and Section 10 ("Invoicing") of this Agreement. Yuba will provide to the Buyer, for payments made under this subsection, a credit against future payments due for Components 2, 3 and 4 Water. Yuba will record and accrue these credits from year to year until Yuba makes Component 2, 3 or 4 Water available, in which time such credits will be applied toward payments due.



2. Under separate agreements among them, Yuba, DWR and Reclamation have paid the costs of environmental compliance for implementing the Yuba River Accord, which is referred to in Section 16 ("Environmental Compliance") of this Agreement.

C. Payments for Adjustments in Groundwater O&M Costs.

During the term of this Agreement, the Buyer will pay Yuba, based on itemized invoices of work done and costs incurred, an amount to compensate for any annual increases above actual 2006 Groundwater O&M Costs using the Consumer Price Index, including those costs necessary for upkeep, power, and operation of those fixed assets that are dedicated to making Water available to the Buyer under this Agreement from groundwater sources, and recurring costs or payments required to obtain consents necessary to make Water available under this Agreement from groundwater sources. Groundwater O&M Costs will exclude general district overhead charges. Yuba will submit to the Technical Committee for a thirty-day review the documentation of work done and costs incurred prior to submitting invoices to the Buyer in accordance with the payment and invoicing provisions for Components 2, 3, or 4 Water under this Agreement. The Technical Committee will review invoices to ensure that payments made under the payment and invoicing provisions for Components 1 through 4 Water do not duplicate payments made under this subsection. Annual increases above the 2006 baseline will be computed based on the Consumer Price Increase as provided by the United States Department of Labor, Bureau of Labor Statistics.

13. Certain Payments Contingent on Appropriation or Allotment of Funds.

A. General.

In consideration of Yuba's eight-year commitment to deliver Component 1 Water, the Buyer confirm that the funds required to pay Yuba for Component 1 Water during that period have been appropriated, and DWR will encumber the funds to pay Yuba for Component 1 Water during that period on the schedule provided for in Section 5C1 of this Agreement. The Buyer intend that the payments due to Yuba under this Agreement for Components 2, 3, and 4 Water that is made available to the SWP and the San Luis & Delta-Mendota Water Authority will be paid from DWR funds received from the SWP and/or the San Luis & Delta-Mendota Water Authority. The Buyer will make contractual arrangements with the SWP and the San Luis & Delta-Mendota Water Authority under which the SWP and the San Luis & Delta-Mendota Water Authority would have an opportunity to make payments due to Yuba under this Agreement, in the event that the Buyer fails to make such payments when due, in order to avoid an interruption in Yuba making Water available to the Buyer under this Agreement. To the extent that the Buyer defaults in making the payments due to Yuba under this Agreement, then: (1) Yuba's obligation to make Water available to the Buyer under this Agreement will be excused to the extent and for the duration of the Buyer's default; (2) Yuba may attempt to mitigate its damages by selling Component 3 and Component 4 Water made available under this Agreement to other parties to the extent and for the duration of the Buyer's

default; and (3) the Buyer will be obligated to pay Yuba to the extent that Yuba is unable to mitigate Yuba's damages resulting from the Buyer's default.

B. State Funding Contingency.

Except to the extent that DWR uses funds from sources that do not require legislative budgetary appropriation, DWR's payment obligations under this Agreement are contingent on appropriation or allotment of funds through the State Budget process.

14. Technical Committee and Management Committee

A. Technical Committee.

The Technical Committee will: (1) collect, review and analyze information relevant to accounting for Water consistent with Exhibits 1 through 3, and information related to advances, payments and cost adjustments; (2) identify and attempt to resolve technical implementation issues; (3) periodically report to the Management Committee on the information gathered and any technical implementation issues identified; and (4) make recommendations to the Management Committee for resolution of any policy issues that arise or for any required factual determinations. If the Technical Committee is unable to agree on a recommendation to the Management Committee, the Technical Committee will cooperate to provide a balanced presentation of the facts, opinions and other information underlying the various positions on the issue to be determined.

B. Management Committee.

The Management Committee will: (1) provide policy guidance in implementing this Agreement; (2) make any factual determinations required to implement this Agreement; (3) consider information provided by the Technical Committee, if applicable, when making decisions; and (4) identify and resolve any policy-related implementation issues. If agreement among the representatives to the Management Committee cannot be reached on any issue necessary to the ongoing implementation of the Agreement, the Buyer and Yuba will meet and confer in a good faith effort to reach agreement. In the event that agreement cannot be reached among the Buyer and Yuba on an issue, that issue will be subject to Section 22 ("Remedies and Dispute Resolution") of this Agreement.

C. Interaction with River Management Team.

DWR will designate a representative to actively participate in the River Management Team established under the Fisheries Agreement. Reclamation may also designate a representative to participate in the River Management Team established under the Fisheries Agreement.

15. Quantities of and Pricing Provisions for Water During a FERC Annual License and During the FERC Long-Term License.

A. Intent of the Parties.

1. Yuba expects that, upon the expiration of the term of the FERC License, FERC will issue to Yuba one or more FERC Annual Licenses, before it issues to Yuba the FERC Long-Term License.

2. The Parties desire that Yuba continue to deliver, and the Buyer continue to pay for, additional quantities of Components 1 through 4 Water in accordance with Section 11 ("General Provisions Applicable to Water") of this Agreement during any Water Year beginning after September 30, 2015 for which either the FERC License or a FERC Annual License is in effect, if: (a) these quantities of Water can be delivered by Yuba consistent with the terms of the FERC License or any FERC Annual License; and (b) subject to a pricing agreement between the Parties. The Parties further intend that, other than the pricing provisions, there will be no change in the other provisions of this Agreement (including the provisions regarding the annual quantities of Components 1 through 4 Water delivered by Yuba, and paid for by the Buyer) during any Water Year beginning after September 30, 2015 that includes all or part of the term of any FERC Annual License, if the terms of the FERC Annual License do not significantly affect Yuba's ability to make these water supplies available.

3. The Parties desire that Yuba continue to deliver, and the Buyer continue to pay for, additional quantities of Components 1 through 4 Water in accordance with Section 11 ("General Provisions Applicable to Water") of this Agreement during any Water Year that is within the term of a FERC Long-Term License, and not within the term of any FERC Annual License, if these quantities of Water can be delivered by Yuba consistent with: (a) the terms of the FERC Long-Term License; (b) the water supply needs within the service area of Yuba; and (c) the ability of the Buyer and Yuba to agree to pricing provisions. The Buyer and Yuba further intend that, other than the quantity and pricing provisions, there will be no change in the other provisions of this Agreement during any Water Year that is within the term of a FERC Long-Term License.

B. Quantities of Water and Pricing Provisions Applicable During the Term of the FERC Annual Licenses.

During any Water Accounting Year beginning after December 31, 2015 during which either the FERC License or any FERC Annual License is in effect, Yuba will deliver, and the Buyer will pay for, additional quantities of Components 1 through 4 Water, in accordance with Section 11 ("General Provisions Applicable to Water") of this Agreement, subject to the following: (1) Yuba may adjust the quantities of Water that Yuba will deliver to the Buyer (but the quantity will not be less than 20,000 acre-feet of Water in each such Water Accounting Year, other than a Conference

Year), but only to the extent needed to reflect the ability of Yuba to deliver these quantities of Water consistent with the terms of the FERC Annual License; and (2) the Buyer and Yuba intend to negotiate in good faith the quantity and pricing provisions applicable to Components 1 through 4 during such Water Accounting Years, but under no circumstance will the price for the Water be less than the pricing provisions applicable to Components 1 through 4 Water, as set forth in Sections 5 through 8 of this Agreement.

C. Quantities of Water and Pricing Provisions Applicable During the Term of the FERC Long-Term License.

During any Water Accounting Year that is within the term of the FERC Long-Term License, and for which no part of the Water Accounting Year is within the term of any FERC Annual License, Yuba will deliver, and the Buyer will pay for, additional quantities of Components 1 through 4 Water, in accordance with Section 11 ("General Provisions Applicable to Water") of this Agreement, subject to the following: the Buyer and Yuba reach agreement as to the quantities of Components 1 through 4 Water that Yuba will deliver to the Buyer (but which quantities will not be less than 20,000 acre-feet of Water in any Water Accounting Year through December 31, 2025, other than during a Conference Year), to reflect the ability of Yuba to deliver these quantities of Water consistent with: (a) the terms of the FERC Long-Term License; (b) the water supply needs within the service area of Yuba; and (c) the Buyer and Yuba's intent to negotiate in good faith the quantity and pricing provisions applicable to Components 1 through 4 Water during the term of the FERC Long-Term License.

16. Environmental Compliance.

Yuba, as lead agency under CEQA has approved and filed a notice of determination concerning the implementation of the Yuba River Accord and its environmental effects. DWR as a responsible agency under CEQA will file a notice of determination concerning its responsibilities as to environmental effects of implementing this Agreement for the Yuba River Accord.

17. Approvals and Conditions Precedent to Performance of this Agreement.

A. Section 5.2 of the Yuba Act.

Yuba represents that Yuba has complied with the provisions of Section 5.2 of the Yuba Act, which requires that, prior to entering into this Agreement, the Board of Directors of Yuba to: (1) determine that water to be purchased under this Agreement would be surplus to the amount of water available to meet the contractual requirements of Member Units; (2) hold a public hearing to receive and consider comments on and objections to this Agreement; (3) confirm that a majority in number of registered voters residing within Yuba County have not filed written protests against this Agreement; and (4) find that the long-term purchase of water under this Agreement may be carried

out without injuring any legal user of water, without unreasonably affecting fish, wildlife or other instream beneficial uses, and without unreasonably affecting the overall economy of Yuba County.

B. Compliance with Water Code Section 1745.10.

Yuba represents that Yuba has complied with the provisions of Water Code Section 1745.10.

C. Other Approvals by Yuba.

Yuba will be responsible for obtaining approval of the State Board as necessary to enable this Agreement to be fully implemented, and for obtaining any other permits and approvals necessary for Yuba to make Water available for diversion by the Buyer under this Agreement. Pursuant to Section 24H of this Agreement, the Buyer will provide reasonable assistance to Yuba in Yuba's actions to obtain any permits or approvals that may be necessary for Yuba to make Water available for diversion by the Buyer under this Agreement.

D. Other Approvals by Buyer.

Except as otherwise addressed in this Agreement, the Buyer will be responsible for complying with State and Federal laws necessary for the Buyer to divert and use the Water made available under this Agreement. Pursuant to Section 24H of this Agreement, Yuba will provide reasonable assistance to the Buyer in the Buyer's actions to obtain any permits or approvals that may be necessary for the Buyer to divert and use Water that Yuba will make available under this Agreement.

18. Place of Use of Water.

Water made available under this Agreement will be not used outside of the place of use specified in the State Board order approving this delivery of Water from Yuba to the Buyer, without the written consent of Yuba.

19. Hold Harmless.

A. DWR will not assert that Yuba, its officers, agents or employees, are liable for damages of any nature whatsoever arising out of any actions or omissions by DWR, its officers, agents or employees, related to DWR's performance of this Agreement, where such liability is caused by an act, error or omission of DWR, its officers, agents or employees.

B. Yuba will not assert that DWR, its officers, agents or employees, are liable for damages of any nature whatsoever arising out of any actions or omissions by Yuba, its officers,

agents or employees, related to Yuba's performance of this Agreement, where such liability is caused by an act, error or omission of Yuba, its officers, agents or employees.

C. To the extent permitted by California law, Yuba will indemnify, defend and hold DWR and its officers, agents and employees safe and harmless from any and all claims, judgments, damages, penalties, costs, liabilities and losses (including without limitation, sums paid in settlement of claims, actual attorney's fees, paralegal fees, consultant fees, engineering fees, expert fees and any other professional fees) that arise from or are related in any way to Yuba's activities under this Agreement that are under the exclusive control of Yuba, including but not limited to the release, conveyance, use or distribution of water released by Yuba from the Yuba Project for purposes of this Agreement.

D. To the extent permitted by California law, DWR will indemnify, defend and hold Yuba and its officers, agents and employees safe and harmless from any and all claims, judgments, damages, penalties, costs, liabilities and losses (including without limitation, sums paid in settlement of claims, actual attorney's fees, paralegal fees, consultant fees, engineering fees, expert fees and any other professional fees) that arise from or are related in any way to DWR's activities under this Agreement that are under the exclusive control of DWR, including but not limited to the conveyance, use or distribution of water made available by Yuba from the Yuba Project for purposes of this Agreement.

E. Yuba and its officers, agents, employees and insurers will not be responsible for the quality of water made available by Yuba from the Yuba Project for purposes of this Agreement.

20. *Force Majeure Event.*

A. A *Force Majeure* Event will excuse or suspend performance as provided in this section for the duration of the *Force Majeure* Event. To the extent that *Force Majeure* Event prevents the Buyer from using the Water delivered by Yuba, then: (a) the Buyer will be excused from paying for Components 2 through 4 Water during the duration of the *Force Majeure* Event; and (b) Yuba will retain the payments received for Component 1 Water with no obligation to deliver this Component 1 Water again at some later time.

B. To the extent that a *Force Majeure* Event prevents Yuba from providing Components 1 through 4 Water, then: (a) Yuba's performance will be excused during the duration of the *Force Majeure* Event; (b) Yuba will not be required to refund payments for Component 1 Water; and (c) Yuba will deliver this Component 1 Water supply at some later time on a schedule that is acceptable to the Buyer and Yuba.

C. During a *Force Majeure* Event, each of the Parties will, to the extent practicable, take actions to minimize the impacts of the *Force Majeure* Event on the other Parties.

21. Regulatory Action.

In the event of a Regulatory Action during the term of this Agreement: (a) the affected Party will promptly notify the other Parties of the Regulatory Action and the manner in which it affects performance under this Agreement; and (b) the Parties will proceed under the process provided for in Section 22 ("Remedies and Dispute Resolution"), to the extent applicable. This section does not affect the other rights and remedies of the parties under this Agreement.

22. Remedies and Dispute Resolution.

A. Should any material disputes arise concerning any provision of this Agreement, or the rights and obligations of the Parties thereunder, including those involving possible termination or those that might cause the initiation of any administrative or judicial proceeding to enforce or interpret this Agreement, the Parties will present the issue to the Management Committee (which may request assistance from the Technical Committee) for a recommendation for resolving the dispute.

B. If the Process described in the preceding subsection fails to resolve the dispute within thirty days, the Parties will submit the dispute to a mediator who has experience in water-related disputes. The costs of any such mediation will be borne one-third each by the Parties. Initiation of this mediation process will be through written notice by one Party to the other Parties. The Parties reserve all of their other remedies that may be provided by law or equity in the event that such mediation fails to resolve a dispute. The Parties, in consultation with the mediator, will use their best efforts to resolve the dispute within thirty days. Under no circumstances, however, will mediation under this Section 22 result in a requirement that diminishes, limits or contravenes the discretion, authority or any delegated authority of the Director of DWR under State law.

C. If mediation fails to resolve the dispute, and prior to commencing any legal action to resolve the dispute, the Party proposing to commence legal action will provide the other Party thirty days' written notice of such action, provided that such notice will not be required where a delay in commencing an action would prejudice the interests of the Party that intends to file suit. During the thirty-day notice period, the Parties will continue to attempt to resolve the dispute.

23. Effect of this Agreement on other Matters.

A. As a Precedent.

Nothing in this Agreement is intended or will be construed as a precedent or other basis for any argument that the Parties have waived or compromised their rights that may be available under State or federal law, except as to matters addressed in this Agreement.

B. As to Water Rights.

The only rights granted to the Parties as a result of this Agreement are those expressly set forth in this Agreement. The providing of water by Yuba under this Agreement will not confer any appropriative, public trust or other right to water on any person or entity. Nothing in this Agreement is intended or will be construed to act as a forfeiture, diminution or impairment of any water right of Yuba. Consistent with the provisions of California Water Code sections 109, 475, 1011, 1014 through 1017, 1244 and 11961, the delivery of water under this Agreement will not be evidence of or used to demonstrate either the existence of surplus water after this Agreement expires, or the lack of beneficial use of the water supplies referred to in this Agreement, and the Parties will not contend otherwise. In accordance with Water Code section 1016, and other applicable provisions of California law, at the conclusion of the term of the water transfers provided for under this Agreement, all rights in, and the use of, the water supplies referred to in this Agreement will revert back to Yuba, and DWR or any beneficiary of this Agreement, will not do either of the following: (1) bring any claim for continuation of the water supply made available by this Agreement; or (2) claim any right to a continued supply of water made available under this Agreement, based on reliance, estoppel, intervening public use, prescription, water shortage emergency, or unforeseen or unforeseeable increases in demand, or any other cause.

C. As to the Phase 8 Settlement

Nothing contained in this Agreement affects the Parties' respective rights and obligations under the Short-Term Phase 8 Agreement. The Parties agree that water provided by Yuba under the Short-term Phase 8 Agreement will be accounted for and delivered on a higher priority than water delivered under this Agreement.

D. As to Termination of the EWA Program

1. DWR intends that Component 1 Water will be dedicated to the EWA, and that in the future, upon completion of environmental documentation for a long-term EWA, the EWA would be sized sufficiently to accommodate the proposed South Delta Improvement Program, including the proposal to increase the maximum diversion rate into Clifton Court Forebay for the SWP Bank's Pumping Plant. If the EWA terminates, DWR agrees that Component 1 Water remaining to be delivered under this Agreement will be managed annually, as follows: (a) Component 1 Water in any year will be used to enhance water supply reliability of the Delta export facilities by off-setting new mandatory restrictions imposed on the CVP and SWP, including those imposed by the federal court order in *NRDC v. Kempthorne*, or through a subsequent biological opinion for conservation or protection of fish, and (b) if any Component 1 Water remains after off-setting the restrictions set forth in subsection (a) above, then the remaining Component 1 Water will be used as determined by DWR in close coordination with the California Department of Fish and Game and consistent with the water supply reliability project requirements of the funding source



from which this water was purchased (Chapter 7(d) of Proposition 50, California Water Code Section 79550(d)).

2. Except as provided in the previous subsection, none of the rights and obligations of the Parties under this Agreement will be affected in the event that the EWA program terminates prior to the expiration of the term of this Agreement.

E. As to the Fisheries Agreement.

None of the rights and obligations of the Parties under this Agreement will be affected in the event that the Fisheries Agreement terminates prior to the expiration of the term of this Agreement.

F. As to the Application of Section 27 of the Federal Power Act.

Section 27 of the Federal Power Act limits the licensing authority of FERC with respect to a law regarding the control, appropriation, use or distribution of water used in irrigation or for municipal or other uses. The Parties, and the SWP and the San Luis & Delta-Mendota Water Authority, will not contend or bring any claim that any provision of this Agreement is a law regarding the control, appropriation, use or distribution of water used in irrigation or for municipal or industrial uses, as these terms are used in Section 27 of the Federal Power Act.

24. General Contracting Provisions.

A. Notices.

The time for providing any notices specified in this Agreement may be extended within the term of this Agreement with the consent of the Parties, confirmed in writing, without requiring an amendment to this Agreement. All notices and other communications required under this Agreement will be in writing, and will be deemed to have been duly given upon the date of service, if: (a) served personally on the Party to whom notice is to be given; (b) sent by electronic mail, and the Party to whom notice is to be given confirms receipt; or (c) on the third day after mailing, if mailed to the Party to whom notice is to be given by first-class mail, postage prepaid, and properly addressed to the designated representatives of the Parties set forth below. A Party may notify the other Parties in writing of a change in its designated representatives, without requiring an amendment to this Agreement.

DWR: Director  
Department of Water Resources  
1416 Ninth Street, Room 1115-1  
P.O. Box 942836  
Sacramento, CA 94236-0001

With Copy to:  
Chief, State Water Project Analysis Office  
1416 Ninth Street, Room 1620-A  
P.O. Box 942836  
Sacramento, CA 94236-0001

Yuba: General Manager  
Yuba County Water Agency  
1402 D Street  
Marysville, CA 95901

B. Signatories' Authority.

The signatories to this Agreement represent that they have authority to execute this Agreement and to bind the Party on whose behalf they execute this Agreement. Yuba will provide to DWR a copy of a resolution or minute order authorizing execution of this Agreement.

C. Counterparts of this Agreement.

This Agreement may be signed in any number of counterparts by the Parties, each of which will be deemed to be an original, and all of which together will be deemed to one and the same instrument. This Agreement, if executed in counterparts, will be valid and binding on a party as if fully executed all in one copy.

D. Binding on Successors/Assignment.

This Agreement will bind and inure to the benefit of the respective successors and assigns of the Parties, except that, none of the obligations of the Parties set forth in this Agreement will be assigned without the prior, written approval of the other Parties, which approval will not unreasonably be withheld.

E. No Third-Party Beneficiaries, Except as Expressly Provided.

This Agreement will not be construed to create any third-party beneficiaries, except as set forth in this section. This Agreement is for the sole benefit of the Parties, their respective successors and assigns, and no other person or entity will be entitled to rely on or receive any benefit from this Agreement or any of its terms.

F. Amendments.

This Agreement may be amended or modified only by a subsequent written agreement

approved and executed by the Parties.

G. Opinions and Determinations.

Where the terms of this Agreement provide for action to be based upon the opinion, determination, approval or review of either Party, such terms are not intended to be, and will not be construed as permitting such actions to be arbitrary, capricious or unreasonable. Any opinion, determination, approval or review required of a Party under this Agreement will be provided in a timely manner.

H. Reasonable Cooperation.

The Parties will reasonably cooperate with each other, including the execution of all necessary documents and providing assistance in obtaining approvals and permits from regulatory agencies required to perform the obligations under this Agreement and to carry out the purpose and intent of this Agreement.

I. Construction and Interpretation.

This Agreement is entered into freely and voluntarily. This Agreement has been arrived at through negotiation, and each Party has had a full and fair opportunity to revise the terms of this Agreement. Consequently, the normal rule of construction that any ambiguities are to be resolved against the drafting party will not apply in construing or interpreting this Agreement.

J. Complete Contract.

This Agreement constitutes the sole, final, complete, exclusive and integrated expression and statement of the terms of this Agreement among the Parties concerning the subject matter, and supersedes all prior negotiations, representations or agreement, either oral or written, that may be related to the subject matter of this Agreement, except as to those other agreements that are expressly referred to in this Agreement.

K. Determination of Unenforceable Provisions.

If any term or provision of this Agreement is deemed invalid or unenforceable by any court of final jurisdiction, the Parties will meet and attempt to address this situation pursuant to the provisions of Section 22 ("Remedies and Dispute Resolution") of this Agreement.

L. Waiver.

The waiver at any time by a Party of its rights with respect to a default or other matter arising in connection with this Agreement will not be deemed a waiver with respect to any other

default or matter.

M. Time.

Time is of the essence in this Agreement. Any date specified in this Agreement may be changed with the written consent of the Parties.

N. Applicable Law.

This Agreement will be construed under and will be deemed to be governed by the laws of the United States and the State of California.

O. Venue.

Any appropriate County under California law will be venue for any state court litigation concerning the enforcement or interpretation of this Agreement.

P. Remedies Not Exclusive.

The remedies provided in this Agreement are cumulative and not exclusive, and are in addition to any other remedies that may be provided by law or equity. The exercise by the Party of any remedy under this Agreement will be without prejudice to the enforcement of any other remedy.

Q. Officials Not To Benefit.

No member or delegate to Congress, Resident Commissioner, or Federal or State official will be admitted to any share or part of this Agreement or to any benefit that may arise therefrom.

R. Standard Clauses.

Yuba will comply with the State of California, Department of Water Resources, Standard Clauses as shown on Exhibit 4 ("State of California, Department of Water Resources, Standard Clauses") to this Agreement.

S. Exhibits Incorporated.

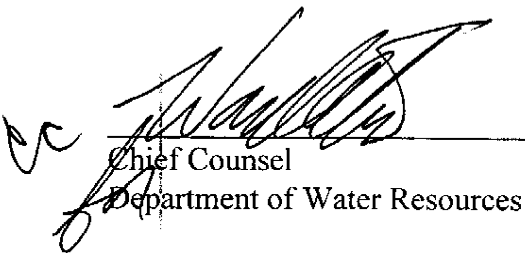
Each exhibit to which reference is made is deemed incorporated in this Agreement, whether or not actually attached.

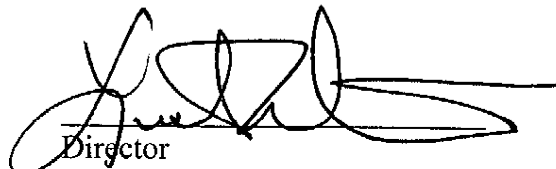
The foregoing is hereby agreed to by the Parties.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the date first written above.

Approved as to legal form  
and sufficiency:

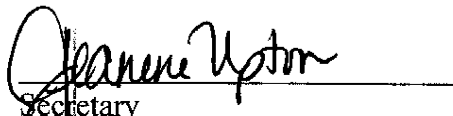
STATE OF CALIFORNIA  
DEPARTMENT OF WATER RESOURCES

  
Chief Counsel  
Department of Water Resources

  
Director  
Department of Water Resources

YUBA COUNTY WATER AGENCY  
A Political Subdivision of the  
State of California

Attest:

  
Secretary  
Yuba County Water Agency

By:   
Chairman of the Board

#### List of Exhibits

- Exhibit 1      Scheduling and Accounting Principles**
- Exhibit 2      Reservoir Refill Accounting Provisions**
- Exhibit 3      Groundwater Substitution Transfer Monitoring and Operations**

**Program**

**Exhibit 4 State of California, Department of Water Resources, Standard Clauses**

## EXHIBIT 1

### Scheduling and Accounting Principles

#### OVERVIEW

Monitoring, measuring, and accounting of the water that will be transferred under the this Agreement can be generally described as consisting of two fundamental parts: (1) measuring the flows at the Marysville Gage resulting from increased releases from storage in New Bullards Bar Reservoir that are greater than the baseline, without-transfer flows; and (2) measuring the ability of the Projects and the EWA to apply these flows to beneficial uses. The amounts of increased releases will be determined by measuring the outflow of the Yuba River at the Marysville Gage, and by measuring groundwater substitution pumping associated with this Agreement. The Projects' ability to use the water will be determined by the ability of the Projects to export the water at the Projects' Delta pumping facilities or to put the water to other beneficial uses. That is, water accounted for as transfer water under this Exhibit will include Released Transfer Water that is deemed to be Delivered Transfer Water, as those terms are defined in this Exhibit.

#### 1. DEFINITIONS

Terms used in this Exhibit have the same definitions as the definitions listed in Section 1 of this Agreement. When used in this Exhibit, the following terms have the following definitions:

**“Accord Flows”** mean the schedule of instream flows listed in Exhibit 1 of the Fisheries Agreement.

**“Accounting Year”** means January 1 to December 31.

**“Agreement”** means the “Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources.”

**“Balanced Conditions”** mean the hydrologic condition of the Delta as defined in the November 24, 1986 “Agreement between the United States of America and the State of California for Coordinated Operations of the Central Valley Project and the State Water Project.” (“COA”)

**“Baseline Conditions”** mean the conditions deemed under this Exhibit to represent the conditions that would have occurred without implementation of this Agreement or the Fisheries Agreement. “Baseline Conditions” define the without-transfer conditions and would result in the Baseline Flows.

**“Baseline Diversions”** mean the diversions that are defined in section 2.3.1.1 of this exhibit.

**“Baseline Flows”** mean the flows that would have been present at the Marysville Gage under the Decision 1644 interim instream flow requirements and all other Baseline Conditions, without implementation of the Yuba River Accord.

**“Baseline Storage”** means the amount of water that would have been stored in New Bullards Bar Reservoir under Baseline Conditions.

**“Baseline Storage Target”** means the storage targets that are defined in section 2.4 of this exhibit.

**“Carriage Water”** means the water losses due to increased Delta outflow necessary to maintain baseline Delta salinity conditions as determined by DWR, that are associated with Delivered Transfer Water or Stored Released Transfer Water that is exported at the Projects’ Delta pumping facilities.

**“Delivered Transfer Water”** means Released Transfer Water that is accounted as being exported by the Projects, or contributing to exports, as described in Section 5 of this exhibit.

**“Delta Export Facilities”** means the Banks and Jones pumping facilities as determined to be available for export by the Projects

**“Flow Fluctuation Operations”** means operations driven by flow fluctuation criteria rather than minimum flow requirements or storage operations.

**“Groundwater Substitution Component”** means the quantity of Released Transfer Water that Yuba makes available from releases from New Bullards Bar Reservoir as a result of Yuba’s groundwater substitution pumping program, and that is not related to releases for the Storage Component of Released Transfer Water. Groundwater Substitution Component water will be made available under the Conjunctive Use Agreements by Member Units forgoing surface water deliveries and instead pumping groundwater as a replacement water supply for local irrigation needs.

**“Marysville Gage”** refers to USGS Gaging Station No. 11421000, Yuba River near Marysville.

**“Minimum Flows”** is the required minimum instream flows specified in Decision 1644 page 176 table titled “Interim Instream Flow Requirements”

**“Negative Transfer Flows”** means the additional amount of flows above the Accord Flows that would have been released as part of a Baseline Flows when the Baseline Conditions Decision 1644 interim instream flow requirement is greater than the Accord Flows. “Negative Transfer Flows” are further defined in Section 4.4 of this exhibit.

**“North Yuba Index”** means the index used to determine the applicable Fisheries Agreement flow schedule for the Lower Yuba River. This index is defined in Exhibit 4 of the Fisheries Agreement.

**“Percent Inflow Diversion Loss”** means the amount of Released Transfer Water that is lost due to the restrictions imposed by the “maximum percent of Delta inflow diverted” standard as described in the SWRCB Revised Decision 1641 when that standard is generally 35% from February 1 to April 30.

**“Projects”** mean the CVP and the SWP.



**“Refill”** is a condition of reduced releases from New Bullards Bar Reservoir as compared with the releases that would occur under Baseline Conditions. These reduced releases could result from diversions to storage to fill storage space evacuated as a result of releases that created the Storage Component of Released Transfer Water.

**“Released Transfer Water”** means the average daily flows measured at the Marysville Gage that are greater than the Baseline Flows. “Released Transfer Water” is further described in Section 4.2 of this exhibit.

**“Section”** refers to sections of this Exhibit, unless otherwise stated.

**“Smartville Gage”** refers to USGS Gaging Station No. 11418000, Yuba River below Englebright Dam, near Smartville

**“Storage Component”** means the quantity of Released Transfer Water that Yuba makes available from storage releases from New Bullards Bar Reservoir, and which storage is not a result of storage releases resulting from Groundwater Substitution Component operations.

**“Stored Released Transfer Water”** means the stored water in Project upstream reservoirs. “Stored Released Transfer Water” is further defined in Section 4.3 of this Exhibit.

**“Total Uncontrolled Flows”** mean the total amount of flows entering Englebright Reservoir, other than from releases from the New Colgate Powerhouse, plus flows from Deer Creek and Dry Creek into the lower Yuba River downstream of Englebright Reservoir.

## 2. **BASELINE CONDITIONS**

Baseline Conditions are the controlling constraints and criteria for operation of the Yuba Project that determine Baseline Flows for the accounting of Released Transfer Water during the term of this Agreement. Baseline Conditions include the following:

### 2.1. **Regulatory Instream Flow Requirements:**

2.1.1. Decision 1644 interim instream flow requirements.

2.1.2. FERC License 2246 instream flow requirement of 400 cfs at the Marysville Gage (below Daguerre Point Dam) for the period of October 1-14, including the dry year reductions of this flow requirement that are authorized in the License.

2.1.3. Flow reduction restrictions required by FERC License 2246.

2.1.4. Flow fluctuation restrictions specified in the November 22, 2005 FERC Order Modifying and Approving Amendment of License (at page 11 of that order).

### 2.2. **Operational Agreements:**

2.2.1. The PG&E Power Contract, as modified by the July 16, 2002 Agreement Concerning Power Purchase Contract of 1966 and Consolidated Operations of the Narrows I and

Narrows II Powerhouses. The 2002 Agreement removed the generation quota terms of the PG&E Power Contract for the months of January to June.

**2.3. Water Supply Agreements:**

2.3.1. Water supply agreements between Yuba and the following Member Units: Browns Valley Irrigation District, Hallwood Irrigation Company, Cordua Irrigation District, Ramirez Water District, Brophy Water District, South Yuba Water District, Dry Creek Mutual Water Company and Wheatland Water District.

2.3.1.1. Baseline Diversions that are made under the agreements listed in Section 2.3.1 are the measured diversions as reported by Yuba, including any reduced diversions that are made to provide water for the Groundwater Substitution Component, and including other reduced diversions that are implemented as part of defined water efficiency or conservation programs or projects.

**2.4. Baseline Storage Target Line** is a graphical line of the maximum storage levels during the year at which Yuba would normally operate New Bullards Bar Reservoir under Baseline Conditions.

2.4.1. These levels are:

- September 30: 705,000 acre-ft;
- October 1 to October 31: linearly ramped from 705,000 acre-ft to 700,000 acre-ft;
- November 1 to February 15: 700,000 acre-ft;
- February 16 through March 31: linearly ramped from 700,000 acre-feet to 796,000 acre-feet;
- April 1 through April 30: linearly ramped from 796,000 acre-feet to 896,000 acre-feet;
- May 1 through May 31: linearly ramped from 896,000 acre-feet to 966,000 acre-feet; and
- June 1 through June 30: 966,000 acre-feet.
- July 1 to September 29: no fixed Baseline Storage Target amounts are provided for this period, because the maximum storage levels during this period at which Yuba would normally operate New Bullards Bar Reservoir under Baseline Conditions are governed by the runoff hydrology conditions of the Yuba River.

**3. BASELINE FLOWS DETERMINATION**

3.1. Baseline Flows will be determined as mean daily flows in cubic feet per second (cfs), with a separate determination for each day of the accounting period. Baseline operations will be

characterized by four categories of operation, each of which are governed by the overriding operational constraint for the applicable time period. The four categories of operation are: (1) Operation to Minimum Flows; (2) Operation to Baseline Storage Target release; (3) Transitional Operations; and (4) Flow Fluctuation Restricted Operations. The four categories and the calculation to determine the Baseline Flows under each category of operation as well as a general description of when each category will occur are described below. Once one of the four categories of operation has been determined to be in effect, the procedures of this section will be used to determine the resulting Baseline Flows that would have occurred at the Marysville Gage. Yuba will prepare a guideline description of baseline operations that can be used by the Parties and others to understand the operations of the Yuba Project that would occur under Baseline Conditions.

3.2. Due to the complex nature of the controlling operational criteria for the Yuba Project and the hydrology of the Yuba River watershed, there may be periods when conditions will not allow for use of the accounting procedures listed for any of these four categories of operations to determine the Baseline Flows. Technical representatives from each Party will work together to attempt to resolve the transfer accounting for such periods. If the Parties cannot agree upon the accounting for such periods, then the dispute resolution process of section 10.2 of this exhibit will be followed.

3.3. **Operation to Minimum Flows** is the controlling category of operation when releases under Baseline Conditions would have been made to maintain the minimum required flows at the Marysville Gage or at the Smartville Gage, whichever is the controlling location. The flow requirements listed in the table titled "Interim Instream Flow Requirements" on page 176 of Decision 1644 are the regulatory minimum required flows under Baseline Conditions and are the Baseline Flows that would occur when this category of operation is controlling.

3.3.1. **Determination of When Operation to Minimum Flows Would Occur -**

3.3.1.1. Beginning October 1, operations under Baseline Conditions will be considered to be at Minimum Flows unless or until there is a need to increase releases to manage storage levels at or below the Baseline Storage Targets. In the late winter and spring, forecasted runoff and resulting New Bullards Bar Reservoir storage govern when releases would exceed the minimum flows. For the winter and spring, if storage in New Bullards Bar Reservoir would have been at or above the Baseline Storage Targets with continued operations to minimum flows then a transition to releases above the minimum flow requirements would occur.

3.3.1.2. For the months of March through September, if, with releases from New Bullards Bar Reservoir to meet the Decision 1644 Interim Instream Flow Requirements and

Baseline Diversions, the end-of-September Baseline Storage Target in New Bullards Bar Reservoir would have been at or below 705,000 acre-feet, then the Baseline Flows for this period will be the Decision 1644 Interim Instream Flow Requirements.

3.3.2. **Calculation of Baseline Flow under Operations to Minimum Flows.** If operations to minimum flows has been determined to occur as described in Section 3.3 then Baseline Flows will be calculated as follows:

3.3.2.1. Calculate the River Balance – The River Balance includes intervening accretions or depletions of the Yuba River between the Smartville Gage and the Marysville Gage. The River Balance equals the measured flow at the Marysville Gage plus the measured Yuba diversions minus the measured flow at the Smartville Gage

3.3.2.2. Calculate the Baseline Flow – The Baseline Flows equal the greater of the required Decision 1644 Interim Instream Flow Requirement at the Smartville Gage minus the sum of the measured Yuba diversion plus the River Balance or the required Decision 1644 Interim Instream Flow Requirement at the Marysville Gage plus any adjustments for Total Uncontrolled Flows that would not have been offset by a reduction in releases from Englebright Reservoir. The adjustment of Total Uncontrolled Flows will include short-duration increases in releases from the Narrows II Powerhouse due to short-term increases in power demands, power outages resulting in loss of control of releases from Englebright Dam and short duration uncontrolled runoff downstream of Englebright Dam that occurs when there is no Decision 1644 Interim Instream Flow Requirement at the Smartville Gage.

#### 3.4. **Operations to Target Storage Release**

3.4.1. For all times of the year, Operations to Target Storage Release is the controlling category of operation if operation to Minimum Flows would result in New Bullards Bar Reservoir storage above the Baseline Storage Target. If Operations to Target Storage Release would have occurred, then the Baseline Flow is the rate of release that would have been needed to meet the monthly Baseline Storage Target amount in New Bullards Bar Reservoir.

3.4.2. In the months of December through March, forecasts of future inflow and actual inflow are used to develop release decisions. During these months, operations are to

manage storage to meet the springtime Baseline Storage Target, while avoiding spills of water from New Bullards Bar Reservoir.

3.4.3. If the end-of-September storage in New Bullards Bar Reservoir under Baseline Conditions would have been above 705,000 acre-feet with releases from New Bullards Bar Reservoir minimized to meet the Decision 1644 Interim Instream Flow Requirements and diversions, then the Baseline Flows will be the flow rate schedule that would have been needed to release sufficient water from New Bullards Bar Reservoir to meet an end-of-September storage of 705,000 acre-feet.

3.4.4. The accounting in wetter years in the summer period is based on reaching storage in New Bullards Bar Reservoir on September 30 as described in and subject to the provisions above. The water storage volume in New Bullards Bar Reservoir is affected by natural inflow, and the scheduled release of water from New Bullards Bar Reservoir is predicated on an estimate of this inflow. Because the release of water to achieve the target storage is relatively fixed as of mid-summer, Yuba and the Projects may revise the target storage volume in New Bullards Bar Reservoir if mutual agreement is reached.

3.5. **Transition Operations** would have occurred when Baseline Releases would have previously been governed by either Operation to Minimum Flows or Operation to Target Storage Release and the operational constraint would have shifted to the other type of operation. Under this condition, a period of transition would have occurred and flows would have been based on the specific conditions at that time, including actual runoff, forecasts of runoff, and planned operations. Because each circumstance of Transition Operations would have been different, Yuba will prepare forecasted Baseline Flows for the transition time period and provide supporting data to show why the Baseline Flows would have been expected to have occurred. Maximum hourly and daily rates of flow change are prescribed in FERC License 2246 and the “November 22, 2005 FERC Order Modifying and Approving Amendment of License” for the Baseline Flows operations.

3.6. **Flow Fluctuation Operations** would have occurred when the FERC License 2246 restriction on flow reductions in the months of October to March, or the restriction on flow reductions in the November 22, 2005 FERC Order Modifying and Approving Amendment of License would have required flows to be maintained above the minimum flows. Flow Fluctuation Operations would have been managed the same as Operations for Minimum Flows except that the minimum instream flow requirement would be prescribed by the flow reduction restrictions in FERC License 2246 or the flow fluctuation restrictions in the November 22, 2005 FERC Order Modifying and Approving Amendment of License, rather

than the Decision 1644 Interim Instream Flow Requirements. As early as practical, Yuba will provide the minimum allowable flows for flow fluctuation operations as the Baseline Flows to DWR, along with an explanation of the determination of these Baseline Flows.

- 3.7. **Fishery Study Flows** - The Fishery Agreement calls for the development of fishery studies. Some of the studies to be conducted could involve fluctuation of flows during some periods. If a defined flow release schedule is planned as part of a fishery study administered by Yuba or the River Management Team (a group defined in the Fisheries Agreement) under the Fisheries Agreement, then these flows in this schedule will not be part of Baseline Flows and, if all other aspects of this exhibit are satisfied, then the amounts of these flows that exceed Baseline Flows will be accounted as Released Transfer Water. Any reduced releases as part of a fishery study will be accounted as a Negative Transfer Flow if the conditions of Section 4.4 of this exhibit Negative Transfer Flow are met. At a minimum of 14 days prior to the start of any such study, and as early as possible, Yuba will provide notice of any Fishery Study Flows to DWR.
- 3.8. **Baseline Storage** -Yuba will use the Baseline Flow amounts to determine the daily storage in New Bullards Bar Reservoir that would have occurred under Baseline Conditions. The calculation of Baseline Storage will use the actual inflows into New Bullards Bar Reservoir and Total Uncontrolled Flows into the lower Yuba River, along with a daily calculation of the releases from New Bullards Bar Reservoir that would have been made to meet the Baseline Flows, to determine the daily Baseline Storage amount. The Baseline Storage amount will be used to calculate the Base Transfer amount for Refill accounting in **Exhibit 2** of this Agreement.

#### 4. **TRANSFER WATER DELIVERY AND FLOW MEASUREMENT**

- 4.1. **Point of Measurement and Delivery** - The point of delivery and the point of measurement of Released Transfer Water, and the point for determination of Baseline Flows, all will be at the Marysville Gage. The flows used for calculating Released Transfer Water and Baseline Flows will be mean-daily flows in cfs.
- 4.2. **Released Transfer Water** will be the amount of the actual mean-daily flow that has been measured at the Marysville Gage minus the mean daily Baseline Flows for the same day. The mean daily Baseline Flow will be determined according to the methods described in Section 3 of this exhibit.
- 4.3. **Stored Released Transfer Water** is water that has been accounted for as Released Transfer Water and that results in increased storage in an upstream Project reservoir (that is, water that is “backed into storage”). Released Transfer water will be deemed to have been stored

in an upstream Project reservoir when the Delta is in Balanced Conditions, there is no available pumping capacity at Project Delta pumping facilities, and releases from Project storage reservoirs would have been greater in the absence of Released Transfer Water. The incrementally greater Project release necessary under Baseline Conditions will be accounted for as Stored Released Transfer Water in Project storage. This accounting of Stored Released Transfer Water will be kept to determine whether Stored Released Transfer Water can subsequently be released from Project storage and exported by the Projects under Section 5.5 of this exhibit, and thus be accounted for as Delivered Transfer Water. Every effort will be made to account for Stored Released Transfer Water as backing into Oroville Reservoir as a first preference. This will necessitate an adjustment in the COA between the two Projects.

- 4.4. **Negative Transfer Flows** – During certain periods, the amount of the actual measured flow under Section 4.1 of this exhibit may be lower than the applicable Decision 1644 Interim Instream Flow Requirement. During these periods, the Baseline Flows will be the applicable Decision 1644 Interim Instream Flow Requirement. During these periods, the amount of the applicable Decision 1644 Interim Instream Flow Requirement minus the measured flow under Section 4.1 of this exhibit will be accounted for as a Negative Transfer Flow. If a Negative Transfer Flow occurs on a day when all or a portion of the Negative Transfer Flow amount could have been accounted for as Delivered Transfer Water as described in Section 5.5 of this exhibit, then this amount will be deducted from the total Delivered Transfer Water for the Water Accounting Year in which the Negative Transfer Flow occurred.
- 4.5. **Groundwater Substitution Component Flow** – Released Transfer Water may be fully or partially derived from Groundwater Substitution Component water. **Exhibit 3** of this Agreement describes the process that will be used to determine the planned amount of Groundwater Substitution Component water that will be provided each year and the monitoring and reporting that will be conducted by Yuba and participating Member Units for Groundwater Substitution Component operations.
- 4.5.1. **Delivery and Measurement** – Groundwater Substitution Component water will be delivered at the Marysville Gage, and measured as Released Transfer Water under Section 4.2 of this exhibit.
- 4.5.2. Water released as Groundwater Substitution Component water will not be included in the transfer amount for Refill accounting in **Exhibit 2** of this Agreement.

4.5.3. The total amount of Released Transfer Water that will be designated as Groundwater Substitution Component water will be limited to the amount of groundwater pumping that is measured by the procedures described in **Exhibit 3** of this Agreement.

## 5. **DETERMINATION OF DELIVERED TRANSFER WATER**

- 5.1. Delivered Transfer Water may only occur when the Delta is determined by DWR to be in Balanced Conditions.
- 5.2. For this Agreement, it is assumed that Released Transfer Water measured at the Marysville Gage will reach the Projects' Delta export pumps two days after the date of measurement at the Marysville Gage.
- 5.3. For this Agreement, Released Transfer Water used as Carriage Water or used as Delta outflow when the E/I ratio is controlling in the time period of July 1 to January 31 by the Projects will be accounted as Delivered Transfer Water as described in Section 5.11 of this exhibit. For this Agreement, Percent Inflow Diversion Loss will not be accounted as Delivered Transfer Water.
- 5.4. For this Agreement, it is assumed that there will be no conveyance losses between the Marysville Gage and the Projects' Delta pumping facilities.
- 5.5. For each day that Released Transfer Water is accounted for under Section 4.2 of this exhibit, Stored Released Transfer Water accounted for under Section 4.3 of this exhibit is released from Project storage, a determination will be made, utilizing information provided by DWR that is described in Section 5.11 of this exhibit, regarding whether or not there was capacity available at the Projects' Delta export facilities.
- 5.6. Stored Released Transfer Water will be released from Project storage only if capacity at the Projects' Delta pumping facilities is available unless the water "spills" from Project storage before such export capacity becomes available and therefore will not be accounted for as Delivered Transfer Water.
- 5.7. The lesser of the following two amounts will be accounted for as Delivered Transfer Water if DWR has determined that capacity is available at the Delta export facilities as described in Section 5.11.
  - 5.7.1. The Released Transfer Water amount determined under Section 4.2 of this exhibit, or
  - 5.7.2. The incremental increase in exports that occurs as a result of Released Transfer Water during a period when Percent Inflow Diversion Loss is occurring.
- 5.8. For each day that there are Negative Transfer Flows as accounted for under Section 4.4 of this exhibit, a determination will be made regarding the amount of reduced Delta exports or



increased Project releases that resulted from the Negative Transfer Flow. A Negative Transfer Flow will be accounted for as a debit to the total amount of Stored Released Transfer Water if the effect of the Negative Transfer Flow is that it causes an increase in Project releases or reduces Delta exports.

- 5.9. Some or all of the Stored Released Transfer Water will be deemed to have been spilled from Project reservoir storage and will be debited from the account described in Section 4.3 of this exhibit, if the Project reservoir in which the Stored Released Transfer Water is stored makes flood control releases. The debit amount will equal the actual amount of Stored Released Transfer Water spilled, or the total amount of Stored Released Transfer Water, whichever is less.
- 5.10. Along with the accounting of Delivered Transfer Water, Yuba will maintain an accounting of the Base Transfer amount for Refill accounting. The Base Transfer amount for refill accounting will be calculated as the difference in volume of actual New Bullards Bar Reservoir storage and the Baseline Storage that is directly attributable to the release of Delivered Transfer Water from New Bullards Bar Reservoir storage.
- 5.11. DWR will make every effort to export Released Transfer Water and Stored Yuba Water based on the available export capacity at the Projects' Delta pumping facilities, as determined by DWR, which includes a determination of capacity available after delivery of SWP water and water for regulatory, water right and contractual obligations.

## 6. **PROCEDURES FOR ACCOUNTING OF BASELINE FLOWS AND TRANSFER AMOUNTS**

- 6.1. The Water Accounting Year and provisions of this Agreement pertaining to notice and invoicing for Delivered Transfer Water will govern the timing of transfer accounting.
- 6.2. **Calculation of Forecasted Baseline Flows.** Yuba will calculate a preliminary forecast of Baseline Flows, as described in Section 3 of this exhibit on a monthly basis unless more frequent forecasted Baseline Flows are requested by DWR or provided by Yuba. The forecasted Baseline Flows along with forecasted flows will be used by DWR to plan Project operations to export Released Transfer Water. The preliminary forecast of the Baseline Flows will be made using forecasted hydrologic conditions for the month, based on Yuba River unimpaired flows forecasted in the most-recent DWR Bulletin 120 and any updates. Within 14 days after the end of the month, Yuba will provide DWR with its draft calculations of Baseline Flows.
  - 6.2.1. Yuba will provide preliminary and draft final calculations of Baseline Flows to DWR for its review and concurrence. The calculation of preliminary Baseline Flows will be

used to predict the amount and timing of Released Transfer Water that will be generated for the upcoming period. During that period, Yuba may update the preliminary calculation of Baseline Flows as changes in hydrologic conditions affect the accuracy of the calculation. Yuba will provide to DWR all requested backup information and calculations, excluding any models that were the bases of the calculation of Baseline Flows, so that DWR may verify the calculation. If DWR concurs with the preliminary calculation of Baseline Flows, then such preliminary Baseline Flows will be used in coordinating operations and for any initial allocation of Released Transfer Water to Components 1, 2, 3 and 4 Water as described in Section 7 of this exhibit. Yuba will also provide a calculation of Baseline Storage for Refill accounting (**Exhibit 2**) and comparison with the Baseline Storage Target Line.

6.2.2. Due to the delayed release of final USGS reporting of flows at the Marysville Gage, Yuba's transfer accounting will use the mean-daily flows as reported by Yuba to the USGS. DWR will be given timely notice if this information subsequently changes due to re-rating or shifts in the Marysville Gage, as reported by Yuba to the USGS.

**6.3. Calculation of Final Baseline Flows and Delivered Transfer Water Amount.** At the time that Yuba develops a preliminary estimate of Baseline Flows and provides it to DWR, Yuba also will develop and provide to DWR a preliminary release schedule and forecast of daily Released Transfer Water. Yuba will update the release schedule and resulting forecast of daily Released Transfer Water no less than once per month, unless an alternative time period is agreed to by the Parties. Within fourteen days after the end of each month or within 14 days of an export period, Yuba will calculate a draft final Transfer Accounting under Section 6.3.5 of this exhibit. Section 11 of this exhibit describes the scheduling and coordination of sharing operational information.

6.3.1. Because of the variability of hydrologic conditions, and because of the uncertainty regarding whether or not DWR will call for option water in some periods, Yuba will prepare a matrix of one or more forecasted Baseline Flows, one or more release schedules and the resulting estimated quantities of Released Transfer Water. Yuba will provide indications of the relative probability of each Baseline Flows scenario that is provided in the matrix.

6.3.2. DWR will notify Yuba periodically, as information is available, when Project conditions are such that any of the forecasted Released Transfer Water may not be exported.

6.3.3. Calculation of the amount of Released Transfer Water will utilize the determination of export capacity and the Percent Inflow Diversion Loss provided to Yuba by DWR no

later than 14 days after the end of the assumed export period. An export period ends following a verifiable point in time at which Baseline Flows can be verified against the Baseline Storage Target Line as described in Section 3 of this exhibit.

6.3.4. If DWR concurs with Yuba's draft final calculation of Baseline Flows, then it will become the final Baseline Flows, and will be used for all final transfer accounting for the corresponding period.

6.3.5. Along with the calculation of the draft final Baseline Flows, Yuba will also calculate and submit to DWR a draft final accounting of the amounts of Components 1, 2, 3 and 4 Water that were Delivered Transfer Water during the accounting period. This draft final accounting will include entries for the following:

- (a) Mean daily flow at the Marysville Gage, as measured according to Section 4 of this exhibit;
- (b) Daily schedule of resulting Released Transfer Water according to Section 4.2 of this exhibit and accounting for Negative Transfer Flows under Section 4.4 of this exhibit;
- (c) Calculation of Delivered Transfer Water under Section 5 of this exhibit, including any necessary reductions for Negative Transfer Flows and an accountings of Stored Released Transfer Water delivered and Stored Released Transfer Water remaining in storage, using the export capacities submitted DWR;
- (d) Calculation of the amounts of Components 1, 2, 3 and 4 Water that were Delivered Transfer Water, as calculated under Section 7 of this exhibit; and
- (e) A breakdown of the Storage Component and the Groundwater Substitution Component of the Delivered Transfer Water for the period.
- (f) A calculation of the amount of reduced storage in New Bullards Bar Reservoir that resulted from releases of Storage Component Delivered Transfer Water. The resulting amount of reduced storage calculated at the start of the Refill Period will be the Base Transfer amount used for Refill accounting as described in **Exhibit 2**.

## 7. ACCOUNTING FOR COMPONENTS OF TRANSFER WATER

7.1. Water that has been determined to be Delivered Transfer Water will be credited towards one of four components of Water: Component 1, Component 2, Component 3, or Component 4.

7.2. Delivered Transfer Water will be credited to one of these four components of Water in the following priorities:

- 7.2.1. The first 60,000 acre-ft of Delivered Transfer Water that also is Storage Component water in each Water Accounting Year will be credited to Component 1 Water.
- 7.2.2. In Dry and Critical Water Years, the first 60,000 acre-ft of Storage Component water will be credited to Component 1 Water, and the next 15,000 acre-ft in Dry Water Years,<sup>1</sup> and 30,000 acre-ft in Critical Water Years, of Storage Component water will be credited to Component 2 Water. If the total amount of Delivered Transfer Water that also is Storage Component water in any Water Accounting Year is less than the total commitment for Component 1 Water (i.e., 60,000 acre-ft), Yuba will not be obligated to provide Groundwater Substitution Water to complete delivery of the 60,000 acre-feet. If the total amount of Delivered Transfer Water from the Storage Component water in a Water Accounting Year is less than the total commitment for Component 2 Water (i.e., 15,000 acre-ft in Dry Water Years and 30,000 acre-ft in Critical Water Years), then Yuba will provide Groundwater Substitution Component water, but subject to the provisions of **Exhibit 3** of this Agreement, to complete the balance of Yuba's commitment for Component 2 Water.
- 7.2.3. In years when Yuba has a commitment to provide 40,000 acre-ft of Component 3 Water, after Component 1 Water and Component 2 Water (if any is required) is fully accounted for, any remaining Storage Component water will be credited as Component 3 Water, and then any remaining unfulfilled commitment for Component 3 Water will be provided and accounted from Groundwater Substitution Component water, but subject to the provisions of **Exhibit 3** of this Agreement.
- 7.2.4. Any remaining balance of Storage Component water, and then Groundwater Substitution Component water, will be credited as Component 4 Water after all other commitments of Water have been credited from the total Delivered Transfer Water for the Water Accounting Year.
- 7.3. In years when there is no commitment for Component 2 or Component 3 Water, any Delivered Transfer Water that also is Storage Component water, and that exceeds the 60,000 acre-ft of the Component 1 Water obligation, will first be credited to repay any accrued deficit in Component 1 Water deliveries and then to repay any accrued deficit in Component 2 and Component 3 Water deliveries and finally accounted as Component 4 Water, subject to the provisions of Section 5A2 of this Agreement.
- 7.4. **Holding Account.** If Delivered Transfer Water Storage Component has been credited as Component 4 Water under Section 7.2.4 or Section 7.3 of this exhibit, and if DWR has not

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<sup>1</sup> These water-year types are defined by the Sacramento Valley Index in SWRCB Decision 1641.

committed to pay for some or all of the credited Component 4 Water under the option provisions of this Agreement, then the uncommitted portion of Component 4 Water will be addressed in the following manner:

7.4.1. By September 30 of any year where there is Delivered Transfer Water that is uncommitted to one of the four Components of water, Yuba will notify DWR of the availability of the uncommitted Delivered Transfer Water for purchase as Component 3 or Component 4 water prior to accounting for the water in the Holding Account.

7.4.2. Water credited to the Holding Account will be available first as the following year's Component 3 or 4 Water and second as a credit to the following year's Component 1 Water, provided that the Holding Account water is not spilled from San Luis reservoir. The applicable purchase price for the water will be determined by the Water Year in which the water is accounted for as Delivered Transfer Water, even if the credit is applied in a subsequent year.

**7.5. Component 1 Water Accounting Deficit.** There are two conditions under which an account deficit of Component 1 Water can occur: (1) in very wet years, Yuba may release sufficient Released Transfer Water to provide the full required amount of Component 1 Water, but due to Delta conditions, some or all of this Released Transfer Water may not be able to be accounted for as Delivered Transfer Water under Section 5 of this exhibit. In such years, the amount of Delivered Transfer Water will be less than Yuba's obligation to provide Component 1 during that Water Accounting Year; and (2) in addition, under section 7.2.2 of this exhibit, there may be years in which there are less than 60,000 acre-feet of Storage Component Water available to meet Yuba's Component 1 obligation. In both of these cases, the amount of outstanding Component 1 Water will be noted as a Component 1 Water account deficit for that Water Accounting Year, and Yuba will be obligated to provide the remaining amount of Component 1 Water in a subsequent Water Accounting Year, subject to the provisions of Section 5A2 of this Agreement.

**7.6 Component 1 Water Makeup Provisions.** Yuba will apply Storage Component water in excess of the 60,000 acre-foot amount of Component 1 Water to be delivered during the current Water Accounting Year to any deficit in the Component 1 Water account from a previous year, as long as the current Water Year type is not a Dry or Critical Water Year. If the current Water Year type is a Dry or Critical Water Year, then Storage Component water may be applied to a deficit in the Component 1 Water account at Yuba's discretion, subject to the provisions of Section 5A2 of this Agreement.

**7.7 Components 2 and 3 Water Accounting Deficit and Makeup Provisions.** A deficit in providing Component 2 and/or Component 3 Water could occur if there is not enough Storage Component water accounted for as Delivered Transfer Water to meet the total obligations to provide Components 1, 2 and 3 Water, and due to the provisions of **Exhibit 3** for determining the amount of Groundwater Substitution Component water that may be provided, the amount of Groundwater Substitution Component water is not sufficient to make up the entire remainder of the commitment to provide Components 1, 2 and 3 Water. If there is a deficit in Component 2 or Component 3 Water the Parties will meet and confer under Section 22 ("Remedies and Dispute Resolution") of this Agreement to determine what actions should be taken.

**8. CONFERENCE YEAR ACCOUNTING**

- 8.1. No Negative Transfer Flows amounts will be accounted for in a Conference Year if there is no Delivered Transfer Water.
- 8.2. In a Conference Year, the obligation to provide Component 1 Water may be suspended by Yuba, and instead Yuba will incur a deficit in its obligation to provide Component 1 Water Delivered Transfer Water that must be repaid in a non-Conference Year as provided in this Agreement.
- 8.3. There will be no obligation to provide Component 2 or Component 3 Water in a Conference Year.
- 8.4. Makeup provisions and repayment of Refill provisions of the accounting will be suspended during a Conference Year. Any amounts of water in Holding Accounts or repayment amounts will be carried forward to the next year non-Conference Year following a Conference Year.
- 8.5. If Yuba and DWR agree to transfer some amount of Water in a Conference Year, then the Conference Year Baseline Conditions will be agreed to by Yuba and DWR.
- 8.6. Transfer of Component 4 Water may occur in a Conference Year only if Negative Transfer Flows and Refill impacts are accounted for and, in the case of Refill impacts, repaid first.

**9. GROUNDWATER SUBSTITUTION COMPONENT WATER**

- 9.1. Yuba, at Yuba's sole discretion, may decide to enter into agreements with participating Member Units under which the participating Member Units will arrange for their respective water users to reduce their use of surface water diversions by amounts to be determined by Yuba and the participating Member Units during the Water Accounting Year, and to pump equivalent amounts of groundwater from approved wells as replacement supplies for the

Groundwater Substitution Component of Released Transfer Water. Yuba will provide DWR with one or more lists of the locations of the wells that may be pumped for the Groundwater Substitution Component. In no case will groundwater pumping commence from a well for the Groundwater Substitution Component before approval of the well by DWR. Wells that are located within two miles of the Yuba River or the Feather River will be subject to review and approval by DWR. All other listed wells will be approved by DWR upon demonstration by Yuba that all required local permits for these wells have been obtained. DWR will review the list of wells, their locations and any other pertinent information provided by Yuba and the participating Member Units, and will notify Yuba and the participating Member Units within ten working days after the submittal of a list by Yuba of any well that DWR reasonably determines is not acceptable for pumping under this Agreement, and will inform Yuba and the Member Unit in which the well is located of the basis for the determination by DWR. Upon receipt of supplemental information from Yuba or the Member Unit in which the well is located, DWR may reconsider its refusal to allow the well to provide Groundwater Substitution Component water and reverse its determination. Groundwater pumped for the Groundwater Substitution Component must be put to reasonable use for irrigation on lands that otherwise would have been served with surface water within the participating Member Unit's service area between March 1 and December 31.

- 9.2. Yuba will comply with the Groundwater Monitoring, Reporting and Operations Program, which is **Exhibit 3** to this Agreement.
- 9.3. Yuba will ensure that flow-measuring devices are acquired, installed and maintained to measure the quantities of groundwater actually being pumped for the Groundwater Substitution Component from wells identified in Section 9.1 of this exhibit. Yuba and the participating Member Units will be responsible for the distribution of water pumped under this Agreement within each participating Member Unit's boundaries. The Projects will not be responsible for any costs of installing, operating or maintaining groundwater pumping facilities or flow-measuring devices, or for any costs of conveying groundwater pumped to places of use within the participating Member Units' service areas pursuant to this Agreement. By the fifteenth day of every other month, Yuba will provide a report to DWR of the quantities of groundwater pumped from each well for the Groundwater Substitution Component during the previous reporting period under this Agreement.
- 9.4. Yuba will make arrangements for DWR and its representatives to have access to facilities and records of Yuba and its participating Member Units to the extent reasonably necessary to verify that the groundwater pumping, the management of such pumping and the

implementation of the Groundwater Monitoring and Reporting Program for the Groundwater Substitution Component meet the requirements of Section 9 of this exhibit.

## 10. ACCOUNTING PREPARATION AND NOTIFICATIONS

10.1. **Accounting preparation for invoicing** - Yuba will prepare a draft accounting of the quantities of Released Transfer Water and the Delivered Transfer Water, utilizing information provided by DWR, as described in Section 6 of this exhibit, and Yuba will submit these calculations in a standard form to be developed by the Parties for review by the Technical Committee according to the schedules set forth in this Agreement. The Technical Committee will provide written notification to Yuba and DWR within 20 days of receipt of the Transfer Accounting from Yuba whether it agrees with the accounting. If the Technical Committee agrees with the accounting, or if there has been no written notification by the 20<sup>th</sup> day, then Yuba will submit invoices to DWR as provided in this Agreement.

10.2. **Disputes on accounting amounts** – If there is a dispute between the Parties regarding accounting, then the Technical Committee will first meet and attempt to resolve the dispute, and submit the disputed accounting for final resolution by the Management Committee. For accounting disputes only, if the dispute cannot be resolved by the Management Committee, then the Parties will resolve the accounting dispute as provided in Section 22 ("Remedies and Dispute Resolution") of this Agreement.

10.3. **Maintaining Records of Accounting and Accounts** – Yuba will maintain a set of records for all accountings, and all back-up materials used to prepare the accountings, at Yuba's offices, and Yuba will make these records available to DWR upon request during normal business hours. DWR will maintain records of DWR's determination of Delta conditions and Project export capacity as described in Section 6.3.2, and make these records available to Yuba upon request during normal business hours.

## 11. FORECASTING AND EXCHANGE OF INFORMATION FOR TRANSFER

11.1. Yuba and DWR will exchange operations forecasts and other data deemed useful for purposes of enhancing the usefulness of the water to be made available under this Agreement. The forecasts will identify and substantiate the quantities and timing of forecasted transfer flows over a range of possible hydrologic conditions, and identify forecasted periods of Balanced Conditions and water allocations for the CVP and SWP. Additionally, the operations forecasts to be provided will assist the CVP and SWP to



efficiently integrate the Yuba flows in their operations plans, and will assist EWA in planning asset acquisition and management.

11.2. Yuba will provide the following:

- Updated forecasts of operations, monthly from February through June.
- Updated forecasts as necessary, but not less than monthly, depending on changing conditions, from July through January.
- The operations forecast should extend through the end of the current Water Year classification through January 31.
- Initially, each Water Year, separate operations forecasts will be provided based on hydrologic probability of exceedence levels of 90%, 10%, and 50%. Some forecasts may be deleted as the Water Year progresses, depending on need. Likewise, other forecasts may be added, if needed.
- Each Yuba forecast will include:
  1. Forecasted flows at Marysville Gage (daily for the first 30 days of forecasted flows and then monthly, or for a partial month if the dates of flow change within month are known)
  2. Forecasted Baseline Flows (daily for the first 30 day of forecasted flows and then monthly, or for a partial month if the dates of flow change within month are known)
  3. Forecasted New Bullards Bar reservoir storage
  4. New Bullards Bar forecasted inflow, outflow, diversions, evaporation
  5. Yuba River Index and Water Year classification
  6. North Yuba Index and computation details, North Yuba Year classification
  7. Forecasted transfer water quantities (monthly)
  8. Identification of any “make-up” flows or other flows planned.
  9. Amounts and timing of groundwater pumping contributing to availability of transfer flows.

DWR will provide to Yuba before the 1<sup>st</sup> of each month from February through June, and from July through January if updated Yuba forecasts are needed, the following information:

- Details of CVP and SWP forecasted reservoir and export operations through the end of the current calendar year.

- Forecasted periods of balanced conditions through the end of the current calendar year.

## **12. TECHNICAL COMMITTEE AND MANAGEMENT COMMITTEE**

### **12.1. Technical Committee**

The Technical Committee will: (1) collect, review and analyze information relevant to accounting of water consistent with **Exhibits 1, 2 and 3** of this Agreement, and information related to advances, payments and cost adjustments; (2) identify and attempt to resolve technical implementation issues; (3) periodically report to the Management Committee on the information gathered and any technical implementation issues identified; and (4) make recommendations to the Management Committee for resolution of any policy issues that arise or for any required factual determinations. If the Technical Committee is unable to agree on a recommendation to the Management Committee, then the Technical Committee will cooperate to provide a balanced presentation of the facts, opinions and other information underlying the various positions on the issue to be determined.

### **12.2. Management Committee.**

The Management Committee will: (1) provide policy guidance in implementing this Agreement; (2) make any factual determinations required to implement this Agreement; (3) consider information provided by the Technical Committee, if applicable, when making decisions; and (4) identify and resolve any policy-related implementation issues.

## EXHIBIT 2

### Reservoir Refill Accounting Provisions

#### SECTION 1: GENERAL PRINCIPLES

DWR must be assured that the refilling of New Bullards Bar Reservoir resulting from purchase of water from Yuba by DWR will not impact the Projects. Such impacts could occur (according to DWR) if storage vacated by the transfer is refilled during Balanced Conditions in the Delta. Yuba agrees that if there is an outstanding account of impacts after the Water Year reservoir refill period, then Yuba will release additional water during subsequent Balanced Conditions in excess of normal operating requirements to compensate for refill impacts. The following procedures for determining refill impacts and conditions for additional releases will be used in accounting for refill. DWR will work with Reclamation to allocate the impact account between the Projects. This exhibit includes the definitions set forth in **Exhibit 1** to this Agreement. In addition, when used in this exhibit, the following terms have the following definitions:

1. “Base Transfer” is the amount of Delivered Transfer Water released from New Bullards Bar Reservoir, as determined by the accounting rules in **Exhibit 1** to this Agreement, and which results in a storage amount in New Bullards Bar Reservoir that is lower than the storage that would have occurred under Baseline Conditions. Calculation of this amount is described in Section 5 of **Exhibit 1** to this Agreement.
2. “Impact Account” is the amount of water DWR would have obtained from the Yuba River in the absence of the transfer releases, but which DWR did not receive due to refilling of New Bullards Bar Reservoir. The amount of Impact Account water will be computed daily during the Refill Period based on Balanced Conditions.
3. “Refill Period” is from October 1 through September 30.
4. “Target Storage” is the maximum storage volume during the Refill Period at which Yuba would normally operate New Bullards Bar Reservoir without a water transfer. The Target Storage levels are as follows:
  - (a) October 1 through October 31: linearly ramped from 705,000 acre-feet to 700,000 acre- feet
  - (b) November 1 through February 15: 700,000 acre-feet.
  - (c) February 16 through March 31: linearly ramped from 700,000 acre-feet to 796,000 acre-feet.
  - (d) April 1 through April 30: linearly ramped from 796,000 acre-feet to 896,000 acre-feet.

- (e) May 1 through May 31: linearly ramped from 896,000 acre-feet to 966,000 acre-feet.
  - (f) June 1 through June 30: 966,000 acre-feet. This Target storage amount of 966,000 acre-ft may be slightly reduced because this amount is the top of conservation storage in New Bullards Bar Reservoir and releases may be made to avoid exceeding this storage amount. The Target Storage reduction will be made when releases from New Bullards Bar Reservoir are increased as storage reaches 996,000 acre-ft which demonstrates filling of the Reservoir.
  - (g) During July 1 through September 29, Target Storage must be determined on a case by case basis as described in **Exhibit 1** to this Agreement.
5. "Actual Storage" is the amount of water physically in storage in New Bullards Bar Reservoir at any time.
  6. "Theoretical Storage" is the sum of: (1) Actual Storage on the day specified; and (2) Transfer Account Amount.
  7. When Actual Storage exceeds the Target Storage during the Refill Period, there will be no further refill impacts.
  8. The accounting procedure in Section 2 of this exhibit will be used to calculate the Impact Account. The general principles in Section 2 of this exhibit will be applied in accounting for any unusual operational conditions not set forth in the application example described below.
  9. If the Transfer Amount Account is not zero on September 30, then the remaining balance of the account will be carried forward to the subsequent water year and the impact accounting will continue until the outstanding balance is eliminated.
  10. If there is an Impact Account balance on September 30, then Yuba will release water during Balanced Conditions on a schedule that is agreed to by the Parties at a time when such releases will not create or affect deficiencies in local deliveries or instream flows, and these releases will be coordinated with releases for other (if any) water transfers of Yuba. The water released to offset refill impacts will be delivered as Delivered Transfer Water by Yuba and the accounting provisions and refill conditions of this section will apply to those quantities.
  11. By July 31 of each year, the Parties will complete an accounting of the Impact Account.
  12. If Project operations effectively reduce or eliminate a refill impact, the Impact Account balance may be adjusted to reflect that reduction or elimination subject to approval by the Projects.

## **SECTION 2: ACCOUNTING PROCEDURES FOR DETERMINING NEW BULLARDS BAR REFILL IMPACTS ON THE PROJECTS**

The following columnar description sets forth the format, criteria, and procedures to be used for the determination of combined impacts to the Projects due to changes in refilling New Bullards Bar Reservoir caused by the transfer to DWR. An example of the application is attached.

### **COLUMNAR DESCRIPTION**

- Column 1 - Date
- Column 2 - New Bullards Bar Reservoir Actual Storage at 2400 hours.
- Column 3 - Transfer Amount Account (Base Transfer for the year) lists transfer water for which impact accounting is yet to be made. It is the previous day's amount minus the previous day's impact volume.  $Column\ 3_i = Column\ 3_{i-1} - Column\ 6_{i-1}$  any transfer amount account remaining after September 30 will be the initial (October 1) amount used in the subsequent water year.
- Column 4 - Theoretical Storage indicates the operation of storage as it might have occurred in the absence of the transfer. It is the actual storage plus the Transfer Amount Account.  $Column\ 4_i = Column\ 2_i + Column\ 3_i$
- Column 5 - Target Storage is a postulated level of storage, which New Bullards Bar Reservoir might not normally exceed. When Column 5 exceeds this level, it is postulated that the storage would be reduced to the Target Storage amount. The Target Storage is defined as follows: October 1 (705,000); October 2-October 31 (ramped linearly to 700,000) November 1-February 15 (700,000); February 16-March 31 (ramped linearly to 796,000); April 1-30 (ramped linearly to 896,000); May 1-31 (ramped linearly to 966,000); June 1-30 (966,000); July 1-September 29 – determined by hydrology.
- Column 6 - Impact Volume indicates daily amounts of water that would be released to achieve the Column 5 Target Storage.  $Column\ 6_i = (Column\ 4_i - Column\ 5_i)$  but not less than zero, and not greater than Column 3i.
- Column 7 - Delta Conditions are determined jointly by DWR and Reclamation in accordance with the COA. A "1" is listed if the Delta is declared to be in Balanced Conditions three days after the daily amounts are calculated, a zero or null "-" is listed when the Delta is declared to be in excess conditions three days after the daily amounts are calculated. The amount of Theoretical Storage above the Target Storage on December 31, if any ( $Column\ 4 - Column\ 5$ ), is deducted from the Transfer Amount Account (Column 3) on January 1.
- Column 8 - Net Daily Impact is the daily impact volumes when the Delta is in Balanced Conditions as indicated in Column 7.  $Column\ 8_i = Column\ 6_i \times Column\ 7_i$ .
- Column 9 - Impact Account is the accumulation of Net Daily Impacts.  $Column\ 9_i = Column\ 9_{i-1} + Column\ 8_i$ .

**WATER TRANSFER REFILL ACCOUNTING EXAMPLE**

(all units are acre-feet)

**Yuba County Water Agency-DWR**

Transfer Amount	
30-Sep-01	102,912

1	2	3	4	5	6	7	8	9
Date	Actual Storage	Transfer Amount Account	Theoretical Storage	Target Storage	Impact Volume	Delta Condition (Balanced = 1)	Net Daily Impact	Impact Account
<b>Previous Year Balances</b>								
	-	102,912	-	-	-	-	-	-
1-Jan-02	597,293	102,912	700,205	700,000	205	1	205	205
2-Jan-02	605,353	102,707	708,060	700,000	8,060	1	8,060	8,265
3-Jan-02	618,678	94,647	713,325	700,000	13,325	1	13,325	21,590
4-Jan-02	625,781	81,322	707,103	700,000	7,103	1	7,103	28,693
5-Jan-02	630,711	74,219	704,930	700,000	4,930	-	-	28,693
6-Jan-02	639,084	69,289	708,373	700,000	8,373	-	-	28,693
7-Jan-02	644,927	60,916	705,843	700,000	5,843	-	-	28,693
8-Jan-02	651,145	55,073	706,218	700,000	6,218	-	-	28,693
9-Jan-02	657,360	48,855	706,215	700,000	6,215	-	-	28,693
10-Jan-02	660,890	42,640	703,530	700,000	3,530	-	-	28,693
11-Jan-02	662,008	39,110	701,118	700,000	1,118	-	-	28,693
12-Jan-02	664,488	37,992	702,480	700,000	2,480	-	-	28,693
13-Jan-02	666,069	35,512	701,581	700,000	1,581	-	-	28,693
14-Jan-02	667,476	33,931	701,407	700,000	1,407	-	-	28,693
15-Jan-02	667,628	32,524	700,152	700,000	152	-	-	28,693
16-Jan-02	665,268	32,372	697,640	700,000	-	-	-	28,693
17-Jan-02	664,036	32,372	696,408	700,000	-	-	-	28,693
18-Jan-02	661,451	32,372	693,823	700,000	-	-	-	28,693
19-Jan-02	660,292	32,372	692,664	700,000	-	-	-	28,693
20-Jan-02	659,197	32,372	691,569	700,000	-	-	-	28,693
21-Jan-02	658,299	32,372	690,671	700,000	-	-	-	28,693
22-Jan-02	658,635	32,372	691,007	700,000	-	-	-	28,693
23-Jan-02	658,686	32,372	691,058	700,000	-	-	-	28,693
24-Jan-02	658,238	32,372	690,610	700,000	-	-	-	28,693
25-Jan-02	658,187	32,372	690,559	700,000	-	-	-	28,693
26-Jan-02	659,197	32,372	691,569	700,000	-	-	-	28,693
27-Jan-02	660,882	32,372	693,254	700,000	-	-	-	28,693
28-Jan-02	661,600	32,372	693,972	700,000	-	-	-	28,693
29-Jan-02	661,304	32,372	693,676	700,000	-	-	-	28,693
30-Jan-02	660,508	32,372	692,880	700,000	-	-	-	28,693
31-Jan-02	659,758	32,372	692,130	700,000	-	-	-	28,693
1-Feb-02	658,985	32,372	691,357	700,000	-	-	-	28,693
2-Feb-02	658,455	32,372	690,827	700,000	-	-	-	28,693
3-Feb-02	657,940	32,372	690,312	700,000	-	-	-	28,693
4-Feb-02	656,783	32,372	689,155	700,000	-	-	-	28,693
5-Feb-02	654,026	32,372	686,398	700,000	-	-	-	28,693
6-Feb-02	652,128	32,372	684,500	700,000	-	-	-	28,693
7-Feb-02	651,570	32,372	683,942	700,000	-	-	-	28,693
8-Feb-02	652,128	32,372	684,500	700,000	-	-	-	28,693
9-Feb-02	652,128	32,372	684,500	700,000	-	-	-	28,693
10-Feb-02	652,259	32,372	684,631	700,000	-	-	-	28,693
11-Feb-02	651,591	32,372	683,963	700,000	-	-	-	28,693
12-Feb-02	650,922	32,372	683,294	700,000	-	-	-	28,693
13-Feb-02	650,232	32,372	682,604	700,000	-	-	-	28,693
14-Feb-02	649,824	32,372	682,196	700,000	-	-	-	28,693
15-Feb-02	649,624	32,372	681,996	700,000	-	-	-	28,693
16-Feb-02	650,032	32,372	682,404	702,182	-	-	-	28,693
17-Feb-02	651,405	32,372	683,777	704,364	-	-	-	28,693
18-Feb-02	652,575	32,372	684,947	706,545	-	-	-	28,693
19-Feb-02	653,281	32,372	685,653	708,727	-	-	-	28,693
20-Feb-02	658,598	32,372	690,970	710,909	-	-	-	28,693
21-Feb-02	666,786	32,372	699,158	713,091	-	-	-	28,693
22-Feb-02	674,144	32,372	706,516	715,273	-	-	-	28,693
23-Feb-02	680,727	32,372	713,099	717,455	-	-	-	28,693
24-Feb-02	685,322	32,372	717,694	719,636	-	-	-	28,693
25-Feb-02	687,811	32,372	720,183	721,818	-	-	-	28,693
26-Feb-02	691,643	32,372	724,015	724,000	15	-	-	28,693
27-Feb-02	694,386	32,357	726,743	726,182	561	-	-	28,693
28-Feb-02	698,917	31,796	730,713	728,364	2,349	-	-	28,693
1-Mar-02	703,159	29,447	732,806	730,545	2,060	-	-	28,693
2-Mar-02	707,155	27,386	734,541	732,727	1,814	-	-	28,693
3-Mar-02	710,373	25,572	735,945	734,909	1,036	-	-	28,693
4-Mar-02	711,120	24,536	735,656	737,091	-	-	-	28,693
5-Mar-02	710,805	24,536	735,341	739,273	-	-	-	28,693
6-Mar-02	721,130	24,536	745,666	741,455	4,212	-	-	28,693
7-Mar-02	722,717	20,325	743,042	743,636	-	-	-	28,693

**WATER TRANSFER REFILL ACCOUNTING EXAMPLE**

(all units are acre-feet)

Yuba County Water Agency-DWR

Transfer Amount	
30-Sep-01	102,912

1	2	3	4	5	6	7	8	9
Date	Actual Storage	Transfer Amount Account	Theoretical Storage	Target Storage	Impact Volume	Delta Condition (Balanced = 1)	Net Daily Impact	Impact Account
8-Mar-02	723,313	20,325	743,638	745,818	-	-	-	28,693
9-Mar-02	723,035	20,325	743,360	748,000	-	-	-	28,693
10-Mar-02	725,630	20,325	745,955	750,182	-	-	-	28,693
11-Mar-02	726,907	20,325	747,232	752,364	-	-	-	28,693
12-Mar-02	727,985	20,325	748,310	754,545	-	-	-	28,693
13-Mar-02	729,862	20,325	750,187	756,727	-	-	-	28,693
14-Mar-02	731,902	20,325	752,227	758,909	-	-	-	28,693
15-Mar-02	732,645	20,325	752,970	761,091	-	-	-	28,693
16-Mar-02	734,698	20,325	755,023	763,273	-	-	-	28,693
17-Mar-02	737,672	20,325	757,997	765,455	-	-	-	28,693
18-Mar-02	738,065	20,325	758,390	767,636	-	-	-	28,693
19-Mar-02	737,191	20,325	757,516	769,818	-	-	-	28,693
20-Mar-02	736,268	20,325	756,593	772,000	-	-	-	28,693
21-Mar-02	735,412	20,325	755,737	774,182	-	-	-	28,693
22-Mar-02	734,609	20,325	754,934	776,364	-	-	-	28,693
23-Mar-02	736,697	20,325	757,022	778,545	-	-	-	28,693
24-Mar-02	741,329	20,325	761,654	780,727	-	-	-	28,693
25-Mar-02	743,517	20,325	763,842	782,909	-	-	-	28,693
26-Mar-02	744,612	20,325	764,937	785,091	-	-	-	28,693
27-Mar-02	745,737	20,325	766,062	787,273	-	-	-	28,693
28-Mar-02	747,115	20,325	767,440	789,455	-	-	-	28,693
29-Mar-02	748,429	20,325	768,754	791,636	-	-	-	28,693
30-Mar-02	751,766	20,325	772,091	793,818	-	-	-	28,693
31-Mar-02	755,597	20,325	775,922	796,000	-	-	-	28,693
1-Apr-02	758,292	20,325	778,617	799,333	-	-	-	28,693
2-Apr-02	760,868	20,325	781,193	802,667	-	-	-	28,693
3-Apr-02	763,749	20,325	784,074	806,000	-	-	-	28,693
4-Apr-02	766,970	20,325	787,295	809,333	-	-	-	28,693
5-Apr-02	770,692	20,325	791,017	812,667	-	-	-	28,693
6-Apr-02	774,878	20,325	795,203	816,000	-	-	-	28,693
7-Apr-02	778,783	20,325	799,108	819,333	-	-	-	28,693
8-Apr-02	780,904	20,325	801,229	822,667	-	-	-	28,693
9-Apr-02	783,327	20,325	803,652	826,000	-	-	-	28,693
10-Apr-02	786,643	20,325	806,968	829,333	-	-	-	28,693
11-Apr-02	790,090	20,325	810,415	832,667	-	-	-	28,693
12-Apr-02	792,364	20,325	812,689	836,000	-	-	-	28,693
13-Apr-02	795,653	20,325	815,978	839,333	-	-	-	28,693
14-Apr-02	799,624	20,325	819,949	842,667	-	-	-	28,693
15-Apr-02	804,117	20,325	824,442	846,000	-	-	-	28,693
16-Apr-02	805,951	20,325	826,276	849,333	-	-	-	28,693
17-Apr-02	806,933	20,325	827,258	852,667	-	-	-	28,693
18-Apr-02	807,617	20,325	827,942	856,000	-	-	-	28,693
19-Apr-02	807,959	20,325	828,284	859,333	-	-	-	28,693
20-Apr-02	809,284	20,325	829,609	862,667	-	-	-	28,693
21-Apr-02	809,626	20,325	829,951	866,000	-	-	-	28,693
22-Apr-02	809,953	20,325	830,278	869,333	-	-	-	28,693
23-Apr-02	809,868	20,325	830,193	872,667	-	-	-	28,693
24-Apr-02	809,626	20,325	829,951	876,000	-	-	-	28,693
25-Apr-02	808,942	20,325	829,267	879,333	-	-	-	28,693
26-Apr-02	809,441	20,325	829,766	882,667	-	-	-	28,693
27-Apr-02	810,850	20,325	831,175	886,000	-	-	-	28,693
28-Apr-02	812,604	20,325	832,929	889,333	-	-	-	28,693
29-Apr-02	813,135	20,325	833,460	892,667	-	-	-	28,693
30-Apr-02	812,793	20,325	833,118	896,000	-	-	-	28,693
1-May-02	811,021	20,325	831,346	898,258	-	-	-	28,693
2-May-02	809,996	20,325	830,321	900,516	-	-	-	28,693
3-May-02	809,996	20,325	830,321	902,774	-	-	-	28,693
4-May-02	808,771	20,325	829,096	905,032	-	-	-	28,693
5-May-02	810,781	20,325	831,106	907,290	-	-	-	28,693
6-May-02	810,952	20,325	831,277	909,548	-	-	-	28,693
7-May-02	811,294	20,325	831,619	911,806	-	-	-	28,693
8-May-02	810,781	20,325	831,106	914,065	-	-	-	28,693
9-May-02	810,781	20,325	831,106	916,323	-	-	-	28,693
10-May-02	809,284	20,325	829,609	918,581	-	-	-	28,693
11-May-02	808,771	20,325	829,096	920,839	-	-	-	28,693
12-May-02	808,087	20,325	828,412	923,097	-	-	-	28,693

ACCOUNTING TO CONTINUE UNTIL SEPTEMBER 30 OR UNTIL REFILL IS NO LONGER POSSIBLE

## EXHIBIT 3

### GROUNDWATER MONITORING AND REPORTING PROGRAM

#### 1. Groundwater Monitoring

In cooperation with DWR, Yuba has monitored Yuba County groundwater conditions for many years, and many aspects of the groundwater resources are well known. Yuba and DWR have worked cooperatively to develop a groundwater transfer monitoring and reporting program specific to Yuba County for past groundwater substitution water transfers. Yuba has also developed a Groundwater Management Plan ("GMP"), which was adopted on March 1, 2005 pursuant to Water Code Sections 10750 *et seq.* The GMP formalizes a monitoring program that includes measuring water levels in wells that are part of a dedicated monitoring well network, a plan to expand the network, annual reporting provisions and other groundwater monitoring activities. Since 2005, Yuba has constructed eight additional groundwater monitoring wells for this program. (See DWR, Memorandum Report, "Monitoring Well Construction Technical Assistance," April 2007.) Information gathered from the activities specified in the GMP, along with the activities described in this exhibit, will be used to assess effects of groundwater pumping on groundwater resources, and to provide reasonable assurances that any water pumped and accounted for as part of any groundwater substitution is in lieu of surface water delivered by Yuba to its Member Units. Yuba will continue to work with DWR and the Member Units to identify and resolve any new groundwater monitoring issues.

a. The water levels in selected production wells geographically dispersed throughout each Member Unit participating in the groundwater substitution program will be measured by the Member Unit prior to the initial pumping for each year during which a groundwater substitution transfer will take place. Selection of these wells will be by mutual agreement by DWR and Yuba, in consultation with the Member Unit. Upon termination of pumping for the year, the water levels will be measured by the Member Units, and such measurements will continue on a monthly basis until water levels have recovered to the pre-pumping levels, or have stabilized. In no case will water-level measurements be required following spring high water levels in the year following the year of the groundwater substitution pumping. The Member Units will provide the water-level readings to Yuba within 15 days of each reading.

b. To supplement the GMP-specified monitoring program, water levels in each monitoring well in the Yuba network will be measured at least every two months by Yuba in each year during which a groundwater substitution transfer is to take place, commencing no later than April. Upon termination of pumping, the monitoring well water levels will be measured, and such measurements will continue on a monthly basis until water levels have recovered to the pre-pumping levels, or have stabilized. In no case will water-level measurements be required following spring high water levels in the year following the year of the groundwater substitution pumping. DWR and Yuba will cooperate in obtaining these measurements.



c. Readings of flow meters on the discharges of the wells will be recorded every month during the pumping period by Member Units for each production well. In addition, electric meter readings and fuel consumption for diesel pumps will be recorded by the Member Units, and made available to Yuba upon request. The quantities of water pumped between successive readings will be calculated by Member Units and reported to Yuba.

d. Electrical Conductivity ("EC") will be measured for water pumped from selected production wells at the initiation of pumping (or as soon thereafter as practicable), two months after the initial EC measurements and at the termination of pumping.

e. For selected production wells (to be identified before the monitoring plan is finalized) near Yuba monitoring wells, drawdown analyses (of distance and time) will be completed, and comparisons made to monitoring well water levels.

All monitoring data will be reported on a semi-monthly basis, and in an annual final summary report prepared by Yuba that will evaluate the impacts of the groundwater substitution pumping transfer program for that year. The final report will include water-level contour maps for the groundwater basin showing initial water levels and final, recovered water levels.

## **2. Groundwater Pumping Operations Plan**

This Agreement sets forth the procedures by which the total amount of water to be transferred will be determined. These amounts include Components 1, 2, 3 and 4 water. A portion of the Water will be from surface water and a portion may be provided through groundwater substitution pumping. Yuba will base the determination of the amount of water to be provided through groundwater substitution pumping (in consultation with the Member Units) by: (a) estimating the amount of surface water that will be transferred for the year by operation to the flow schedules in the Fisheries Agreement and the September 30 target New Bullards Bar Reservoir storage level; (b) determining the amount of water from groundwater substitution pumping that Member Units can make available through wells of farmers who are willing to participate in the program and whose farms are located within a participating Member Unit; and (c) determining the amount of water that can be pumped within the safe yield of the basin without contributing to long-term overdraft and without resulting in significant unmitigated impacts to other groundwater users in the basin.

This section sets forth the procedure that will be used to determine the amount of water that can be pumped within the safe yield of the basin without contributing to long-term overdraft, and without resulting in any significant unmitigated third-party ("Third Party" or "Third Parties") impacts to other groundwater users in the basin. Section 1 of this Exhibit describes the monitoring plan that will be used to obtain information from which the determination will be made of the condition of the groundwater basin in the spring of the year during which groundwater substitution pumping is planned. Based on this condition,

Yuba will determine the expected response of the basin to the proposed pumping for that year and the resulting condition of the basin at the conclusion of the pumping. Determination of the expected condition at the conclusion of the pumping will be made by examining the historic response of the basin during previous years when pumping occurred and by examining the recovery of the basin during pumping years and successive years, and by comparing these basin responses with the planned pumping. Analysis of the historical responses of the basin to pumping will be used to develop empirical relationships between pumping and basin drawdown and recovery. These empirically derived relationships will be the formulas that will be used to determine basin response to the proposed pumping.

The determination of basin response to the proposed pumping will result in an estimated basin condition at the end of pumping and an estimated condition for the spring of the next year. This estimated condition will be compared to historical groundwater levels in the basin. In 1991, Yuba and the Member Units completed a groundwater substitution transfer to provide water to other parts of California under the Governor's Emergency Drought Water Bank in response to a severe statewide drought. The groundwater levels that occurred in the fall of 1991 at the end of pumping did not result in any overdraft of the groundwater basin or any significant unmitigated Third-Party impacts. Groundwater levels had been lower than these levels during the 1980's, but the extent of effects of these lower levels on groundwater users in the basin is not well known. Therefore, the fall 1991 groundwater levels will be used for comparison with the estimated condition of the basin that will result from the proposed groundwater pumping under this Agreement and the Yuba River Accord.

If the estimated levels are above the fall 1991 levels, then significant unmitigated Third-Party impacts will not be expected. If the estimated levels are below the fall 1991 levels, then further examination of potential impacts and consultation with the Member Units and the GMP Water Advisory Group (discussed below) will be required. The GMP Water Advisory Group is a group that was formed under the GMP to provide input and guidance on groundwater issues. The GMP Water Advisory Group comprises representatives from local groundwater users, including municipal water purveyors, Member Units, reclamation districts and others. Groundwater substitution pumping that would result in levels near the fall 1991 levels will occur only if the Member Units agree to allow such pumping. Even if the determination is that estimated levels resulting from proposed pumping will be above the fall 1991 levels, the Member Units still will be consulted, and each Member Unit must individually approve the proposed pumping in its area or such pumping will not occur. If the amount of proposed pumping that will not cause fall groundwater levels to drop below 1991 levels cannot be confirmed using the procedures described above, then a lower amount of pumping that satisfies the conditions of this section will be determined using these procedures. The Yuba Board reserves the right to restrict the maximum amount of groundwater substitution pumping and the right to resolve any disputes in the Water Advisory Group regarding maximum amount of groundwater pumping.

If for any year the total amount of groundwater pumping that is determined to be acceptable under this section is less than the total amount of Components 1, 2 and 3 water

that is provided for in the Agreement, minus the amount of surface water to be transferred, then Yuba may either: (a) use additional surface water through supplemental surface water transfers to provide Components 1, 2 and 3 water; or (b) advise DWR that the total unmet amount of Components 1, 2 and 3 water will not be provided during the present year and instead will be owed to the Buyer and repaid in a manner detailed in **Exhibit 1** of this Agreement

### **3. Third-Party Impacts Action Plan**

The purpose of this Third-Party impacts action plan is to describe actions that will be undertaken by Yuba and Member Units to respond to impacts to Third Parties that occur because of groundwater substitution pumping for transfers under this Agreement. Third Parties include local groundwater users that could be affected by fluctuations in groundwater levels because of the pumping of such groundwater substitution water. Yuba and the Member Units agree that prompt responses to and mitigation of potential impacts to Third Parties are an important requirement for Yuba's present and future groundwater substitution transfers.

This action plan includes a series of steps that will be taken to ensure that the groundwater substitution component of this Agreement and the Yuba River Accord does not cause significant, unmitigated impacts to Third Parties. Under this action plan, groundwater substitution pumping must not produce significant unmitigated impacts on Third Parties, impacts must be identified and mitigated as quickly as possible, and there must be ongoing, open communications with affected Third Parties. Because not all potential impacts can be known in advance, this plan provides a process for responding to concerns expressed by local groundwater users who believe that their water-production facilities are being or will be impacted by groundwater substitution pumping under this Agreement and the Yuba River Accord.

As a contractual condition of a Member Unit participating in the groundwater substitution component of this Agreement and the Yuba River Accord, the Member Unit will identify a contact person or persons who will be responsible for initially responding to a notification of a potential Third-Party impact, and take the other action specified in this section. The contact person for a Member Unit will be the person designated by the Member Unit. The responsibilities of Yuba under this action plan will be carried out by the General Manager, or by a person designated by the General Manager. The contact persons for the Member Units will also serve on a Yuba Groundwater Substitution Program Advisory Group ("Advisory Group") for either the area north of the Yuba River or the area south of the Yuba River.

Upon either Yuba or the Member Unit receiving notification of a potential Third-Party impact, Yuba or the Member Unit will immediately notify the other party of the nature of the potential impact. The Member Unit will promptly (within one day) contact the Third Party and obtain all available information regarding the nature and extent of the potential

impact, and provide that information to Yuba. The Member Unit also will regularly update Yuba on the status of the Member Unit's response.

If the Third Party is not within the boundaries of any Member Unit of Yuba, then Yuba will either: (a) determine if it is evident that the Third Party is in close proximity to the groundwater-production facilities within a Member Unit that are involved in the groundwater substitution program, and designate the Member Unit or Member Units responsible for responding to the potential impact; or (b) consult with the Advisory Group concerning which Member Unit or Member Units should be designated for responding to the potential impact.

After the Third Party has been contacted and the relevant information regarding the potential impact has been received, the Member Unit will develop an approach (subject to approval by Yuba) to: (a) determine whether the Third Party has actually been impacted by groundwater pumping by the Member Unit, and, if so; (b) mitigate for the impact. Yuba will be available to provide assistance to the Member Unit in developing the foregoing approach. Yuba and the Member Unit will consult with the applicable Advisory Group in developing the approach referred to in this section.

Yuba will resolve any dispute concerning implementation of this action plan, including which Member Unit will be responsible for mitigating a potential impact, whether it is reasonably likely that there was a Third-Party impact, and the measures to be taken by the Member Unit to mitigate the impact. If a Member Unit fails to carry out its responsibilities under this action plan, then Yuba will be authorized (but not required) to perform the responsibilities of the Member Unit and recover its reasonable costs in doing so from the Member Unit, including deducting these costs from payments due the Member Unit for the groundwater substitution transfer. Yuba will consult with the applicable Advisory Group in carrying out its responsibilities under this section.

It is the intention of this action plan that: (a) any Third-Party impact that is reasonably likely to have been caused by implementation of the groundwater substitution program will be promptly and substantially mitigated; (b) as to any Third-Party impact that is not reasonably likely to have been caused by implementation of the groundwater substitution program, the Third Party will be provided information to reasonably demonstrate the reasons that there were no impacts; and (c) Yuba, the Member Units and the Advisory Group will be involved in the implementation of this action plan. Actions that will be taken to mitigate an impact include, but are not limited to, deepening of the impacted Third Party's well or lowering of pump bowls, cessation of pumping in the area of the impacted well, and providing a temporary or permanent alternative water supply to the Third Party.

## EXHIBIT 4

### State of California – Department of Water Resources

#### Agreement for the Long-term Purchase of Water from Yuba County Water Agency by the Department of Water Resources

#### STANDARD CLAUSES

*Worker's Compensation Clause.* Contractor affirms that it is aware of the provisions of Section 3700 of the California Labor Code which require every employee to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor affirms that it will comply with such provisions before commencing the performance of work under this Agreement.

*Nondiscrimination Clause.* During the performance of this Agreement, Contractor and its subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, physical disability (including HIV and AIDS), mental disability, medical condition (cancer), age (over 40), marital status, and denial of family care leave. Contractor and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Contractor and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Gov. Code §12990 (a-f) et seq.) and the applicable regulations promulgated thereunder (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12990 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. Contractor and its subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other Agreement.

Contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Agreement.

*Compliance with Laws, Regulations, Permit Requirements.* Contractor shall at all times comply with, and require its contractors and subcontractors to comply with, all applicable federal and State laws, rules and regulations, permits and all applicable local ordinances, specifically including but not limited to environmental, procurement and safety laws, rules, regulations, permits and ordinances.

*Availability of Funds.* Work to be performed under this contract is subject to the availability of funds through the State's normal budget process.

*Audit Clause.* For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after the final payment under the contract (Government Code Section 8546.7).

*Payment Retention Clause.* Ten percent of any progress payments that may be provided under this contract shall be withheld per Public Contract Code Sections 10346 and 10379 pending satisfactory completion of all services under the contract.

*Reimbursement Clause.* If applicable, travel and per diem expenses to be reimbursed under this contract shall be at the same rates the State provides for unrepresented employees in accordance with the provisions of Title 2, Chapter 3, of the California Code of Regulations. Contractor's designated headquarters for the purpose of computing such expenses shall be: 1402 D Street, Marysville, California 95901-4226.

*Drug-Free Workplace Certification.* By signing this contract, the Contractor or grantee hereby certifies under penalty of perjury under the laws of the State of California that the Contractor or grantee will comply with the requirements of the Drug-Free Workplace Act of 1990 (Government Code Section 8350 et seq.) and will provide a drug-free workplace by taking the following actions:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.
2. Establish a Drug-Free Awareness Program to inform employees about all of the following:
  - (a) The dangers of drug abuse in the workplace,
  - (b) The person's or organization's policy of maintaining a drug-free workplace,
  - (c) Any available counseling, rehabilitation, and employee assistance programs; and
  - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Every employee who works on the proposed contract or grant:
  - (a) Will receive a copy of the company's drug-free policy statement, and
  - (b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract or grant.

This contract or grant may be subject to suspension of payments or termination, or both, and the contractor or grantee may be subject to debarment if the Department determines that: 1) the Contractor or grantee has made a false certification, or 2) the Contractor or grantee violates the certification by failing to carry out the requirements noted above.

*Americans with Disabilities Act.* By signing this contract, Contractor assures the State that it complies with the Americans With Disabilities Act (ADA) of 1990, 942 U.S.C.12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

*Conflict of Interest.* Current State Employees: a) No officer or employee shall engage in any employment activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity or enterprise is required as a condition of regular State employment. b) No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.

Former State Employees: a) For the two year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. b) For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.

*Child Support Compliance Act.* For any agreement in excess of \$100,000, the Contractor acknowledges in accordance herewith, that:

1. The Contractor recognizes the importance of child and family support obligations and shall full comply with all applicable State and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earning assignment orders, as provided in Chapter 8 (commencing with Section 5200) of Part 5 of Division 9 of the Family Code; and
2. The Contractor, to the best of its knowledge, is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the Employment Development Department.

*Air or Water Pollution Violation.* Under the State laws, the Contractor shall not be: 1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; 2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste

discharge requirements or discharge prohibitions; or 3) finally determined to be in violation of federal law relating to air or water pollution.

*Union Organizing.* For all contracts, except fixed price contracts of \$50,000 or less, the Contractor acknowledges that: by signing this Agreement the Contractor hereby acknowledges the applicability of Government Code Section 16645 through Section 16649 to this Agreement and agrees to the following:

- (a) Contractor will not assist, promote or deter union organizing by employees performing work on a State service contract, including a public works contract.
- (b) No State funds received under this Agreement will be used to assist, promote or deter union organizing.
- (c) Contractor will not, for any business conducted under this Agreement, use any State property to hold meetings with employees or supervisors, if the purpose of such meetings is to assist, promote or deter union organizing, unless the State property is equally available to the general public for holding meetings.
- (d) If Contractor incurs costs or makes expenditures to assist, promote or deter union or organizing, Contractor will maintain records sufficient to show that no reimbursement from State funds has been sought for these costs, and that the Contractor shall provide those records to the Attorney General upon request.

*Recycling Certification.* Contractor shall certify in writing under penalty of perjury, the maximum, if not exact, percentage of recycled content, both post consumer water and secondary waste as defined in Public Contract Code, Section 12161 and 12200, in materials, goods, or supplies offered or products used in the performance of this Agreement, regardless of whether the product meets the required recycled product percentage as defined in Public Contract Code, Sections 12161 and 12200. Contractor may certify that the product contains zero content. (PCC 10233, 10308.5, 10354)



**STATE OF CALIFORNIA  
THE RESOURCES AGENCY  
DEPARTMENT OF WATER RESOURCES  
AND  
YUBA COUNTY WATER AGENCY**

**AMENDMENT NO. 5 TO THE  
AGREEMENT FOR THE LONG-TERM PURCHASE OF WATER FROM YUBA  
COUNTY WATER AGENCY BY THE DEPARTMENT OF WATER RESOURCES  
SWPAO NO. 14-851**

This Amendment No. 5 (Amendment) to the December 4, 2007 Agreement for the Long-Term Purchase of Water from Yuba County Water Agency by the Department of Water Resources, as amended from time to time (Agreement), is entered into as of \_\_\_\_\_, 2014, between the Department of Water Resources of the State of California (DWR), pursuant to the provisions of the California Water Resources Development Bond Act, the Central Valley Project Act, and other applicable laws of the State of California, and Yuba County Water Agency (Yuba), pursuant to the Yuba Act (California Statutes 1959, Chapter 788, as amended), and other applicable laws of the State of California. Except as provided for in this Amendment, defined terms in the Agreement will have the same meaning in this Amendment.

The Parties hereby amend the Agreement as follows:

1. **Recitals.** The Recitals Section of the Agreement is amended by adding the following new recitals:

“N. The Parties amended the Agreement in 2009 (Amendment No. 1 and Amendment No. 2), 2010 (Amendment No. 3) and 2012 (Amendment No. 4).

O. Under Section 15 of the Agreement, the pricing provisions for Water that is made available after September 30, 2015 will be subject to a new pricing agreement among the Parties. Amendment 5 memorializes the agreement of the Parties under Section 15 of the Agreement, as well as amending other provisions of the Agreement.

P. On June 9, 2014, the State Board approved Yuba’s petition to change water right permit 15026 to add a point of rediversion at the point of diversion for the Freeport Regional Water Project. The State Board’s order determined that the ordering conditions satisfied the State Board’s public trust responsibility, relying on the Yuba Accord Environmental Impact Report and an addendum to the Yuba Accord Environmental Impact Report that was prepared by Yuba.”

2. **Definitions.** Section 1 of the Agreement is amended by inserting in proper alphabetical order, the following new defined terms:

A. “Accrued Groundwater Substitution Component” water means the amount of surface water in New Bullards Bar Reservoir that results from Yuba’s groundwater substitution pumping program established by Yuba and its Member Units under their Conjunctive Use Agreements for making available Groundwater Substitution Component water.”

**B.** “Freeport POD” means the point of diversion for the Freeport Regional Water Project, as described in the June 9, 2014 order of the State Board that approved the Freeport POD as an authorized point of rediversion for Yuba transfer water.”

**C.** “Participating Contractors” means all SWP contractors and CVP contractors who have executed an agreement with DWR to be entitled to receive water supplies under the Agreement.”

**D.** "State Board Order" means State Board Corrected Order WR 2008-0014, which amended Yuba’s Water Right Permits 15026, 15027 and 15030 to include, with some modifications, the streamflow requirements in the Fisheries Agreement and by adding, through December 31, 2025, the SWP and CVP Delta diversion facilities as points of rediversion, and the SWP and CVP service areas to the place of use, under Permit 15026.”

**3. Section 5.A.2.** Section 5.A.2. of the Agreement is amended to read as follows:

“2. In certain years, and pursuant to the accounting principles set forth in Exhibit 1 to the Agreement, operational limitations of the Yuba Project, the CVP, and/or the SWP may cause the quantity of Component 1 Water that Yuba can deliver to the Buyer to be reduced below 60,000 acre-feet during a Water Accounting Year. Under those circumstances, unless the Parties agree otherwise, Yuba will deliver the undelivered Component 1 Water from the 2011 Water Accounting Year and the quantity (if any) of undelivered Component 1 Water from the 2015 Water Accounting Year during subsequent years under the following conditions: (a) during the next Water Accounting Year that is not a Dry or Critical Water Year; (b) when such make-up water can be

delivered from Yuba's available surface-water supply;  
(c) notwithstanding any other provision of the Agreement, as the first Delivered Transfer Water provided in the first Water Accounting Year after 2015 that has a Final Classification either as Wet, Above Normal, or Below Normal at the rate of 60,000 acre-feet per year until fully repaid; and (d) on a schedule that is acceptable to the Buyer and Yuba. Yuba will not be required to provide a makeup supply for an account deficit of Component 1 Water that was incurred on or after January 1, 2016. In any year starting in the 2016 Water Accounting Year that Yuba provides a makeup supply of Component 1 Water, Yuba will not be obligated to also provide the quantity of Component 1 Water that is provided for in section 25.C.1 of the Agreement."

4. **Section 5.A.4.** Section 5.A.4. of the Agreement (Component 1 Water Quantity during the term of an FERC Annual License) is deleted as of October 1, 2015.
5. **Section 5.C.** Section 5.C. of the Agreement is amended to read as follows:

**“C. Invoicing.** Yuba will invoice DWR for Component 1 Water made available starting January 1, 2016 in the same manner that Yuba invoices DWR for Component 2 Water and Component 3 Water except that, in those years when Yuba is delivering the remaining undelivered quantity of the 480,000 acre-feet of Component 1 Water, Yuba will reduce its invoice for current year Component 1 deliveries by the amount of water being delivered to repay the remaining undelivered quantity of the 480,000 acre-feet of Component 1 Water.”

6. **Section 6.A.** Section 6.A. of the Agreement is amended by adding at the end the following new paragraph:

“5. Yuba will not be required to provide a makeup supply for an account deficit of Component 2 Water that existed before or after the effective date of Amendment 5 to the Agreement.”

7. **Section 6.C.1** Section 6.C.1. of the Agreement is amended by changing the date of June 1 to the date of May 22.

8. **Section 7.A.** Section 7.A. of the Agreement is deleted.

9. **Section 7.B.1.** Section 7.B.1. of the Agreement is amended by deleting subpart f.

10. **Section 7.C.1.** Section 7.C.1. of the Agreement is amended by changing the date of June 1 to the date of May 22.

11. **Section 7.C.** Section 7.C. of the Agreement is amended by adding at the end the following new paragraph:

“3. Yuba will not be required to provide a makeup supply for an account deficit of Component 3 Water that existed before or after the effective date of Amendment 5 to the Agreement.”

**12. Section 8.B.** Section 8.B. of the Agreement is amended to read as follows:

**B.** Provisions Applicable to Groundwater Substitution Component Water as of the Effective Date of Amendment 5 to the Agreement. Notwithstanding any other provision of the Agreement (including Amendment 4 to the Agreement), the following provisions will apply to Groundwater Substitution Component Water that is made available by Yuba after January 1, 2016:

1. Yuba is not required to provide Groundwater Substitution Component water for any purpose under the Agreement except upon pricing and other terms that are agreed to by Yuba and the Member Units, which are also agreed to by DWR and the Participating Contractors.

2. Yuba is not required to provide Groundwater Substitution Component water for delivery of Component 1 Water, Component 2 Water or Component 3 Water. Sections 7.2.2, 7.2.3 and 7.2.4 of Exhibit 1 of the Agreement are inapplicable to Groundwater Substitution Component water.

3. Groundwater Substitution Component water will be the only water that comprises Component 4.

4. Yuba will notify DWR by April 1 of each year during the term of this Agreement of the amount of Accrued Groundwater Substitution Component water that Yuba will make available during the Water Accounting Year. By April 15, DWR will notify Yuba of the amount of Accrued Groundwater Substitution Component water it commits to purchase based on requests by Participating

Contractors. DWR may adjust this amount, up or down, on or before May 15, and on May 15 DWR will commit to the final quantity of Accrued Groundwater Substitution Component water to be purchased during the Water Accounting Year, but such amount will not be less than the actual amount of Accrued Groundwater Substitution Component water made available between April 1 and May 15 for Groundwater Substitution Component water in accordance with the accounting provisions for Groundwater Substitution Component water set forth in Exhibit 1 of the Agreement. The dates herein may be adjusted if approved in writing by Yuba and DWR to allow the Member Units to maximize the quantities of groundwater substitution pumping program water that could be made available during each year.

**5.** In every year that DWR desires to purchase Accrued Groundwater Substitution Component water, representatives of DWR, Yuba, the Member Units and the Participating Contractors will convene by February 15 and conclude by March 31 as the Management Committee to negotiate the price per acre-foot of Accrued Groundwater Substitution Component water, any provisions for the Delta export priority for such water and any other terms applicable to the Accrued Groundwater Substitution Component water. The 30,000 acre-feet of Groundwater Substitution Component water that Yuba is required to provide in a Schedule 6 Year under term 1a of the State Board Order will be Accrued Groundwater Substitution Component water for all purposes under the Agreement, except that, the Member Units will not be involved in the negotiation of the price for this water supply.

**6.** In every Water Accounting Year when: (1) one or more Participating Contractor(s) desire to purchase Accrued

Groundwater Substitution Component water; (2) the annual negotiations referenced in Paragraph 5 above have reached a successful conclusion calling for the purchase of such water in that year; (3) the Management Committee representatives for Yuba, the Authority, and the State Water Contractors have agreed as to the terms of, and each of these representatives has recommended in writing said terms and the approval of, a letter agreement between Yuba and DWR establishing the price per acre-foot and any other modified terms that will be applicable to the Accrued Groundwater Substitution Component water for that Water Accounting Year; and (4) DWR and Yuba have executed said letter agreement, DWR will offer in writing to Participating Contractors the opportunity to purchase Accrued Groundwater Substitution Component water at the price and terms as provided in the letter agreement between DWR and Yuba.

7. Yuba will confirm on a monthly basis the quantities of the Accrued Groundwater Substitution Component water and the quantities of Groundwater Substitution Component water released as Released Transfer Water, in accordance with the accounting provisions for Groundwater Substitution Component water set forth in Exhibit 1 of the Agreement.

8. DWR will provide Yuba not less than 72 hours' notification for suspension or termination of groundwater pumping due to limitations on the ability of DWR to divert and use the Groundwater Substitution Component water. In the event of such a suspension or termination of Groundwater Substitution Component water, DWR will pay for the quantity of Accrued Groundwater Substitution Component water up to and including through the 72-hour notification of suspension or termination (i.e., DWR will pay



for the quantity of Accrued Groundwater Substitution Component water through the notice period irrespective of whether DWR was able to divert and use the Accrued Groundwater Substitution Component water).

**9.** Pursuant to the negotiations described in Paragraph 5 above, if the Management Committee so determines, DWR will require any Participating Contractor requesting Groundwater Substitution Component water to schedule this water with the Delta conveyance priority in relation to any other transfer water that DWR conveys at the Harvey O. Banks Pumping Plant for these same Participating Contractors that has been agreed to by the Management Committee, provided that the Groundwater Substitution Component water will not have a higher priority than Storage Component water provided under the Agreement.

**10.** Pursuant to the negotiations described in Paragraph 5 above, if the Management Committee so determines, DWR will require that the Authority schedule Groundwater Substitution Component water with the Delta conveyance priority in relation to any other transfer water that the Authority schedules for conveyance at the Harvey O. Banks Pumping Plant or at the C.W. Jones pumping plant for the members of the Authority that will receive water pursuant to this Amendment that has been agreed to by the Management Committee, provided that the Groundwater Substitution Component water will not have a higher priority than Storage Component water provided under the Agreement.

**11.** Except as otherwise provided herein, Groundwater Substitution Component water and Accrued Groundwater

Substitution Component water will be accounted for in accordance with the provisions of the Agreement.

12. Consistent with the water accounting principles set forth in Exhibit 1 to the Agreement, Yuba agrees that making the Groundwater Substitution Component water available in any Water Accounting Year will not affect the quantity of Storage Component water that Yuba makes available in that year or thereafter.”

13. **Section 8.C.** Section 8.C. of the Agreement is amended to read as follows:

**“C. Groundwater Substitution Payment Provisions**

1. DWR will pay Yuba the per acre foot price for the amount of Accrued Groundwater Substitution Component that DWR has committed to purchase in the letter agreement described in this Section, unless this amount is reduced as provided for under Section 8.B.8 or is reduced because the Yuba Member Units do not pump the requested quantity of groundwater substitution pumping program water for the Groundwater Substitution Component water.

2. The Parties acknowledge that Section 5.1.8 of the Yuba Accord Fisheries Agreement allows the River Management Team to schedule the release of a portion of Groundwater Substitution Component water at a time when it might not be transferable. DWR will not be required to pay for the portion (if any) of Groundwater Substitution Component water that is scheduled for release in accordance with the provisions of Section 5.1.8 of the Yuba Accord Fisheries Agreement to the extent that this quantity of Groundwater Substitution Component water is not transferable

under the accounting provisions set forth in Exhibit 1 of the Agreement.”

14. **Section 8.** Section 8 of the Agreement is amended by adding at the end the following new subparagraph:

**“D. Groundwater Substitution Water Invoicing**

1. On or about May 22 in each year that DWR has agreed to purchase Accrued Groundwater Substitution Component water, Yuba will submit an invoice to DWR for 50 percent of the amount of Accrued Groundwater Substitution Component water that DWR has committed to purchase in the letter agreement described in this section during the current Water Accounting Year.

2. On or about August 30 in each year that DWR has agreed to purchase Accrued Groundwater Substitution Component water, Yuba will submit an invoice to DWR for 100 percent of the amount of Accrued Groundwater Substitution Component water DWR has committed to purchase in the letter agreement described in this section or that is otherwise payable under Section 8 during the current Water Accounting Year, less the amount of prior invoices for such Accrued Groundwater Substitution Component water during the current Water Accounting Year.

3. Within 60 days of the date that DWR receives an invoice from Yuba, DWR will submit payment to Yuba. DWR’s payment will be reduced by 10 percent to allow accounting adjustments (if necessary) in the final payment to Yuba for the Accrued Groundwater Substitution Component water.

4. Approximately 30 days after the end of the release of groundwater substitution transfer water from New Bullards Bar Reservoir, after confirmation of the amount of groundwater substitution transfer water has been completed, and after Yuba and DWR have reached agreement on the final accounting, Yuba will provide to DWR in a final invoice that is undisputed and as required under the Agreement, an amount for final payment for Accrued Groundwater Substitution Component water provided under Section 8. The final payment for Accrued Groundwater Substitution Component water will reflect any adjustments necessary to account for the total quantity of Accrued Groundwater Substitution Component water payable under Section 8 and any adjustments provided for under Section 8.B.8.

5. If payments from any contractors to DWR for Accrued Groundwater Substitution Component water are delinquent, DWR will make partial payments to Yuba by the invoice due dates by remitting the amounts received pursuant to the invoice as of the due date. DWR will pay any delinquent portion to Yuba as soon as DWR receives the delinquent payments.

6. The agreements between DWR and the Participating Contractors provide for a Participating Contractor to pay interest on delinquent payments at the rate of 1 percent per month from the due date until paid in full. DWR will assess and use reasonable efforts to collect such interest from Participating Contractors who are delinquent in making payments to DWR for invoices under the Agreement, and DWR will pay such interest collected along with the payments on invoices to Yuba.”

15. **Section 11.F.** Section 11.F. of the Agreement is amended to read as follows:

**“F. Reservation of the Right of Yuba to Transfer Certain Quantities of Water to a Third Party.**

1. As provided in Section 25.B. of the Agreement, DWR will purchase all Storage Component water that is accounted for as Delivered Transfer Water. The Parties will estimate as expeditiously as possible during each year whether Storage Component water is likely to be accounted for as Delivered Transfer Water in that Water Accounting Year. Yuba may transfer any quantity of Released Transfer Water that DWR determines will not be accounted for as Delivered Transfer Water to a “Third Party.” A Third Party as defined in this Section 11 includes an agency, entity or individual that is other than: (a) DWR; (b) a Participating Contractor; or (c) a member unit, customer, landowner or any other entity within the boundaries of a Participating Contractor. This type of water transfer is referred to as the “First Type of Third-Party Transfer.” Yuba may transfer the First Type of Third-Party Transfer water for diversion at any diversion facility that is a current or future authorized point of redirection for Yuba transfer water, except that, the First Type of Third-Party Transfer can be diverted at diversion facilities for Contra Costa Water District, if authorized, and if the diversion does not adversely affect the operation of the Projects during Balanced Conditions or at any other time that such diversion would directly or indirectly require the Projects to release water from storage or to reduce their diversion or redirection of water from the Delta to provide or assure flow in the Delta required to meet any applicable provision of state or federal law. In order to implement the First Type of Third-Party Transfer, Yuba reserves the right to notify DWR on or before September 1 to not back a specified quantity of Released Transfer Water into Project storage

after September 30 of a Water Accounting Year. DWR reserves the right on or before September 15 to notify Yuba that DWR will purchase the specified quantity of water at current year pricing.

2. Notwithstanding Paragraph 1, beginning in the 2016 Water Accounting Year, Yuba may transfer up to 10,000 acre-feet per year of Released Transfer Water to a Third Party that would otherwise have been made available to DWR and the Participating Contractors as Component 2 Water or Component 3 Water under the Agreement (referred to as the “Second Type of Third-Party Transfer”), subject to the following: (a) The Second Type of Third-Party Transfer can be diverted: (i) at the Freeport POD; (ii) at a point of diversion North of the Freeport POD, if authorized; (iii) at diversion facilities for Contra Costa Water District, if authorized, and if the diversion does not adversely affect the operation of the Projects during Balanced Conditions or at any other time that such diversion would directly or indirectly require the Projects to release water from storage or to reduce their diversion or redirection of water from the Delta to provide or assure flow in the Delta required to meet any applicable provision of state or federal law; (b) Yuba will use reasonable efforts to transfer the Second Type of Third-Party Transfer during times when Yuba Storage Component water could not otherwise be accounted for as Delivered Transfer Water, as a way of minimizing to the extent feasible reductions in the quantities of Component 2 Water and Component 3 Water that Yuba makes available to DWR and the Participating Contractors; and (c) To the extent needed to preserve the benefit of the 80% payment for Component 2 Water (as provided in Section 26) that DWR and the Participating Contractors would have received that year but for a Second Type of Third-Party Transfer, Yuba will adjust the invoice for payments for Component 1 water at 80% for the

quantity of the Second Type of Third-Party Transfer. The following hypothetical example illustrates this provision (c) to preserve benefits of Component 2 pricing: if in a Critical Year, there would have been 90,000 acre-feet of Delivered Transfer Water (which would have been allocated 60,000 acre-feet for Component 1 and 30,000 acre-feet for Component 2), and Yuba carries out a Second Type of Third-Party Transfer in the amount of 10,000 acre-feet that was transferred during times when Yuba Storage Component water would have been accounted for as Delivered Transfer Water, then the payment for 50,000 acre-feet of Component 1 Water would be at \$300 per acre foot, the payment for 10,000 acre-feet of Component 1 Water would be at \$240 per acre foot (reflecting the 80% Component 2 Water) and the payment for 20,000 acre-feet of Component 2 Water would be at \$240 per acre foot.

**3.** So long as a First Type of Third-Party Transfer or a Second Type of Third-Party Transfer is carried out consistent with the transfer water accounting provisions of Exhibit 1 for Released Transfer Water during Balanced Conditions, DWR and the Participating Contractors will not object based on the use of the transfer water accounting provisions of Exhibit 1 to such a transfer as not protective of DWR and the Participating Contractors as legal users of water. Except as provided in Section 11.F.2 above, Yuba may conduct Third-Party transfers provided that such transfers will not impair Yuba's ability to meet its obligations under this Agreement. Any agreement between DWR and a Participating Contractor to implement Amendment 5 will contain provisions that are consistent with this subsection. Yuba will provide DWR with ten days' advance notice of a Yuba water transfer to a Third Party. Yuba may transfer Storage Component water to a Third Party only in accordance with this Section 11.F.

4. So long as a transfer of Accrued Groundwater Storage Component water is carried out consistent with the transfer water accounting provisions of Exhibit 1 for Released Transfer Water during Balanced Conditions, Yuba may sell to a Third-Party any quantity of Accrued Groundwater Substitution Component water for which there is no agreement for DWR and the Participating Contractors to purchase pursuant to the negotiations described in Paragraphs 5 and 6 of Section 8.B. and DWR and the Participating Contractors will not object based on the use of the transfer water accounting provisions of Exhibit 1 to such a transfer as not protective of DWR and the Participating Contractors as legal users of water. Any agreement between DWR and the Participating Contractors to implement Amendment 5 will contain provisions that are consistent with this subsection. Yuba will provide DWR with ten days' advance notice of a Yuba water transfer to a Third-Party. Yuba may transfer Accrued Groundwater Component water to a Third Party only in accordance with this Section 11.F.”

16. **Section 11.** Section 11 of the Agreement is further amended by adding at the end the following new subparagraphs:

“H. The Water Scheduling and Accounting Principles (Exhibit 1) of the Agreement: (a) are intended to provide long-term protection of legal users of water (including without limitation, DWR, Participating Contractors, the SWP and the CVP) from injury from Yuba water transfers; (b) apply throughout the term of the Agreement to Yuba water transfers made available under the Agreement; and (c) are not subject to adjustment due to any regulatory actions (including actions regarding instream flows) that



concern Yuba's water rights permits or licenses, a FERC Annual License, the FERC Long-Term License or a Water Quality Certification issued by the State Board in relation thereto. If there is a regulatory action that requires a change in the operation of the Yuba Project, then Yuba will promptly notify DWR and discuss with DWR and the Participating Contractors the extent to which such action would affect the ability of Yuba to deliver Storage Component or Groundwater Substitution Component water under this Agreement.

I. Yuba has no obligation to make available Storage Component or Groundwater Substitution Component water after September 30, 2020, and DWR and the Participating Contractors have no obligation to pay for such water, unless and until the Parties have entered into an amendment to the Agreement for that purpose.”

- 17. Section 12.** Section 12 of the Agreement is amended by deleting Subparagraph B. (Payments for Fixed Annual Costs and for Environmental Compliance) and Subparagraph C. (Payments for Adjustments in Groundwater O&M Costs).

- 18. New Sections 25 and 26.** The Agreement is amended by adding at the end the following new sections:

**“25. Storage Component Water.** Notwithstanding any other provision of the Agreement, the following provisions will apply to Storage Component water that is made available by Yuba:

**A.** Following the effective date of Amendment 5 to the Agreement, Yuba will provide an invoice for payment by DWR to Yuba of \$20,000,000 (Prepayment) by wire transfer instructions provided by Yuba. Payment of this invoice will be due no later than December 31, 2014. Yuba understands that DWR will make arrangements for Participating Contractors to provide the funding for this purpose to DWR. After DWR has obtained contractual commitments from Participating Contractors to fund the Prepayment, then DWR will process one or more wire transfers to Yuba of partial funding of the Prepayment as funds are received by DWR from the Participating Contractors until the full amount of the Prepayment has been made. The Prepayment will be credited by Yuba toward payments due on invoices for Storage Component water that has been accounted for as Delivered Transfer Water that is made available starting October 1, 2015. In the event that there are Prepayment funds that have not been fully credited for Storage Component water that has been accounted for as Delivered Transfer Water that is made available through September 30, 2020, then these remaining funds will be: (1) applied to future payments due by DWR to Yuba for Storage Component Delivered Transfer Water delivered on or after October 1, 2020 under a subsequent amendment between the Parties at the prices provided in Section

26 of the Agreement, (as added by Amendment 5); or (2) if there is no such amendment, refunded by Yuba to DWR.

**B.** DWR will purchase under the terms set forth in Amendment 5 to the Agreement, all Storage Component water that Yuba makes available from October 1, 2015 through September 30, 2020 that is accounted for as Delivered Transfer Water under the accounting rules set forth in Exhibit 1 to the Agreement, except that DWR is not required to pay for Storage Component water that Yuba transfers to a Third-Party as provided in Section 11.F. of the Agreement, as amended. The Parties expect that DWR will enter into agreements with the Participating Contractors to provide funding for such payments.

**C.** Subject to the provisions of Section 11 of the Agreement, as amended, Yuba will make the following quantities of Storage Component water available in each Water Accounting Year from January 1, 2016 through December 31, 2020.

- 1. Component 1.** 60,000 acre-feet per year of Component 1 Water.
- 2. Component 2.** 15,000 acre-feet in a Final Classification Dry Year and 30,000 acre-feet in a Final Classification Critical Year of Component 2 Water.
- 3. Component 3.** Any quantity of Storage Component water in excess of the amount of Component 1 and Component 2 Water will be considered Component 3 Water. Yuba will optimize to the extent feasible the operation of the

Yuba Project to make Component 1, 2 and 3 Water available.

**26. Payments.** In accordance with Section 15 of the Agreement, the Parties have met, conferred and agreed upon the following pricing for Storage Component Water made available from October 1, 2015 through September 30, 2020. DWR will make the following payments to Yuba for Storage Component water made available during this time period, except that, the payment for Component 2 Water will be 80% of these amounts:

- A. Wet Year.** \$50 per acre foot in a Final Classification Wet Water Year.
  
- B. Above-Normal Year.** \$100 per acre foot in a Final Classification Above-Normal Water Year.
  
- C. Below-Normal Year.** \$150 per acre foot in a Final Classification Below-Normal Water Year.
  
- D. Dry-Year.** \$200 per acre foot in a Final Classification Dry Water Year (except as provided in subsection 6, below).
  
- E. Critical Year.** \$300 per acre foot in a Final Classification Critical Water Year (except as provided in subsection 6, below).
  
- F. Consecutive Dry or Critical Years.** \$350 per acre foot in two or more consecutive Final Classification Dry Water Years (or a Dry Year following a Critical Year) or in two or more consecutive Final Classification Critical Water Years.”

19. **DWR Agreements with Participating Contractors.** Nothing in the terms of an agreement between DWR and the Participating Contractors that implements this Amendment will be inconsistent with DWR's or Yuba's obligations under this Amendment.
  
20. **Effective Date of this Amendment.** Section 25.A. of the Agreement (Prepayment) will become effective upon execution by the Parties of this Amendment. Section 26 of the Agreement (Payments) will become effective October 1, 2015. The remaining terms of the Amendment will become effective January 1, 2015.
  
21. **Effect of this Amendment.** All of the remaining provisions of the Agreement that are not changed by this Amendment will remain in full force and effect. Nothing in this Amendment affects the current term of the Agreement, which is through December 31, 2025.
  
22. **Environmental Compliance.** On October 23, 2007, Yuba's Board of Directors adopted Resolution No. 2007-23 and, as the lead agency under CEQA, certified the Final Environmental Impact Report/Environmental Impact Statement for the Proposed Lower Yuba River Accord (State Clearinghouse #2005062111) (Final EIR). DWR approved the Final EIR as a responsible agency under CEQA. Yuba will be responsible for complying with CEQA to the extent required for Yuba to transfer water to a Third Party under this Agreement.

The foregoing is hereby agreed to by the Parties.

Approved as to legal form and sufficiency:

STATE OF CALIFORNIA  
DEPARTMENT OF WATER  
RESOURCES

\_\_\_\_\_  
Cathy Crothers, Chief Counsel

\_\_\_\_\_  
Mark W. Cowin, Director

\_\_\_\_\_, 2014

\_\_\_\_\_, 2014

Approved as to legal form and sufficiency:

YUBA COUNTY WATER AGENCY  
A Political Subdivision of the  
State of California

\_\_\_\_\_  
Paul M Bartkiewicz,  
General Legal Counsel

\_\_\_\_\_  
Chairman of the Board of Directors

\_\_\_\_\_, 2014

\_\_\_\_\_, 2014

Attest:

\_\_\_\_\_  
Secretary

\_\_\_\_\_, 2014

## Appendix E – Mojave Basin Area Stipulated Judgment

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**JUDGMENT AFTER TRIAL**

**JANUARY 10, 1996**

**MOJAVE BASIN AREA ADJUDICATION  
CITY OF BARSTOW, ET AL V. CITY OF ADELANTO, ET AL  
RIVERSIDE COUNTY SUPERIOR COURT CASE NO. 208568**





CHAMBERS OF  
VICTOR MICELI  
JUDGE OF THE SUPERIOR COURT

**Superior Court**  
STATE OF CALIFORNIA  
COUNTY OF RIVERSIDE

COURTHOUSE  
4050 MAIN STREET  
RIVERSIDE, CALIFORNIA 92501

January 10, 1996

TO: ALL PARTIES LISTED ON THE ATTACHED MAILING LIST  
FROM: E. MICHAEL KAISER, JUDGE *by ss*  
SUBJECT: CITY OF BARSTOW VS CITY OF ADELANTO, Case No.: 208568

The Judgment in the above-entitled case was signed on January 10, 1996. Please find attached the amended two pages of Exhibit B, Table B-1.

Please find attached two amended pages of Exhibit B, Table B-1.

~~12/10/92~~  
~~01/20/93~~  
~~02/02/93~~  
~~04/18/93~~  
~~04/28/93~~  
09/25/95

EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup>	BASE ANNUAL <sup>2</sup>	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
	PRODUCTION  (ACRE-FEET)	PRODUCTION RIGHT (PERCENT)	FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
SAN BERNARDINO CO SERVICE AREA 70J	1,005	0.8213	1,005	954	904	854	804
SAN BERNARDINO CO SERVICE AREA 70L	355	0.2901	355	337	319	301	284
SAN FILIPPO, JOSEPH & SHELLEY	35	0.0286	35	33	31	29	28
SILVER LAKES ASSOCIATION	3,987	3.2583	3,987	3,787	3,588	3,388	3,189
SOUTHDOWN, INC	1,519	1.2414	1,519	1,443	1,367	1,291	1,215
SOUTHERN CALIFORNIA WATER COMPANY	940	0.7682	940	893	846	799	752
SPRING VALLEY LAKE ASSOCIATION	3,056	2.4974	3,056	2,903	2,750	2,597	2,444
SPRING VALLEY LAKE COUNTRY CLUB	977	0.7984	977	928	879	830	781
STORM, RANDALL	62	0.0507	62	58	55	52	49
SUDMEIER, GLENN W	121	0.0989	121	114	108	102	96
SUMMIT VALLEY RANCH	452	0.3694	452	429	406	384	361
TATRO, RICHARD K & SANDRA A	280	0.2288	280	266	252	238	224
TATUM, JAMES B	829	0.6775	829	787	746	704	663
TAYLOR, ALLEN C / HAYMAKER RANCH	456	0.3727	456	433	410	387	364
THOMAS, S DALE	440	0.3596	440	418	396	374	352
THOMAS, WALTER	36	0.0294	36	34	32	30	28
THOMPSON, JAMES A	418	0.3416	418	397	376	355	334
THOMPSON, RODGER	76	0.0621	76	72	68	64	60
THRASHER, GARY	373	0.3048	373	354	335	317	298
THUNDERBIRD COUNTY WATER DISTRICT	118	0.0964	118	112	106	100	94
TURNER, ROBERT	70	0.0572	70	66	63	59	56
VAIL, JOSEPH B & PAULA E	126	0.1030	126	119	113	107	100
* VAN BURGER, CARL	710	0.5802	710	674	639	603	568
VAN LEEUWEN FAMILY TRUST	341	0.2787	341	323	306	289	272

\* Durston Well, location 06N/04W-18F, APN 468-151-11 - water production right of 357 acre/feet, claimed by Durston/Van Burger/CVB Investments and Industrial Asphalt. Product right to be determined in a subsequent severed proceeding, jurisdiction reserved.

~~12/10/92~~  
~~01/20/93~~  
~~02/02/93~~  
~~01/10/93~~  
~~01/28/92~~  
09/25/95

EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN CENTRO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

CENTRO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup>	BASE ANNUAL <sup>2</sup>	FREE PRODUCTION ALLOWANCES (ACRE-FBET)				
	PRODUCTION  (ACRE-FBET)	PRODUCTION  RIGHT (PERCENT)	FIRST  YEAR	SECOND <sup>3</sup>  YEAR	THIRD <sup>3</sup>  YEAR	FOURTH <sup>3</sup>  YEAR	FIFTH <sup>3</sup>  YEAR
AGCON, INC	0	0.0000	0	0	0	0	0
AGUAYO, JEANETTE L	212	0.3742	212	201	190	180	169
ATCHISON, TOPEKA, SANTA FE RAILWAY CO	120	0.2118	120	114	108	102	96
AVDEEF, THOMAS	34	0.0600	34	32	30	28	27
AZTEC FARM DEVELOPMENT COMPANY (Now, Virgil Gorman)	220	0.3883	220	209	198	187	176
BARNES, PAY - EXECUTOR OF ESTATE OF WAYNE BARNES	243	0.4289	243	230	218	206	194
BROMMER, MARVIN	361	0.6372	361	342	324	306	288
BURNS, RITA J & PAMELA E	16	0.0282	16	15	14	13	12
CHAPA, LARRY R	96	0.1694	96	91	86	81	76
CHOI, YONG IL & JOUNG AE	38	0.0671	38	36	34	32	30
CHRISTISON, JOEL	75	0.1324	75	71	67	63	60
COOK, KWON W	169	0.2983	169	160	152	143	135
DE VRIES, NEIL	3,800	6.7070	3,800	3,610	3,420	3,230	3,040
DESERT COMMUNITY BANK	156	0.2753	156	148	140	132	124
DURAN, FRANK T	50	0.0883	50	47	45	42	40
GAINES, JACK	117	0.2065	117	111	105	99	93
GESIRIECH, WAYNE	121	0.2136	121	114	108	102	96
GORMAN, VIRGIL	138	0.2436	138	131	124	117	110
GRIEDER, RAYMOND H & DORISANNE	30	0.0530	30	28	27	25	24
GRILL, NICHOLAS P & MILLIE D	21	0.0371	21	19	18	17	16
GROEN, CORNELIS	1,043	1.8409	1,043	990	938	886	834
HANIFY, DBA - WHITE BEAR RANCH	152	0.2683	152	144	136	129	121
HARMSBN, JAMES & RUTH ANN	1,522	2.6863	1,522	1,445	1,369	1,293	1,217
HARPER LAKE COMPANY	1,433	2.5293	1,433	1,361	1,289	1,218	1,146

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7  
8 SUPERIOR COURT OF THE STATE OF CALIFORNIA  
9 IN AND FOR THE COUNTY OF RIVERSIDE

10  
11 CITY OF BARSTOW, et al, )

CASE NO. 208568

12 Plaintiff, )

ASSIGNED TO JUDGE KAISER  
13 DEPT. 4 FOR ALL PURPOSES

14 v. )

JUDGMENT AFTER TRIAL

15 CITY OF ADELANTO, et al, )

16 Defendant. )

17 MOJAVE WATER AGENCY, )

18 Cross-complainant, )

19 v. )

20 ANDERSON, RONALD H. et al, )

21 Cross-defendants. )

TABLE OF CONTENTS

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

I.	<u>INTRODUCTION</u> .....	1
	A. The Complaint.....	1
	B. The MWA Cross-Complaint.....	1
	C. The Arc Las Flores Cross-Complaint.....	2
	D. Stipulation and Trial.....	2
II.	<u>DECREE</u> .....	3
	A. JURISDICTION, PARTIES, DEFINITIONS.....	3
	1. Jurisdiction and Parties.....	3
	a. Jurisdiction.....	3
	b. Parties.....	3
	c. Minimal Producers.....	3
	2. Physical and Legal Complexity.....	5
	3. Need for a Declaration of Rights and Obligations and for Physical Solution.....	5
	4. Definitions.....	7
	a. Afton .....	7
	b. Annual or Year .....	7
	c. Aquaculture Water.....	7
	d. Assessments.....	7
	e. Barstow.....	7
	f. Base Annual Production.....	7
	g. Base Annual Production Right.....	8
	h. Base Flow.....	8
	i. Carry Over Right.....	8
	j. Consumption or Consumptive Use.....	9
	k. Free Production Allowance.....	9
	l. Groundwater.....	9
	m. Harper Lake Basin.....	9
	n. Lower Narrows.....	9
	o. Makeup Water.....	9
	p. Makeup Obligation.....	9
	q. Minimal Producer.....	9
	r. Minimum Subarea Obligation.....	10
	s. Mojave Basin Area or Basin Area.....	10
	t. MWA.....	10
	u. Overdraft.....	10
	v. Party (Parties).....	10
	w. Person(s).....	11
	x. Produce.....	11
	y. Producer.....	11

1	z.	Production.....	11
	aa.	Production Safe Yield.....	11
2	bb.	Purpose of Use.....	11
	cc.	Recirculated Water.....	12
3	dd.	Replacement Obligation.....	12
	ee.	Replacement Water.....	12
4	ff.	Responsible Party.....	12
	gg.	Stored Water.....	12
5	hh.	Storm Flow.....	12
	ii.	Subareas.....	13
6	jj.	Subarea Obligation.....	13
	kk.	Subsurface Flow.....	13
7	ll.	Supplemental Water.....	13
	mm.	Transition Zone.....	13
8	nn.	Watermaster.....	13
9	5.	Exhibits.....	13
10	B.	DECLARATION OF HYDROLOGIC CONDITIONS.....	14
11	6.	Mojave Basin Area as Common Source of Supply.....	14
12	7.	Existence of Overdraft.....	14
13	C.	DECLARATION OF RIGHTS AND OBLIGATIONS.....	15
14	8.	Production Rights of the Parties.....	15
15	a.	Aquaculture.....	15
16	b.	Camp Cady.....	16
	c.	Recreational Lakes in Baja Subarea...	16
17	9.	MWA Obligation.....	17
18	a.	Secure Supplemental Water.....	17
19	b.	Supplemental Water Prices.....	17
20	c.	Supplemental Water Deliver Plan.....	17
	d.	Water Delivery Cost Allocation.....	18
	e.	Legislative Changes.....	19
	f.	Court Review and Determination of Benefit.....	19
21	10.	Priority and Determination of Production Rights.....	19
22	11.	Exercise of Carry Over Rights.....	21
23	12.	Production Only Pursuant to Judgment.....	21
24	13.	Declaration of Subarea Rights and Obligations.....	21
25	13.	Declaration of Subarea Rights and Obligations.....	21
26	III.	<u>INJUNCTION</u> .....	22
27	14.	Injunction Against Unauthorized Production.....	22
28			

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

15.	Injunction Re Change in Purpose of Use Without Notice Thereof to Watermaster.....	23
16.	Injunction Against Unauthorized Recharge.....	23
17.	Injunction Against Transportation from Mojave Basin Area.....	23
18.	Injunction Against Diverting Storm Flows.....	23
IV.	<u>CONTINUING JURISDICTION</u> .....	24
19.	Jurisdiction Reserved.....	24
V.	<u>PHYSICAL SOLUTION</u> .....	24
A.	GENERAL.....	24
20.	Purpose and Objective.....	24
21.	Need for Flexibility.....	25
22.	General Pattern of Operations.....	25
B.	ADMINISTRATION.....	26
23.	Administration by Watermaster.....	26
	(a) Standard of Performance .....	27
	(b) Removal of Watermaster .....	27
	(c) MWA Appointed as Initial Watermaster.....	27
24.	Powers and Duties.....	28
	(a) Rules and Regulations.....	28
	(b) Employment of Experts and Agents.....	28
	(c) Makeup and Replacement Obligations...	29
	(d) Measuring Devices, etc.....	29
	(e) Hydrologic Data Collection.....	29
	(f) Assessments.....	29
	(g) Purchase of and Recharge with Supplemental Water.....	30
	(h) Water Quality.....	30
	(i) Notice List.....	30
	(j) Annual Administrative Budget.....	30
	(k) Annual Report to Court.....	30
	(l) Investment of Funds.....	32
	(m) Borrowing.....	32
	(n) Transfers.....	32
	(o) Free Production Allowance.....	32
	(p) Production Reports.....	32
	(q) Production Adjustment for Change in Purpose of Use.....	33



1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

(r)	Reallocation of Base Annual Production Rights.....	34
(s)	Storage Agreements.....	34
(t)	Subarea Advisory Committee Meetings.....	34
(u)	Unauthorized Production.....	35
(v)	Meetings and Records.....	35
(w)	Data, Estimates and Procedures.....	35
(x)	Biological Resource Mitigation.....	35
C.	ASSESSMENTS.....	36
25.	Purpose.....	36
(a)	Administrative Assessments.....	36
(b)	Replacement Water Assessments.....	36
(c)	Makeup Water Assessments.....	36
(d)	Biological Resource Assessment.....	36
(e)	MWA Assessment of Minimal Producers..	37
26.	Procedure.....	37
27.	Availability of Supplemental Water.....	38
28.	Use of Replacement Water Assessment Proceeds and Makeup Water Assessment Proceeds.....	39
29.	MWA Annual Report to the Watermaster.....	39
D.	SUBAREA ADVISORY COMMITTEES.....	40
30.	Authorization.....	40
31.	Composition and Election.....	40
32.	Compensation.....	41
33.	Powers and Functions.....	41
E.	TRANSFERABILITY.....	41
34.	Assignment, Transfer, etc. of Rights.....	41
F.	MISCELLANEOUS PROVISIONS.....	41
35.	Water Quality .....	41
36.	Review Procedures.....	41
(a)	Effective Date of Watermaster Action.	41
(b)	Notice of Motion.....	42
(c)	Time for Motion.....	42
(d)	De Novo Nature of Proceeding.....	42
(e)	Decision.....	43
(f)	Payment of Assessments.....	43

1  
2  
3  
4  
5  
6  
7  
8  
9  
10  
11  
12  
13  
14  
15  
16  
17  
18  
19  
20  
21  
22  
23  
24  
25  
26  
27  
28

37. Designation of Address for Notice and Service..... 43

38. Service of Documents..... 44

39. No Abandonment of Rights..... 44

40. Intervention After Judgment..... 44

41. Recordation of Notice..... 45

42. Judgment Binding on Successors, etc..... 45

43. Costs..... 45

44. Entry of Judgment..... 45

Exhibit "A" - Map entitled, "Map showing Mojave Water Agency, Mojave River, Mojave Basin Area and Hydrologic Subareas and Limits of Adjudicated Area Together with Geologic and Other Pertinent Features."

Exhibit "B" - Tables entitled, "Table B-1: Table Showing Base Annual Production, Base Annual Production Right of Each Producer Within Each Subarea, and Free Production Allowance for Subareas for First Five Years of the Judgment" and "Table B-2: Table Showing Total Water Production for Aquaculture and Recreational Lake Purposes."

Exhibit "C" - Engineering Appendix.

Exhibit "D" - Time Schedules.

Exhibit "E" - List of Producers and Their Designees.

Exhibit "F" - Transfers of Base Annual Production Rights.

Exhibit "G" - Subarea Obligations.

Exhibit "H" - Biological Resource Mitigation.

Exhibit "I" - Map Showing Potential Groundwater Recharge Areas

1 I. INTRODUCTION

2 A. The Complaint. The original complaint herein was filed  
3 by the City of Barstow and Southern California Water Company  
4 (collectively "Plaintiffs") in San Bernardino Superior Court, North  
5 Desert District, on May 30, 1990 as Case No. BCV6672, and  
6 transferred to Riverside County Superior Court on November 27,  
7 1990. Plaintiffs allege that the cumulative water Production  
8 upstream of the City of Barstow Overdrafted the Mojave River  
9 system, and request an average Annual flow of 30,000 acre-feet of  
10 surface water to the City of Barstow area. The complaint also  
11 includes a request for a writ of mandate to require the Mojave  
12 Water Agency ("MWA") to act pursuant to its statutory authority to  
13 obtain and provide Supplemental Water for use within the Mojave  
14 Basin Area.

15 B. The MWA Cross-Complaint. On July 26, 1991, the MWA filed  
16 its first amended cross-complaint in this case. The MWA first  
17 amended cross-complaint and its ROE amendments name Producers who  
18 collectively claim substantially all rights of water use within the  
19 Mojave Basin Area, including Parties downstream of the City of  
20 Barstow. The MWA cross-complaint, as currently amended, requests  
21 a declaration that the available native water supply to the Mojave  
22 Basin Area (not including water imported from the California State  
23 Water Project) is inadequate to meet the demands of the combined  
24 Parties and requests a determination of the water rights of  
25 whatever nature within the MWA boundaries and the Mojave Basin  
26 Area. The MWA has named as Parties several hundred Producers  
27 within the Basin Area.

28 ///

1 C. The Arc Las Flores Cross-Complaint. On July 3, 1991, Arc  
2 Las Flores filed a cross-complaint for declaratory relief seeking  
3 a declaration of water rights of certain named cross-defendants and  
4 a declaration that the appropriative, overlying and riparian rights  
5 of Arc Las Flores be determined to be prior and paramount to any  
6 rights of the Plaintiffs and other appropriators.

7 D. Stipulation and Trial. On October 16, 1991, the Court  
8 ordered a litigation standstill. The purpose of the standstill was  
9 to give the parties time to negotiate a settlement and develop a  
10 solution to the overdraft existing in the Mojave River Basin.

11 A committee of engineers and attorneys, representing a variety  
12 of water users and interests throughout the Mojave River Basin, was  
13 created to develop a physical solution to the water shortage  
14 problem. The work of the committee resulted in a stipulated  
15 interlocutory order and judgment, which was entered by the court on  
16 September 23, 1993.

17 Several non-stipulating parties requested a trial. On April  
18 20, 1994, the Court issued a memorandum setting forth the trial  
19 issues. This cause came on regularly for trial on February 6,  
20 1995, and was tried in Department 4 of the above-entitled Court,  
21 the Honorable E. Michael Kaiser, Judge, Presiding, without a jury.  
22 Oral and documentary evidence was introduced on behalf of the  
23 respective parties and the cause was argued and submitted for  
24 decision.

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1 II. DECREE

2 NOW, THEREFORE, IT IS ORDERED, ADJUDGED AND DECREED:

3 A. JURISDICTION, PARTIES, DEFINITIONS.

4 1. Jurisdiction and Parties.

5 a. Jurisdiction. This Court has jurisdiction to  
6 enter Judgment declaring and adjudicating the rights to reasonable  
7 and beneficial use of water by the Parties in the Mojave Basin Area  
8 pursuant to Article X, Section 2 of the California Constitution.  
9 This Judgment constitutes an adjudication of water rights of the  
10 Mojave Basin Area pursuant to Section 37 of Chapter 2146 of  
11 Statutes of 1959 ("the MWA Act").

12 b. Parties. All Parties to the MWA cross-  
13 complaint are included in this Judgment. The MWA has notified  
14 those Persons claiming any right, title or interest to the natural  
15 waters within the Mojave Basin Area to make claims. Such notice  
16 has been given: 1) in conformity with the notice requirements of  
17 Water Code §§ 2500 et seq.; 2) pursuant to Section 37 of the MWA  
18 Act; and 3) pursuant to order of this Court. Subsequently, all  
19 Producers making claims have been or will be included as Parties.  
20 The defaults of certain Parties have been entered, and certain  
21 named cross-defendants to the MWA cross-complaint who are not  
22 Producers have been dismissed. All named Parties who have not been  
23 dismissed have appeared herein or have been given adequate  
24 opportunity to appear herein. The Court has jurisdiction of the  
25 subject matter of this action and of the Parties hereto.

26 c. Minimal Producers. There are numerous Minimal  
27 Producers in the Basin Area and their number is expected to  
28 increase in the future. In order to minimize the cost of

1 administering this Judgment and to assure that every Person  
2 producing water in the Basin Area participates fairly in the  
3 Physical Solution, MWA shall:

4           i. within one Year following entry of this  
5 Judgment, prepare a report to the Court: 1) setting forth the  
6 identity and verified Base Annual Production of each Minimal  
7 Producer in each Subarea of the Basin Area; and 2)  
8 recommending a proposed system of Minimal Producer  
9 Assessments. The system of Minimal Producer Assessments shall  
10 achieve an equitable allocation of the costs of the Physical  
11 Solution that are attributable to Production of verified Base  
12 Annual Production amounts by Minimal Producers in each Subarea  
13 to and among such Minimal Producers. Minimal Producer  
14 Assessments need not be the same for existing Minimal  
15 Producers as for future Minimal Producers.

16           ii. within one Year following entry of this  
17 Judgment, prepare a report to the Court setting forth a  
18 proposed program to be undertaken by MWA, pursuant to its  
19 statutory authority, to implement the proposed system of  
20 Minimal Producer Assessments. The Court may order MWA to  
21 implement the proposed program or, if MWA's statutory  
22 authority is inadequate to enable implementation, or if either  
23 the proposed program or the proposed system of Minimal  
24 Producer Assessments is unacceptable to the Court, the Court  
25 may then order MWA either to implement an alternative program  
26 or system, or in the alternative, to name all Minimal  
27 Producers as Parties to this litigation and to serve them for  
28 the purpose of adjudicating their water rights.

1 Any Minimal Producer whose Annual Production exceeds ten (10) acre-  
2 feet in any Year following the date of entry of Judgment shall be  
3 made a Party pursuant to Paragraph 12 and shall be subject to  
4 Administrative, Replacement Water, Makeup Water and Biological  
5 Resources Assessments. Any Minimal Producer who produced during  
6 the 1986-1990 period may become a Party pursuant to Paragraph 40  
7 with a Base Annual Production Right based on such Minimal  
8 Producer's verified Base Annual Production. To account properly  
9 for aggregate Production by Minimal Producers in each Subarea,  
10 Table B-1 of Exhibit B shall include an estimated aggregate amount  
11 of Base Annual Production by all Minimal Producers in each Subarea.  
12 The Base Annual Production of any Minimal Producer who becomes a  
13 Party shall be deducted from the aggregate amount and assigned to  
14 such Minimal Producer.

15 2. Physical and Legal Complexity. The physical and  
16 legal issues of the case as framed by the complaint and cross-  
17 complaints are extremely complex. Production of more than 1,000  
18 Persons producing water in the Basin Area has been ascertained. In  
19 excess of 1,000 Persons have been served. The water supply and  
20 water rights of the entire Mojave Basin Area and its hydrologic  
21 Subareas extending over 4000 square miles have been brought into  
22 issue. Most types and natures of water right known to California  
23 law are at issue in the case. Engineering studies by the Parties,  
24 jointly and severally, leading toward adjudication of these rights  
25 and a Physical Solution, have required the expenditure of over two  
26 Years' time and hundreds of thousands of dollars.

27 3. Need for a Declaration of Rights and Obligations and  
28 for Physical Solution. A Physical Solution for the Mojave Basin

1 Area based upon a declaration of water rights and a formula for  
2 Intra- and Inter-Subarea allocation of rights and obligations is  
3 necessary to implement the mandate of Article X, Section 2 of the  
4 California Constitution and California water policy. Such Physical  
5 Solution requires the definition of the individual rights of all  
6 Producers within the Basin Area in a manner which will equitably  
7 allocate the natural water supplies and which will provide for  
8 equitable sharing of costs for Supplemental Water. Nontributary  
9 supplemental sources of water are or will be available in amounts,  
10 which when combined with water conservation, water reclamation,  
11 water transfers, and improved conveyance and distribution methods  
12 within the Basin Area, will be sufficient in quantity and quality  
13 to assure implementation of a Physical Solution. Sufficient  
14 information and data are known to formulate a reasonable and just  
15 allocation of existing water supplies as between the hydrologic  
16 Subareas within the Basin Area and as among the water users within  
17 each Subarea. Such Physical Solution will allow the public water  
18 supply agencies and individual water users within each hydrologic  
19 Subarea to proceed with orderly water resource planning and  
20 development. It will be necessary for MWA to construct conveyance  
21 facilities to implement the Physical Solution. Absent the  
22 construction of conveyance facilities, some Subareas may be  
23 deprived of an equitable share of the benefits made possible by the  
24 Physical Solution. Accordingly, this Physical Solution mandates  
25 the acquisition or construction of conveyance facilities for  
26 importation and equitable distribution of Supplemental Water to the  
27 respective Subareas. Such construction is dependent on the  
28 availability of appropriate financing, and any such financing



1 assessed to the Parties will be based upon benefit to the Parties  
2 in accordance with the MWA Act.

3 4. Definitions. As used in this judgment, the  
4 following terms shall have the meanings herein set forth:

5 a. Afton - The United States Geological Survey gauging  
6 station "Mojave River at Afton, CA."

7 b. Annual or Year - As used in this Judgment refers to  
8 the Annual period beginning October 1 and ending  
9 September 30 of the following Year.

10 c. Aquaculture Water - Water so identified in Exhibit  
11 "B". Such water may be used only for fish breeding  
12 and rearing. The Annual Consumptive Use of such  
13 water in acre-feet is equal to the water surface  
14 area, in acres, of the fish rearing facilities  
15 multiplied by seven (feet).

16 d. Assessments - Those Assessments levied and  
17 collected pursuant to this judgment including  
18 Replacement Water, Makeup Water, Administrative and  
19 Biological Resource Assessments.

20 e. Barstow - The United States Geological Survey  
21 Gauging Station "Mojave River at Barstow, CA."

22 f. Base Annual Production - The verified maximum Year  
23 Production, in acre-feet, for each Producer for the  
24 five Year Period 1986-1990 as set forth in Table  
25 B-1 of Exhibit "B", except where otherwise noted  
26 therein. The maximum Year Production for each  
27 Producer was verified based on one or more of the  
28 following: flow meter readings, electrical power

1 or diesel usage records or estimated applied water  
2 duty. The Base Annual Production for recreational  
3 lakes in the Baja Subarea and for Aquaculture shall  
4 be equal either to the area of water surface  
5 multiplied by seven feet or to verified Production,  
6 whichever is less. The five Year period 1986-1990  
7 shall also be the time period for which Base Annual  
8 Production for Minimal Producers shall be  
9 calculated.

10 g. Base Annual Production Right - The relative Annual  
11 right of each Producer to the Free Production  
12 Allowance within a given Subarea, expressed as a  
13 percentage of the aggregate of all Producers' Base  
14 Annual Production in the Subarea. The percentage  
15 for each Producer is calculated by multiplying that  
16 Producer's Base Annual Production in a Subarea  
17 times one hundred (100) and dividing the result by  
18 the aggregate Base Annual Production for all  
19 Producers in the Subarea. The percentage shall be  
20 rounded off to the nearest one ten-thousandth of  
21 one per cent.

22 h. Base Flow - That portion of the total surface flow  
23 measured Annually at Lower Narrows which remains  
24 after subtracting Storm Flow.

25 i. Carry Over Right - The right of a Producer to delay  
26 and accumulate the Production of such Producer's  
27 share of a Subarea Free Production Allowance until  
28

///

1 and only until the following Year free of any  
2 Replacement Water Assessment.

3 j. Consumption or Consumptive Use - The permanent  
4 removal of water from the Mojave Basin Area through  
5 evaporation or evapo-transpiration. The  
6 Consumptive Use rates resulting from particular  
7 types of water use are identified in Paragraph 2 of  
8 Exhibit "F".

9 k. Free Production Allowance - The total amount of  
10 water, and any Producer's share thereof, that may  
11 be Produced from a Subarea each Year free of any  
12 Replacement Obligation.

13 l. Groundwater - Water beneath the surface of the  
14 ground and within the zone of saturation; i.e.,  
15 below the existing water table, whether or not  
16 flowing through known and definite channels.

17 m. Harper Lake Basin - That portion of the Centro  
18 Subarea identified as such on Exhibit "A".

19 n. Lower Narrows - The United States Geological Survey  
20 gauging station "Mojave River near Victorville,  
21 CA."

22 o. Makeup Water - Water needed to satisfy a Minimum  
23 Subarea Obligation.

24 p. Makeup Obligation - The obligation of a Subarea to  
25 pay for Makeup Water to satisfy its Subarea  
26 Obligation.

27 q. Minimal Producer - Any Person whose Base Annual  
28 Production, as verified by MWA is not greater than

1 ten (10) acre-feet. A Person designated as a  
2 Minimal Producer whose Annual Production exceeds  
3 ten (10) acre-feet in any Year following the date  
4 of entry of Judgment is no longer a Minimal  
5 Producer.

6 r. Minimum Subarea Obligation - The minimum Annual  
7 amount of water a Subarea is obligated to provide  
8 to an adjoining downstream Subarea or the  
9 Transition Zone or, in the case of the Baja  
10 Subarea, the minimum Annual Subsurface Flow at the  
11 MWA eastern boundary toward Afton in any Year, as  
12 set forth in Exhibit "G".

13 s. Mojave Basin Area or Basin Area - The area shown on  
14 Exhibit "A" that lies within the boundaries of the  
15 line labelled "Limits of Adjudicated Area" which  
16 generally includes the area tributary to the Mojave  
17 River and its tributaries except for such area not  
18 included within the Mojave Water Agency's  
19 jurisdiction.

20 t. MWA - Cross complainant Mojave Water Agency.

21 u. Overdraft - A condition wherein the current total  
22 Annual Consumptive Use of water in the Mojave Basin  
23 Area or any of its Subareas exceeds the long term  
24 average Annual natural water supply to the Basin  
25 Area or Subarea.

26 v. Party (Parties) - Any Person(s) named in this  
27 action who has intervened in this case or has

28 ///

1 become subject to this Judgment either through  
2 stipulation, default, trial or otherwise.

3 w. Person(s) - Any natural person, firm, association,  
4 organization, joint venture, partnership, business,  
5 trust, corporation, or public entity.

6 x. Produce - To pump or divert water.

7 y. Producer(s) - A Person, other than a Minimal  
8 Producer, who Produces water.

9 z. Production - Annual amount of water produced,  
10 stated in acre-feet of water.

11 aa. Production Safe Yield - The highest average Annual  
12 Amount of water that can be produced from a  
13 Subarea: (1) over a sequence of years that is  
14 representative of long-term average annual natural  
15 water supply to the Subarea net of long-term  
16 average annual natural outflow from the Subarea,  
17 (2) under given patterns of Production, applied  
18 water, return flows and Consumptive Use, and (3)  
19 without resulting in a long-term net reduction of  
20 groundwater in storage in the Subarea.

21 bb. Purpose of Use - The broad category of type of  
22 water use including but not limited to municipal,  
23 irrigation, industrial, aquaculture, and lakes  
24 purposes. A change in Purpose of Use includes any  
25 reallocation of water among mixed or sequential  
26 uses, excluding direct reuse of municipal  
27 wastewater.

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cc. Recirculated Water - Water that is Produced but not consumed by the Parties listed in Table B-2 of Exhibit "B" and then returned either to the Mojave River or to the Groundwater basin underlying the place of use.

dd. Replacement Obligation - The obligation of a Producer to pay for Replacement Water for Production from a Subarea in any Year in excess of the sum of such Producer's share of that Year's Free Production Allowance for the Subarea plus any Production pursuant to a Carry Over Right.

ee. Replacement Water - Water purchased by Watermaster or otherwise provided to satisfy a Replacement Obligation.

ff. Responsible Party - The Person designated by a Party as the Person responsible for purposes of filing reports and receiving notices pursuant to the provisions of this Judgment.

gg. Stored Water - Water held in storage pursuant to a Storage Agreement with Watermaster.

hh. Storm Flow - That portion of the total surface flow originating from precipitation and runoff without having first percolated to Groundwater storage in the zone of saturation and passing a particular point of reckoning, as determined annually by the Watermaster.

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- 1           ii. Subareas - The five Subareas of the Mojave Basin  
2           Area -- Este, Oeste, Alto, Centro and Baja -- as  
3           shown on Exhibit "A".
- 4           jj. Subarea Obligation - The average Annual amount of  
5           water that a Subarea is obligated to provide to an  
6           adjoining downstream Subarea or the Transition Zone  
7           or, in the case of the Baja Subarea, the average  
8           Annual Subsurface Flow toward Afton at the MWA  
9           eastern boundary as set forth in Exhibit "G".
- 10          kk. Subsurface Flow - Groundwater which flows beneath  
11          the earth's surface.
- 12          ll. Supplemental Water - Water imported to the Basin  
13          Area from outside the Basin Area, water that would  
14          otherwise be lost from the Basin Area but which is  
15          captured and made available for use in the Basin  
16          Area, or any Producer's share of Free Production  
17          Allowance that is not Produced and is acquired by  
18          Watermaster pursuant to this Judgment.
- 19          mm. Transition Zone - The portion of the Alto Subarea,  
20          shown on Exhibit "A", that lies generally between  
21          the Lower Narrows and the Helendale Fault.
- 22          nn. Watermaster - The Person(s) appointed by the Court  
23          to administer the provisions of this Judgment.

24          5. Exhibits. The following exhibits are attached to this  
25          Judgment and made a part hereof.

26                 Exhibit "A" - Map entitled, "Map showing Mojave Water  
27          Agency, Mojave River, Mojave Basin Area and Hydrologic Subareas and

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1 Limits of Adjudicated Area Together with Geologic and Other  
2 Pertinent Features."

3 Exhibit "B" - Table entitled, "Table B-1: Table Showing  
4 Base Annual Production and Base Annual Production Right of Each  
5 Producer Within Each Subarea, and Free Production Allowances for  
6 Subareas for First Five Years after entry of the Interlocutory  
7 Judgment" and "Table B-2: Table Showing Total Water Production for  
8 Aquaculture and Recreational Lake Purposes."

9 Exhibit "C" - Engineering Appendix.

10 Exhibit "D" - Time Schedules.

11 Exhibit "E" - List of Producers and Their Designees.

12 Exhibit "F" - Transfers of Base Annual Production Rights.

13 Exhibit "G" - Subarea Obligations.

14 Exhibit "H" - Biological Resource Mitigation.

15 Exhibit "I" - Map Showing Potential Groundwater Recharge  
16 Areas

17 B. DECLARATION OF HYDROLOGIC CONDITIONS.

18 6. Mojave Basin Area as Common Source of Supply. The  
19 area shown on Exhibit "A" as the Mojave Basin Area is comprised of  
20 five Subareas. The waters derived from the Mojave River and its  
21 tributaries constitute a common source of supply of the five  
22 Subareas and of the Persons producing therefrom.

23 7. Existence of Overdraft. In each and every Year, for  
24 a period in excess of five (5) years prior to the May 30, 1990  
25 filing date of Plaintiffs' Complaint, the Mojave Basin Area and  
26 each of its respective Subareas have been and are in a state of  
27 Overdraft, and it is hereby found that there is no water available

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1 for Production from the Basin Area or any Subarea therein except  
2 pursuant to this Judgment.

3 C. DECLARATION OF RIGHTS AND OBLIGATIONS.

4 8. Production Rights of the Parties. The Base Annual  
5 Production and Base Annual Production Right of each Party are  
6 declared as set forth in Table B-1 of Exhibit "B". Certain Parties  
7 also have the right to continue to Produce Recirculated Water in  
8 the amounts set forth in Table B-2 of Exhibit "B", subject to the  
9 following:

10 a. Aquaculture. Two of the Producers listed in  
11 Table B-2 of Exhibit "B", California Department of Fish and Game  
12 Mojave River Fish Hatchery (Hatchery) and Jess Ranch Water Company  
13 (Jess), Produce Recirculated Water for Aquaculture. The Hatchery  
14 and Jess or their successors or assignees shall have the right to  
15 continue to Produce up to the amounts listed in Table B-2 of  
16 Exhibit "B" as Recirculated Water for Aquaculture on the property  
17 where it was used in the Year for which Base Annual Production was  
18 verified. Production of such amount of Recirculated water by Jess  
19 shall be free of any Replacement Water Assessments, Makeup Water  
20 Assessments or Administrative Assessments but shall be subject to  
21 Biological Resources Assessments and each Jess well producing  
22 Recirculated Water shall be subject to an Annual administrative fee  
23 equal to the lowest Annual fee paid to MWA by a Minimal Producer.  
24 Neither the Hatchery nor Jess Recirculated Water may be transferred  
25 or used for any other purpose or transferred for use on any other  
26 property, except as provided in Paragraph 7 of Exhibit "F" for the  
27 Hatchery. Any Production of Recirculated Water by Jess in excess  
28 of the amount shown in Table B-2 shall be subject to all

1 Assessments. Production of Recirculated Water by the Hatchery will  
2 be subject to the rules set forth in Paragraph 7 of Exhibit "F".  
3 All Jess Aquaculture Recirculated Water shall be discharged  
4 immediately and directly to the Mojave River.

5 b. Camp Cady. One Producer listed in Table B-2 of  
6 Exhibit "B", California Department of Fish and Game-Camp Cady (Camp  
7 Cady), Produces Recirculated Water for Lakes containing Tui Chub,  
8 an endangered species of fish. Camp Cady or its successors or  
9 assignees shall have the right to continue to Produce up to the  
10 amount listed in Table-B-2 of Exhibit "B" as Recirculated Water at  
11 Camp Cady. Production of each amount of Recirculated water shall  
12 be free of any Assessments. Camp Cady Recirculated Water may not  
13 be transferred or used for any other purpose or transferred for use  
14 on any other property. Any Production of Recirculated Water by  
15 Camp Cady in excess of the amount shown in Table B-2 of Exhibit "B"  
16 shall be subject to all Assessments except Biological Resource  
17 Assessments. All Camp Cady Recirculated Water shall be allowed to  
18 percolate immediately and directly to the Groundwater basin  
19 underlying Camp Cady.

20 c. Recreational Lakes in Baja Subarea. All  
21 Producers listed in Table B-2 of Exhibit "B" except the Hatchery,  
22 Jess and Camp Cady Produce Recirculated Water for recreational  
23 lakes in the Baja Subarea. Such Producers or their successors or  
24 assignees shall have the right to continue to Produce up to the  
25 amounts identified in Table B-2 of Exhibit "B" as Recirculated  
26 Water for use in recreational lakes on the property where it was  
27 used in the Year for which Base Annual Production was verified,  
28 free of any Replacement Water Assessments, Makeup Water

1 Assessments, or Administrative Assessments, but such Production  
2 shall be subject to any Biological Resource Assessment. Each well  
3 producing such Recirculated Water shall be subject to an Annual  
4 administrative fee equal to the lowest Annual fee paid by a Minimal  
5 Producer. Recirculated Water cannot be transferred or used for any  
6 other purpose. All recreational lake Recirculated Water shall be  
7 allowed to percolate immediately and directly to the Groundwater  
8 basin underlying the recreational lake.

9 9. MWA Obligations. The Physical Solution is intended  
10 to provide for delivery and equitable distribution to the  
11 respective Subareas by MWA of the best quality of Supplemental  
12 Water reasonably available. MWA shall develop conveyance or other  
13 facilities to deliver this Supplemental Water to the areas depicted  
14 in Exhibit "I," unless prevented by forces outside its reasonable  
15 control such as an inability to secure financing consistent with  
16 sound municipal financing practices and standards.

17 a. Secure Supplemental Water. MWA, separate and  
18 apart from its duties as the initial Watermaster designated under  
19 this Judgment, shall exercise its authority under Sections 1.5 and  
20 15 of the MWA Act to pursue promptly, continuously and diligently  
21 all reasonable sources to secure Supplemental Water as necessary to  
22 fully implement the provisions of this Judgment.

23 b. Supplemental Water Prices. The MWA shall  
24 establish fair and equitable prices for Supplemental Water  
25 delivered to the Watermaster under this Judgment.

26 c. Supplemental Water Delivery Plan. Not later  
27 than September 30, 1996, MWA shall prepare a report on potential  
28 alternative facilities or methods to deliver Supplemental Water to

1 the areas shown on Exhibit "I." The report shall include, for each  
2 alternative, a development time schedule, a summary of cost  
3 estimates, an analysis of the relative benefits to Producers in  
4 each Subarea and an analysis of alternative methods of financing  
5 and cost allocation, including any state or federal sources of  
6 funding that may be available.

7 d. Water Delivery Cost Allocation. The report  
8 required by subdivision (c) above shall recommend methods of  
9 financing and cost allocation that are based on benefits to be  
10 received. MWA's cost allocation plan shall be subject to Court  
11 review as provided in subdivision (f) below to verify that costs  
12 are allocated fairly and according to benefits to be received. The  
13 MWA financing and cost allocation plan may include a mix of revenue  
14 sources including the following:

15 (1) Developer or connection fees to the  
16 extent MWA can demonstrate a nexus, as  
17 required by law, between the fees and the  
18 impact of the development upon the water  
19 resources of the Mojave Basin Area and  
20 each subarea thereof;

21 (2) Other methods of financing available to  
22 MWA, including but not limited to  
23 property based taxes, assessments or  
24 standby charges;

25 (3) Water sales revenues, but only to the  
26 extent other sources are not available or  
27 appropriate, and in no event shall the  
28 water sales price to cover facility

1 capital costs exceed a rate equal to  
2 fifty percent of the variable cost rate  
3 charged to MWA under its contract for  
4 water delivery from the California State  
5 Water Project;

6 e. Legislative Changes. MWA shall seek promptly  
7 to have enacted amendments to the MWA Act (Water Code Appendix,  
8 Part 97) that allow MWA to implement any methods of governmental  
9 financing available to any public entity in California.

10 f. Court Review and Determination of Benefit. Not  
11 later than September 30, 1996, MWA shall submit its report to the  
12 Court in a noticed motion pursuant to Paragraph 36. The report  
13 shall set forth MWA's recommendations as to the following: (1)  
14 which alternatives should be implemented; (2) methods of cost  
15 allocation for the recommended alternatives; (3) financing for the  
16 recommended alternatives; and (4) a time schedule to complete the  
17 recommended alternatives. The Court may approve or reject the  
18 recommendations. The Court may further order the use of  
19 alternatives and time schedules or it may order additional studies  
20 and resubmittals, as it may deem proper.

21 10. Priority and Determination of Production Rights.  
22 The water rights involved herein are of differing types and  
23 commenced at different times. Many of the rights involved are  
24 devoted to public uses. The Declaration of Water Rights that is  
25 part of the judgment and the Physical Solution decreed herein takes  
26 into consideration the competing priorities which have been  
27 asserted in addition to the equitable principles applicable to  
28 apportionment of water in this situation. The following factors

1 have been considered in the formulation of each Producer's Base  
2 Annual Production Right:

3 a. The Mojave Basin Area and each of its hydrologic  
4 Subareas have continuously for many Years been in a state of  
5 system-wide Overdraft;

6 b. All Producers have contributed to the Overdraft;

7 c. None of the priorities asserted by any of the  
8 Producers is without dispute;

9 d. Under the complex scheme of California water  
10 law, the allocation of water and rights mechanically based upon the  
11 asserted priorities would be extremely difficult, if not  
12 impossible, and would not result in the most equitable  
13 apportionment of water;

14 e. Such mechanical allocation would, in fact,  
15 impose undue hardship on many Parties;

16 f. There is a need for conserving and making  
17 maximum beneficial use of the water resources of the State;

18 g. The economy of the Mojave Basin Area has to a  
19 great extent been established on the basis of the existing  
20 Production;

21 h. The Judgment and Physical Solution take into  
22 consideration the unique physical and climatic conditions of the  
23 Mojave Basin Area, the Consumptive Use of water in the several  
24 sections of the Basin, the character and rate of return flows, the  
25 extent of established uses, the availability of storage water, the  
26 relative benefits and detriments between upstream areas and  
27 downstream areas if a limitation is imposed on one and not the

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1 other, and the need to protect public interest and public trust  
2 concerns.

3 In consideration of the foregoing factors, and in  
4 accordance with the terms and conditions of this Judgment, the  
5 Parties are estopped and barred from asserting special priorities  
6 or preferences.

7 11. Exercise of Carry Over Rights. The first water  
8 Produced by a Producer during any Year shall be deemed to be an  
9 exercise of any Carry Over Right. Such Carry Over Right may be  
10 transferred in accordance with Exhibit "F".

11 12. Production Only Pursuant to Judgment. This  
12 Judgment, and the Physical Solution decreed herein, addresses all  
13 Production within the Mojave Basin Area. Because of the existence  
14 of Overdraft, any Production outside the framework of this Judgment  
15 and Physical Solution will contribute to an increased Overdraft,  
16 potentially damage the Mojave Basin Area and public interests in  
17 the Basin Area, injure the rights of all Parties, and interfere  
18 with the Physical Solution. Watermaster shall bring an action or  
19 a motion to enjoin any Production that is not pursuant to the terms  
20 of this Judgment.

21 13. Declaration of Subarea Rights and Obligations. In  
22 the aggregate, Producers within certain Subareas have rights, as  
23 against those in adjoining upstream Subareas, to receive average  
24 Annual water supplies and, in any one Year, to receive minimum  
25 Annual water supplies equal to the amounts set forth in Exhibit  
26 "G", in addition to any Storm Flows. In turn, in the aggregate,  
27 Producers within certain Subareas have an obligation to provide to  
28 adjoining downstream Subareas such average Annual water supplies in

1 the amounts and in the manner set forth in Exhibit "G". In any one  
2 Year, Producers within certain Subareas have an obligation to  
3 provide to adjoining downstream Subareas such minimum Annual water  
4 supplies in the amounts and in the manner set forth in Exhibit "G".  
5 The Producers in the Baja Subarea have an obligation to provide  
6 average and minimum Subsurface Flows toward Afton at the MWA  
7 eastern boundary equal to the amounts shown in Exhibit "G".  
8 Producers in each of the Subareas have rights in the aggregate, as  
9 against each adjoining downstream Subarea or, in the case of the  
10 Baja Subarea, as against flows at the MWA eastern boundary toward  
11 Afton, to divert, pump, extract, conserve, and use all surface  
12 water and Groundwater supplies originating therein or accruing  
13 thereto, and so long as the adjoining downstream Subarea  
14 Obligations are satisfied under this Judgment and there is  
15 compliance with all of its provisions. Watermaster shall maintain  
16 a continuing account of the status of each Subarea's compliance  
17 with its Subarea Obligation, including any cumulative credits or  
18 debits and any requirement for providing Makeup Water. The  
19 accounting and determinations relative to Subarea Obligations shall  
20 be made in accordance with procedures set forth in Exhibit "G".

21  
22 **III. INJUNCTION**

23 **14. Injunction Against Unauthorized Production.** Each  
24 and every Party, its officers, agents, employees, successors, and  
25 assigns, is ENJOINED AND RESTRAINED from Producing water from the  
26 Basin Area except pursuant to the provisions of the Physical  
27 Solution in this Judgment.

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1           15. Injunction Re Change in Purpose of Use Without  
2 Notice Thereof to Watermaster. Each and every Party, its officers,  
3 agents, employees, successors, and assigns, is ENJOINED AND  
4 RESTRAINED from changing its Purpose of Use at any time without  
5 first notifying Watermaster of the intended change.

6           16. Injunction Against Unauthorized Recharge. Each and  
7 every Party, its officers, agents, employees, successors and  
8 assigns, is ENJOINED AND RESTRAINED from claiming any right to  
9 recapture Water that has been recharged in the Basin Area except  
10 pursuant to a Storage Agreement with Watermaster. This provision  
11 does not prohibit Parties from importing Supplemental Water into  
12 the Basin Area for direct use.

13           17. Injunction Against Transportation from Mojave Basin  
14 Area. Except upon further order of the Court, each and every  
15 Party, its officers, agents, employees, successors and assigns, is  
16 ENJOINED AND RESTRAINED from transporting water hereafter Produced  
17 from the Basin Area to areas outside the Basin Area.

18           18. Injunction Against Diverting Storm Flows. No Party  
19 may undertake or cause the construction of any project that will  
20 directly reduce the amount of Storm Flow that would otherwise go  
21 through the naturally occurring hydrologic regime to a downstream  
22 Subarea or that will reduce the surface area over which Storm Flow  
23 currently occurs by alteration to the bed of the Mojave River.  
24 This paragraph shall not prevent any flood control agency or  
25 municipality from taking such emergency action as may be necessary  
26 to protect the physical safety of its residents and its structures  
27 from flooding. Any such action shall be done in a manner that will  
28 minimize any reduction in the quantity of Storm Flows.

1 IV. CONTINUING JURISDICTION

2 19. Jurisdiction Reserved. Full jurisdiction, power and  
3 authority are retained by and reserved to the Court for purposes of  
4 enabling the Court upon the application of any Party, by a motion  
5 noticed in accordance with the notice procedures of Paragraph 36  
6 hereof, to make such further or supplemental order or directions as  
7 may be necessary or appropriate for interim operation before the  
8 Physical Solution is fully operative, or for interpretation,  
9 enforcement or carrying out of this Judgment, and to modify, amend  
10 or amplify any of the provisions of this Judgment or to add to the  
11 provisions thereof consistent with the rights herein decreed;  
12 provided, that nothing in this paragraph shall authorize either a  
13 reduction of the Base Annual Production Right of any Party, except  
14 in accordance with the rules set forth in Exhibit "F", or a  
15 reduction of the Base Flow portion of any Subarea Obligation.

16  
17 V. Physical Solution

18 A. GENERAL

19 20. Purpose and Objective. The Court hereby declares  
20 and decrees that the Physical Solution herein contained: 1) is a  
21 fair and equitable basis for satisfaction of all water rights in  
22 the Mojave Basin Area; 2) is in furtherance of the mandate of the  
23 State Constitution and the water policy of the State of California;  
24 and 3) takes into account applicable public trust interests; and  
25 therefore adopts and orders the Parties to comply with the Physical  
26 Solution. As noted in Paragraph 3 of this Judgment, the  
27 declaration of rights and obligations of the Parties and Subareas  
28 is a necessary component of this Physical Solution. The purpose of

1 the Physical Solution is to establish a legal and practical means  
2 for making the maximum reasonable beneficial use of the waters of  
3 the Basin Area by providing for the long-term conjunctive  
4 utilization of all water available thereto to meet the reasonable  
5 beneficial use requirements of water users therein.

6 21. Need for Flexibility. It is essential that this  
7 Physical Solution provide maximum flexibility and adaptability in  
8 order that the Court may be free to use existing and future  
9 technological, social, institutional and economic options in order  
10 to maximize reasonable beneficial use of the waters of the Basin  
11 Area. To that end, the Court's retained jurisdiction may be  
12 utilized where appropriate, to supplement the Physical Solution.

13 22. General Pattern of Operations. The Producers will  
14 be divided into five Subareas for purposes of administration. The  
15 Subarea rights and obligations are herein decreed. A fundamental  
16 premise of the Physical Solution is that all Parties will be  
17 allowed, subject to this Judgment, to Produce sufficient water to  
18 meet their reasonable beneficial use requirements. To the extent  
19 that Production by a Producer in any Subarea exceeds such  
20 Producer's share of the Free Production Allowance of that Subarea,  
21 Watermaster will provide Replacement Water to replace such excess  
22 Production according to the methods set forth herein. To the  
23 extent that any Subarea incurs a Makeup Obligation, Watermaster  
24 will provide Supplemental Water to satisfy such Makeup Obligation  
25 according to the methods set forth herein. For the initial five  
26 (5) full Years after entry of this Judgment (including any  
27 interlocutory Judgment), the Free Production Allowance for each  
28 Subarea shall be set as the amount of water equal to the following

1 percentages of the aggregate Base Annual Production for that  
2 Subarea:

	<u>Judgment Year</u>	<u>Percentage</u>	
3			
4	1993-1994	First Full Year	100
5	1994-1995	Second Full Year	95
6	1995-1996	Third Full Year	90
7	1996-1997	Fourth Full Year	85
8	1997-1998	Fifth Full Year	80

9 The extent of Overdraft now varies between Subareas and the  
10 reasonableness of any physical solution as applied to each Producer  
11 depends in part upon such Producer's foreseeable needs and the  
12 present and future availability of water within the Subarea in  
13 which each Producer is located. The Physical Solution described in  
14 this Judgment in part generally contemplates (i) initially allowing  
15 significant unassessed production on a substantially uniform basis  
16 for all Producers and Subareas and (ii) a phasing in of the  
17 monetary obligations necessary to obtain Supplemental Water. The  
18 above two provisions will affect each Subarea differently, may not  
19 be sufficient to ultimately eliminate the condition of Overdraft in  
20 each Subarea and could result in increased Overdraft within a  
21 Subarea. Any adverse impact to any Subarea caused by the  
22 implementation of the provisions shall be the responsibility of the  
23 Producers in each such Subarea.

24 B. ADMINISTRATION.

25 23. Administration by Watermaster. Watermaster shall  
26 administer and enforce the provisions of the Judgment and any  
27 subsequent instructions or orders of this Court.

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1 (a) Standard of Performance. Watermaster shall, in  
2 carrying out its duties, powers and responsibilities herein, act in  
3 an impartial manner without favor or prejudice to any Subarea,  
4 Producer, Party or Purpose of Use.

5 (b) Removal of Watermaster. Full jurisdiction, power  
6 and authority are retained and reserved by the Court for the  
7 purpose of enabling the Court on its own motion, or upon  
8 application of any Party, and upon notice in accordance with the  
9 notice procedures of paragraph 36 hereof, and after hearing  
10 thereon, to remove any appointed Watermaster and substitute a new  
11 Watermaster in its place. The Court shall find good cause for the  
12 removal of Watermaster upon a showing that Watermaster has failed  
13 to perform its duties, powers and responsibilities in an impartial  
14 manner, or has otherwise failed to act in the manner consistent  
15 with the provisions set forth in this Judgment or subsequent order  
16 of the Court.

17 (c) MWA Appointed as Initial Watermaster. The MWA is  
18 hereby appointed, until further order of the Court, as Watermaster  
19 to administer and enforce the provisions of this Judgment and any  
20 subsequent orders of this Court issued in the performance of its  
21 continuing jurisdiction. In carrying out this appointment, MWA  
22 shall segregate and separately exercise in all respects the  
23 Watermaster powers delegated by the Court under this Judgment from  
24 MWA's statutory powers. All funds received, held, and disbursed by  
25 MWA as Watermaster shall be by way of separate Watermaster  
26 accounts, subject to separate accounting and auditing. Meetings  
27 and hearings held by the MWA Board of Directors when acting as  
28 Watermaster shall be noticed and conducted separately from MWA

1 meetings. All Watermaster staff and consultant functions shall be  
2 separate and distinct from MWA staff and consultant functions;  
3 provided, however, that pursuant to duly adopted Watermaster rules,  
4 which shall be subject to review according to Paragraph 36 hereof,  
5 Watermaster staff and consultant functions may be accomplished by  
6 MWA staff and consultants, subject to strict time and cost  
7 accounting principles so that Watermaster functions, and the  
8 Assessments provided under this Judgment, do not subsidize, and are  
9 not subsidized by, MWA functions. Subject to these principles, MWA  
10 shall implement practicable cost efficiencies through consolidation  
11 of Watermaster and MWA staff and consultant functions.

12           24. Powers and Duties. Subject to the continuing  
13 supervision and control of the Court, Watermaster shall have and  
14 may exercise the following express powers, and shall perform the  
15 following duties, together with any specific powers, authority and  
16 duties granted or imposed elsewhere in this Judgment or hereafter  
17 ordered or authorized by the Court in the exercise of its  
18 continuing jurisdiction:

19           a. Rules and Regulations. To adopt any and all  
20 appropriate rules and regulations for conduct pursuant to this  
21 Judgment after public hearing. Notice of hearing and a copy of the  
22 proposed rules and regulations, and any amendments thereof, shall  
23 be mailed to all Parties thirty days prior to the date of the  
24 hearing thereon.

25           b. Employment of Experts and Agents. To employ  
26 such administrative personnel, engineering, legal, accounting, or  
27 other specialty services and consulting assistants as may be deemed  
28 appropriate in carrying out the terms of this Judgment.

1 c. Makeup and Replacement Obligations. To  
2 determine the Makeup Obligations for each Subarea and Replacement  
3 Obligations for each Producer and each Subarea, pursuant to the  
4 terms of the Judgment.

5 d. Measuring Devices, etc. To adopt rules and  
6 regulations regarding determination of amounts of Production and  
7 installation of individual water meters. The rules and regulations  
8 shall provide for approved devices or methods to measure or  
9 estimate Production. Producers who meter Production on the date of  
10 entry of this Judgment shall continue to meter Production.  
11 Thereafter, Producers who do not meter Production on the effective  
12 date of entry of this Judgment may be required by Watermaster rules  
13 and regulations to install water meters upon a showing that then  
14 employed measurement devices or methods do not accurately determine  
15 actual Production. The rules and regulations shall require that  
16 within three Years after the date of entry of this Judgment, any  
17 Producer who provides piped water for human Consumption to more  
18 than five service connections shall have installed an individual  
19 water meter on each service connection.

20 e. Hydrologic Data Collection. To install, operate  
21 and maintain such wells, measuring devices and/or meters necessary  
22 to monitor stream flow, precipitation and groundwater levels and to  
23 obtain such other data as may be necessary to carry out the  
24 provisions of this Judgment, including a study of the Basin Area  
25 phreatophyte consumptive use.

26 f. Assessments. To set, levy and collect all  
27 Assessments specified herein.

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1                   g.    Purchase of and Recharge with Supplemental  
2 Water. In accordance with Paragraph 27, to the extent Supplemental  
3 Water is available and is reasonably needed for Replacement Water  
4 or Makeup Water, to use Replacement Water Assessment proceeds to  
5 purchase Replacement Water, and to use Makeup Water Assessment  
6 proceeds to purchase Makeup Water and to have such Replacement  
7 Water and Makeup Water provided to the appropriate Subarea as soon  
8 as practicable. Watermaster may prepurchase Supplemental Water and  
9 apply subsequent Assessments towards the costs of such  
10 prepurchases.

11                   h.    Water Quality. To take all reasonable steps to  
12 assist and encourage appropriate regulatory agencies to enforce  
13 reasonable water quality regulations affecting the Basin Area,  
14 including regulation of solid and liquid waste disposal.

15                   i.    Notice List. To maintain a current list of  
16 Responsible Parties to receive notice hereunder.

17                   j.    Annual Administrative Budget. To prepare a  
18 proposed administrative budget for each Year, hold hearings  
19 thereon, and adopt an administrative budget according to the time  
20 schedule set forth in Exhibit "D". The administrative budget shall  
21 set forth budgeted items and Administrative Assessments in  
22 sufficient detail to show the allocation of the expense among the  
23 Producers. Following the adoption of the budget, expenditures  
24 within budgeted items may thereafter be made by Watermaster in the  
25 exercise of powers herein granted, as a matter of course.

26                   k.    Annual Report to Court.

27                   (1) To file an Annual report with this Court  
28 not later than April 1 of each Year beginning April 1 following the



1 first full Year after entry of Judgment. Prior to filing the  
2 Annual report with the Court, Watermaster shall notify all Parties  
3 that a draft of the report is available for review and shall  
4 provide notice of a hearing to receive comments and recommendations  
5 for changes in the report. The public hearing shall be conducted  
6 on the same date and at the same place as the hearings required by  
7 Paragraphs 3 and 4 of Exhibit "D". The notice of hearing may  
8 include such summary of the draft report as Watermaster may deem  
9 appropriate. Watermaster shall also distribute the report to the  
10 Parties requesting copies.

11 (2) The Annual report shall include an Annual  
12 fiscal report of the preceding Year's operation and shall include  
13 details as to operation of each of the Subareas and an audit of all  
14 Assessments and expenditures pursuant to this Physical Solution and  
15 a review of Watermaster activities pursuant to this Judgment. The  
16 Annual report shall include a compilation of at least the  
17 following:

18 Determinations and data required by:

- 19 i) Paragraph 24(c) (Makeup and Replacement Obligations)  
20 ii) Paragraph 24(e) (Hydrologic Data Collection)  
21 iii) Paragraph 24(g) (Purchase of and Recharge with  
22 Supplemental Water)  
23 iv) Paragraph 24(i) (Notice List)

24 Rules and regulations adopted pursuant to:

- 25 v) Paragraph 24(a) (Rules and Regulations)  
26 vi) Paragraph 24(d) (Measuring Devices, etc.)  
27 vii) Paragraph 24(s) (Storage Agreements)

28 Reports required by:

- 1 viii) Paragraph 24(j) (Annual Administrative Budget)  
2 ix) Paragraph 24(n) (Transfers)  
3 x) Paragraph 24(o) (Free Production Allowance)  
4 xi) Paragraph 24(p) (Production Reports)  
5 xii) Exhibit "D" (Prior Year Report)  
6 xiii) Exhibit "F" (Transfers of Base Annual Production  
7 Rights)  
8 xiv) Exhibit "G" (Status of Subarea Obligation)  
9 xv) Exhibit "H" (Biological Resource Mitigation)

10 1. Investment of Funds. To hold and invest any  
11 funds in investments authorized from time to time for public  
12 agencies in the State of California.

13 m. Borrowing. To borrow in anticipation of receipt  
14 of Assessment proceeds in an amount not to exceed the Annual amount  
15 of Assessments levied but uncollected.

16 n. Transfers. To prepare on an Annual basis and  
17 maintain a report or record of any transfer of Base Annual  
18 Production Rights. Such report or record shall be available for  
19 inspection by any Party upon reasonable notice to the Watermaster.

20 o. Free Production Allowance. Not later than the  
21 end of the 1997-1998 Water Year, and Annually thereafter, to  
22 recommend in the Watermaster Annual Report an adjustment, if  
23 needed, to the Free Production Allowance for any Subarea. In  
24 making its recommendation, Watermaster shall be guided by the  
25 factors set forth in Exhibit "C", including but not limited to an  
26 annual calculation of the change of water in storage. The Annual  
27 report shall include all assumptions and calculations relied upon  
28 in making its recommendations. Following the 1997-1998 Water Year,

1 or any time thereafter, Watermaster shall obtain prior Court  
2 approval for any increase or reduction of any Subarea's Free  
3 Production Allowance. In no event shall a reduction in any Year  
4 for a Subarea exceed five percent of the aggregate Base Annual  
5 Production of that Subarea. In the event Watermaster recommends in  
6 its report to the Court that the Free Production Allowance for any  
7 Subarea may need to be increased or reduced, the Court shall  
8 conduct a hearing, after notice given by Watermaster according to  
9 paragraph 36, upon Watermaster's recommendations and may order such  
10 changes in Subarea Free Production Allowance. The most recent  
11 Subarea Free Production Allowances shall remain in effect until  
12 revised according to this Paragraph 24(o).

13 p. Production Reports. To require each Producer to  
14 file with Watermaster, pursuant to procedures and time schedules to  
15 be established by Watermaster, a report on a form to be prescribed  
16 by Watermaster showing the total Production of such Party for each  
17 reporting period rounded off to the nearest tenth of an acre foot,  
18 and such additional information and supporting documentation as  
19 Watermaster may require.

20 q. Production Adjustment for Change in Purpose of  
21 Use. If Watermaster determines, using the Consumptive Use rates  
22 set forth in Exhibit "F", that a new Purpose of Use of any  
23 Producer's Production for any Year has resulted in a higher rate of  
24 Consumption than the rate applicable to the original Purpose of Use  
25 of that Producer's Production in the Year for which Base Annual  
26 Production was determined, Watermaster shall use a multiplier (1)  
27 to adjust upward such Production for the purpose of determining the  
28 Producer's Replacement Water Assessment and, (2) to adjust upward

1 the Free Production Allowance portion of such Production for the  
2 purpose of determining the Producer's Makeup Water Assessment. The  
3 multiplier shall be determined by dividing the number of acre feet  
4 of Consumption that occurred under the new Purpose of Use by the  
5 number of acre feet of Consumption that would have occurred under  
6 the original Purpose of Use for the same Production.

7 r. Reallocation of Base Annual Production Rights.

8 To reallocate annually the Base Annual Production Rights in each  
9 Subarea to reflect any permanent transfers of such Rights among  
10 Parties.

11 s. Storage Agreements. To enter into Storage

12 Agreements with any Party in order to accommodate the acquisition  
13 of Supplemental Water. Watermaster may not enter into Storage  
14 Agreements with non-Parties unless such non-Parties become subject  
15 to the provisions of this Judgment and the jurisdiction of the  
16 Court. Such Storage Agreements shall by their terms preclude  
17 operations which will have a substantial adverse impact on any  
18 Producer. If a Party pursuant to a Storage Agreement has provided  
19 for predelivery or postdelivery of Replacement Water for the  
20 Party's use, Watermaster shall at the Party's request credit such  
21 water to the Party's Replacement Obligation. Watermaster shall  
22 adopt uniformly applicable rules for Storage Agreements.  
23 Watermaster shall calculate additions, extractions and losses of  
24 water stored under Storage Agreements and maintain an Annual  
25 account of all such water.

26 t. Subarea Advisory Committee Meetings. To meet on

27 a regular basis and at least semi-annually with the Subarea  
28 Advisory Committees to review Watermaster activities pursuant to

1 this Judgment and to receive advisory recommendations from the  
2 Subarea Advisory Committees.

3 u. Unauthorized Production. To bring such action  
4 or motion as is necessary to enjoin unauthorized Production as  
5 provided in Paragraph 12 hereinabove.

6 v. Meetings and Records. To ensure that all  
7 meetings and hearings by Watermaster shall be noticed and conducted  
8 according to then current requirements of the Ralph M. Brown Act,  
9 Government Code Sections 54950, et seq. Watermaster files and  
10 records shall be available to any person according to the  
11 provisions of the Public Records Act, Government Code §§ 6200 et  
12 seq.

13 w. Data, Estimates and Procedures. To rely on and  
14 use the best available records and data to support the  
15 implementation of this Judgment. Where actual records of data are  
16 not available, Watermaster shall rely on and use sound scientific  
17 and engineering estimates. Watermaster may use preliminary records  
18 of measurements, and, if revisions are subsequently made,  
19 Watermaster may reflect such revisions in subsequent accounting.  
20 Exhibit "C" sets forth methods and procedures for determining  
21 surface flow components. Watermaster shall use either the same  
22 procedures or procedures that will yield results of equal or  
23 greater accuracy.

24 x. Biological Resource Mitigation. To implement  
25 the Biological Resource Mitigation measures set forth in Exhibit  
26 "H" herein.

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1 C. ASSESSMENTS

2 25. Purpose. Watermaster shall levy and collect  
3 Assessments from the Parties based upon Production in accordance  
4 with the time schedules set forth in Exhibit "D". Watermaster  
5 shall levy and collect such Assessments as follows:

6 a. Administrative Assessments. Administrative  
7 Assessments to fund the Administrative Budget adopted by the  
8 Watermaster pursuant to Paragraph 24(j) shall be levied uniformly  
9 against each acre foot of Production. A Producer who does not  
10 Produce in a given Year shall pay an Administrative Assessment in  
11 amount equal to the lowest MWA assessment for Minimal Producers for  
12 that Year.

13 b. Replacement Water Assessments. Replacement  
14 Water Assessments shall be levied against each Producer on account  
15 of such Producer's Production, after any adjustment pursuant to  
16 Paragraph 24(q), in excess of such Producer's share of the Free  
17 Production Allowance in each Subarea during the prior Year.

18 c. Makeup Water Assessments. Makeup Water  
19 Assessments shall be levied against each Producer in each Subarea  
20 on account of each acre-foot of Production therein which does not  
21 bear a Replacement Assessment hereunder, after any adjustment  
22 pursuant to Paragraph 24(q), to pay all necessary costs of  
23 satisfying the Makeup Obligation, if any, of that Subarea.

24 d. Biological Resource Assessment. To establish  
25 and, to the extent needed, to maintain the Biological Resource  
26 Trust Fund balance at one million dollars (in 1993 dollars)  
27 pursuant to Paragraph 24(x) and Exhibit "H", a Biological Resource  
28 Assessment in an amount not to exceed fifty cents (in 1993 dollars)

1 for each acre-feet of Production shall be levied uniformly against  
2 each producer except the California Department of Fish and Game.

3 e. MWA Assessment of Minimal Producers. The MWA  
4 shall identify and assess Minimal Producers through its own  
5 administrative procedures, and not acting as Watermaster.

6 26. Procedure. Each Party hereto is ordered to pay the  
7 Assessments herein provided for, which shall be levied and  
8 collected in accordance with the procedures and schedules set forth  
9 in Exhibit "D". Any Assessment which becomes delinquent, as  
10 defined in Paragraph 7 of Exhibit "D", shall bear interest at the  
11 then current San Bernardino County property tax delinquency rate  
12 Said interest rate shall be applicable to any said delinquent  
13 Assessment from the due date thereof until paid. Such delinquent  
14 Assessment, together with interest thereon, costs of suit,  
15 attorneys fees and reasonable costs of collection, may be collected  
16 pursuant to motion giving notice to the delinquent Party only, or  
17 Order to Show Cause proceeding, or such other lawful proceeding as  
18 may be instituted by the Watermaster; and shall, if provided for in  
19 the MWA Act, constitute a lien on the property of the Party as of  
20 the same time and in the same manner as does the tax lien securing  
21 County property taxes. The Watermaster shall Annually certify a  
22 list of all such unpaid delinquent Assessments to the MWA (in  
23 accordance with applicable provisions of the MWA Act). The MWA (in  
24 accordance with applicable provisions of the MWA Act) shall include  
25 the names of those Parties and the amounts of the liens in its list  
26 to the County Assessor's Office in the same manner and at the same  
27 time as it does its administrative assessments. MWA shall account  
28 for receipt of all collections of Assessments collected pursuant to

1 this Judgment, and shall pay such amounts collected pursuant to  
2 this Judgment to the Watermaster. The Watermaster shall also have  
3 the ability to enjoin production of those Persons who do not pay  
4 Assessments pursuant to this Judgment.

5           27.     Availability of Supplemental Water.       All  
6 Replacement and Makeup Water Assessments collected by the  
7 Watermaster shall be used to acquire Supplemental Water from MWA.  
8 Watermaster shall determine when to request Supplemental Water from  
9 MWA and shall determine the amount of Supplemental Water to be  
10 requested. MWA shall use its best efforts to acquire as much  
11 Supplemental Water as possible in a timely manner. If MWA  
12 encounters delays in the acquisition of Supplemental Water which,  
13 due to cost increases, results in collected assessment proceeds  
14 being insufficient to purchase all Supplemental Water for which the  
15 Assessments were made, MWA shall purchase as much water as the  
16 proceeds will allow when the water becomes available. If available  
17 Supplemental Water is insufficient to meet all Makeup and  
18 Replacement Water obligations, Watermaster shall allocate the  
19 Supplemental Water for delivery to the Subareas on an equitable and  
20 practicable basis pursuant to duly adopted Watermaster rules and  
21 regulations, giving preference to: First, Transition Zone  
22 Replacement Water Obligations as set forth in Exhibit "G"; Second,  
23 Makeup Water Obligations; and Third, other Replacement Water  
24 Obligations. MWA may acquire Supplemental Water at any time. MWA  
25 shall be entitled to enter into a Storage Agreement with  
26 Watermaster to store water MWA acquires prior to being paid to do  
27 so by Watermaster. Such water, including such water acquired and  
28 stored prior to the date of this Judgment or prior to the entry of



1 a Storage Agreement, may later be used to satisfy MWA's duty under  
2 this paragraph.

3 28. Use of Replacement Water Assessment Proceeds and  
4 Makeup Water Assessment Proceeds. The Proceeds of Replacement  
5 Water Assessments and any interest accrued thereon shall only be  
6 used for the purchase of Replacement Water for that Subarea from  
7 which they were collected. In addition, the proceeds of  
8 Replacement Water Assessments collected on account of Production in  
9 the Transition Zone, except as provided in Exhibit "G", shall only  
10 be used for the purchase of Replacement Water for the Transition  
11 Zone, and the proceeds of Replacement Water Assessments collected  
12 on account of Production in that portion of the Baja Subarea  
13 downstream of the Calico-Newberry fault shall only be used for the  
14 purchase of Replacement Water for that portion of the Baja Subarea  
15 downstream of the Calico-Newberry fault. The proceeds of Makeup  
16 Water Assessments and any interest accrued thereon shall only be  
17 used for the purchase of Makeup Water to satisfy the Makeup  
18 Obligation for which they are collected.

19 29. MWA Annual Report to the Watermaster. MWA shall  
20 Produce and deliver to Watermaster an Annual written report  
21 regarding actions of MWA required by the terms of this Judgment.  
22 The report shall contain: 1) a summary of the actions taken by MWA  
23 in identifying and assessing Minimal Producers, including a report  
24 of Assessments made and collected; 2) a summary of other MWA  
25 activities in collecting Assessment on behalf of Watermaster; 3) a  
26 report of water purchases and water distribution for the previous  
27 Year; 4) actions taken to implement its Regional Water Management  
28 Plan, including actions relating to conveyance facilities referred

1 to in this Judgment. The MWA report will be provided to  
2 Watermaster not less than 30 days prior to the Annual Watermaster  
3 report to the Court required by this Judgment.

4 D. SUBAREA ADVISORY COMMITTEES.

5 30. Authorization. The Producers in each of the five  
6 Subareas are hereby authorized and directed to cause committees of  
7 Producer representatives to be organized and to act as Subarea  
8 Advisory Committees.

9 31. Composition and Election. Each Subarea Advisory  
10 Committee shall consist of five (5) Persons who shall be called  
11 advisors. In the election of advisors, every Party shall be  
12 entitled to one vote for every acre-foot of Base Annual Production  
13 for that Party in that particular Subarea. Parties may cumulate  
14 their votes and give one candidate a number of votes equal to the  
15 number of advisors to be elected multiplied by the number of votes  
16 to which the Party is normally entitled, or distribute the Party's  
17 votes on the same principle among as many candidates as the Party  
18 thinks fit. In any election of advisors, the candidates receiving  
19 the highest number of affirmative votes of the Parties are elected.  
20 Elections shall be held upon entry of this Judgment and thereafter  
21 every third year. In the event a vacancy arises, a temporary  
22 advisor shall be appointed by unanimous decision of the other four  
23 advisors to continue in office until the next scheduled election.  
24 The California Department of Fish and Game shall serve as a  
25 permanent ex-officio member of the Alto and Baja Subarea Advisory  
26 Committees. Rules and regulations regarding organization, meetings  
27 and other activities shall be at the discretion of the individual

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1 Subarea Advisory Committees, except that all meetings of the  
2 committees shall be open to the public.

3 32. Compensation. The Subarea Advisory Committee  
4 members shall serve without compensation.

5 33. Powers and Functions. The Subarea Advisory  
6 Committee for each Subarea shall act in an advisory capacity only  
7 and shall have the duty to study, review and make recommendations  
8 on all discretionary determinations made or to be made hereunder by  
9 Watermaster which may affect that Subarea.

10 E. TRANSFERABILITY.

11 34. Assignment, Transfer, etc. of Rights. In order to  
12 further the purposes of this Judgment and Physical Solution, any  
13 Base Annual Production Right, or any portion thereof, may be sold,  
14 assigned, transferred, licensed or leased pursuant to the rules and  
15 procedures set forth in Exhibit "F".

16 F. MISCELLANEOUS PROVISIONS.

17 35. Water Quality. Nothing in this Judgment shall be  
18 interpreted as relieving any Party of its responsibilities to  
19 comply with state or federal laws for the protection of water  
20 quality or the provisions of any permits, standards, requirements,  
21 or orders promulgated thereunder.

22 36. Review Procedures. Any action, decision, rule or  
23 procedure of Watermaster pursuant to this Judgment shall be subject  
24 to review by the Court on its own motion or on timely motion by any  
25 Party, as follows:

26 a. Effective Date of Watermaster Action. Any  
27 order, decision or action of Watermaster pursuant to this Judgment  
28 on noticed specific agenda items shall be deemed to have occurred

1 on the date of the order, decision or action.

2 b. Notice of Motion. Any Party, may, by a  
3 regularly noticed motion, petition the Court for review of  
4 Watermaster's action or decision pursuant to this Judgment. The  
5 motion shall be deemed to be filed when a copy, conformed as filed  
6 with the Court, has been delivered to Watermaster together with the  
7 service fee established by Watermaster sufficient to cover the cost  
8 to photocopy and mail the motion to each Party. Watermaster shall  
9 prepare copies and mail a copy of the motion to each Party or its  
10 designee according to the official service list which shall be  
11 maintained by Watermaster according to Paragraph 37. A Party's  
12 obligation to serve notice of a motion upon the Parties is deemed  
13 to be satisfied by filing the motion as provided herein. Unless  
14 ordered by the Court, any such petition shall not operate to stay  
15 the effect of any Watermaster action or decision which is  
16 challenged.

17 c. Time for Motion. A motion to review any  
18 Watermaster action or decision shall be filed within ninety (90)  
19 days after such Watermaster action or decision, except that motions  
20 to review Watermaster Assessments hereunder shall be filed within  
21 thirty (30) days of mailing of notice of the Assessment.

22 d. De Novo Nature of Proceeding. Upon filing of a  
23 petition to review Watermaster action, the Watermaster shall notify  
24 the Parties of a date when the Court will take evidence and hear  
25 argument. The Court's review shall be de novo and the Watermaster  
26 decision or action shall have no evidentiary weight in such  
27 proceeding.

28 ///

1 e. Decision. The decision of the Court in such  
2 proceeding shall be an appealable Supplemental Order in this case.  
3 When the same is final, it shall be binding upon Watermaster and  
4 the Parties.

5 f. Payment of Assessments. Payment of Assessments  
6 levied by Watermaster hereunder shall be made pursuant to the time  
7 schedule in Exhibit "D"; notwithstanding any motion for review of  
8 Watermaster actions, decisions, rules or procedures, including  
9 review of Watermaster Assessments.

10 37. Designation of Address for Notice and Service. Each  
11 Party shall designate the name and address to be used for purposes  
12 of all subsequent notices and service herein, either by its  
13 endorsement on the Stipulation for Judgment or by a separate  
14 designation to be filed within thirty (30) days after Judgment has  
15 been entered. Said designation may be changed from time to time by  
16 filing a written notice of such change with Watermaster. Any Party  
17 desiring to be relieved of receiving notices of Watermaster  
18 activity may file a waiver of notice on a form to be provided by  
19 Watermaster. Watermaster shall maintain at all times a current  
20 list of Parties to whom notices are to be sent and their addresses  
21 for purposes of service. Watermaster shall also maintain a full  
22 current list of names and addresses of all Parties or their  
23 successors, as filed herein. Copies of such lists shall be  
24 available to any Person. If no designation is made, a Party's  
25 designee shall be deemed to be, in order of priority: i) the  
26 Party's attorney of record; ii) if the Party does not have an  
27 attorney of record, the Party itself at the address on the  
28 Watermaster list.

1           38. Service of Documents. Delivery to or service upon  
2 any Party by Watermaster, by any other Party, or by the Court, of  
3 any document required to be served upon or delivered to a Party  
4 under or pursuant to the Judgment shall be deemed made if made by  
5 Deposit thereof (or by copy thereof) in the mail, first class,  
6 postage prepaid, addressed to the designee of the Party and at the  
7 address shown in the latest designation filed by that Party.

8           39. No Abandonment of Rights. It is in the interest of  
9 reasonable beneficial use of the Basin Area and its water supply  
10 that no Party be encouraged to take and use more water in any Year  
11 than is actually required. Failure to Produce all of the water to  
12 which a Party is entitled hereunder shall not, in and of itself, be  
13 deemed or constitute an abandonment of such Party's right, in whole  
14 or in part.

15           40. Intervention After Judgment. Any person who is not  
16 a Party or successor to a Party and who proposes to Produce water  
17 from the Basin Area may seek to become a Party to this Judgment  
18 through a Stipulation for Intervention entered into with  
19 Watermaster. Watermaster may execute said Stipulation on behalf of  
20 the other Parties herein but such Stipulation shall not preclude a  
21 Party from opposing such Intervention at the time of the Court  
22 hearing thereon. Said Stipulation for Intervention must thereupon  
23 be filed with the Court, which will consider an order confirming  
24 said intervention following thirty (30) days' notice to the  
25 Parties. Thereafter, if approved by the Court, such intervenor  
26 shall be a Party bound by this Judgment and entitled to the rights  
27 and privileges accorded under the Physical Solution herein.

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EXHIBIT A

MAP OF MOJAVE BASIN AREA

[INDEX MAP AND DETAIL SHEET CONSISTING OF 42  
1" = 4,000' SCALE MAPS COVERING THE BASIN  
AREA; THE MAP IS ON DISPLAY AT THE OFFICE OF  
THE MOJAVE WATER AGENCY, 22450 HEADQUARTERS,  
APPLE VALLEY, CA 92307 AND ON FILE WITH THE  
COURT]



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EXHIBIT B

PRODUCTION TABLES

CONTENTS

TABLE B-1: TABLE SHOWING BASE ANNUAL PRODUCTION AND BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN EACH SUBAREA AND FREE PRODUCTION ALLOWANCES FOR EACH SUBAREA FOR THE FIRST FIVE YEARS AFTER ENTRY OF THE INTERLOCUTORY JUDGMENT

TABLE B-2: TABLE SHOWING TOTAL VERIFIED PRODUCTION, BASE ANNUAL PRODUCTION AND RECIRCULATED WATER PRODUCTION FOR AQUACULTURE AND FOR RECREATIONAL LAKES

~~12/30/92~~  
~~01/30/93~~  
~~02/28/93~~  
~~04/10/93~~  
~~04/30/93~~  
09/25/95

EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ESTE SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
ABSHIRE, DAVID V	24	0.1093	24	22	21	20	19
ANDERSON, ROSS C & BETTY J	34	0.1548	34	32	30	28	27
BAR H MUTUAL WATER COMPANY	53	0.2414	53	50	47	45	42
BELL, CHUCK	494	2.2497	494	469	444	419	395
BURNS, BOBBY J & EVELYN J	1,300	5.9204	1,300	1,235	1,170	1,105	1,040
CASA COLINA FOUNDATION	90	0.4099	90	85	81	76	72
CENTER WATER CO	40	0.1822	40	38	36	34	32
CLUB VIEW PARTNERS	1,276	5.8111	1,276	1,212	1,148	1,084	1,020
CROSS, LAWRENCE E	23	0.1047	23	21	20	19	18
CRYSTAL HILLS WATER COMPANY	194	0.8835	194	184	174	164	155
DAHLQUIST, GEORGE R	594	2.7052	594	564	534	504	475
DELPERDANG, ROBERT H	56	0.2550	56	53	50	47	44
DESERT DAWN MUTUAL WATER COMPANY	15	0.0683	15	14	13	12	12
GABTA, TRINIDAD	512	2.3317	512	486	460	435	409
GAYJIKIAN, SAMUEL & HAZEL	102	0.4645	102	96	91	86	81
GRACETOWN INVESTMENT CO - JETCO PROP FUND	752	3.4247	752	714	676	639	601
GUBLER, HANS	30	0.1366	30	28	27	25	24
HAL-DOR LTD	23	0.1047	23	21	20	19	18
HANDLEY, DON R & MARY ANN	73	0.3325	73	69	65	62	58
HART, MERRILL W	473	2.1541	473	449	425	402	378
HERT, SCOTT	276	1.2569	276	262	248	234	220
HI-GRADE MATERIALS	442	2.0129	442	419	397	375	353
HITCHIN LUCERNE, INC	16	0.0729	16	15	14	13	12
JAMS RANCH	28	0.1275	28	26	25	23	22

~~10/10/92~~  
~~01/20/93~~  
~~02/02/93~~  
~~04/10/93~~  
~~04/28/93~~  
09/25/95

EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ESTE SUBARBA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
JUBILEE MUTUAL WATER COMPANY	142	0.6467	142	134	127	120	113
JUNIPER RIVIERA COUNTY WATER DISTRICT	37	0.1685	37	35	33	31	29
LEE, DOO HWAN	78	0.3552	78	74	70	66	62
LOPEZ, BALTAZAR	385	1.7533	385	365	346	327	308
LUA, ANTONIO	348	1.5848	348	330	313	295	278
LUCERNE VALLEY MUTUAL WATER COMPANY	54	0.2459	54	51	48	45	43
LUCERNE VALLEY PARTNERS	1,213	5.5242	1,213	1,152	1,091	1,031	970
LUCERNE VISTA WATER CO	21	0.0956	21	19	18	17	16
MITSUBISHI CEMENT CORPORATION	1,299	5.9158	1,299	1,234	1,169	1,104	1,039
MONACO INVESTMENT COMPANY	70	0.3188	70	66	63	59	56
MOSS, LAWRENCE W & HELEN J	43	0.1958	43	40	38	36	34
PARK, CHANHO	597	2.7188	597	567	537	507	477
PARK, JEONG, IL & HEA JA	96	0.4372	96	91	86	81	76
PEREZ, EVA	247	1.1249	247	234	222	209	197
PETTIGREW, DAN	1,422	6.4760	1,422	1,350	1,279	1,208	1,137
PETTIGREW, HOWARD L	1,500	6.8312	1,500	1,425	1,350	1,275	1,200
PLUESS-STAUFER CALIFORNIA INC	23	0.1047	23	21	20	19	18
REED, MIKE	58	0.2641	58	55	52	49	46
ROGERS, ROY	1,449	6.5990	1,449	1,376	1,304	1,231	1,159
SAN BERNARDINO CO SERVICE AREA 29	21	0.0956	21	19	18	17	16
SEALS, LAWRENCE	113	0.5146	113	107	101	96	90
SON'S RANCH	140	0.6376	140	133	126	119	112
SOUTHERN CALIFORNIA WATER COMPANY	178	0.8106	178	169	160	151	142
SPECIALTY MINERALS, INC	42	0.1913	42	39	37	35	33

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ESTE SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
SPILLMAN, JAMES R & NANCY J	23	0.1047	23	21	20	19	18
STEWART WATER COMPANY	54	0.2459	54	51	48	45	43
STRINGER, W EDWARD	573	2.6095	573	544	515	487	458
THE CUSHENBURY TRUST, C/O SPECIALTY MINERALS, INC	10	0.0455	10	9	9	8	8
TURNER, LOYD & CAROL	77	0.3507	77	73	69	65	61
VISOSKY, JOSEPH F JR	1,120	5.1006	1,120	1,064	1,008	952	896
WEISER, SIDNEY & RAQUEL	90	0.4099	90	85	81	76	72
WILLOW WELLS MUTUAL WATER COMPANY	30	0.1366	30	28	27	25	24

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ESTE SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MINIMAL PRODUCER POOL	2,000	9.1083	2,000	1,900	1,800	1,700	1,600
UNIDENTIFIED/UNVERIFIED PRODUCER POOL	1,485	6.7629					
ESTE SUBAREA TOTALS =	21,958	100					

- 1 Base Annual Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records, site inspection, land use estimates from 1987 and 1989 aerial photography and responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production Right expressed as a percentage of the Total Base Annual Production.
- 3 Values based on production ramp down of five percent (5%) per year. Free Production Allowance for the fifth year is equal to eighty percent (80%) of the Base Annual Production.

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN OESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

OESTE SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
AEROCHEM, INC	660	5.3645	660	627	594	561	528
BROWN, DOUG & SUB	46	0.3739	46	43	41	39	36
CHAMISAL MUTUAL	96	0.7803	96	91	86	81	76
DAVIS, PAUL	19	0.1544	19	18	17	16	15
DOSSEY, D A	14	0.1138	14	13	12	11	11
MEADOWBROOK DAIRY	2,335	18.9791	2,335	2,218	2,101	1,984	1,868
RESSEGUE, JOHN & BILL	259	2.1052	259	246	233	220	207
SAN BERNARDINO CO SERVICE AREA 70G	110	0.8941	110	104	99	93	88
SAN BERNARDINO CO SERVICE AREA 70L	1,306	10.6153	1,306	1,240	1,175	1,110	1,044
THORESON, ROBERT F & A KATHLEEN	40	0.3251	40	38	36	34	32
TROEGER, RICHARD H	112	0.9103	112	106	100	95	89
VAN DAM BROTHERS	1,860	15.1183	1,860	1,767	1,674	1,581	1,488

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN OESTE SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

OESTE SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MINIMAL PRODUCER POOL	1,500	12.1921	1,500	1,425	1,350	1,275	1,200
UNIDENTIFIED/UNVERIFIED PRODUCER POOL	3,946	32.0735					
OESTE SUBAREA TOTALS =	12,303	100					

- 1 Base Annual Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records, site inspection, land use estimates from 1987 and 1989 aerial photography and responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production Right expressed as a percentage of the Total Base Annual Production.
- 3 Values based on production ramp down of five percent (5%) per year. Free Production Allowance for the fifth year is equal to eighty percent (80%) of the Base Annual Production.

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBARRA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
ABBOND, EDWARD & GRACE	28	0.0229	28	26	25	23	22
ABBOTT, LEONARD C	284	0.2321	284	269	255	241	227
ADELANTO, CITY OF	1,573	1.2855	1,573	1,494	1,415	1,337	1,258
ADELANTO, CITY OF - GEORGE A F B	3,433	2.8055	3,433	3,261	3,089	2,918	2,746
AGCON, INC	384	0.3138	384	364	345	326	307
APPLE VALLEY COUNTRY CLUB	709	0.5794	709	673	638	602	567
APPLE VALLEY DEVELOPMENT	724	0.5917	724	687	651	615	579
APPLE VALLEY FOOTHILL CO WATER DISTRICT	167	0.1365	167	158	150	141	133
APPLE VALLEY HEIGHTS COUNTY WATER DISTRICT	125	0.1022	125	118	112	106	100
APPLE VALLEY RANCHOS WATER COMPANY	13,022	10.6419	13,022	12,370	11,719	11,068	10,417
APPLE VALLEY RECREATION & PARKS	45	0.0368	45	42	40	38	36
APPLE VALLEY VIEW MUTUAL WATER CO	36	0.0294	36	34	32	30	28
APPLE VALLEY, TOWN OF	298	0.2435	298	283	268	253	238
ARC LAS FLORES	6,331	5.1739	6,331	6,014	5,697	5,381	5,064
BACA, ENRIQUE	74	0.0605	74	70	66	62	59
BALDY MESA WATER DISTRICT	1,495	1.2218	1,495	1,420	1,345	1,270	1,196
BASS, NEWTON T	514	0.4201	514	488	462	436	411
BASTIANON, REMO	77	0.0629	77	73	69	65	61
BASURA, STEVE	25	0.0204	25	23	22	21	20
BEINSCHROTH, A J	90	0.0736	90	85	81	76	72
BOYCE, KENNETH & WILLA	102	0.0834	102	96	91	86	81
BROWN, BOBBY G & VALERIA R	42	0.0343	42	39	37	35	33
BURNS, ULYSSES & ANNIE L	164	0.1340	164	155	147	139	131
CARDOZO, MANUEL & MARIA	909	0.7429	909	863	818	772	727



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BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
CDFG - MOJAVE NARROWS REGIONAL PARK	2,107	1.7219	2,107	2,001	1,896	1,790	1,685
CDFG - MOJAVE RIVER FISH HATCHERY	20	0.0163	20	19	18	17	16
CLARK, KENNETH R	223	0.1822	223	211	200	189	178
CLEAR VIEW FARMS	501	0.4094	501	475	450	425	400
COPELAND, ET AL (C/O DON W. LITTLE)	175	0.1430	175	166	157	148	140
CRAMER, MARGARET MUIR	280	0.2288	280	266	252	238	224
CUNNINGHAM, WILLIAM	29	0.0237	29	27	26	24	23
DEXTER, CLAIR F	175	0.1430	175	166	157	148	140
DEXTER, J P	515	0.4209	515	489	463	437	412
DIBERNARDO, JOHN	203	0.1659	203	192	182	172	162
DOLCH, ROBERT & JUDY	426	0.3481	426	404	383	362	340
DOMBROWSKI, MICHAEL W & SUSAN M	19	0.0155	19	18	17	16	15
DOWSE, PHILIP	20	0.0163	20	19	18	17	16
EVENSON, EDWIN H & JOYCELAINE	70	0.0572	70	66	63	59	56
FISHER, DOLORES DR	48	0.0392	48	45	43	40	38
FISHER, JEROME	633	0.5173	633	601	569	538	506
FITZWATER, R E	291	0.2378	291	276	261	247	232
GARCIA, SONIA L	288	0.2354	288	273	259	244	230
GOMBZ, CIRIL - LIVING TRUST	330	0.2697	330	313	297	280	264
GREEN ACRES ESTATES	25	0.0204	25	23	22	21	20
GULBRANSON, MERLIN	163	0.1332	163	154	146	138	130
HELENDALE SCHOOL DISTRICT	18	0.0147	18	17	16	15	14
HESPERIA GOLF AND COUNTRY CLUB	678	0.5541	678	644	610	576	542
HESPERIA WATER DISTRICT	12,213	9.9808	12,213	11,602	10,991	10,381	9,770

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EXHIBIT B  
TABLE B-1  
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BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
HI-GRADE MATERIALS	149	0.1218	149	141	134	126	119
HODGE, STANLEY W	67	0.0548	67	63	60	56	53
HOLWAY, ROBERT	88	0.0719	88	83	79	74	70
HRUBIK, THOMAS A	3,862	3.1561	3,862	3,668	3,475	3,282	3,089
INDUSTRIAL ASPHALT	109	0.0891	109	103	98	92	87
JESS RANCH WATER COMPANY	7,480	6.1129	7,480	7,106	6,732	6,358	5,984
JOHNSON, LARRY & CARLEAN	82	0.0670	82	77	73	69	65
JOHNSON, RONALD	31	0.0253	31	29	27	26	24
JOHNSTON, HARRIET AND LARRY W	127	0.1038	127	120	114	107	101
KEMPER CAMPBELL RANCH	473	0.3865	473	449	425	402	378
LAKE ARROWHEAD COMMUNITY SERVICES DISTRICT	658	0.5377	658	625	592	559	526
LAWSON, ERNEST & BARBARA	15	0.0123	15	14	13	12	12
LENHERT, RONALD & TONI	37	0.0302	37	35	33	31	29
LEWIS HOMES OF CALIFORNIA	1,693	1.3836	1,693	1,608	1,523	1,439	1,354
LONGMAN, JACK	115	0.0940	115	109	103	97	92
LOUNSBURY, J PETER & CAROLYN	208	0.1700	208	197	187	176	166
LOW, ROBERT	399	0.3261	399	379	359	339	319
LUCKEY, MANLEY J	800	0.6538	800	760	720	680	640
LUTH, KEN	27	0.0221	27	25	24	22	21
MARIANA RANCHOS COUNTY WATER DISTRICT	245	0.2002	245	232	220	208	196
MCCALL, REX	44	0.0360	44	41	39	37	35
MCINNIS, WILLIAM S	30	0.0245	30	28	27	25	24
MITCHELL, ROBIN & JUDITH	36	0.0294	36	34	32	30	28
MURPHY, BERNARD H	25	0.0204	25	23	22	21	20

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TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MURPHY, BERNARD TRUST	162	0.1324	162	153	145	137	129
MURPHY, KENNETH	42	0.0343	42	39	37	35	33
MUTUAL FUNDING CORP	101	0.0825	101	95	90	85	80
NAVAJO MUTUAL WATER CO	88	0.0719	88	83	79	74	70
NUNN, DONALD & PEARL	66	0.0539	66	62	59	56	52
O'BRYANT, ROBERT C & BARBARA	107	0.0874	107	101	96	90	85
ORMSBY, HARRY G	386	0.3154	386	366	347	328	308
PALISADES RANCH	824	0.6734	824	782	741	700	659
PARKER, DAVID E	37	0.0302	37	35	33	31	29
PEARL, ALICE	147	0.1201	147	139	132	124	117
PEARSON, DERYL B	22	0.0180	22	20	19	18	17
PERRY, THOMAS A	35	0.0286	35	33	31	29	28
PETTIS TRUST	126	0.1030	126	119	113	107	100
PHENIX PROPERTIES LTD	652	0.5328	652	619	586	554	521
PITTMAN, LEROY W	148	0.1209	148	140	133	125	118
POLICH, LEE & DONNA	65	0.0531	65	61	58	55	52
RANCHERITOS MUTUAL WATER CO	169	0.1381	169	160	152	143	135
RIVERSIDE CEMENT CO - ORO GRANDE PLANT	3,452	2.8211	3,452	3,279	3,106	2,934	2,761
ROGERS, ROY (ORO GRANDE RANCH)	115	0.0940	115	109	103	97	92
RUDMAN, ROBERT T	300	0.2452	300	285	270	255	240
RUE RANCH	30	0.0245	30	28	27	25	24
SAN BERNARDINO CO SERVICE AREA 42	465	0.3800	465	441	418	395	372
SAN BERNARDINO CO SERVICE AREA 64	3,822	3.1234	3,822	3,630	3,439	3,248	3,057
SAN BERNARDINO CO SERVICE AREA 70C	2,346	1.9172	2,346	2,228	2,111	1,994	1,876

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EXHIBIT B  
TABLE B-1  
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TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
SAN BERNARDINO CO SERVICE AREA 70J	1,005	0.8213	1,005	954	904	854	804
SAN BERNARDINO CO SERVICE AREA 70L	355	0.2901	355	337	319	301	284
SAN FILIPPO, JOSEPH & SHELLEY	35	0.0286	35	33	31	29	28
SILVER LAKES ASSOCIATION	3,987	3.2583	3,987	3,787	3,588	3,388	3,189
SOUTHDOWN, INC	1,519	1.2414	1,519	1,443	1,367	1,291	1,215
SOUTHERN CALIFORNIA WATER COMPANY	940	0.7682	940	893	846	799	752
SPRING VALLEY LAKE ASSOCIATION	3,056	2.4974	3,056	2,903	2,750	2,597	2,444
SPRING VALLEY LAKE COUNTRY CLUB	977	0.7984	977	928	879	830	781
STORM, RANDALL	62	0.0507	62	58	55	52	49
SUDMEYER, GLENN W	121	0.0989	121	114	108	102	96
SUMMIT VALLEY RANCH	452	0.3694	452	429	406	384	361
TATRO, RICHARD K & SANDRA A	280	0.2288	280	266	252	238	224
TATUM, JAMES B	829	0.6775	829	787	746	704	663
TAYLOR, ALLEN C / HAYMAKER RANCH	456	0.3727	456	433	410	387	364
THOMAS, S DALE	440	0.3596	440	418	396	374	352
THOMAS, WALTER	36	0.0294	36	34	32	30	28
THOMPSON, JAMES A	418	0.3416	418	397	376	355	334
THOMPSON, RODGER	76	0.0621	76	72	68	64	60
THRASHER, GARY	373	0.3048	373	354	335	317	298
THUNDERBIRD COUNTY WATER DISTRICT	118	0.0964	118	112	106	100	94
TURNER, ROBERT	70	0.0572	70	66	63	59	56
VAIL, JOSEPH B & PAULA B	126	0.1030	126	119	113	107	100
VAN BURGER, CARL	710	0.5802	710	674	639	603	568
VAN LEEUWEN FAMILY TRUST	341	0.2787	341	323	306	289	272

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BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
VANNI, MIKE	54	0.0441	54	51	48	45	43
VICTOR VALLEY COMMUNITY COLLEGE DIST	240	0.1961	240	228	216	204	192
VICTOR VALLEY WATER DISTRICT	13,354	10.9133	13,354	12,686	12,018	11,350	10,683
VICTORVILLE, CITY OF	12	0.0098	12	11	10	10	9
VOGLER, ALBERT H	132	0.1079	132	125	118	112	105
WACKERN, CAESAR	1,635	1.3362	1,635	1,553	1,471	1,389	1,308
WAKULA, JOHN	291	0.2378	291	276	261	247	232
WARD, KEN & BARBARA	65	0.0531	65	61	58	55	52
WEBER, DAVE	80	0.0654	80	76	72	68	64
WEST, CAROLYN & SMITH, RICHARD	24	0.0196	24	22	21	20	19
WEST, HOWARD & SUZY	72	0.0588	72	68	64	61	57
WHITTINGHAM, RICHARD V	15	0.0123	15	14	13	12	12
YEAGER, E L - CONSTRUCTION COMPANY INC	34	0.0278	34	32	30	28	27

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN ALTO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

ALTO SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MINIMAL PRODUCER POOL	4,000	3.2689	4,000	3,800	3,600	3,400	3,200
UNIDENTIFIED/UNVERIFIED PRODUCER POOL	4,967	4.0592					
ALTO SUBAREA TOTALS =	122,365	100					

- 1 Base Annual Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records, site inspection, land use estimates from 1987 and 1989 aerial photography and responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production Right expressed as a percentage of the Total Base Annual Production.
- 3 Values based on production ramp down of five percent (5%) per year. Free Production Allowance for the fifth year is equal to eighty percent (80%) of the Base Annual Production.

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN CENTRO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

CENTRO SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST <sup>3</sup> YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
AGCON, INC	0	0.0000	0	0	0	0	0
AGUAYO, JEANETTE L	212	0.3742	212	201	190	180	169
ATCHISON, TOPEKA, SANTA FE RAILWAY CO	120	0.2118	120	114	108	102	96
AVDEEF, THOMAS	34	0.0600	34	32	30	28	27
AZTEC FARM DEVELOPMENT COMPANY	220	0.3883	220	209	198	187	176
BARNES, FAY - EXECUTOR OF ESTATE OF WAYNE BARNES	243	0.4289	243	230	218	206	194
BROMMER, HARVIN	361	0.6372	361	342	324	306	288
BURNS, RITA J & PAMELA E	16	0.0282	16	15	14	13	12
CHAFAR, LARRY R	96	0.1694	96	91	86	81	76
CHOI, YONG IL & JOUNG AE	38	0.0671	38	36	34	32	30
CHRISTISON, JOEL	75	0.1324	75	71	67	63	60
COOK, KWON W	169	0.2983	169	160	152	143	135
DE VRIES, NEIL	3,800	6.7070	3,800	3,610	3,420	3,230	3,040
DESERT COMMUNITY BANK	156	0.2753	156	148	140	132	124
DURAN, FRANK T	50	0.0883	50	47	45	42	40
GAINES, JACK	117	0.2065	117	111	105	99	93
GBSIRIECH, WAYNE	121	0.2136	121	114	108	102	96
GORMAN, VIRGIL	138	0.2436	138	131	124	117	110
GRIEDER, RAYMOND H & DORISANNE	30	0.0530	30	28	27	25	24
GRILL, NICHOLAS P & MILLIE D	21	0.0371	21	19	18	17	16
GROEN, CORNELIS	1,043	1.8409	1,043	990	938	886	834
HANIFY, DBA - WHITE BEAR RANCH	152	0.2683	152	144	136	129	121
HARMSEN, JAMES & RUTH ANN	1,522	2.6863	1,522	1,445	1,369	1,293	1,217
HARPER LAKE COMPANY	1,433	2.5293	1,433	1,361	1,289	1,218	1,146

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN CENTRO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

CENTRO SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
HI DESERT MUTUAL WATER CO	34	0.0600	34	32	30	28	27
HILEMAN, KATHERINE	19	0.0335	19	18	17	16	15
HILL, MELVIN	2,335	4.1213	2,335	2,218	2,101	1,984	1,868
HOY, MIKE	632	1.1155	632	600	568	537	505
JORDAN, RAYMOND	460	0.8119	460	437	414	391	368
JUSTICE, CHRIS	421	0.7431	421	399	378	357	336
KING, GENEVIEVE E	69	0.1218	69	65	62	58	55
LEE, SEPOONG ETAL & WOO POONG	77	0.1359	77	73	69	65	61
LEYERLY, GENEVA	65	0.1147	65	61	58	55	52
LEYERLY, RICHARD	862	1.5214	862	818	775	732	689
LUDINGTON, JAMES E & JO ANN	58	0.1024	58	55	52	49	46
LYON, LOUIS & BRIKA	130	0.2295	130	123	117	110	104
MARTIN, LENDELL	14	0.0247	14	13	12	11	11
MCCOLLUM, CHARLES L	347	0.6125	347	329	312	294	277
MEAD, G C	90	0.1589	90	85	81	76	72
MEYERS, LONNIE	27	0.0477	27	25	24	22	21
MITCHELL, CHARLES A	201	0.3548	201	190	180	170	160
MOFFITT, THOMAS R & EDITH I	62	0.1094	62	58	55	52	49
MOST, MILTON W	9,660	17.0500	9,660	9,177	8,694	8,211	7,728
NELSON, MILDRED L	52	0.0918	52	49	46	44	41
NEWBERRY SPRINGS COMPANY, INC	2,489	4.3931	2,489	2,364	2,240	2,115	1,991
OHAI, REYNOLDS & DOROTHY	137	0.2418	137	130	123	116	109
OROPEZA, JOSE M	190	0.3354	190	180	171	161	152
OSTERKAMP, GEROLD	260	0.4589	260	247	234	221	208



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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN CENTRO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

CENTRO SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
OWL ROCK PRODUCTS COMPANY	466	0.8225	466	442	419	396	372
PG & B	1,657	2.9246	1,657	1,574	1,491	1,408	1,325
REDDY, BOMMI V & KARUNA V	24	0.0424	24	22	21	20	19
ROWLAND, JAMES & HELEN	22	0.0388	22	20	19	18	17
RUISCH, DALE W	650	1.1473	650	617	585	552	520
SHIRKEY, ALAN G & MARY E	35	0.0618	35	33	31	29	28
SMITH, ROBERT A	43	0.0759	43	40	38	36	34
SOPPELAND, WAYNE	783	1.3820	783	743	704	665	626
SOUTHERN CALIFORNIA WATER COMPANY	11,309	19.9605	11,309	10,743	10,178	9,612	9,047
SPINK, WALTHALL	44	0.0777	44	41	39	37	35
ST CHARLES, DONALD B	609	1.0749	609	578	548	517	487
SUN 'N SKY COUNTRY CLUB	337	0.5948	337	320	303	286	269
TALLAKSON, WILLIAM V	17	0.0300	17	16	15	14	13
TILLEMA, HAROLD	874	1.5426	874	830	786	742	699
VAN DAM, ELBERT & SUSAN	722	1.2743	722	685	649	613	577
VAN LEEUWEN, JOHN	1,922	3.3923	1,922	1,825	1,729	1,633	1,537
VAN VLIET, HENDRIKA	820	1.4473	820	779	738	697	656
VANHOF, LUTHER C	23	0.0406	23	21	20	19	18
VERNOLA, PAT	3,116	5.4998	3,116	2,960	2,804	2,648	2,492
VISSER, ANNIE	91	0.1606	91	86	81	77	72
YANG, YOUNG MO	371	0.6548	371	352	333	315	296
YKEMA HARMSSEN DAIRY	1,000	1.7650	1,000	950	900	850	800

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN CENTRO SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

CENTRO SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MINIMAL PRODUCER POOL	2,000	3.5300	2,000	1,900	1,800	1,700	1,600
UNIDENTIFIED/UNVERIFIED PRODUCER POOL	864	1.5250					
CENTRO SUBAREA TOTALS =	56,657	100					

- 1 Base Annual Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records, site inspection, land use estimates from 1987 and 1989 aerial photography and responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production Right expressed as a percentage of the Total Base Annual Production.
- 3 Values based on production ramp down of five percent (5%) per year. Free Production Allowance for the fifth year is equal to eighty percent (80%) of the Base Annual Production.

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
AKE, CHARLES J & MARJORIE M	23	0.0333	23	21	20	19	18
ANGERSER, ROBERT J & PEGGY	24	0.0347	24	22	21	20	19
ANTELOPE VALLEY DAIRY	5,430	7.8597	5,430	5,158	4,887	4,615	4,344
ARGUELLES, ALFREDO	1,047	1.5155	1,047	994	942	889	837
ATCHISON, TOPEKA, SANTA FE RAILWAY CO	80	0.1158	80	76	72	68	64
BAGLEY, ROY	20	0.0289	20	19	18	17	16
BALDERRAMA, ALFRED & LINDA	250	0.3619	250	237	225	212	200
BALL, DAVID P	81	0.1172	81	76	72	68	64
BARAK, RICHARD	132	0.1911	132	125	118	112	105
BARBER, JAMES B	167	0.2417	167	158	150	141	133
BARSTOW CALICO K O A	24	0.0347	24	22	21	20	19
BAUR, KARL & RITA	26	0.0376	26	24	23	22	20
BEDINGFIELD, LYNDLELL & CHARLENE	56	0.0811	56	53	50	47	44
BENTON, PHILIP G	35	0.0507	35	33	31	29	28
BORGOGNO, STEVEN & LILLIAN B	1,844	2.6691	1,844	1,751	1,659	1,567	1,475
BOWMAN, EDWIN L	31	0.0449	31	29	27	26	24
BROWN, RONALD A	1,080	1.5632	1,080	1,026	972	918	864
BROWY, ORVILLE & LOUISE	33	0.0478	33	31	29	28	26
BRUINS, NICHOLAS	29	0.0420	29	27	26	24	23
CALICO LAKES HOMEOWNERS ASSOCIATION	1,031	1.4923	1,031	979	927	876	824
CALIF DEPT OF TRANSPORTATION	71	0.1028	71	67	63	60	56
CAMPBELL, M A & DIANNE	22	0.0318	22	20	19	18	17
CARTER, JOHN THOMAS	746	1.0798	746	708	671	634	596
CDFG - CAMP CADY	14	0.0203	14	13	12	11	11

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
CHANG, TIMOTHY & JANE	18	0.0261	18	17	16	15	14
CHASTAIN, W C	100	0.1447	100	95	90	85	80
CHEYENNE LAKE, INC	122	0.1766	122	115	109	103	97
CHIAO MEI DEVELOPMENT	451	0.6528	451	428	405	383	360
CHO BROTHERS RANCH	758	1.0972	758	720	682	644	606
CHUANG, MARSHAL	70	0.1013	70	66	63	59	56
CONNER, WILLIAM H	25	0.0362	25	23	22	21	20
COOL WATER RANCH	76	0.1100	76	72	68	64	60
CRYSTAL LAKES PROPERTY OWNERS ASSOCIATION	447	0.6470	447	424	402	379	357
DAGGETT COMMUNITY SERVICES DISTRICT	235	0.3402	235	223	211	199	188
DALJO CORPORATION	31	0.0449	31	29	27	26	24
DAVIS, RONALD & DONNA	53	0.0767	53	50	47	45	42
DE JONG, ALAN L	1,648	2.3854	1,648	1,565	1,483	1,400	1,318
DENNISON, QUENTIN D	29	0.0420	29	27	26	24	23
DESERT LAKES CORPORATION - (LAKE DOLORES)	483	0.6991	483	458	434	410	386
DOCIMO, DONALD P & PATRICIA J	23	0.0333	23	21	20	19	18
DONALDSON, JERRY & BEVERLY	90	0.1303	90	85	81	76	72
ELLISON, SUSAN	15	0.0217	15	14	13	12	12
EVKHANIAN, JAMES H	110	0.1592	110	104	99	93	88
FAWCETT, EDWARD C	20	0.0289	20	19	18	17	16
FELIX, ALAN E & CAROL L	36	0.0521	36	34	32	30	28
PERRO, DENNIS & NORMA	32	0.0463	32	30	28	27	25
FRIEND, JOSEPH & DEBORAH	60	0.0868	60	57	54	51	48
FUNDAMENTAL CHRISTIAN ENDRAVOR	285	0.4125	285	270	256	242	228

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EXHIBIT B  
 TABLE B-1  
 TABLE SHOWING BASE ANNUAL PRODUCTION AND  
 BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
 TOGETHER WITH FREE PRODUCTION ALLOWANCES  
 FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
GARCIA, DANIEL	23	0.0333	23	21	20	19	18
GOLD, HAROLD	249	0.3604	249	236	224	211	199
GRAVES, CHESTER B	32	0.0463	32	30	28	27	25
HAIGH, WHILLYN & MARGARET	32	0.0463	32	30	28	27	25
HALL, LARRY	23	0.0333	23	21	20	19	18
HARALIK, BESS & ROBERT	27	0.0391	27	25	24	22	21
HARDESTY, LESLIE E & BECKY J	47	0.0680	47	44	42	39	37
HARSON, NICHOLAS & MARY	30	0.0434	30	28	27	25	24
HARTER FARMS	1,083	1.5676	1,083	1,028	974	920	866
HARTER, JOE & SUE	738	1.0682	738	701	664	627	590
HARTLEY, LONNIE	19	0.0275	19	18	17	16	15
HARVEY, FRANK	38	0.0550	38	36	34	32	30
HENDLEY, RICK & BARBARA	48	0.0695	48	45	43	40	38
HIETT, PATRICIA J	16	0.0232	16	15	14	13	12
HILARIDES, FRANK	1,210	1.7514	1,210	1,149	1,089	1,028	968
HOLLISTER, ROBERT H & RUTH M	44	0.0637	44	41	39	37	35
HONG, PAUL B & MAY	95	0.1375	95	90	85	80	76
HORTON'S CHILDREN'S TRUST	106	0.1534	106	100	95	90	84
HORTON, JOHN MD	183	0.2649	183	173	164	155	146
HOSKING, JOHN W & JEAN	94	0.1361	94	89	84	79	75
HUBBARD, ESTER & MIZUNO, ARLEAN	28	0.0405	28	26	25	23	22
HUNT, RALPH M & LILLIAN F	31	0.0449	31	29	27	26	24
HUTCHISON, WILLIAM O	901	1.3042	901	855	810	765	720
HYATT, JAMES & BRENDA	210	0.3040	210	199	189	178	168

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBARRA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBARRA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
IRVIN, BERTRAND W	29	0.0420	29	27	26	24	23
J V A AIR INC	54	0.0782	54	51	48	45	43
JACKSON, RAY	20	0.0289	20	19	18	17	16
JOHNSON, JAMES R	247	0.3575	247	234	222	209	197
JUSTICE, CHRIS	6	0.0087	6	5	5	5	4
KAPLAN, ABRAHAM M	76	0.1100	76	72	68	64	60
KASNER, ROBERT	1,001	1.4489	1,001	950	900	850	800
KATCHER, AUGUST M & MARCELYNE	23	0.0333	23	21	20	19	18
KEMP, ROBERT & ROSE	32	0.0463	32	30	28	27	25
KIEL, MARY	34	0.0492	34	32	30	28	27
KIM, JOON HO	764	1.1059	764	725	687	649	611
KOSHAREK, JOHN & JOANNE	54	0.0782	54	51	48	45	43
LAKE JODIE PROPERTY OWNERS ASSOCIATION	254	0.3677	254	241	228	215	203
LAKE WAIKIKI	98	0.1419	98	93	88	83	78
LAKE WAINANI OWNERS ASSOCIATION	202	0.2924	202	191	181	171	161
LANGLEY, MICHAEL R	20	0.0289	20	19	18	17	16
LAWRENCE, WILLIAM W	45	0.0651	45	42	40	38	36
LBE, MOON & OKBEA	49	0.0709	49	46	44	41	39
LBE, VIN JANG T	630	0.9119	630	598	567	535	504
LESHIN, CONNIE & SOL	1,416	2.0496	1,416	1,345	1,274	1,203	1,132
LESHIN, SOL	1,997	2.8906	1,997	1,897	1,797	1,697	1,597
LEVINE, DR LESLIE	1,637	2.3695	1,637	1,555	1,473	1,391	1,309
LONG, BALLARD	35	0.0507	35	33	31	29	28
M BIRD CONSTRUCTION	41	0.0593	41	38	36	34	32

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
	(ACRE-FEET)	(PERCENT)	FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
MAHJOUBI, APSAR S	63	0.0912	63	59	56	53	50
MALIN, LILY	54	0.0782	54	51	48	45	43
MALONEY, JANICE	36	0.0521	36	34	32	30	28
MARCROFT, JAMES A & JOAN	38	0.0550	38	36	34	32	30
MARSHALL, CHARLES	20	0.0289	20	19	18	17	16
MAYBERRY, DONALD J	41	0.0593	41	38	36	34	32
MILBRAT, IRVING	73	0.1057	73	69	65	62	58
MITCHELL, CHARLOTTE	115	0.1665	115	109	103	97	92
MITCHELL, JAMES L & CHERYL A	155	0.2244	155	147	139	131	124
MOORE, WAYNE G & JULIA H	103	0.1491	103	97	92	87	82
MORRIS, KARL	304	0.4400	304	288	273	258	243
MULLIGAN, ROBERT & INEZ	35	0.0507	35	33	31	29	28
NEWBERRY COMMUNITY SERVICE DIST	23	0.0333	23	21	20	19	18
NU VIEW DEVELOPMENT, INC	2,899	4.1962	2,899	2,754	2,609	2,464	2,319
O P D L INC	109	0.1578	109	103	98	92	87
O'KEEFE, SARAH-LEE & JOKE E	50	0.0724	50	47	45	42	40
P & H ENGINEERING & DEV CORP	667	0.9654	667	633	600	566	533
PARKER, GEORGE R	144	0.2084	144	136	129	122	115
PATHFINDER INVESTORS	472	0.6832	472	448	424	401	377
PAYAN, PAUL	32	0.0463	32	30	28	27	25
PERKO, BERT K	132	0.1911	132	125	118	112	105
PITTS, JOE	30	0.0434	30	28	27	25	24
POHL, ANDREAS & CATHLYN	17	0.0246	17	16	15	14	13
POLAND, JOHN R & SANDRA M	92	0.1332	92	87	82	78	73

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
PRICE, ALAN E	37	0.0536	37	35	33	31	29
PRICE, DONALD	42	0.0608	42	39	37	35	33
PUCKHABER, WILLIAM F TRUST	63	0.0912	63	59	56	53	50
PURCIO, THOMAS F & PATRICIA A	80	0.1158	80	76	72	68	64
RANDOLPH, JOAN E	24	0.0347	24	22	21	20	19
REEVES, RICHARD	230	0.3329	230	218	207	195	184
RICE, DANIEL & MARY	121	0.1751	121	114	108	102	96
RICE, HENRY C & DIANA	24	0.0347	24	22	21	20	19
RIBGER, WALTER M	62	0.0897	62	58	55	52	49
RIKUO CORPORATION	1,517	2.1958	1,517	1,441	1,365	1,289	1,213
ROSSI, JAMES L & NAOMI I	614	0.8887	614	583	552	521	491
ROTEX CONSTRUCTION COMPANY	2,529	3.6606	2,529	2,402	2,276	2,149	2,023
SAN BERNARDINO COUNTY BARSTOW - DAGGETT AIRPORT	168	0.2432	168	159	151	142	134
SANTUCCI, ANTONIO & WILSA	30	0.0434	30	28	27	25	24
SCOGGINS, JERRY	105	0.1520	105	99	94	89	84
SHEPPARD, THOMAS & GLORIA	217	0.3141	217	206	195	184	173
SHORT, CHARLES & MARGARET	54	0.0782	54	51	48	45	43
SHORT, JEFF	30	0.0434	30	28	27	25	24
SILVER VALLEY RANCH, INC	109	0.1578	109	103	98	92	87
SMITH, WILLIAM E	19	0.0275	19	18	17	16	15
SNYDER, KRYL K & ROUTH, RICHARD J	64	0.0926	64	60	57	54	51
SOUTHERN CALIFORNIA EDISON CO - AGRICULTURE	5,858	8.4792	5,858	5,565	5,272	4,979	4,686
SOUTHERN CALIFORNIA EDISON CO - INDUSTRIAL	4,565	6.6076	4,565	4,336	4,108	3,880	3,652
SOUTHERN CALIFORNIA GAS COMPANY	98	0.1419	98	93	88	83	78



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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA  PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION  (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
ST ANTONY COPTIC ORTHODOX MONASTERY	130	0.1882	130	123	117	110	104
STEWART, STANLEY & PATRICIA	27	0.0391	27	25	24	22	21
SUGA, TAKRAKI	154	0.2229	154	146	138	130	123
SUNDOWN LAKES, INC	168	0.2432	168	159	151	142	134
SWARTZ, ROBERT & IRENE	50	0.0724	50	47	45	42	40
TAPIE, RAYMOND & MURIEL	18	0.0261	18	17	16	15	14
TAYLOR, TOM	503	0.7281	503	477	452	427	402
THAYER, SHARON	58	0.0840	58	55	52	49	46
THE 160 NEWBERRY RANCH CALIFORNIA, LTD	1,033	1.4952	1,033	981	929	878	826
TRIPLE H PARTNERSHIP	993	1.4373	993	943	893	844	794
UNION PACIFIC RAILROAD COMPANY	249	0.3604	249	236	224	211	199
VAN BASTELAAR, ALPHONSE	78	0.1129	78	74	70	66	62
VAN DIEST, CORNELIUS	934	1.3519	934	887	840	793	747
VAN LEEUWEN, JOHN	1,084	1.5690	1,084	1,029	975	921	867
VANDER DUSSEN, AGNES	1,792	2.5938	1,792	1,702	1,612	1,523	1,433
VAUGHT, ROBERT E & KAREN M	43	0.0622	43	40	38	36	34
VERNOLA, PAT	1,310	1.8962	1,310	1,244	1,179	1,113	1,048
WARD, ERNEST & LAURA	38	0.0550	38	36	34	32	30
WARD, RONNY H	130	0.1882	130	123	117	110	104
WEBER, F R & JUNELL	96	0.1390	96	91	86	81	76
WEBSTER, THOMAS M & PATRICIA J	24	0.0347	24	22	21	20	19
WEIDKNECHT, ARTHUR J & PEGGY A	79	0.1143	79	75	71	67	63
WESTERN HORIZON ASSOCIATES INC	1,188	1.7196	1,188	1,128	1,069	1,009	950
WESTERN ROCK PRODUCTS	31	0.0449	31	29	27	26	24

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EXHIBIT B  
TABLE B-1  
TABLE SHOWING BASE ANNUAL PRODUCTION AND  
BASE ANNUAL PRODUCTION RIGHT OF EACH PRODUCER WITHIN BAJA SUBAREA  
TOGETHER WITH FREE PRODUCTION ALLOWANCES  
FOR FIRST FIVE YEARS OF THE JUDGMENT

BAJA SUBAREA PRODUCER	BASE ANNUAL <sup>1</sup> PRODUCTION (ACRE-FEET)	BASE ANNUAL <sup>2</sup> PRODUCTION RIGHT (PERCENT)	FREE PRODUCTION ALLOWANCES (ACRE-FEET)				
			FIRST YEAR	SECOND <sup>3</sup> YEAR	THIRD <sup>3</sup> YEAR	FOURTH <sup>3</sup> YEAR	FIFTH <sup>3</sup> YEAR
WET SET, INC	129	0.1867	129	122	116	109	103
WITTE, E DANIEL	27	0.0391	27	25	24	22	21
WLSR INC	133	0.1925	133	126	119	113	106
WORSEY, REVAE	29	0.0420	29	27	26	24	23
YARD, BETTY	26	0.0376	26	24	23	22	20
YERMO WATER COMPANY	453	0.6557	453	430	407	385	362
YOUNG, KRITH O - (DESERT TURF)	312	0.4516	312	296	280	265	249
MINIMAL PRODUCER POOL	3,500	5.0661	3,500	3,325	3,150	2,975	2,800
UNIDENTIFIED/UNVERIFIED PRODUCER POOL	320	0.4632					
BAJA SUBAREA TOTALS =	69,087	100					

- 1 Base Annual Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records, site inspection, land use estimates from 1987 and 1989 aerial photography and responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production Right expressed as a percentage of the Total Base Annual Production.
- 3 Values based on production ramp down of five percent (5%) per year. Free Production Allowance for the fifth year is equal to eighty percent (80%) of the Base Annual Production.

EXHIBIT B  
TABLE B-2  
TABLE SHOWING TOTAL WATER PRODUCTION  
FOR AQUACULTURE AND RECREATIONAL LAKE PURPOSES  
ALTO SUBAREA

PRODUCER	TOTAL WATER <sup>1</sup> PRODUCTION	BASE ANNUAL <sup>2</sup> PRODUCTION	RECIRCULATED <sup>3</sup> WATER
	(ACRE-FEET)		
CDFG - MOJAVE RIVER FISH HATCHERY	10,678	20	10,658
JESS RANCH WATER COMPANY	18,625	7,480	11,145
ALTO SUBAREA TOTALS =	29,303	7,500	21,803

Total Water Production is the reported maximum year production for each producer for the five year period 1986-1990.

These values reflect the maximum production determined by one or more of the following: Southern California Edison records; James C. Hanson site inspection; land use estimates from 1989 aerial photography; responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.

<sup>2</sup> Base Annual Production as shown on Table B-1.

<sup>3</sup> Amount shown is the difference between the Total Water Production and the Base Annual Production.

EXHIBIT B  
TABLE B-2  
TABLE SHOWING TOTAL WATER PRODUCTION  
FOR AQUACULTURE AND RECREATIONAL LAKE PURPOSES  
BAJA SUBAREA

PRODUCER	TOTAL WATER <sup>1</sup> PRODUCTION	BASE ANNUAL <sup>2</sup> PRODUCTION	RECIRCULATED <sup>3</sup> WATER
	(ACRE-FEET)		
BROWY, ORVILLE & LOUISE	210	33	177
CALICO LAKES HOMEOWNERS ASSOCIATION	2,513	1,031	1,482
CDFG - CAMP CADY	102	14	88
CHEYENNE LAKE, INC	638	122	516
CRYSTAL LAKES PROPERTY OWNERS ASSOCIATION	6,575	447	6,128
DESERT LAKES CORPORATION - (LAKE DOLORES)	928	483	445
FUNDAMENTAL CHRISTIAN ENDEAVOR	440	285	155
HORTON'S CHILDREN'S TRUST	1,291	106	1,185
HORTON, JOHN MD	672	183	489
KIEL, MARY	188	34	154
LAKE JODIE PROPERTY OWNERS ASSOCIATION	2,805	254	2,551
LAKE WAIKIKI	400	98	302
LAKE WAINANI OWNERS ASSOCIATION	1,420	202	1,218
LEE, MOON & OKBEA	171	49	122
O F D L INC	434	109	325
RICE, DANIEL & MARY	614	121	493
SCOGGINS, JERRY	922	105	817
SILVER VALLEY RANCH, INC	455	109	346
SMITH, WILLIAM E	153	19	134
SUNDOWN LAKES, INC	1,109	168	941
TAPIE, RAYMOND & MURIEL	108	18	90
THAYER, SHARON	159	58	101
WET SET, INC	441	129	312
WLSR INC	678	133	545

EXHIBIT B  
TABLE B-2  
TABLE SHOWING TOTAL WATER PRODUCTION  
FOR AQUACULTURE AND RECREATIONAL LAKE PURPOSES  
BAJA SUBAREA

PRODUCER	TOTAL WATER <sup>1</sup> PRODUCTION	BASE ANNUAL <sup>2</sup> PRODUCTION	RECIRCULATED <sup>3</sup> WATER
(ACRE-FEET)			
BAJA SUBAREA TOTALS =	23,426	4,310	19,116

- 1 Total Water Production is the reported maximum year production for each producer for the five year period 1986-1990. These values reflect the maximum production determined by one or more of the following: Southern California Edison records; James C. Hanson site inspection; land use estimates from 1989 aerial photography; responses to special interrogatories. All values are subject to change if additional information is made available, or if any value reported herein is found to be in error.
- 2 Base Annual Production as shown on Table B-1.
- 3 Amount shown is the difference between the Total Water Production and the Base Annual Production.

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EXHIBIT C

ENGINEERING APPENDIX

CONTENTS

- A. ADJUSTMENT OF FREE PRODUCTION ALLOWANCES
- B. DETERMINATION OF SURFACE FLOW COMPONENTS

TABLE C-1: MOJAVE BASIN AREA ADJUDICATION SUBAREA HYDROLOGICAL INVENTORY BASED ON LONG-TERM AVERAGE NATURAL WATER SUPPLY AND OUTFLOW AND CURRENT YEAR IMPORTS AND CONSUMPTIVE USE

EXHIBIT C

ENGINEERING APPENDIX

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3           The purpose of this Engineering Appendix is to establish  
4 the basis for measurements, calculations and determinations  
5 required in the operation of the Physical Solution.

6           A.     Adjustment of Free Production Allowances.         In the  
7 preparation of the report required by Paragraph 24 (o) of this  
8 Judgment, the Watermaster shall take into account all available  
9 pertinent hydrologic data and estimates, including at least the  
10 factors, or changes in the factors, shown in the attached Table  
11 C-1, "MOJAVE BASIN AREA ADJUDICATION SUBAREA HYDROLOGICAL INVENTORY  
12 BASED ON LONG-TERM AVERAGE NATURAL WATER SUPPLY AND OUTFLOW AND  
13 CURRENT YEAR IMPORTS AND CONSUMPTIVE USE," and changes in storage  
14 as determined by well levels, the factors listed in Paragraph 2(a)  
15 of Exhibit "H", and other pertinent data. The numbers for each of  
16 the factors for each Subarea shown in Table C-1 are Sample Numbers  
17 only, and are not intended to be used in determining actual water  
18 supply, Consumptive Use and outflow, or Free Production Allowance  
19 of the Subareas.

20           B.     Determination of Surface Flow Components. The procedures  
21 used to determine the historical surface flow components of the  
22 Mojave River at various locations are summarized below.

23                   1.     Determination of Surface Flow Components at Lower  
24 Narrows.    Since the records available for the discharge of the  
25 Mojave River at Lower Narrows only provide data on the total amount  
26 of surface flow and since Storm Flow occurs during and following  
27 periods of rainfall, it was necessary to determine what portion of  
28

1 total measured surface flow at Lower Narrows was Storm Flow and  
2 what portion was Base Flow.

3 The Parties in reaching the physical solution provided for in  
4 the Judgment, used certain procedures to separate the Storm Flow  
5 and Base Flow components of the total measured surface flow at  
6 Lower Narrows. Hydrographs of the mean daily discharge at Lower  
7 Narrows were plotted for the Year under consideration together with  
8 corresponding rainfall data obtained from the National Oceanic and  
9 Atmospheric Administration (NOAA) for Lake Arrowhead. Hydrographs  
10 were also plotted for the combined flow of West Fork Mojave River  
11 and Deep Creek which together with the Lake Arrowhead precipitation  
12 data served as a guide for interpreting those periods during which  
13 Storm Flow was likely to have occurred at Lower Narrows.

14 Other factors considered included:

15 \* Occurrences of Storm Flow at Barstow and Afton Canyon,  
16 \* Precipitation at Victorville and Barstow,  
17 \* Consideration of the time of Year and temperature, &  
18 \* Shape of hydrographs for Years having similar Base Flow  
19 characteristics.

20 Based on interpretation of all of the foregoing information,  
21 the flows occurring on those days during which Storm Flow most  
22 likely occurred were "scalped" by projecting an estimated Base Flow  
23 Curve through the Storm Flow Period. The Base Flow component of  
24 the total monthly flow was then determined as follows:

25 a. For those periods during which there was obviously no  
26 Storm Flow, the entire recorded mean daily flows were assumed to be  
27 Base Flow.  
28



1           b. For the remaining Storm Flow periods, the Base Flow  
2 component was taken as the area under the Base Flow Curve, except  
3 that for those days within the Storm Flow period when the actual  
4 mean daily discharge is less than the amount indicated by the Base  
5 Flow Scalping Curves, then the actual recorded amount is used.

6           2. Determination of Surface Flow Components at Waterman  
7 Fault. The total amount of surface flow passing the Waterman Fault  
8 (under current riverbed conditions) is considered to be Storm Flow  
9 and can be estimated from the Storm Flow passing the USGS gauging  
10 station Mojave River at Barstow. The following table was developed  
11 to provide a method for estimating flow at Waterman Fault:

12	Storm Flow At Barstow Gage <sup>1</sup> 13 <u>(Acre-Feet)</u>	Estimated Surface Flow at Waterman Fault 14 <u>(Acre-Feet)</u>
14	2,000	0
15	10,000	6,200
16	20,000	14,300
17	30,000	22,600
18	40,000	31,400
19	50,000	40,500
20	60,000	49,200
21	70,000	58,400
22	80,000	67,800
23	90,000	76,800
24	100,000	85,400

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27 <sup>1</sup>From Recorded Flow at USGS Gaging Station Mojave River at  
28 Barstow. Relationship is based on single storm events. More than  
one storm event separated by more than five day of zero flow will  
be considered as separate storms.

1                   3.    Determination of Surface Flow Components at Afton.

2   Records available for the discharge of the Mojave River at Afton,  
3   California, provide data on the total amount of surface flow and  
4   since storm runoff occurs during and immediately following a major  
5   storm event in the watershed area tributary to the Baja Basin below  
6   Barstow or in the event of large Storm Flows at Barstow which reach  
7   Afton, it was necessary to determine what portion of the total  
8   measured surface flow at Afton is Storm Flow and what portion of  
9   Base Flow.

10           The Parties, in reaching the physical solution provided for in  
11   the Judgment, used certain procedures to separate the Storm Flow  
12   and Base Flow components of the total measured surface flow at  
13   Afton. Hydrographs of the mean daily discharge at Afton were  
14   plotted for the water Year under consideration. In the absence of  
15   Storm Flow, the Base Flow curve at Afton was generally a relatively  
16   constant amount. Storm Flows were evidenced by sharp spikes or  
17   abrupt departures from the antecedent Base Flow and a fairly rapid  
18   return to pre-storm Base Flow Condition. The hydrograph of flows  
19   at Barstow served as a guide for identifying those periods during  
20   which Storm Flow was likely to have occurred at Afton.

21           Based on interpretation of all of the foregoing information,  
22   the flows occurring on those days during which Storm Flow most  
23   likely occurred were "scalped" by projecting an estimated Base Flow  
24   Curve through the Storm Flow Period. The Base Flow component of  
25   the total monthly flow was then determined as follows:

26           a. For those periods during which there is obviously no  
27   Storm Flow, the entire recorded mean daily flows were assumed to be  
28   Base Flow.

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b. For the remaining Storm Flow periods, the Base Flow component was taken as the area under the Base Flow Curve except that for those days within the Storm Flow period when the actual mean daily discharge was less than the amount indicated by the Base Flow Scalping Curves, then the actual recorded amount was used.

4. Engineers' Work Papers. These procedures are reflected in the Work Papers of the Engineers, copies of which are filed with the Watermaster.

**TABLE C-1**  
**Mojave Basin Area Adjudication**  
**Subarea Hydrological Inventory Based On**  
**Long-Term Average Natural Water Supply and Outflow**  
**and Current Year Imports and Consumptive Use**  
**(All Amounts in Acre-Feet)**

<b>WATER SUPPLY</b>	<b>Este</b>	<b>Oeste</b>	<b>Alto</b>	<b>Centro</b>	<b>Baja</b>	<b>Basin Totals</b>
Surface Water Inflow						
Gaged	0	0	65,000	0	0	65,000 <sup>1</sup>
Ungaged	1,700	1,500	3,000	37,300 <sup>1</sup>	14,300 <sup>2</sup>	6,500 <sup>3</sup>
Subsurface Inflow	0	0	1,000	2,000	1,200	0 <sup>4</sup>
Deep Percolation of Precipitation	0	0	3,500	0	100	3,600
Imports						
Lake Arrowhead CSD	0	0	1,500	0	0	1,500
Big Bear ARWWA	2,000	0	0	0	0	2,000
<b>TOTAL</b>	<b>3,700</b>	<b>1,500</b>	<b>74,000</b>	<b>39,300</b>	<b>15,600</b>	<b>78,600</b>
<b>CONSUMPTIVE USE AND OUTFLOW</b>						
Surface Water Outflow						
Gaged	0	0	0	0	8,200	8,200
Ungaged	0	0	37,300 <sup>1</sup>	14,000 <sup>5</sup>	0	0
Subsurface Outflow	200	800	2,000	1,200	0	0
Consumptive Use						
Agriculture	6,800	2,900	16,300	20,300	30,200	76,500
Urban	1,900	1,200	36,300	9,500	9,700	58,600 <sup>6</sup>
Phreatophytes	0	0	5,100	900	1,500	7,500
Exports	0	0	0	0	0	0
<b>TOTAL</b>	<b>8,900</b>	<b>4,900</b>	<b>97,000</b>	<b>45,900</b>	<b>49,600</b>	<b>150,800</b>
Surplus / (Deficit)	(5,200)	(3,400)	(23,000)	(6,600)	(34,000)	(72,200)
Total Estimated Production (Current Year) <sup>7</sup>	15,700	7,600	98,900	46,500	54,300	223,000
<b>PRODUCTION SAFE YIELD (Current Year)<sup>7</sup></b>	<b>10,500</b>	<b>4,200</b>	<b>75,900</b>	<b>39,900</b>	<b>20,300</b>	<b>150,800</b>

<sup>1</sup> Estimated from reported flows at USGS gaging station, Mojave River at Victorville Narrows.

<sup>2</sup> Includes 14,000 acre-feet of Mojave River surface flow across the Waterman Fault estimated from reported flows at USGS gaging station, Mojave River at Barstow, and 300 acre-feet of local surface inflow from Kane Wash.

<sup>3</sup> Represents the sum of Este (1,700 af), Oeste (1,500 af), Alto (3,000 af) and Baja (300 af from Kane Wash).

<sup>4</sup> Inter subarea subsurface flows do not accrue to the total basin water supply.

<sup>5</sup> Estimated from reported flows at USGS gaging station, Mojave River at Barstow.

<sup>6</sup> Estimated by Bookman-Edmonston.

<sup>7</sup> For purposes of this Table, the current year is 1990.

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EXHIBIT D  
  
TIME SCHEDULES



1 Production Allowance, Watermaster shall notify all Parties as to  
2 its recommendation not later than February 1, shall hold a public  
3 hearing thereon not later than March 1, and shall submit any such  
4 recommendation, which may be revised pursuant to the public  
5 hearing, to the Court not later than April 1.

6 5. Payment of Administrative Assessments and Biological  
7 Resource Assessments. Each Producer shall submit quarterly along  
8 with the Production report required by Paragraph 24 (p) an  
9 Administrative Assessment payment in an amount equal to the current  
10 Year Administrative Assessment Rate multiplied times the acre-feet  
11 of water Produced during the quarter and a Biological Resource  
12 Assessment payment in an amount equal to the current Year  
13 Biological Resource Assessment Rate multiplied times the acre-feet  
14 of water Produced during the quarter.

15 6. Payment of Replacement Water Assessments and Makeup Water  
16 Assessments. Replacement Water Assessments and Makeup Water  
17 Assessments for the prior Year shall be due and payable on July 1.

18 7. Delinquency of Assessments. Any assessment payable  
19 pursuant to this Judgment shall be deemed delinquent: i) if paid in  
20 Person, if not paid within five (5) days of the date due; ii) if  
21 paid by electronic funds transfer, if not paid within three (3)  
22 banking days of the date due; or iii) if paid by any other means,  
23 if not paid within ten (10) days of the date due. "Payment" shall  
24 occur when good and sufficient funds have been received by the  
25 Watermaster. Any assessment shall also be deemed delinquent in the  
26 event that any attempted payment is by funds that are not good and  
27 sufficient.

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EXHIBIT E

LIST OF PRODUCERS AND THEIR DESIGNEES



EXHIBIT E

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AGCON, INC.	Robert E. Hove
AGUAYO, JEANETTE L.	Same
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ANDERSON, ROSS C & BETTY J	Same
ANGERER, ROBERT J & PEGGY	Same
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APPLE VALLEY DEVELOPMENT	Same
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APPLE VALLEY HEIGHTS CO. WATER	Elizabeth Hanna, Esq.
APPLE VALLEY RANCHOS WATER	Fredric Fudacz, Esq.
APPLE VALLEY REC. & PARKS	Elizabeth Hanna, Esq.
APPLE VALLEY VIEW MUTUAL WATER CO.	Joseph Saltmeris, Esq.
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AVDEEF, THOMAS & LUCILLE	Same
AZTEC FARM DEVELOPMENT CO	Al Jackson
BACA, ENRIQUE	Same
BAGLEY, ROY	Same
BALDERRAMA, ALFRED & LINDA	Same
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BARNES, FAY  
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BASTIANON, REMO  
BASURA, STEVE  
BAUR, KARL & RITA  
BEDINGFIELD, LYNDELL&CHARLENE  
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BELL, CHUCK  
BENTON, PHILIP G  
BORGOGNO, STEVEN & LILLIAN  
BOWMAN, EDWIN L  
BOYCE, KENNETH & WILLA  
BROMMER, MARVIN  
BROWN, BOBBY G & VALERIA R  
BROWN, DOUG & SUE  
BROWN, RONALD A  
BROWY, ORVILLE & LOUISE  
BRUINS, NICHOLAS  
BURNS, BOBBY J & EVELYN J  
BURNS, RITA J & PAMELA E  
BURNS, ANNIE L  
CALICO LAKES HOMEOWNERS  
CALIF DEPT OF TRANSPORTATION  
CAMPBELL, M A & DIANNE  
CARDOZO, MANUEL & MARIA  
CARTER, JOHN THOMAS  
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CDFG - MOJAVE RIVER FISH  
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CHAMISAL MUTUAL  
CHANG, TIMOTHY & JANE  
CHASTAIN, W C  
CHEYENNE LAKE, INC  
CHIAO MEI DEVELOPMENT  
CHO BROTHERS RANCH  
CHOI, YONG IL & JOUNG AE  
CHRISTISON, JOEL  
CHUANG, MARSHAL  
CLARK, KENNETH R  
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CLUB VIEW PARTNERS  
CONNER, WILLIAM H  
COOK, KWON W  
COOL WATER RANCH  
COPELAND, ETAL  
CRAMER, MARGARET MUIR  
CROSS, LAWRENCE E & SHARON I  
CRYSTAL HILLS WATER COMPANY  
CRYSTAL LAKES PROPERTY OWNERS  
CUNNINGHAM, WILLIAM  
DAGGETT COMMUNITY SERVICES  
DAHLQUIST, GEORGE R  
DALJO CORPORATION  
DAVIS, Paul  
DAVIS, RONALD & DONNA  
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DESERT LAKES CORPORATION - (LAKE DOLORES)  
DESERT COMMUNITY BANK  
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DOCIMO, DONALD P & PATRICIA J  
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ELLISON, SUSAN  
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FERRO, DENNIS & NORMA  
FISHER, DR DOLORES  
FISHER, JEROME  
FITZWATER, R E  
FRIEND, JOSEPH & DEBORAH  
FUNDAMENTAL CHRISTIAN ENDEAVOR  
GAETA, TRINIDAD C/O BLUE BEAD FARMS  
GAINES, JACK & MARY  
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GREEN ACRES ESTATES  
GRIEDER, RAYMOND H & DORISANNE  
GRILL, NICHOLAS P & MILLIE D  
GROEN, CORNELIUS  
GUBLER, HANS  
GULBRANSON, MERLIN  
HAIGH, WHILLDYN & MARGARET  
HAL-DOR LTD  
HALL, LARRY  
HANDLEY, DON R & MARY ANN  
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HARALIK, BESS & ROBERT  
HARDESTY, LESLIE E & BECKY J  
HARESON, NICHOLAS & MARY  
HARPER LAKE CO;UC OPERATING/HARPER DRY LAKE  
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HARTER FARMS  
HARTER, JOE & SUE  
HARTLEY, LONNIE  
HARVEY, FRANK  
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HENDLEY, RICK & BARBARA  
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HONG, PAUL B & MAY  
HORTON'S CHILDREN'S TRUST  
HORTON, JOHN MD  
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JOHNSON, JAMES R  
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JOHNSON, RONALD  
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NEWBERRY SPRINGS COMPANY  
NUNN, DONALD & PEARL  
NU VIEW DEVELOPMENT, INC  
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OHAI, REYNOLDS & DOROTHY  
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P & H ENGINEERING & DEV CORP  
PALISADES RANCH  
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REEVES, RICHARD  
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RICE, DANIEL & MARY  
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ROGERS, ROY  
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SAN BERNARDINO CSA #64	William Smillie
SAN BERNARDINO CSA #70C	William Smillie
SAN BERNARDINO CSA #70G	William Smillie
SAN BERNARDINO CSA #70J	William Smillie
SAN BERNARDINO CSA #70L	William Smillie
SAN BERNARDINO CO. BARSTOW-DAGGETT AIRPORT	William Smillie
SAN FILIPPO, JOSEPH & SHELLEY	Same
SANTUCCI, ANTONIO & WILSA	Same
SAN BERNARDINO CSA #70L	William Smillie
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VAN DAM, ELDERT & SUSAN  
VAN DIEST, CORNELIUS  
VAN LEEUWEN FAMILY TRUST  
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WESTERN ROCK PRODUCTS  
WET SET, INC  
WHITTINGHAM, RICHARD V  
WILLOW WELLS MUTUAL WATER COMPANY  
WITTE, E DANIEL & MARCIA  
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WORSEY, JOSEPH A & REVAE  
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EXHIBIT F  
TRANSFERS OF BASE ANNUAL PRODUCTION RIGHTS.

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EXHIBIT F  
TRANSFERS OF  
BASE ANNUAL PRODUCTION RIGHTS

1. Transferability. Any Base Annual Production Right, including any Carryover Right (Right) or any portion thereof may be sold, assigned, transferred, licensed or leased subject to the rules set forth in this Exhibit "F".

2. Consumptive Use Adjustments. A transferred Right shall be adjusted so as not to cause an increased Consumptive Use of water. For either inter Subarea or intra Subarea transfers, if the transferee's Consumptive Use of water Produced under the transferred Right would be at a higher rate than that of transferor, the transferred Right shall be reduced by Watermaster to a level that equalizes the Consumptive Use to that of transferor. Any such adjustments by Watermaster shall be made using the following Consumptive Use rates. If a transfer would cause the same or a decreased Consumptive Use, no adjustment shall be made.

Type of Water Use	Consumptive Use Rate
Municipal	50%
Irrigation	50%
Industrial	case by case
Lakes or Aquaculture	surface acres x 7 ft.

For mixed or sequential uses of water excluding direct reuse of municipal wastewater, the total acre-feet of Consumptive Use shall be the sum of Consumptive Uses for each use.



1           3.   Notice to Watermaster. No transfer shall become operable  
2 until the Parties to the transfer have jointly notified Watermaster  
3 of the terms and conditions of the transfer, the price to be paid  
4 by the transferee, the name of the Responsible Party and the name  
5 of the Person who will pay any applicable Assessments. Intra-  
6 Subarea transfers shall not require Watermaster authorization after  
7 giving notice. No inter-Subarea transfer shall become operable  
8 until authorized by Watermaster after giving notice. Watermaster  
9 shall authorize such transfers in the order of the date of notice,  
10 provided that funds are available as set forth in Paragraph 4 of  
11 this Exhibit "F".

12           4.   Inter Subarea Transfers of Rights. A Party's Right in a  
13 (Source) Subarea may be transferred (by lease only) to a Party in  
14 another (Use) Subarea provided that in any Year the resulting  
15 unconsumed water in the Source Subarea due to all such transfers  
16 shall not be greater than the Replacement Water requirement of the  
17 Source Subarea in the preceding Year. Watermaster shall replace  
18 the resulting Consumptive Use in the Use Subarea that is  
19 attributable to the transfer, utilizing Replacement Water  
20 Assessments from the Source Subarea.

21           5.   Transfers to Meet Replacement Water or Makeup Water  
22 Obligations. Watermaster may use Assessment proceeds to purchase  
23 or lease Rights in a Subarea in order to obtain water to meet an  
24 Obligation. The water so obtained shall be equal to the  
25 Consumptive Use portion of the transferred and unproduced Rights.  
26 No such purchases of leases of Rights in the Harper Lake Basin may  
27 be used to satisfy Obligations in other parts of the Centro  
28 Subarea.

1           6.    Inter Subarea Transfers of Water.  Water Produced in one  
2 (source) Subarea and exported to another Subarea for use or  
3 disposal shall bear a Replacement Water Obligation equal to the sum  
4 of the Production in excess of the Producer's share of the Free  
5 Production Allowance in the source Subarea plus the amount of water  
6 exported that would normally have been returned to the source  
7 Subarea.  Such exported water shall be credited to the appropriate  
8 Subarea Obligation unless it has been purchased or leased as  
9 Replacement Water pursuant to a transfer agreement.

10           7.    Verde Ranch Producers.  Together the Spring Valley Lake  
11 Country Club ("the Country Club"), the Spring Valley Lake  
12 Association ("the Association"), the California Department of Fish  
13 and Game (DFG) Mojave Narrows Regional Park ("the Park") the Kemper  
14 Campbell Ranch ("the Ranch") comprise a group herein called the  
15 Verde Ranch Producers.  Each Verde Ranch Producer has the ability  
16 physically both to Produce Groundwater and to Produce water that  
17 originated as tailwater flowing from the DFG Mojave River Fish  
18 Hatchery.  DFG Producer Groundwater to supply the Hatchery, and  
19 Hatchery tailwater can be discharged in part or entirely to the  
20 Mojave River or in part or entirely to a lined channel that conveys  
21 tailwater to points where the Verde Ranch Producers can Produce it.  
22 The present flow regimen is as follows:  Hatchery Production flows  
23 through the Hatchery and is then discharged to the River and/or the  
24 lined channel.  Water discharged to the lined channel flows to a  
25 Country Club lake.  The Country Club Produces Groundwater that is  
26 discharged to the Country Club lake.  The Country Club property is  
27 irrigated by pumping from the Country Club lake.  Water overflowing  
28 from the Country Club lake flows through a lined channel and

1 through other Country Club lakes, and finally is discharged to  
2 Spring Valley Lake. The Association Produces Groundwater that is  
3 discharged to Spring Valley Lake. Water overflowing from Spring  
4 Valley Lake flows to lakes in the Park. The Park Produces  
5 Groundwater that is discharged to the lakes in the Park. The Park  
6 also Produces Groundwater that is used directly for irrigation of  
7 the Park. The Park is also irrigated by pumping from the lakes in  
8 the Park. Water overflowing from the lakes in the Park is  
9 discharged to the Mojave River. Some water from the lakes in the  
10 Park also flows to a lake on the Ranch. The Ranch also Produces  
11 Groundwater. The Ranch is irrigated from the lake on the Ranch.  
12 No water flows on the surface from the Ranch property to the Mojave  
13 River.

14 In order to continue the present arrangements among the  
15 Hatchery and the Verde Ranch Producers while assuring that they  
16 participate fairly in the Physical Solution the following rules  
17 shall apply:

18 a. Total Production by the Country Club will be  
19 calculated as the sum of Country Club Groundwater Production plus  
20 inflow of Hatchery tailwater minus outflow to Spring Valley Lake.  
21 The Country Club shall monitor and report to Watermaster the  
22 amounts of such Groundwater Production, inflow and outflow.

23 b. Total Production by the Association will be  
24 calculated as the sum of Association Groundwater Production plus  
25 inflow from the Country Club minus outflow to the Park. The  
26 Association shall monitor and report to Watermaster the amounts of  
27 such Groundwater Production, inflow and outflow.

28

1           c.    Total Production by the Park will be calculated as  
2 the sum of Park Groundwater Production plus inflow from the  
3 Association minus outflow to the Ranch minus outflow to the Mojave  
4 River. The Park shall monitor and report to Watermaster as to such  
5 Groundwater Production, inflow and outflows.

6           d.    Total Production by the Ranch will be calculated as  
7 the sum of Ranch Groundwater Production plus inflow from the Park.  
8 The Ranch shall monitor and report to Watermaster the amounts of  
9 such Groundwater Production and inflow.

10          e.    Hatchery Production up to 10,678 acre-feet per Year  
11 will be permitted free of any Assessments against the Hatchery.  
12 The Hatchery shall monitor and report to Watermaster its  
13 Groundwater Production and the amounts of tailwater discharged to  
14 the River and to the artificial channel. In any Year the Hatchery  
15 may Produce more than 10,678 acre-feet free of any Assessments  
16 against the Hatchery, provided such Production in excess of 10,678  
17 acre-feet is reported as Groundwater Production by one or more of  
18 the Verde Ranch Producers in the same Year pursuant to operating  
19 agreements by and between the Hatchery and such Producer(s) filed  
20 with the Watermaster. The operating agreement shall specify the  
21 responsibility for payment of assessments. In the operating  
22 agreement, the Verde Ranch Producers may elect to have assessments  
23 be based on the aggregate Production of the Verde Ranch Producers,  
24 and may freely transfer Base Annual Production Rights internally,  
25 provided that the aggregate consumptive use of the Verde Ranch  
26 Producers shall not be increased. In the absence of such operating  
27 agreements, or if the operating agreements do not otherwise  
28 allocate responsibility for payment of Assessments, the Hatchery

1 shall be liable for Administrative, Replacement Water and  
2 Biological Resource Assessments on the amount of water Produced by  
3 the Hatchery in excess of 10,678 acre-feet in any Year. In the  
4 event that Verde Ranch Producer who is allocated responsibility for  
5 payment of Assessments pursuant to an operating agreement is  
6 delinquent in making any such payment, the Hatchery shall not be  
7 liable therefor.

8 f. In any Year, if the total discharge to the River  
9 from the Hatchery and the Verde Ranch Producers exceeds the  
10 Groundwater Production by the Hatchery, such excess discharge shall  
11 be subject to Administrative, Replacement Water and, except for the  
12 Park, Biological Resource Assessments. Such Assessments shall be  
13 levied against individual Verde Ranch Producers in proportion to  
14 the extent that outflow from each Producer exceeds inflow to that  
15 Producer.

16 g. The Hatchery and the Verde Ranch Producers shall  
17 install all stage recorders, meters or other measuring devices  
18 necessary to determine inflows, outflows and Production that they  
19 are responsible for monitoring and reporting to Watermaster. Such  
20 stage recorders, meters or other measuring devices shall be  
21 installed, calibrated and operated in manner satisfactory to  
22 Watermaster.

23 h. Any change in the flow regimen described above will  
24 be subject to the same general rules set forth in this Paragraph 7.  
25 Any such change shall be reported to Watermaster in advance.

26 8. Harper Lake Basin. No Producer in the Harper Lake Basin  
27 may transfer any Base Annual Production Right or any portion  
28 thereof to Producers outside of Harper Lake Basin except by

1 physically conveying the water in compliance with the rules set  
2 forth in this Exhibit "F".

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EXHIBIT G

SUBAREA OBLIGATIONS

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EXHIBIT G

SUBAREA OBLIGATIONS

1. Subarea Obligations. Producers in the respective Subareas shall have the obligation to provide the following average Annual and minimum Annual Subsurface Flows and/or Base Flows per Year:

a. Este Subarea Producers--200 acre-feet per Year of Subsurface Flow to the Alto Subarea, except that in any Year the Subsurface Flow obligation shall be not be less than 160 acre-feet plus one-third of any cumulative debit plus any additional amount of water required to reduce the cumulative debit to 200 acre-feet.

b. Oeste Subarea Producers--800 acre-feet per Year of Subsurface Flow to the Alto Subarea, except that in any Year the Subsurface Flow obligation shall be not less than 640 acre-feet plus one-third of any cumulative debit plus any additional amount of water required to reduce the cumulative debit to 800 acre-feet.

c. Centro Subarea Producers--1200 acre-feet per Year of Subsurface Flow to the Baja Subarea, except that in any Year the Subsurface Flow Obligation shall be not less than 960 acre-feet plus one-third of any cumulative debit plus any additional amount of water required to reduce the cumulative debit to 1200 acre-feet.

d. Baja Subarea Producers--400 acre-feet per Year of Subsurface Flow toward Afton across the MWA eastern boundary, except that in any Year the Subsurface Flow Obligation shall not be less than 320 acre-feet plus one-third of any cumulative debit plus any additional amount of water required to reduce the cumulative debit to 400 acre-feet.



1 e. Alto Subarea Producers--an average Annual combined  
2 Subsurface Flow and Base Flow of 23,000 acre-feet per Year to the  
3 Transition Zone. For the purposes of Paragraph 6 of this Exhibit  
4 G, the Subsurface Flow component shall be deemed to be 2,000 acre-  
5 feet per Year. In any Year Alto Subarea Producers shall have an  
6 obligation to provide to the Transition Zone a minimum combined  
7 Subsurface Flow and Base Flow as follows:

8 i. If the accounting pursuant to Paragraph 5, below,  
9 reflects a net cumulative credit at the beginning of the Year,  
10 the combined minimum flow obligation shall be 18,400 acre-feet  
11 minus any net cumulative credit, but shall be not less than  
12 15,000 acre-feet.

13 ii. If the accounting pursuant to Paragraph 5, below,  
14 does not reflect a net cumulative credit at the beginning of  
15 the Year, the combined minimum flow obligation shall be 18,400  
16 acre-feet plus one-third of any net cumulative debit plus any  
17 additional amount of water required to reduce the net  
18 cumulative debit to 23,000 acre-feet.

19 2. Obligation for Transition Zone Replacement Water.

20 a. Until the Court approves Groundwater levels to be  
21 established and maintained pursuant to Subparagraph 2b of this  
22 Exhibit, Watermaster shall provide Replacement Water in the  
23 Transition Zone equal to Production in the Transition Zone that is  
24 in excess of the Transition Zone Producers' share of the Alto  
25 Subarea Free Production Allowance for that Year. All such  
26 Replacement Water shall be provided as soon as practicable during  
27 the next ensuing Year.  
28

1           b. As soon as is practicable, the MWA shall establish  
2 key wells to be used to monitor Groundwater levels in the  
3 Transition Zone and, subject to approval by the Court, Watermaster  
4 shall establish minimum water levels to be maintained in the key  
5 wells.

6           c. After water level elevations have been established  
7 pursuant to Subparagraph 2b of this Exhibit, Watermaster shall  
8 provide Replacement Water in the Transition Zone as necessary to  
9 maintain the minimum water levels. Water purchased with  
10 Replacement Water Assessments paid by Producers in the Transition  
11 Zone in excess of the quantity of water needed to maintain said  
12 water levels shall be provided elsewhere in the Alto Subarea.

13           3. Other Water. "Other Water" that may be credited to a  
14 Subarea Obligation may include water conveyed and discharged across  
15 a boundary or Free Production Allowance water that is not Produced.  
16 Water other than Base Flow, Subsurface Flow or Storm Flow that is  
17 conveyed and discharged across a boundary between Subareas other  
18 than pursuant to a transfer agreement, shall be credited or  
19 debited, as appropriate, to the pertinent Subarea Obligation during  
20 the Year in which it is so conveyed and discharged. Any portion of  
21 the Subarea's Free Production Allowance that is allowed to remain  
22 unproduced in a Subarea pursuant to transfer agreements in order to  
23 satisfy a Subarea Obligation shall be credited to the pertinent  
24 Subarea Obligation in accordance with the terms of the transfer  
25 agreements.

26           4. Makeup Water. Assessments for Makeup Water shall be paid  
27 in accordance with the time schedule set forth in Exhibit D.  
28

1 Makeup Water shall be credited to the Subarea Obligation at the end  
2 of the Year in which the Makeup Water Assessment is paid.

3 5. Accounting. Watermaster shall Annually not later than  
4 February 1 cause to be prepared a report of the status of each  
5 Subarea Obligation as of the end of the prior Year. The report  
6 shall set forth at least the following information for each Subarea  
7 Obligation:

8 a. The cumulative total of the average Annual Subarea  
9 Obligations since the Judgment was entered as of the beginning of  
10 the prior Year;

11 b. The cumulative total of all water credited to the  
12 Subarea Obligation since the Judgment was entered as of the  
13 beginning of the prior Year;

14 c. The net cumulative credit or debit [the difference  
15 between (a) and (b)] as of the beginning of the prior Year;

16 d. The amounts of water credited to the Subarea  
17 Obligation during the prior Year including, as appropriate, Base  
18 Flow, Subsurface Flow, Other Water and Makeup Water;

19 e. The cumulative total of the average Annual Subarea  
20 Obligations as of the end of the prior Year;

21 f. The cumulative total of all water credited to the  
22 Subarea Obligation as of the end of the prior Year;

23 g. The net cumulative credit or debit as of the end of  
24 the prior Year;

25 h. Any Makeup Water Obligation;

26 i. The Minimum Subarea Obligation for the current Year.

27 6. Subsurface Flow Assumptions. Some Subarea Obligations  
28 are expressed as average Annual or minimum Annual Subsurface Flow.

1 In all cases the Subsurface Flow obligations have been established  
2 initially at amounts equal to the estimated historical average  
3 Subsurface Flow across Subarea boundaries. Not later than two  
4 Years following entry of this Judgment MWA shall begin to install  
5 monitoring wells to be used to obtain data to enable improved  
6 estimates of Subsurface Flow at each Subarea boundary where there  
7 is a Subsurface Flow obligation and to develop methodology for  
8 future determinations of actual Subsurface Flow. Not later than  
9 ten years following entry of this Judgment Watermaster shall  
10 prepare a report setting forth the results of the monitoring  
11 program and the future methodology. Following opportunity for  
12 review of Watermaster's report by all Parties, Watermaster shall  
13 prepare a recommendation to the Court as to the likely accuracy of  
14 the estimated historical Subsurface Flows and any revision of  
15 Subarea Obligations that may be indicated. Pending Watermaster's  
16 report to the Court, Subsurface Flows shall be assumed to be equal  
17 to the Subsurface Flow obligations for purposed of accounting for  
18 compliance therewith.

19 7. Example Calculation. Table G-1 sets forth an example of  
20 Subarea Obligation accounting procedures using hypothetical flows.  
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TABLE G-1  
 HYPOTHETICAL EXAMPLE  
 ACCOUNTING FOR COMPLIANCE WITH SUBAREA OBLIGATIONS

OBLIGATION OF SUBAREA A TO SUBAREA B

AVERAGE ANNUAL: 23,000 AFA (21,000 AFA BASEFLOW + 2,000 AFA SUBSURFACE FLOW)

MINIMUM ANNUAL: 18,400 AFA + 1/3 OF ANY NET CUMULATIVE DEBIT; OR 18,400 AFA - ANY NET CUMULATIVE CREDIT, BUT NOT LESS THAN 15,000 AFA

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10
	AF	AF	AF	AF	AF	AF	AF	AF	AF	AF
<b>STATUS AT BEGINNING OF YEAR</b>										
CUMULATIVE OBLIGATION	0	23,000	46,000	69,000	92,000	115,000	138,000	161,000	184,000	207,000
CUMULATIVE FLOW	0	17,000	32,600	50,000	69,067	87,067	107,111	139,978	168,378	198,978
<b>NET CUMULATIVE CREDIT (DEBIT)</b>										
	0	(6,000)	(13,400)	(18,200)	(22,933)	(27,933)	(30,889)	(21,022)	(15,622)	(8,022)
<b>FLOW DURING THE YEAR (HYPOTHETICAL)</b>										
BASE FLOW	8,000	5,000	4,000	4,000	2,000	2,000	15,000	18,000	20,000	23,000
SUBSURFACE FLOW	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000	2,000
OTHER WATER	7,000	7,200	7,400	7,600	7800	8,000	8,200	8,400	8,600	8800
MAKEUP WATER PURCHASED	0	1,400	4,800	4,667	6,200	8,044	7,667	0	0	0
<b>TOTAL FLOW</b>										
	17,000	15,600	18,200	18,267	18,000	20,044	32,867	28,400	30,600	33,800
<b>MINIMUM OBLIGATION DURING THE YEAR</b>										
	18,400	20,400	22,867	24,467	26,044	27,711	28,696	25,407	23,607	21,074
<b>MAKEUP OBLIGATION INCURRED</b>										
	1,400	4,800	4,667	6,200	8,044	7,667	0	0	0	0
<b>STATUS AT END OF YEAR</b>										
CUMULATIVE OBLIGATION	23,000	46,000	69,000	92,000	115,000	138,000	161,000	184,000	207,000	230,000
CUMULATIVE FLOW	17,000	32,600	50,000	69,067	87,067	107,111	139,978	168,378	198,978	232,778
<b>NET CUMULATIVE CREDIT (DEBIT)</b>										
	(6,000)	(13,400)	(18,200)	(22,933)	(27,933)	(30,889)	(21,022)	(15,622)	(8,022)	2,778
<b>FOLLOWING YEAR MINIMUM OBLIGATION</b>										
18,400 + 1/3 OF NET CUM. DEBIT	20,400	22,867	24,467	26,044	27,711	28,696	25,407	23,607	21,074	0
ADDITIONAL TO REDUCE DEBIT TO 23,000	0	0	0	0	0	0	0	0	0	0
18,400 - CUM. CREDIT, BUT NLY 15,000	0	0	0	0	0	0	0	0	0	15,622
<b>MINIMUM OBLIGATION</b>										
	20,400	22,867	24,467	26,044	27,711	28,696	25,407	23,607	21,074	15,622

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**EXHIBIT H**

**BIOLOGICAL RESOURCE MITIGATION**

1                                   EXHIBIT H

2                                   BIOLOGICAL RESOURCE MITIGATION

3           1.   Protection of and Description of Existing Riparian  
4 Habitat.   In arriving at a Physical Solution, the Parties have  
5 taken into consideration the water needs of the public trust  
6 resources of the Mojave Basin Area, including but not limited to,  
7 those species listed in Table H-1 within each of the areas as shown  
8 on Figure H-1 and the riparian habitat areas shown on Figure H-1  
9 and described generally as follows:

10           a.   The area which extends, south to north, in the Alto  
11 Subarea, from the intersection of the north line of Section 36,  
12 Township 5 North, Range 4 West with the Mojave River channel to the  
13 United States Geological Survey gauging station at the Lower  
14 Narrows;

15           b.   The Lower Narrows to the Helendale Fault (Transition  
16 Zone);

17           c.   The Harvard/Eastern Baja Subarea reach of the Mojave  
18 River that extends west to east, from Harvard Road to the Iron  
19 Ranch/Iron Mountain area (0.5 miles east of the west line of  
20 Section 20, Township 10 North, Range 4 East).

21           2.   Protection Pursuant to Physical Solution.   The following  
22 aspects of the Physical Solution must be implemented to seek to  
23 achieve the water table standards set forth in Table H-2 which were  
24 proposed by DFG as being necessary to maintain and converse the  
25 riparian resources in the areas shown on Figure H-1, including the  
26 species listed in Table H-1:

27           a.   Pursuant to Paragraph 24(o) of the Judgment, the  
28 Watermaster in recommending an adjustment in Free Production

1 Allowance, shall compare the Free Production Allowance with the  
2 estimated Production Safe Yield. In the event the Free Production  
3 Allowance exceeds the estimated Production Safe Yield by five  
4 percent or more, Watermaster shall recommend a reduction of the  
5 Free Production Allowance equal to a full five percent of the  
6 aggregate Subarea Base Annual Production. In considering whether  
7 to increase or decrease the Free Production Allowance in a Subarea,  
8 Watermaster shall, among other factors, take into consideration for  
9 the areas shown on Figure H-1 the Consumptive Use of water by  
10 riparian habitat, the protection of public trust resources,  
11 including the species listed in Table H-1 and the riparian habitat  
12 areas shown on Figure H-1, and whether an increase would be  
13 detrimental to the protection of public trust resources.

14 b. If, pursuant to Paragraph 27, Watermaster buys or  
15 leases Free Production Allowance in the Baja Subarea below the  
16 Calico-Newberry Fault to satisfy the need for Replacement Water,  
17 priority shall be given to purchases or leases that will result in  
18 reducing Production in or near the area described in Subparagraph  
19 1(c) of this Exhibit.

20 c. Pursuant to Paragraph 2 of Exhibit "G", Watermaster  
21 shall purchase Replacement Water to maintain Groundwater levels in  
22 the Transition Zone.

23 3. Additional Protection Pursuant to Trust Fund Established  
24 by Watermaster Using the Proceeds of Biological Resource  
25 Assessments.

26 a. Watermaster shall establish a Biological Resources  
27 Trust Fund account for the benefit of the riparian habitat areas  
28 shown on Figure H-1 and the species listed on Table H-1. To



1 establish and maintain the Trust Fund Watermaster shall levy  
2 against each acre-foot of Production within the Basin Area, other  
3 than Production by the California Department of Fish and Game  
4 (DFG), a Biological Resource Assessment of fifty cents (\$0.50)  
5 (1993 dollars) to be collected at the same time and in the same  
6 manner as the Administrative Assessment, except that no Biological  
7 Resources Assessment shall be levied whenever the Trust Fund  
8 account balance exceeds \$1,000,000 (1993 dollars).

9           b. Watermaster shall make funds held in the Biological  
10 Resources Trust Fund available to DFG only in the event that  
11 Groundwater levels are not maintained as set forth in Table H-2.  
12 Watermaster shall take action to acknowledge any proposed  
13 expenditure from the Biological Resources Trust Fund by DFG. Such  
14 Watermaster action shall be subject to the review procedures set  
15 forth in Paragraph 36 of the Judgment, provided that any motion  
16 made pursuant thereto and any Court disapproval of such Watermaster  
17 action and proposed DFG expenditure may be based only: 1) on the  
18 ground that the Groundwater levels set forth in Table H-2 are being  
19 maintained; and/or 2) the ground that the proposed expenditure is  
20 not for any of the purposes set forth in Subparagraphs 3.b.(i),  
21 (ii), or (iii) below in this Exhibit. The Biological Resources  
22 Trust Fund may be used only for the following purposes and only in  
23 the three areas identified on Figure H-1:

24           i. not to exceed \$100,000 for the preparation by DFG of  
25 a DFG habitat water supply management plan, which plan shall  
26 include the water needs of the species listed in Table H-1 and  
27 the riparian habitat areas shown on Figure H-1.  
28

1           ii. the purchase or lease by DFG of Supplemental Water  
2 or the lease or purchase of DFG of Base Annual Production  
3 Rights to be used to meet riparian habitat water needs of the  
4 species listed in Table H-1 and the riparian habitat areas  
5 shown on Figure H-1.

6           iii. the construction, repair and replacement of wells or  
7 other facilities identified in the plan prepared pursuant to  
8 Subparagraph (i), above, and/or any other measures necessary  
9 to implement the plan.

10 DFG shall not prepare or make any expenditure from the trust fund  
11 for the payment of administrative overhead or staff of DFG.

12           4. DFG agrees that absent substantial changed circumstances,  
13 DFG shall not seek to modify the provisions of this Judgment in any  
14 way to add to or change the above-stated measures to protect the  
15 referenced species or habitat. Nothing stated in this Judgment or  
16 in this Exhibit "H" is intended nor shall be deemed to relieve any  
17 Party hereto from any obligation or obligations not specifically  
18 referenced in this Exhibit H. Nothing in this Judgment or in this  
19 Exhibit H is intended or shall be construed to be a waiver by the  
20 State or any of its departments or agencies, including DFG, of its  
21 rights and obligations under the common law, the public trust  
22 doctrine, the constitution, statutes and regulations to preserve,  
23 protect or enhance the natural resources of the State including  
24 rare, threatened or endangered species or species of concern.



TABLE H-1

LIST OF SPECIES  
(CONT'D)

SPECIES	ALTO			CENTRO		BAJA		
	Forks Dam to Upper Narrows	Upper Narrows to Lower Narrows	Lower Narrows to Helendale	Helendale to Hodge	Hodge to Barstow	Barstow to Harvard Road	Harvard Road to Mannix Wash	Afton Canyon
Yellow Warbler	9							
Yellow-breasted Chat	8	8			8	8		
Summer Tanager	8	8						8
Pale Big Eared Bat	8							
Mohave Ground Squirrel	4, 6		4, 6	4, 6				
Mohave Vole			6	6				
Nelson's Bighorn Sheep					10	10		10
TOTAL NUMBER OF SPECIES = 30								
TOTAL NUMBER OF SPECIES IN EACH AREA:	25	11	7	8	7	8	3	5

- 1 = Federally Endangered
- 2 = Federally Threatened
- 3 = State Endangered
- 4 = State Threatened
- 5 = Federal Category: 1
- 6 = Federal Category: 2
- 7 = Federal Category: 3b
- 8 = State: Special Concern
- 9 = State: Sensitive
- 10 = State: Fully Protected

**TABLE H-2**

**RIPARIAN HABITAT MONITORING WELL  
WATER LEVEL CRITERIA**

<b>ZONE</b>	<b>WELL NUMBER</b>	<b>MAXIMUM DEPTH BELOW GROUND</b>
Victorville/Alto	H1-1	Seven (7) Feet
Victorville/Alto	H1-2	Seven (7) Feet
Lower Narrows/Transition	H2-1	Ten (10) Feet
Harvard/Eastern Baja Riparian Forest Habitat	H3-1	Seven (7) Feet
Harvard/Eastern Baja Surface Water Habitat	H3-2	Plus One (1) Foot (1705 Ft msl)*

\* Surface Water Habitat water surface elevation of 1705 ft. msl is approximate pending ground elevation survey.

# FIGURE H-1 VICTORVILLE - ALTO RIPARIAN ZONE

## LEGEND



Water Table Monitoring well

H-2



Riparian Forest Habitat Area

## SCALE



# FIGURE H-1: LOWER NARROWS TRANSITION RIPARIAN ZONE

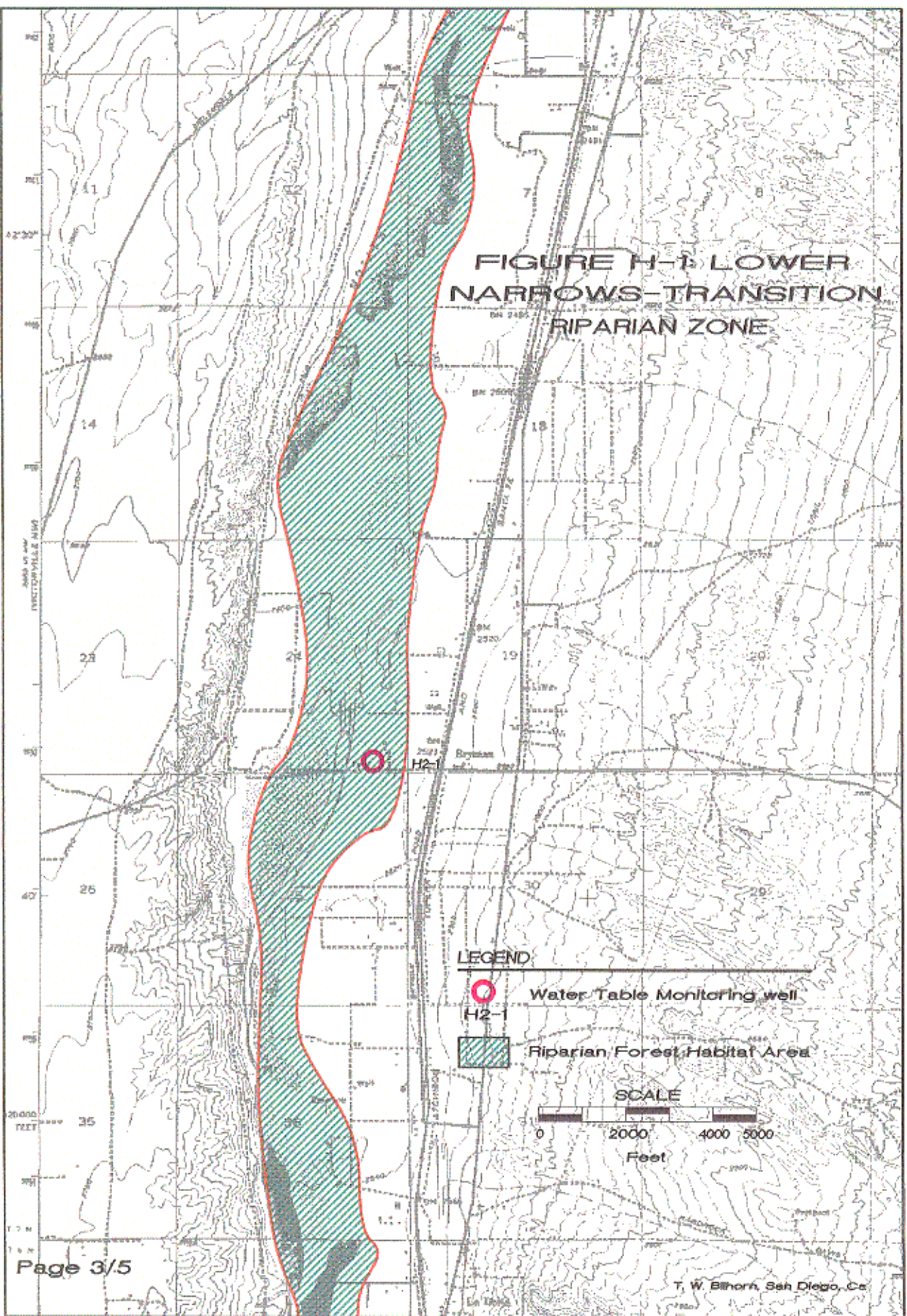
## LEGEND

-  Water Table Monitoring well  
H1-1
-  Riparian Forest Habitat Area



## SCALE



**FIGURE H-1: LOWER  
NARROWS-TRANSITION  
RIPARIAN ZONE**



**LEGEND**

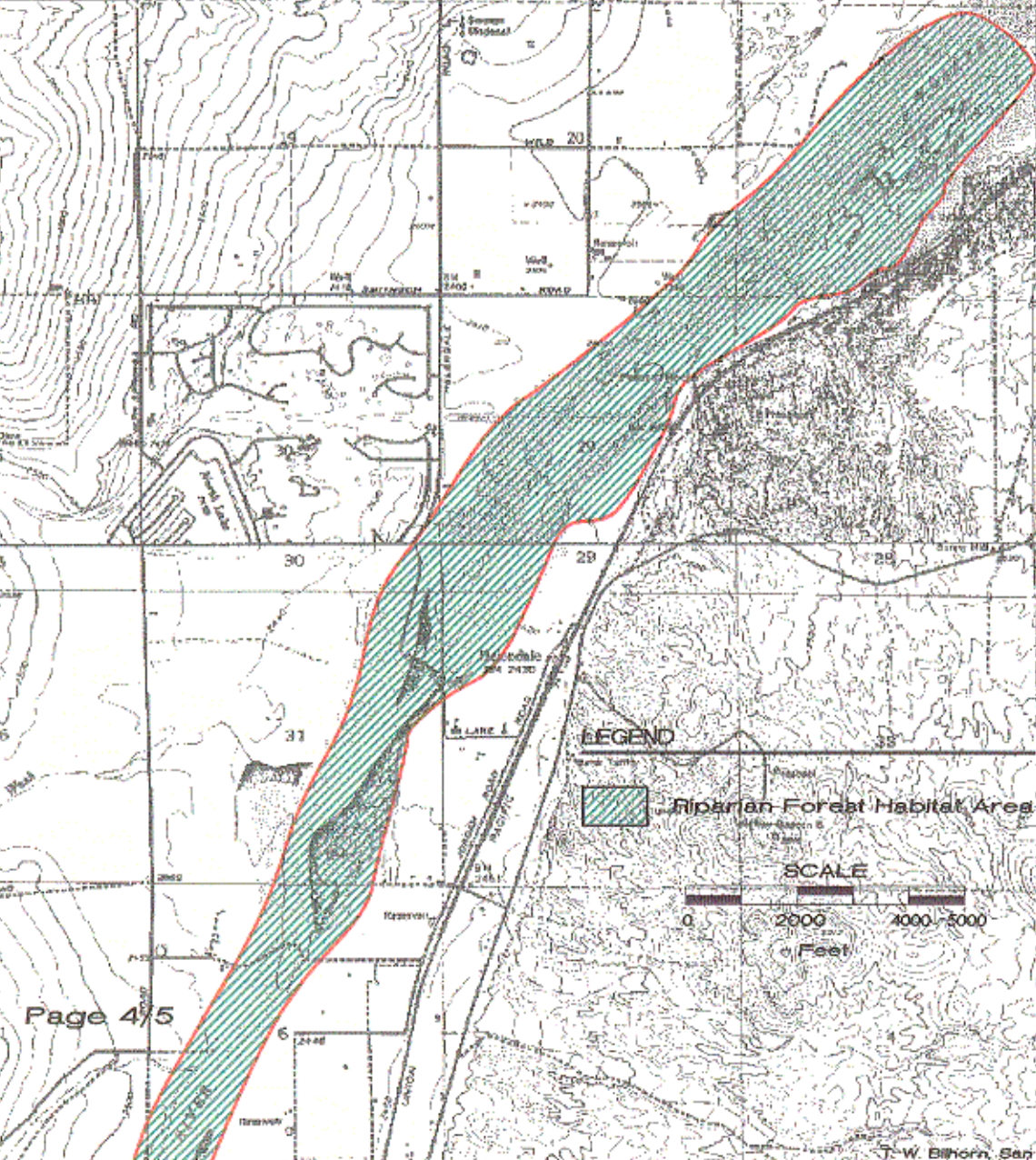
-  Water Table Monitoring well  
H2-1
-  Riparian Forest Habitat Area

**SCALE**





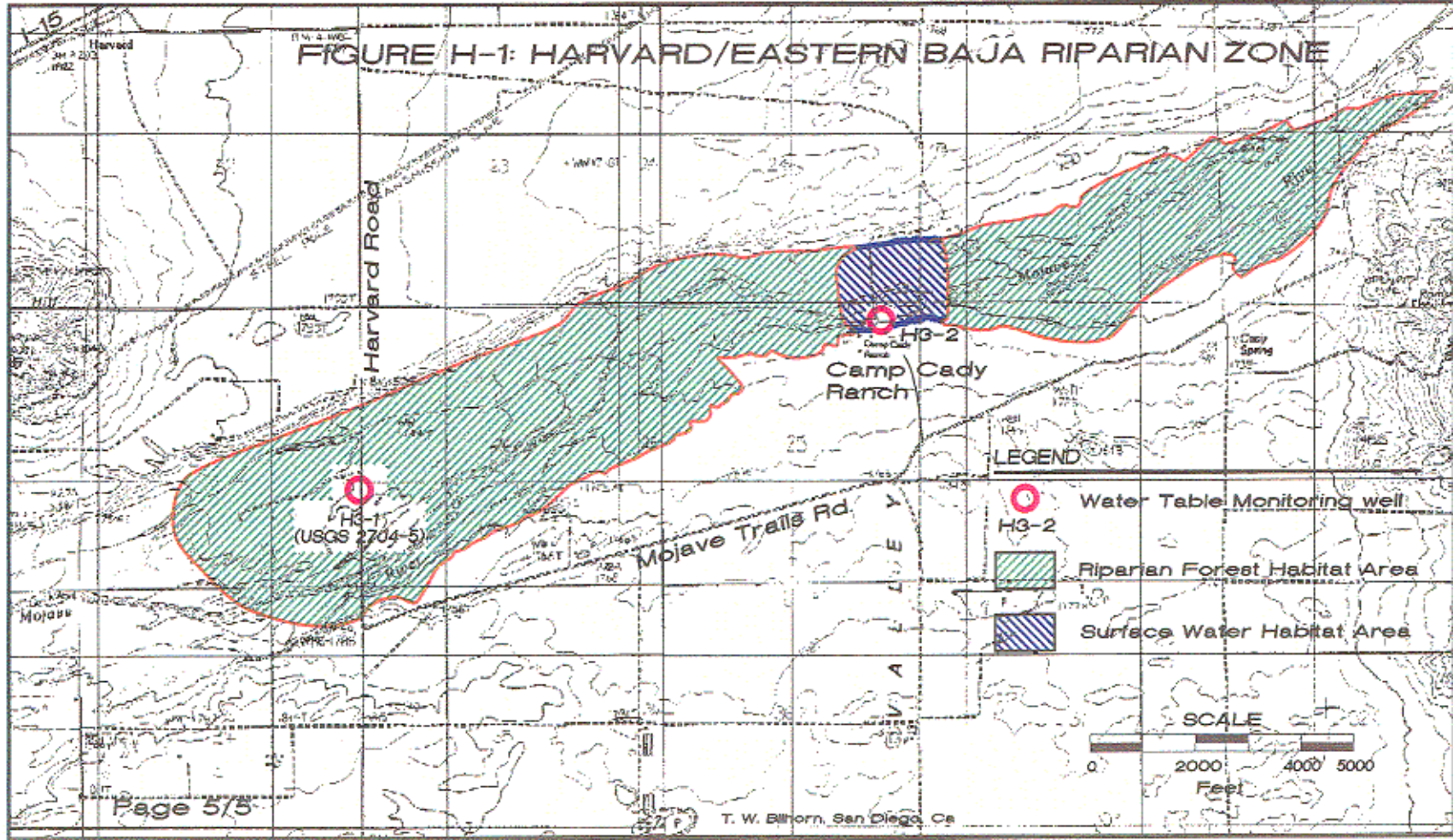
# FIGURE HI TRANSITION RIPARIAN ZONE



**LEGEND**  
Riparian Forest Habitat Area

**SCALE**  
0 2000 4000 6000  
Feet

FIGURE H-1: HARVARD/EASTERN BAJA RIPARIAN ZONE



LEGEND

- STATE BOUNDARY
- COUNTY BOUNDARY
- DISTRICT BOUNDARY
- WATER RIGHT
- POTENTIAL RECHARGE AREA

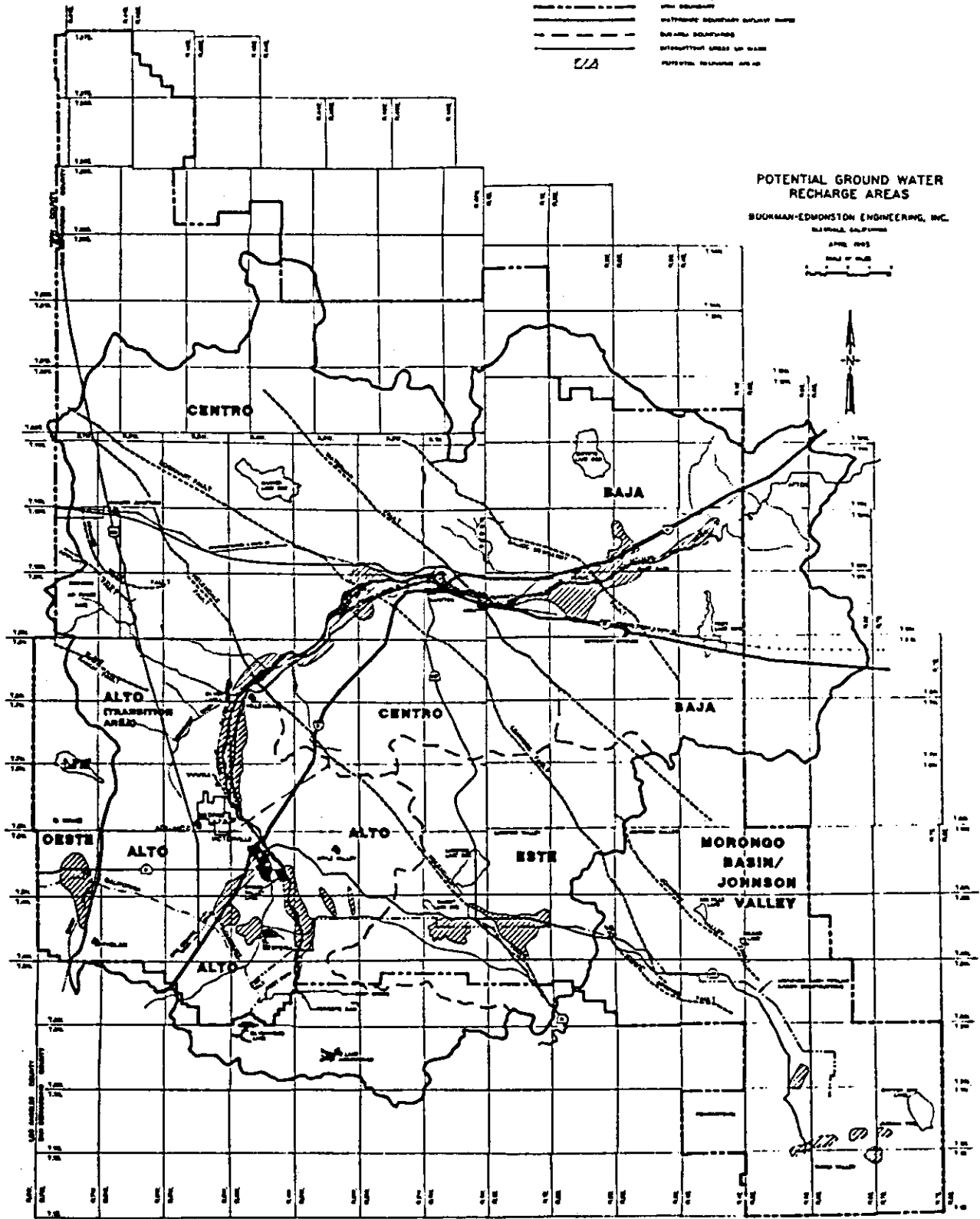
POTENTIAL GROUND WATER RECHARGE AREAS

BOOKMAN-EDMONSTON ENGINEERING, INC.

NATIONAL CAPITAL

APRIL 1995

SCALE OF 1:50,000



MOJAVE WATER AGENCY

REGIONAL WATER MANAGEMENT PLAN

## Appendix F – Warren Valley Judgment

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ORIGINAL FILED

SEP 16 1977

V. DENNIS WARDLE  
COUNTY CLERK

SUPERIOR COURT OF THE STATE OF CALIFORNIA  
FOR THE COUNTY OF SAN BERNARDINO

HI-DESERT COUNTY WATER )  
DISTRICT, )  
 )  
Plaintiff, )  
 )  
v. )  
 )  
YUCCA WATER COMPANY, LTD., )  
et al., )  
 )  
Defendants. )

No. 172103  
JUDGMENT

I. INTRODUCTION

1. Pleadings, Parties and Jurisdiction. The complaint herein was filed on July 1, 1976, seeking an adjudication of all or substantially all water rights within Warren Valley Basin. All defendants have appeared herein by stipulation, except for those defendants who have been dismissed. This Court has jurisdiction of the subject matter of this action and of the parties.

2. Stipulation for Judgment. A stipulation for judgment was filed on August 26, 1977, executed by all of the parties.

3. Findings and Conclusions. Trial was had on September 7, 1977, and findings of fact and conclusions of law have been entered.

1           4. Exhibits. The following exhibits are attached to this  
2 Judgment and made a part hereof:

3            "A" -- "General Location Map of Warren Valley Basin"  
4 showing relevant geographic, hydrologic and geologic  
5 features.

6           5. Definitions. As used in this Judgment, the following  
7 terms shall have the following meanings:

8           (a) Annual or Year -- A calendar year, unless the  
9 context shall clearly indicate a contrary meaning.

10           (b) Blue Skies -- Blue Skies Country Club.

11           (c) District -- Hi-Desert County Water District.

12           (d) Ground Water -- Water beneath the surface of the  
13 ground and within the zone of saturation, i.e., below the  
14 existing water table.

15           (e) Ground Water Basin -- An area underlain by one or  
16 more permeable formations capable of furnishing substantial  
17 water storage.

18           (f) Institute -- The Institute of Mentalphysics.

19           (g) Minimal Pumper -- Any pumper whose right and pro-  
20 duction do not exceed one acre-foot per year.

21           (h) Native Safe Yield -- The long-term average annual  
22 net native supply of water to the Basin under cultural  
23 conditions of a particular year.

24           (i) Overdraft -- A condition wherein the total annual  
25 production from the Basin exceeds the native safe yield  
26 thereof.

27           (j) Produce or Producing -- The extraction of ground  
28 water by pumping or any other method.

1 (k) Producer -- Any person who extracts water from  
2 Warren Valley Basin.

3 (l) Production -- Annual quantity of water produced  
4 by a producer, stated in acre feet.

5 (m) Supplemental Water -- Water imported from outside  
6 the watershed of Warren Valley Basin, and water salvaged,  
7 conserved or reclaimed from sources within the Basin.

8 (n) Utility -- Yucca Water Company, Ltd.

9 (o) Warren Valley Basin or Basin -- The ground water  
10 basin underlying the area shown as such on Exhibit "A".

11 (p) Zone of Transmission -- A subsurface area of tran-  
12 sition between two basins through which the natural under-  
13 flows drain from one basin into another.

14 II. DECLARATION

15 A. HYDROLOGIC CIRCUMSTANCES

16 6. Warren Valley Basin. Warren Valley Basin is a small  
17 desert ground water basin bounded on the north by the San  
18 Bernardino Mountains and the Pinto Mountain Fault, on the east by  
19 a zone of transition to Joshua Tree Subbasin, on the south by the  
20 Little San Bernardino Mountains and on the west by a natural  
21 topographic and ground water divide. The Basin contains a sub-  
22 stantial quantity of ground water in storage. Average annual  
23 recharge and replenishment does not exceed 200 acre feet per year  
24 from precipitation on the Basin and runoff from its limited  
25 watershed. The surface area of Warren Valley Basin is approxi-  
26 mately 6,400 acres.

27 7. Common Source of Supply. Warren Valley Basin constitutes  
28 a common source of supply of water for lands overlying said Basin.

1 With the exception of irrigation use on its golf course by Blue  
2 Skies and overlying use by Institute, all use of water from the  
3 Basin is for domestic and municipal purposes. There is no commer-  
4 cial agricultural or industrial use of water from the Basin.

5 8. Native Safe Yield and Overdraft. The native safe yield  
6 of Warren Valley Basin is approximately 200 acre feet per year.  
7 Present net consumptive use of Basin waters exceeds substantially  
8 said Native Safe Yield. The basin is, and for more than five  
9 years prior to filing of the Complaint herein has been, in a  
10 condition of overdraft. It is presently estimated that ground  
11 water supplies of the Basin are sufficient to meet the needs of  
12 the projected overlying population only until about the period  
13 1990 to 2000. Supplemental water will, accordingly, be required  
14 to meet water demands of the Basin in future years.

15 9. Prescription. The taking of water by the parties hereto  
16 has been open, notorious, continuous, hostile, adverse and under  
17 claim of right for more than five years prior to filing of the  
18 Complaint herein. Said condition of overdraft of Warren Valley  
19 Basin has been a matter of common knowledge and all parties and  
20 overlying property owners have had notice of said condition during  
21 said period of years.

22 10. Zone of Transmission. The area underlying Section 28,  
23 Township 1 North, Range 6 East, S.B.B. & M., constitutes a zone of  
24 transmission. To the extent that water production overlying said  
25 area merely intercepts the outflow from the Warren Valley Basin,  
26 such production does not have a significant effect on the ground  
27 water of the Basin. It is estimated that such outflow does not  
28 exceed 80 acre feet per year and that production within said zone



1 of transition up to 80 acre feet should be exempt from obligations,  
2 if any, to be imposed under the physical solution hereunder.

3 B. WATER RIGHTS

4 11. Overlying Rights. The following parties own lands over-  
5 lying Warren Valley Basin. By reason of production of water from  
6 the Basin during the period 1970-1975, each of said parties has  
7 preserved by self help the overlying right to produce up to the  
8 quantity of water herein set forth:

9	<u>Name</u>	<u>Overlying Right</u>	<u>Nature of Use</u>
10	Blue Skies	585 acre feet/year	Golf Course
11	Angelina Boveri	1 acre foot/year	Domestic - Minimal
12	Judith G. Buchanan	1 acre foot/year	Domestic - Minimal
13	Elmer F. Cloe	1 acre foot/year	Domestic - Minimal
14	Marjorie L. Cloe	1 acre foot/year	Domestic - Minimal
15	Alta M. Fickle	1 acre foot/year	Domestic - Minimal
16	Edward T. Fickle	1 acre foot/year	Domestic - Minimal
17	Emma L. Ford	1 acre foot/year	Domestic - Minimal
18	Raymond M. Ford	1 acre foot/year	Domestic - Minimal
19	Kate Hamilton	1 acre foot/year	Domestic - Minimal
20	Agnes Lasley	1 acre foot/year	Domestic - Minimal
21	Albert B. Machado	1 acre foot/year	Domestic - Minimal
22	Alma Nuckolls (aka		
23	Alma Katje)	1 acre foot/year	Domestic - Minimal
24	Albert Paiso	1 acre foot/year	Domestic - Minimal
25	Mary Jane Pusey	1 acre foot/year	Domestic - Minimal
26	Warren Stoker	1 acre foot/year	Domestic - Minimal
27	Patricia Tripp	1 acre foot/year	Domestic - Minimal
28	-----		

1 (a) Self Help. By reason of the prescriptive circum-  
2 stances found in Paragraph 9 hereof, said overlying rights  
3 have been prescribed and are thereby limited to the extent  
4 of such maximum annual self help by production during the  
5 prescriptive period. Said rights remain overlying in char-  
6 acter, and as such may only be exercised except for reason-  
7 able overlying uses on the lands now owned by said parties.

8 (b) Prescription Against Unused Overlying Rights. By  
9 reason of said prescriptive circumstances, all unexercised  
10 overlying rights have been lost and extinguished, and no new  
11 overlying production may be commenced, so long as Warren  
12 Valley Basin remains in a state of overdraft.

13 12. Appropriative Rights. Appropriative rights to the  
14 waters of Warren Valley Basin have been perfected by District and  
15 Utility. By stipulation of said parties, said appropriative  
16 rights shall be deemed, and are hereby decreed, to be of equal  
17 priority. Said appropriative rights are exempt from prescription  
18 by reason of Section 1007 of the California Civil Code. The  
19 respective quantities of said rights are as follows:

<u>Name</u>	<u>Appropriative Right</u>
District	896 acre feet/year
Utility	726 acre feet/year

23 13. Production in the Zone of Transmission. Institute  
24 overlies the Zone of Transmission. Because production in said  
25 zone of not more than 80 acre feet per year has no significant  
26 effect on the ground waters of the Basin, Institute is accorded  
27 the right to produce up to 80 acre feet per year under this Judg-  
28 ment without liability for costs or assessments under any physical

1 solution which may be adopted. To the extent that Institute's  
2 production exceeds 80 acre feet per year, Institute shall be  
3 subject to the physical solution imposed herein for all such excess  
4 production.

### 5 III. INJUNCTION

6 14. Injunction Against Unauthorized Production. Each party,  
7 to whom rights to waters of Warren Valley Basin have been de-  
8 clared and decreed herein, together with its officers, agents,  
9 employees, successors, assigns, heirs, administrators, executors,  
10 lessees and licensees, is ENJOINED AND RESTRAINED from producing  
11 water therefrom, except pursuant to the rights herein decreed or  
12 pursuant to the provisions of any Physical Solution which may be  
13 adopted under this Judgment.

### 14 IV. CONTINUING JURISDICTION

15 15. Jurisdiction Reserved. Full jurisdiction, power and  
16 authority are retained and reserved to the Court for the purpose  
17 of enabling the Court upon application of any party or of the  
18 Watermaster, by motion and upon at least 30 days' notice thereof,  
19 and after hearing thereon, to make such further or supplemental  
20 orders or directions as may be necessary or appropriate for inter-  
21 pretation, enforcement or carrying out of this Judgment, and to  
22 modify, amend or amplify any of the provisions of this Judgment  
23 whenever substantial changes or developments affecting the phys-  
24 ical, hydrologic or other conditions dealt with herein may, in the  
25 Court's opinion, justify or require such modification, amendment  
26 or amplification.

### 27 V. WATERMASTER

28 16. Watermaster Appointment. Hi-Desert County Water

1 District, acting by and through its board of directors, is hereby  
2 appointed Watermaster, to administer and enforce the provisions of  
3 this Judgment and any subsequent instructions or orders of the  
4 Court hereunder.

5 VI. PHYSICAL SOLUTION

6 17. Need For Physical Solution. In order that the Court may  
7 assure maximum beneficial use of the water resources of Warren  
8 Valley Basin in accordance with Section 2 of Article X of the  
9 California Constitution, it is necessary that a physical solution  
10 be developed and implemented under the continuing jurisdiction  
11 heretofore reserved. Said physical solution is required because:

12 (a) Safe Yield Operations Are Inappropriate. Warren  
13 Valley Basin is a desert ground water basin. It has only a  
14 nominal annual replenishment from native waters. To restrict  
15 production of the basin to its native safe yield would frus-  
16 trate all development and use of its resources. The Basin  
17 contains substantial supplies of ground water as a result of  
18 recharge over geologic time. The overlying economy is de-  
19 pendent upon controlled mining of such water in storage.

20 (b) Supplemental Water. In the ultimate development of  
21 the lands overlying Warren Valley Basin, supplemental water  
22 supplies will be required. To that end, the lands overlying  
23 the Basin were included within Mojave Water Agency, which has  
24 a contractual right to purchase supplemental water from the  
25 State Water Resources System. In addition, salvage conserva-  
26 tion and reclamation may well afford additional supplemental  
27 water.

28 (c) Need for Funding. Supplemental water, although

1 legally available to the Basin as aforesaid, is not physically  
2 or economically available at present. Delivery facilities  
3 will require extensive engineering studies, negotiations with  
4 other interested agencies, and, most of all, financial arrange-  
5 ments within the capacity of the landowners and water users  
6 of Warren Valley Basin. The economy which is built during  
7 the period of controlled mining of said basin must ultimately  
8 be committed to payment of such supplemental water costs.

9 18. Watermaster to Formulate Proposal. Watermaster is  
10 hereby authorized and instructed to formulate and submit to the  
11 Court and the parties on or before July 31, 1978, a plan and  
12 program for a physical solution herein, together with appropriate  
13 provisions for Watermaster administration thereof; provided,  
14 however, that the Court hereby finds that it is inappropriate to  
15 burden minimal producers with administrative costs, report require-  
16 ments or assessments so long as the production of any such party  
17 is for domestic use and in annual quantities of less than one acre  
18 foot (325,851 U.S. gallons). After submission of Watermaster's  
19 proposal, Court will, upon notice and after hearing, adopt a  
20 physical solution in the exercise of its continuing jurisdiction  
21 herein.

## 22 VII. MISCELLANEOUS PROVISIONS

23 19. Service Upon and Delivery to Parties of Various Papers.  
24 Service of the Judgment on those parties who have executed the  
25 Stipulation for Judgment shall be made by first class United  
26 States mail, postage prepaid, addressed to the designee and at the  
27 address designated for that purpose in the executed and filed  
28 Counterpart of the Stipulation for Judgment, or in any substitute

1 designation filed with the Court.

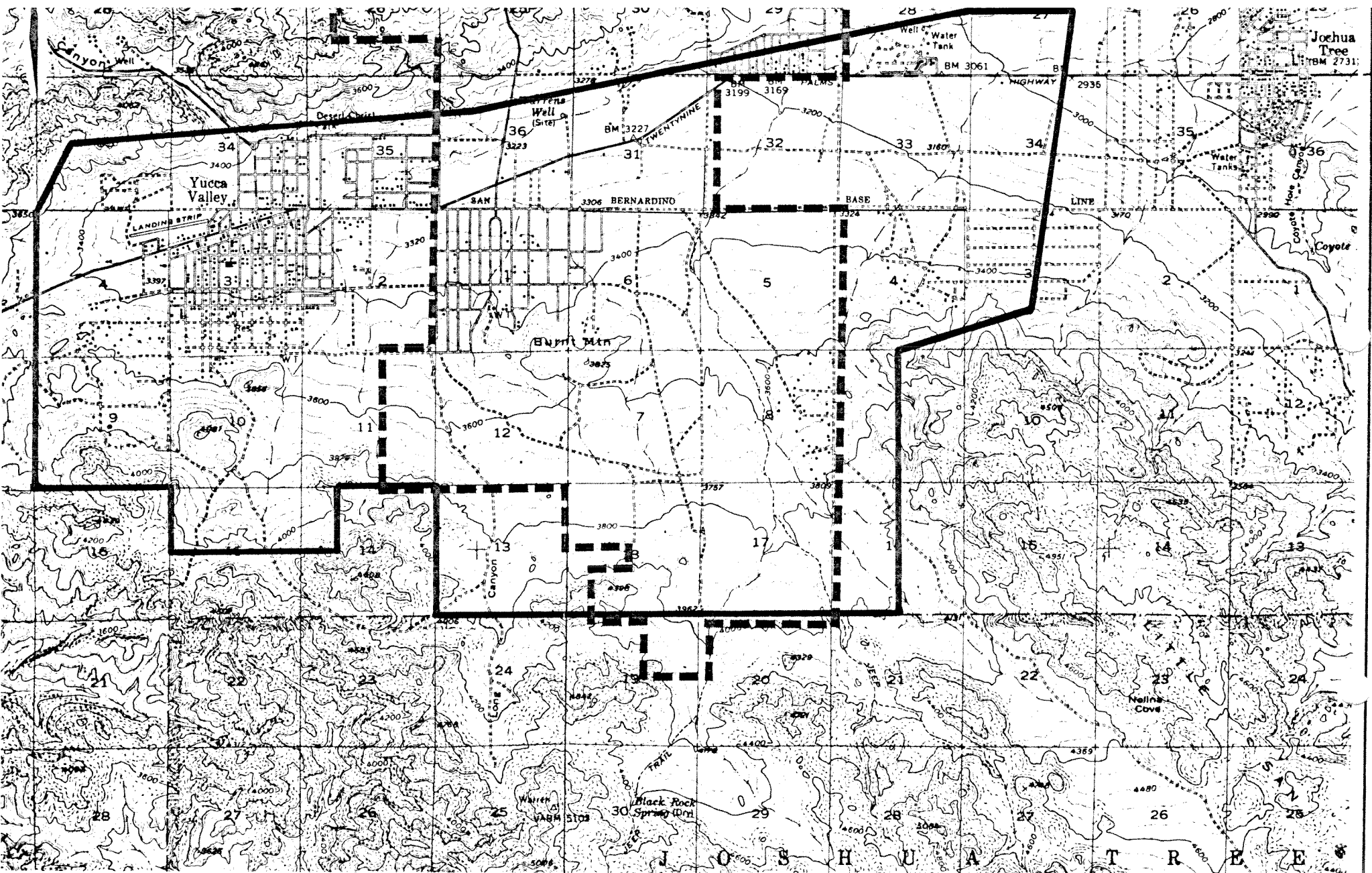
2 Each party who has not heretofore made such a designation  
3 shall, within thirty (30) days after the Judgment shall have been  
4 served upon that party, file with the Court, with proof of service  
5 of a copy upon the Watermaster, a written designation of the person  
6 to whom and the address at which all future notices, determinations,  
7 requests, demands, objections, reports and other papers and pro-  
8 cesses to be served upon that party or delivered to that party are  
9 to be so served or delivered.

10 A later substitute designation filed and served in the same  
11 manner by any party shall be effective from the date of filing as  
12 to then future notices, determinations, requests, demands, objec-  
13 tions, reports and other papers and process to be served upon or  
14 delivered to that party.

15 Delivery to or service upon any party by the Watermaster, by  
16 any other party, or by the Court, of any item required to be  
17 served upon or delivered to a party under or pursuant to the  
18 Judgment may be by deposit in the United States mail, first class,  
19 postage prepaid, addressed to the designee and at the address in  
20 the latest designation filed by that party.

21 20. Judgment Binding on Successors. This Judgment and all  
22 provisions hereof are applicable to and binding upon not only the  
23 parties to this action, but also upon their respective heirs,  
24 executors, administrators, successors, assigns, lessees and licen-  
25 sees and upon the officers, agents, employees and attorneys in  
26 fact of all such parties.

27 - - - - -  
28 - - - - -



**LEGEND**

- BASIN BOUNDARY
- - -** DISTRICT BOUNDARY

**GENERAL LOCATION MAP  
WARREN VALLEY BASIN**

**EXHIBIT "A"**

Appendix G – Ames Valley Basin Stipulation and Amended  
and Restated Judgment

---



**AMES/RECHE GROUNDWATER STORAGE  
AND RECOVERY PROGRAM AND MANAGEMENT AGREEMENT**

This Agreement (“the Agreement” hereinafter) is made and entered into by and among Bighorn Desert View Water Agency (“BDV” hereinafter), County of San Bernardino Special District County Service Area No. 70 Zone W-1 Landers (“W-1” hereinafter), County of San Bernardino Special District County Service Area No. 70 Zone W-4 Pioneertown (“W-4” hereinafter), Hi-Desert Water District (“Hi-Desert” hereinafter) and Mojave Water Agency (“MWA” hereinafter) who are collectively referred to herein as “Parties” and individually referred to herein as a “Party.”

**A. Recitals**

(i) Bighorn Desert View Water Agency is a public entity organized and operating pursuant to the provisions of the Bighorn Desert View Water Agency Law, California Water Code Appendix, Sections 112-1 *et. seq.*

(ii) Hi-Desert Water District is a County Water District organized and operating pursuant to the provisions of the County Water District Law, California Water Code Sections 30,000 *et. seq.*

(iii) Mojave Water Agency is a public entity organized and operating pursuant to the provisions of the Mojave Water Agency Law, California Water Code Appendix Sections 97-1 *et. seq.*

(iv) County of San Bernardino Service Area No. 70 W-1 Landers is a public entity governed by the San Bernardino County Board of Supervisors pursuant to the provisions of California Government Code Sections 25210 *et. seq.*

(v) County of San Bernardino Service Area No. 70 W-4 Pioneertown is a public entity governed by the San Bernardino County Board of Supervisors pursuant to the provisions of California Government Code Sections 25210 *et. seq.*

(vi) BDV and Hi-Desert entered into an agreement entitled “Ames Valley Water Basin Agreement” effective January 10, 1991 (“the Original Agreement” hereinafter) which was the result of a CEQA complaint against Hi-Desert by BDV’s predecessor agency.

(vii) The Original Agreement provided for the settlement of a lawsuit protesting the adequacy of an environmental impact report through the entry of a Judgment by which a water production well referred to as the Section 24 Well (Main Stream Well) and other water production facilities owned and operated by Hi-Desert would be governed, the groundwater basin monitored and the water supplies therein protected.

(viii) That Judgment, dated June 3, 1991 was entered in Riverside County Superior Court Case No. 211504 (“the Judgment” hereinafter).

(ix) The Original Agreement was amended twice, as of August 12, 1993 and then as of February 3, 1997 and the Judgment was amended pursuant to a Court order dated November 8, 2001.

(x) Portions of the groundwater basin referred to in the Original Agreement and the Judgment as Ames Valley Groundwater Basin now are commonly referred to as the Pipes and Reche Groundwater Sub-basins and, together with that area commonly referred to as Pioneertown, form a management area for purposes of this Agreement that is referred to herein as "the Basin." The boundaries of the Basin are generally described in Exhibit A and depicted on Exhibit B hereto. The Parties hereto have conducted studies which indicate that substantial portions of the Basin are likely overdrafted and that approximately 400,000 acre-feet or more subsurface storage space is available in the Basin. The studies conducted by the Parties have also estimated the amount of water available perennially in the Basin due to natural supplies, the amount of water produced from the Basin from calendar year 2004 through calendar year 2008, and the feasibility of a project by which MWA would import and recharge state project water to the Basin through facilities located on property owned by the federal Bureau of Land Management and leased by BDV, thereby supplementing the local water supply. For purposes of applicable environmental laws, BDV is named the lead project proponent for this project known and referred to as the Ames/Reche Spreading Grounds and Recovery Program.

(xi) BDV, W-1, W-4 and Hi-Desert all wish to increase the amount of water available in the Basin and to make the Basin a more reliable source of water to be served to residents and businesses. MWA supports the efforts of those Parties and wishes to enhance its ability to store water resources and increase the reliability of regional water supplies.

(xii) In furtherance of this Agreement and the Ames/Reche Spreading Grounds and Recovery Program, the Ames/Reche Groundwater Management Plan is being developed to provide a basis for long-term management of local groundwater resources.

(xiii) The purposes of the Agreement are to establish mechanisms for the management and water supply reliability of the Basin, to bring the Basin demand and supply into operational balance, and to establish the groundwater production and storage rights of the Parties within the Basin.

(xiv) In order to implement the Agreement, the Parties shall enter into a Stipulation to Enter an Amended and Restated Judgment which supersedes the Judgment and which embodies the terms and conditions of this Agreement. W-1, W-4 and MWA will seek to intervene as Parties in the case and join in a joint motion of all Parties hereto for the entry of the Amended and Restated Judgment.

## **B. Agreement**

NOW, THEREFORE, the Parties hereto agree as follows:

1. Upon the Recharge Facilities described in paragraph 3 below being fully completed and operative, the Parties will promptly enter into and jointly file a Stipulation for Entry of an Amended and Restated Judgment embodying the terms and conditions of this

Agreement including, but not limited to, an injunction prohibiting the production of water from or storage of water in the Basin by any Party which is not based on production and storage rights articulated herein, and take any and all actions necessary to support the Court's entering said Amended and Restated Judgment. W-1, W-4 and MWA shall at the same time move to intervene as Parties to that Amended and Restated Judgment.

2. There hereby is established for BDV, W-1, W-4 and Hi-Desert the following water production allowances ("Annual Baseline Amounts" hereinafter) based upon a methodology agreed to by the Parties. The Annual Baseline Amounts are based upon 135% of amounts produced from the Basin by the Parties from calendar year 2004 through calendar year 2008, as verified by meter readings or energy usage data:

<u>Party</u>	<u>Annual Baseline Amount</u>
CSA 70 .Z. W-1 (Landers)	267 Acre Feet
CSA 70 .Z. W-4 (Pioneer Town)	35 Acre Feet
Hi-Desert Water District	703 Acre Feet
Bighorn Desert View Water Agency	641 Acre Feet

Commencing upon entry of the Amended and Restated Judgment referred to above, each Party shall have the right to produce native water from the Basin in each fiscal year (July 1 - June 30) equal to its Annual Baseline Amount, prorated for any partial fiscal year on a 365 day year basis, subject to the terms and provisions hereof. Any Party withdrawing less than its Annual Baseline Amount in any fiscal year may carryover its right to produce that unproduced amount for the next two fiscal years. The first water produced at any time by any Party shall be deemed to be water credited to the Party which has been carried over for two fiscal years and the next water produced by that Party shall be deemed to be water credited to that Party which has been carried over for one fiscal year. Any Annual Baseline Amount not produced by that Party, or any transferee of that right, for more than said two fiscal years shall be deemed to be abandoned and the right to produce it knowingly and intentionally waived and relinquished. No Party or other person or entity shall have the right to produce such abandoned carryover which shall serve to provide protection against over production of Basin water. Further, the Parties hereto hereby waive and relinquish any right they might assert to produce return flows emanating from state project water percolated into the Basin on their account through the Recharge Facilities referred to below.

3. MWA will employ its best efforts to construct at its sole cost, and then to own, maintain and operate recharge facilities ("the Recharge Facilities" hereinafter) on that land leased by BDV described and depicted on Exhibit C hereto. Such facilities are to include pipeline and ancillary structures and equipment necessary to connect those Recharge Facilities to MWA's Morongo Pipeline, all as described in "Bighorn Desert View Water Agency (BDVWA) Mitigated Negative Declaration for Water Infrastructure Restoration Program (WIRP): Ames/Reche Groundwater Storage and Recovery Program; and Pipeline Installation/Replacement Program and the Ames/Reche Groundwater Management Plan." MWA must comply with all the Mitigation Monitoring Provisions of the Mitigated Negative Declaration, all

stipulations placed on the project's constructions, operations and maintenance activities under permits obtained from United States Fish and Wildlife Service, California Fish and Game, Army Corps of Engineers and other permits identified or obtained as part of the project. The Recharge Facilities are designed for a capacity of approximately 1,500 acre feet per year. MWA shall complete the Recharge Facilities so that those facilities are fully operative no later than December 1, 2012. If the Recharge Facilities are not fully operative on or before December 1, 2012, any Party hereto may terminate the Agreement by written notice provided to each Party hereto on or before February 1, 2013. In light of the Parties' extensive time and effort to formulate this Agreement and to complete regulatory approvals for and completion of the Recharge Facilities, the Parties shall attempt in good faith to agree to a new date if construction of the Recharge Facilities is substantially complete but the facilities are not fully operative by December 1, 2012. Each party hereto agrees to support the completion of the Recharge Facilities and not to impede in any way the implementation of the recharge process through the completion and operation of the Recharge Facilities.

4. Subject to the provisions of paragraph 6 and 8 hereof, BDV, W-1, W-4 and Hi-Desert may purchase state project water from MWA to be percolated into the Basin at the Recharge Facilities and later withdrawn from the Basin by the purchasing entity. MWA shall maintain storage accounts reflecting the amount of water in storage in the Basin by each other Party due to state project water percolated in the Basin on its behalf by MWA. Amounts withdrawn above a Party's Annual Baseline Amount must be based on water then credited in that Party's storage account. State project water purchases are not subject to the maximum two year carryover imposed on the production of Annual Baseline Amounts. No Party shall produce water from the Basin not based upon either the Party's available Annual Baseline Amount or water present in its storage account except pursuant to an order of the Court obtained in accordance with the procedure referred to below, except pursuant to adjustment of the Annual Baseline Amounts in accordance with paragraph 10 hereof. No person or entity not a Party to this Agreement shall store or be allowed to store water in the Basin.

A Party may by written motion seek an order of the Court which provides that it may produce water from the Basin in excess of water based upon its Annual Baseline Amount, carryover rights or stored water in its account provided that the following criteria are met:

A. The hearing of the motion must be upon at least 90 days' written notice provided to the other Parties hereto; and

B. At a minimum, the moving Party shall provide substantial evidence demonstrating that it has exhausted all reasonably available means to meet its demands based on water rights allocated hereunder, including, but not limited to, seeking in writing to purchase or lease other Parties' production rights at reasonable prices.

5. Subject to the provisions of paragraph 6 and 8 hereof, MWA may percolate state project water into the Basin for its own account for subsequent sale, production and use in any location within MWA's physical boundaries so long as such activity does not substantially impair or inhibit any other Party's use of the Basin as a source of water for its residents and businesses.

6. Five percent (5%) of all state project water percolated into the Basin at the Recharge Facilities pursuant to orders from and for the banked credit of Hi-Desert, W-1 or W-4 shall be credited to the BDV storage account in consideration of various efforts and expenses undertaken by BDV in connection with this Agreement and the use of the site leased by BDV for the Recharge Facilities without regard to which Party hereto other than BDV has purchased or owns the right to such water when so percolated. The Parties also recognize that BDV production results in return flows to the Basin to a degree substantially greater than the other Parties. For example, if MWA chooses to sell the water in storage to meet its IDM contractual obligations, MWA will charge the buyer only for the water credited to the buyers account (95% of original water stored) with the balance credited to the BDV storage account. If a buyer requests transfer of water stored by MWA into buyers account, MWA will charge the buyer for the entire amount (100% of original water stored). All charges will be at the then current pricing policy of the MWA Board.

7. Water production rights as specified herein may be transferred from any Party hereto to any other Party hereto permanently or for any delineated period of time. The execution of this Agreement does not constitute a transfer of any water right from one party to another. A transfer of rights carried over by a Party as provided in paragraph 2 hereof shall not extend the two year period in which those rights must be exercised.

8. MWA shall offer water available for storage and later extraction through the Recharge Facilities to the other four Parties, Bighorn Desert View, Hi-Desert Water District and the County of San Bernardino W-1 and W-4, hereto whenever such water is made available to MWA from time to time in accordance with the policies and agreements concerning water allocation adopted by MWA as may be amended from time to time.

9. MWA shall administer a monitoring program to ensure protection of the Basin as a water supply and storage facility for the Parties hereto and their end users. The monitoring program will utilize the wells identified in Exhibit C hereto at a minimum. At MWA's direction, additional wells may be added to or removed from the program to provide a more accurate depiction of the state of the Basin as to maintenance of supplies and water quality. In accordance with schedules and protocols reasonably satisfactory to and approved in writing by the other Parties' general managers, the participants will take groundwater level measurement and samples for quality testing. BDV, W-1, W-4 and Hi-Desert agree to provide to MWA each year, no later than July 10, for the immediately prior 12 months (July 1 – June 30), the water level and water quality laboratory analysis collected during the prior year in accordance with the approved monitoring program.

10. BDV, W-1, W-4 and Hi-Desert agree to provide to MWA each year no later than July 10, the meter readings, electrical records and any available data reflecting the production of water from the Basin from all of the entities' wells for the immediately prior 12 months (July 1 - June 30). On or before the following September 1, MWA shall provide to the other Parties a report which compiles all water production, water quality and Basin well elevation data for the immediately previous fiscal year (June 30 - July 1). Every five years, the MWA report shall make recommendations on the Parties' ability to produce their Annual Baseline Amounts commencing in the following current fiscal year and any other recommendations for actions which MWA believes are required to protect the Basin water supply based on the Ames/Reche

Groundwater Management Plan. To ensure maintenance of Basin elevations at acceptable levels and still allow withdrawals and utilization of basin resources, and with the unanimous agreement of the general managers of BDV, W-1, W-4 and Hi-Desert, the Annual Baseline Amount for each such Party may be reduced or increased by the same percentage for an annual or other specified period. The first determination on such potential reduction or increase shall occur within 90 days of MWA issuing its first report required hereunder. Records of any changes to Parties' Annual Baseline Amounts made pursuant to this paragraph shall be made and maintained by MWA, and included in each annual report required hereunder, yet shall not constitute an amendment to this Agreement or the Amended and Restated Judgment, and shall not require approval by or notification to the Court.

11. Each Party shall indemnify, hold harmless and assume the defense of the other Parties, their officers, agents, employees, and elective boards, and that Party shall pay all court costs and reasonable attorneys fees relating thereto, in any action, with respect to a claim, loss, damage or injury, asserted by a third Party against any Party entitled to indemnification under this Agreement, and arising out of a negligent act, error or omission, or willful misconduct, of an employee or agent of the Party whose actions under this Judgment gave rise to such third Party claim.

12. Any notice, tender or delivery to be given hereunder by any Party to another Party or Parties shall be effected by personal delivery in writing or by registered or certified mail, postage prepaid, return receipt requested, and shall be deemed communicated as of mailing or in case of personal delivery, as of actual receipt. Mailed notices shall be addressed as set forth below, but each Party may change its address by written notice in accordance with this paragraph 12.

To: Hi-Desert Water District  
55439 29 Palms Hwy.  
Yucca Valley, CA 92284  
Attention: General Manager

To: Bighorn-Desert View Water Agency  
622 S. Jemez Trail  
Yucca Valley, CA 92284  
Attention: General Manager

To: County of San Bernardino Special District  
County Service Area No. 70  
12402 Industrial Blvd., Building D, Suite 6  
Victorville, CA  
Attention: General Manager

To: Mojave Water Agency  
13846 Conference Center Drive  
Apple Valley, CA 92307  
Attention: General Manager

13. Full jurisdiction, power and authority shall be retained and reserved by the Court for the purpose of enabling the Court, upon application of any Party hereto by motion and upon at least thirty (30) days notice thereof, after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate for the construction, enforcement or implementation of this Agreement, and the Amended and Restated Judgment entered based on this Agreement, including independent review of any decision presented to the General Managers of BDV, W-1, W-4, Hi-Desert and MWA under paragraph 10 of this Agreement which is not unanimously approved. A responding and/or defending Party who is determined to be a prevailing Party in any such hearing shall be entitled to recover as costs upon the conclusion of such hearing all attorneys fees or other costs actually incurred in connection with resolving the dispute by the making of such motion and the hearing thereon.

14. If a dispute arises regarding breach or enforcement of the provisions of this Agreement, a responding and/or defending Party who is determined to be a prevailing Party therein shall be entitled to recover all attorneys fees or other costs actually incurred in connection with resolving the dispute, but only to the extent such resolution is achieved by an order or decision of a court of competent jurisdiction.

15. This is an entire Agreement and supersedes all prior agreements oral or written between any of the Parties, and their agents, on the same subject matter, and cannot be amended unless in writing, with specific reference hereto by the Parties authorized to be charged; provided, however, this Agreement does not supersede nor affect the interpretation of any existing agreement between MWA and any other party hereto regarding the construction, operation and financing of the Morongo Basin Pipeline Project nor does this Agreement in any way alter or obligate current and/or future capacity in the Morongo Basin Pipeline Project. Failure by any Party to enforce any provisions shall not constitute a waiver of said Party's right to enforce subsequent violation of the same or any other provisions. Pending satisfaction of the conditions subsequent in Paragraphs 1, 2 and 3, Hi-Desert shall continue to have the right to produce groundwater as set forth in the Original Agreement and Judgment.

16. This Agreement shall be binding upon and inure to the benefit of the successors and assigns of the Parties.

17. If any section, clause or phrase of this Agreement is for any reason held to be unconstitutional or unlawful, such a decision shall not affect the validity of the remaining portions of this Agreement.

18. The persons executing this Agreement on behalf of the Parties hereto represent and warrant that (i) such Party is duly organized and existing, (ii) they are duly authorized to execute and deliver this Agreement on behalf of said Party and to bind that Party, including its members, agents and assigns, and (iii) by so executing this Agreement, such Party is formally bound to the provisions of this Agreement.

19. This Agreement may be executed in multiple counterparts, each of which shall be considered an original but all of which shall constitute one agreement.

IN WITNESS WHEREOF, the Parties have entered into this Agreement as of the date stated below opposite the name of each such Party.

BIGHORN DESERT VIEW WATER AGENCY

Dated: January 10, 2012 By: Terry Burkhart Terry Burkhart, President  
By: Marina West Marina West, General Manager

COUNTY OF SAN BERNARDINO SPECIAL DISTRICT  
COUNTY SERVICE AREA 70 ZONE W-1

Dated: MAR 13 2012 By: Josie Gonzales  
By: Josie Gonzales

COUNTY OF SAN BERNARDINO SPECIAL DISTRICT  
COUNTY SERVICE AREA 70 ZONE W-4

Dated: MAR 13 2012 By: Josie Gonzales  
By: Josie Gonzales

HI-DESERT WATER DISTRICT

Dated: February 15, 2012 By: Sarann Graham Sarann Graham, President  
By: Ed Muzik Ed Muzik, General Manager

MOJAVE WATER AGENCY

Dated: May 29, 2012 By: AK  
By: \_\_\_\_\_



*[Handwritten signature]*  
2015/07/07

*[Handwritten signature]*  
2015/07/07

SIGNED AND CERTIFIED THAT A COPY OF  
THIS DOCUMENT HAS BEEN DELIVERED  
TO THE CHAIRMAN OF THE BOARD  
LAURA H. WELCH  
Clerk of the Board of Supervisors  
of the County of San Bernardino

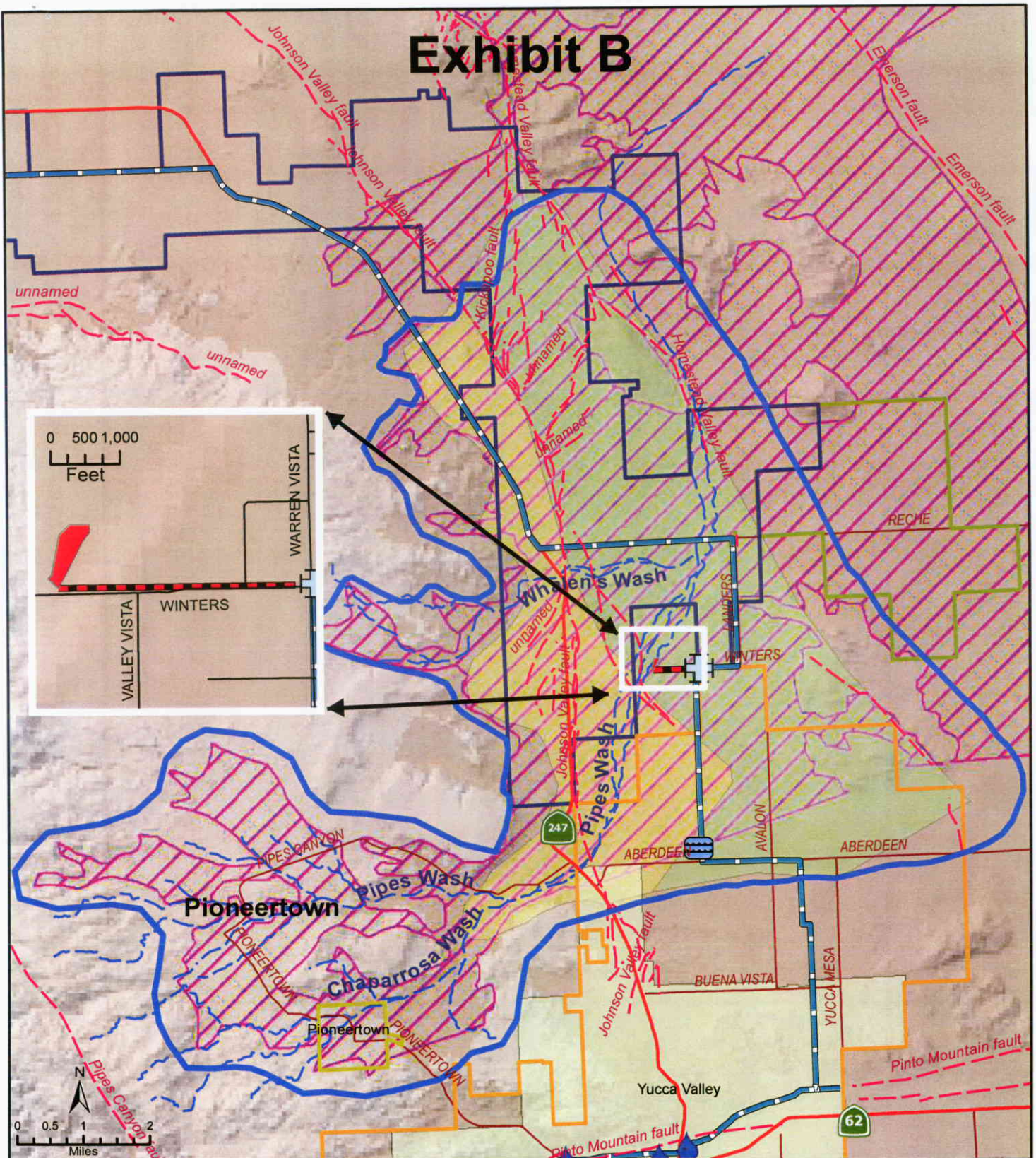
By *[Handwritten signature]*  
Deputy



## EXHIBIT A

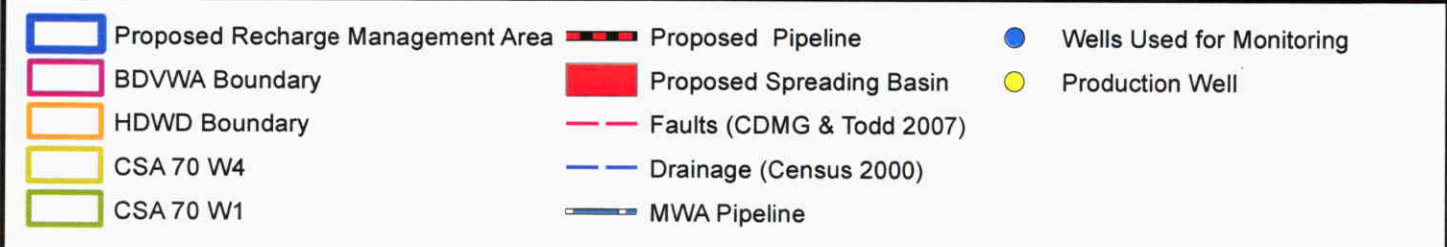
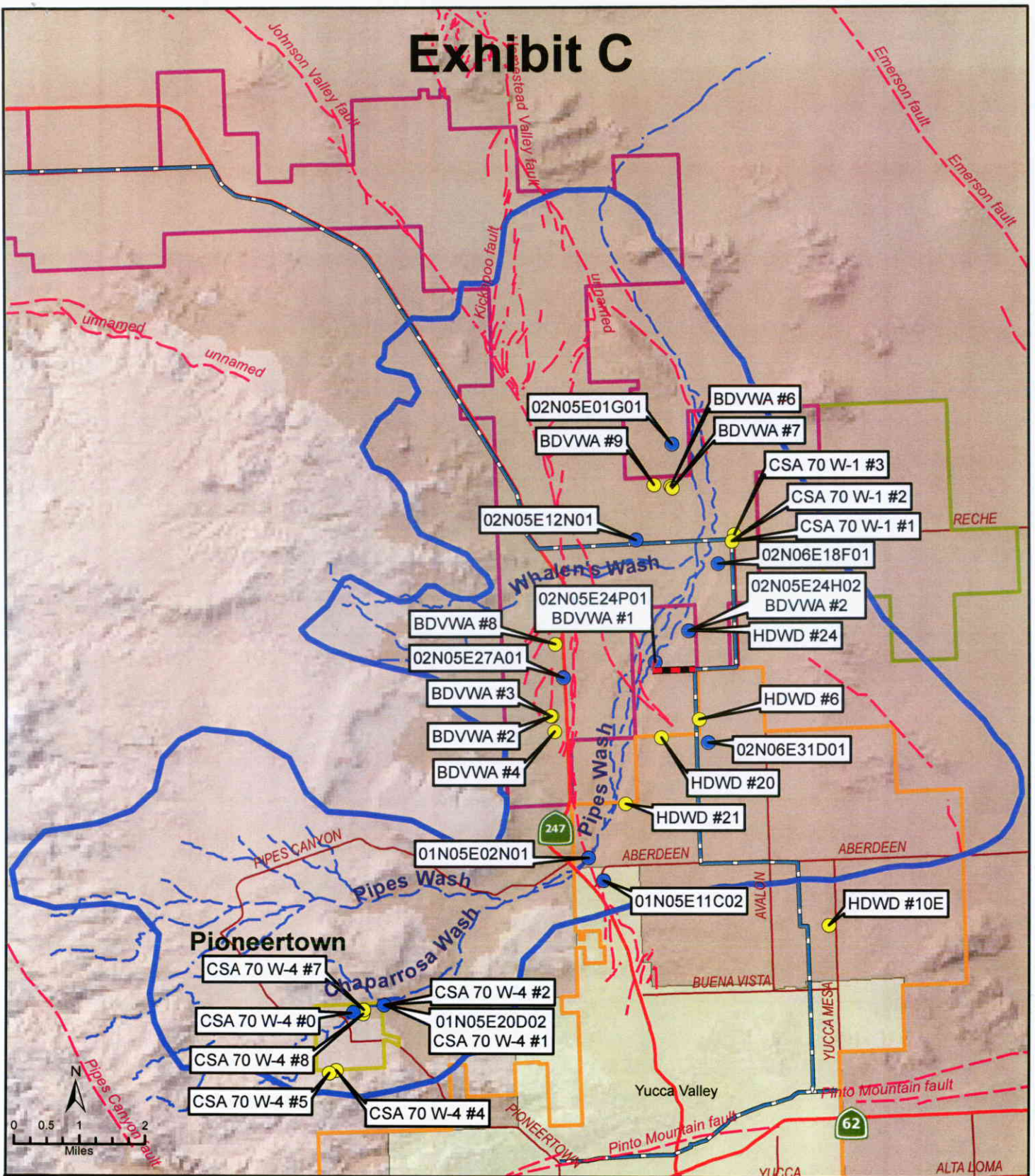
The boundary of the Basin management area subject to this Agreement includes portions of the Ames Valley Groundwater Basin (DWR, 2003), portions of its upper watershed, the areas referred to by the United States Geologic Survey as the Pipes and Reche subbasins (as defined by Stamos et al., 2004), along with the area historically defined as Pioneertown (Lewis, 1972). Exhibit B further depicts the geographical boundaries of the basin management area subject to this Agreement.

# Exhibit B



- |                                     |                                   |                            |
|-------------------------------------|-----------------------------------|----------------------------|
| Pipes Groundwater Subbasin (USGS)   | CSA 70 W4                         | Faults (CDMG & Todd 2007)  |
| Reche Groundwater Subbasin (USGS)   | CSA 70 W1                         | MWA Pipeline               |
| Ames Valley Groundwater Basin (DWR) | Proposed Pipeline                 | MWA Warren Vista Reservoir |
| BDVWA Boundary                      | Proposed Spreading Basin          | MWA Turnout                |
| HDWD Boundary                       | Proposed Recharge Management Area |                            |

# Exhibit C



Appendix H – Mojave Water Agency Population Forecast,  
December 2015 (Beacon Report)

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# Mojave Water Agency Population Forecast



December  
2015



# Mojave Water Agency Population Forecast

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This publication was prepared for:

## **Mojave Water Agency**

This publication was prepared by:

## **Beacon Economics**

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# Contents

Executive Summary	1
Forecast Methodology	2
San Bernardino County / Inland Empire Economic and Demographic Trends	3
Mojave Water Agency Population Forecast	5
Summary	7
Appendix 1: MWA Incorporated City Forecasts	8
Appendix 2: MWA Sub Area Forecasts	9
Appendix 3: MWA Water Purveyor Forecasts	10





## EXECUTIVE SUMMARY

Having a good sense of population growth trends is a crucial part of urban development planning, especially when it comes to water. Food and other resources can be readily imported, but developing and managing water infrastructure and resources is best done over the long run with a keen eye on the future. Population forecasting then becomes an integral part of that planning process, and to that end this report has been commissioned by the Mojave Water Agency (MWA) in order to get a better sense of future population growth, as well as the magnitude of that growth.



San Bernardino County and the broader Inland Empire region are anticipated to see more population growth in the near term than the coastal regions of Southern California, and in the longer run, Beacon Economics expects the MWA service area to see even stronger population growth. Affordability is the name of the game here. As housing has become more unaffordable in the coastal counties of Los Angeles, Orange, and San Diego, the Inland Empire has been a destination of choice for many residents willing to commute to the coast.

This has boosted economic activity within the Inland Empire as these commuters spend their wages locally, creating a positive feedback effect which drives further growth and attracts more residents to the area. The MWA service area is, in terms of housing prices, even more affordable than other parts of San Bernardino County, and we expect these dynamics to help drive future population growth above and beyond growth in the County overall.

This forecast uses historical trends primarily to drive future results. Areas that have grown the fastest in the past are projected to see population growth rates above and beyond what is projected for the MWA service area as a whole. Similarly, areas that have grown slower in the past are projected to see slower population growth over the life of the forecast. The forecasts for the incorporated cities have a large influence on the forecasts for the unincorporated regions of the MWA service area (which will be discussed in the subsequent section). Some of the incorporated areas worthy of mention include:

- Victorville: This city experienced one of the strongest average annual population growth rates from 1990 to 2010 – and the 2011 to 2015 estimates indicate similar relative growth. The current forecast calls for 2.0% average annual population growth, slightly higher than the 1.8% for the MWA service area overall.

- Barstow: Out of the incorporated cities Barstow experienced some of the slowest growth from 1990 to 2010 – and the 2011 to 2015 estimates indicate the same trend. As such, this city is expected to be one of the slower growing over the life of the forecast.

This report is divided into three sections. In the first section we provide a broad overview of the methodology used to arrive at the current forecast. The affordability dynamics that have helped drive growth in the broader Inland Empire region are examined in the second part of this report, and in the third part, the similar dynamics are examined for the MWA service area specifically. The detailed forecasts of the MWA service area and its various regions can be found in the appendices at the end of the report.

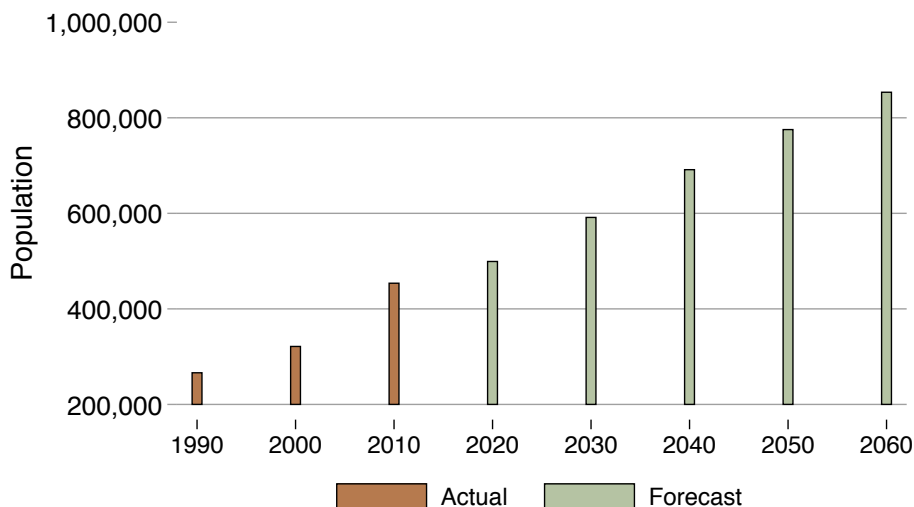
### FORECAST METHODOLOGY

Beacon Economics forecast of the MWA service area and its incorporated cities, sub areas, and water purveyors is based on historic correlations with population trends in their surrounding area. A long run driver of future population in the surrounding area was used to forecast population growth out to the year 2060. In the case of the incorporated portions of the MWA service area, historic population trends were correlated with population growth in San Bernardino County overall. In the case of the sub areas and water purveyors in unincorporated regions of the MWA service area, the historical population data was correlated with the nearest incorporated city.

Historical data used in the forecast of the incorporated cities were obtained from the California Department of Finance (DOF), which makes estimates available from 1970 forward on an annual basis. With this data in hand, an econometric time series model was created to capture the historical correlations with countywide population growth. Future population growth for the incorporated cities of the MWA service area was then estimated using these historic correlations and a long run driver of countywide population growth.

Population projections for San Bernardino County from the DOF were used as the long run driver for the forecasts of incorporated cities. The DOF uses a baseline cohort-component method to produce their population projections out to the calendar year 2060. This method traces people born in a given year throughout their lives. As each year passes, cohorts change due to mortality and migration assumptions. Applying fertility assumptions to women of childbearing age forms new cohorts.<sup>1</sup>

Mojave Water Agency Population Forecast  
1990 to 2060



Forecast by Beacon Economics

<sup>1</sup>For a more detailed description of the DOF methodology see State of California, Department of Finance, State and County Population Projections by Race/Ethnicity, Sex, and Age 2010-2060, Sacramento, California, December 2014.

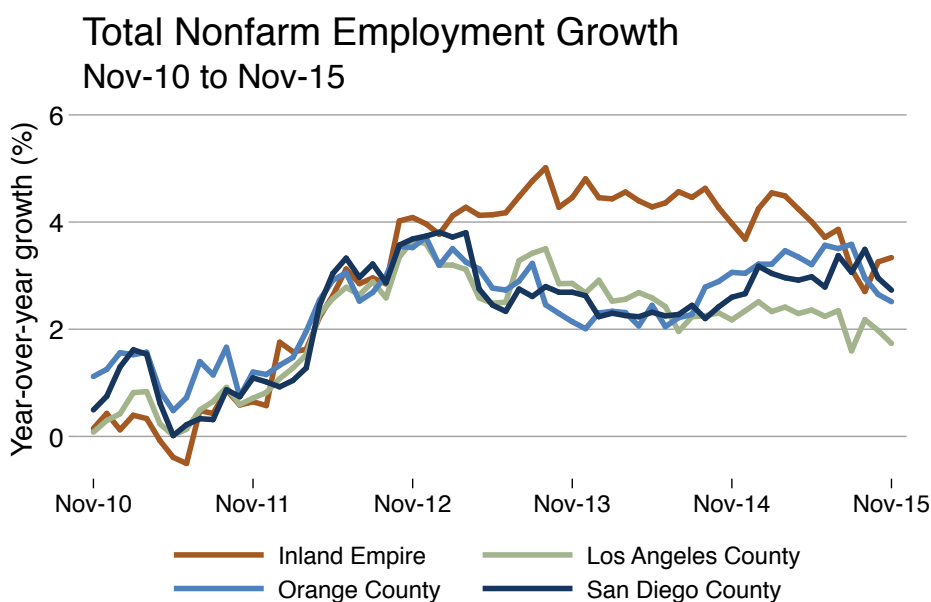
Several sub areas and water purveyors in the MWA service area are closely associated with the boundaries of one or more incorporated cities. In these cases the forecasted population growth rates from the incorporated cities were applied to historical population counts for these areas to produce a forecast of future population. For sub areas or water purveyors in an unincorporated portion of the MWA service area, the historical correlations between the respective area and the nearest incorporated city were used to project future population growth. Due to the long run nature of this forecast, DOF countywide population estimates were the primary driver of the estimates for future population in the MWA service area. Other factors, such as building permits or planned developments, were not used as they represent a very short term outlook and are not a driver of population growth in of themselves. A forecast of long run population growth carries with it the assumption that there will be sufficient residential development to accommodate future population growth.

It should be noted that long run forecasts of any nature have a greater margin of error the longer the forecast time frame. Forecasts of one to two years can be quite accurate, whereas forecasts of five to ten years into the future are less likely to be as accurate. Several factors, most notably business cycle effects, can have strong impacts on population or other socioeconomic indicators, over the long run. Forecasts are a ultimately a “best guess” given current data and assumptions, and forecasts far into the future, such as a ten years plus, can be subject to very large forecast errors.

### SAN BERNARDINO COUNTY / INLAND EMPIRE ECONOMIC AND DEMOGRAPHIC TRENDS

In order to put population growth of the Mojave Water Agency regions in proper context, it is important to consider the broader San Bernardino and Inland Empire economy. The various regions of California experience population and economic growth differently, which in turn impacts sub-regional performance over time. The inland regions of California, for example, are expected to grow quite differently than coastal areas, and San Bernardino is no exception to this.

Historically, economic growth has been concentrated in the coastal regions of California, particularly in Southern California. This has resulted in the coastal regions of Los Angeles, Orange, and San Diego counties becoming the major job centers in Southern California. With economic and employment growth concentrated along the coast, real estate prices, on both the residential and commercial sides of the market, remain higher in coastal counties. This has in turn resulted in inland areas having a considerable



Source: California Employment Development Department

affordability advantage, which has and will continue to attract residents and businesses to regions like the Inland Empire.

In recent years, we have already begun to see the Inland Empire region begin to separate itself from the major job centers along the coast. Total nonfarm employment growth in the Inland Empire has drastically outpaced its coastal neighbors. Since the beginning of 2012, the Inland Empire has seen year-over-year non-farm job growth average 3.8%, noticeably higher than Los Angeles County (2.5%), Orange County (2.8%), and San Diego County (2.7%).

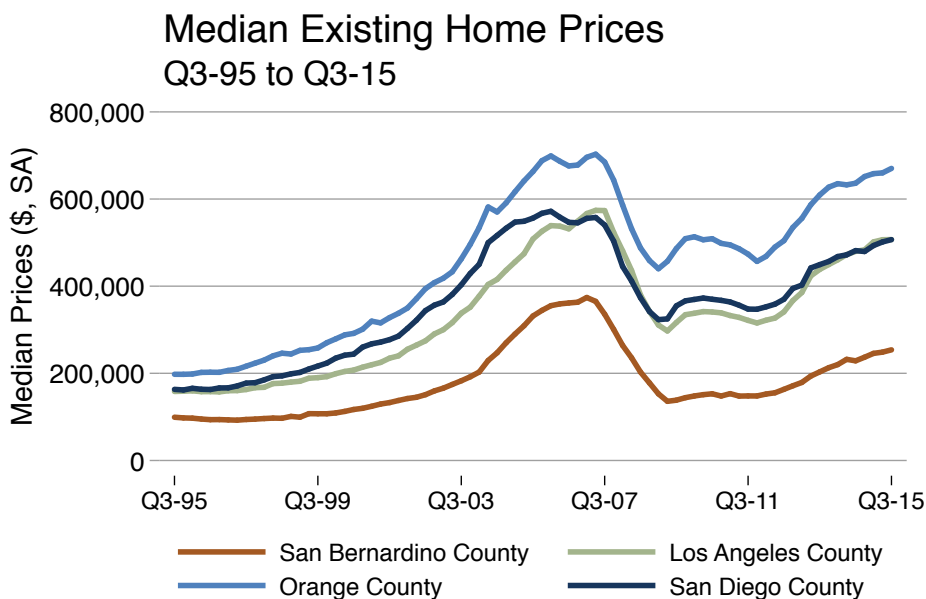
Many workers in the coastal job centers choose to take advantage of more affordable housing in the Inland Empire region. According to the American Community Survey, 29.1% of workers age 16 and over in San Bernardino County in 2014 commuted outside of the County for work.

These commuters spend most of their wages locally, which in turn fosters “internal” driven economic growth. Indeed, consumer and business spending in San Bernardino County, as measured by taxable sales, has grown faster in recent years compared to its coastal neighbors. From 2009 to 2014 taxable sales in San Bernardino grew by 38.7% over the five-year period, faster than Los Angeles (31.0%), Orange (31.1%), and San Diego (32.6%) counties. During the first three quarters of 2015, growth has accelerated as taxable sales in San Bernardino County were 7.6% higher than the same year-to-date period the prior year, vastly outpacing the coastal counties.

County	2009 to 2014	2015 YTD
Los Angeles	31.0	4.0
Orange	31.1	2.3
San Bernardino	38.7	7.6
San Diego	32.6	3.6

Source: California Board of Equalization

Home prices in San Bernardino County in particular present a stark example of just how affordable housing is in the County, relative to the coastal regions. As of the third quarter of 2015, the median price for an existing home in San Bernardino County stood at \$254,000 on a seasonally adjusted basis. In contrast, median prices in Los Angeles and San Diego counties were both \$507,000, double the median price in San Bernardino County. The price differential was even greater in Orange County where the median price was \$670,000 in the third quarter.



Source: DataQuick

On the commercial side of the market we see very similar affordability dynamics at work. For both office and retail properties, the average rent per square foot in the Inland Empire is more than 25% lower compared to the coastal counties. So not only does the

Inland empire region attract new residents through housing affordability, but businesses have an incentive to start up or relocate to the region as well.

The affordability advantage of the Inland Empire region, coupled with the strong post-recession growth of the region's economy, has succeeded in drawing residents to the region, even more than the coastal counties of Southern California. In fact, net migration to the Inland Empire has been greater than the coastal regions in both 2014 and 2015. In 2014 there were 14,256 more residents that moved into the Inland Empire than those that left the Inland Empire, and net migration was 9,418 in 2015. In contrast, Los Angeles County experienced negative net migration for both years (-4,183 in 2014; -3,651 in 2015), and both San Diego County (13,818 in 2014; 2,977 in 2015) and Orange County (6,697 in 2014; 5,128 in 2015) had lower net migration in absolute terms.

The higher net migration in the Inland Empire has resulted in faster rates of population growth in recent years compared to these coastal counties. The latest data from the California Department of Finance shows that the Inland Empire population increased 1% from July 2014 to July 2015, which had faster population growth than Los Angeles County (0.7%), Orange County (0.8%), and San Diego County (0.9%).

Looking forward, Beacon Economics expects these affordability advantages to continue to promote economic and population growth in the Inland Empire region. The Inland Empire is home to many commuters working in the coastal job centers, but they spend much of their wages locally. This in turn generates positive feedback within the region's economy and helps to promote further business and employment growth. Compared to the coastal regions of Southern California, the Inland Empire is expected to experience higher growth rates for the foreseeable future due to its affordability advantage, much like we have seen in the last few years.

## MOJAVE WATER AGENCY POPULATION FORECAST

The service area of the MWA has vast potential for future growth over the next several decades. In much the same way that San Bernardino County and the broader Inland Empire region hold an affordability advantage over coastal counties, making the area more attractive to residents and businesses, the MWA area holds an affordability advantage within San Bernardino County. This will allow the population within the MWA service area to increase at a faster rate than the County overall for the life of this forecast.

Looking at median home prices in the incorporated parts of the MWA service area provides the clearest example of this affordability advantage. As of October 2015, all six of the incorporated cities within the MWA service areas have median home prices that are lower than the countywide median of \$260,000. Hesper-

### California Commercial Rents (\$/Sq. Ft.)

Region	Office	Retail
Los Angeles County	35.12	31.24
Inland Empire	21.79	21.48
Orange County	30.07	32.25
San Diego County	30.61	30.13

Source: REIS

### MWA Incorporated City Median Home Prices

City	Oct-2015 (\$)	YoY (%)
Adelanto	156,500	1.0
Apple Valley	189,000	-0.8
Barstow	76,750	-4.1
Hesperia	220,000	16.4
Victorville	185,000	5.0
Yucca Valley	142,500	10.5
San Bernardino County	260,000	7.0

Source: DataQuick

ria comes the closest with a median price of \$220,000, and Barstow is on the lower end of the spectrum with a median price of \$76,750.

The lower home prices in the incorporated cities within the MWA service areas indicate that demand for housing is currently not as strong as in other parts of the county, but as population grows in other cities this will drive up prices in those parts and the MWA areas will become that much more attractive. This is the same dynamic that has been at work for the larger Inland Empire region as coastal parts of Southern California become increasingly unaffordable.

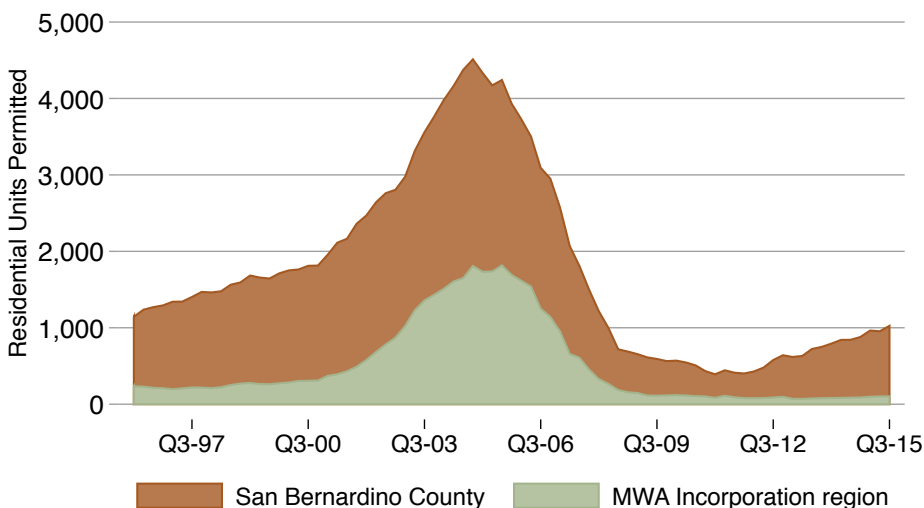
Overall economic growth in the incorporated cities of the MWA service area, as measured by taxable sales, indicates that these cities have yet to transition towards the growth centers of San Bernardino County. Five-year growth trends show that most of the incorporated cities grew slower than the County overall. During the first three quarters of 2015, all six incorporated cities witnessed lower growth than the County overall compared to the same year-to-date period the year prior. In the coming years, we expect this trend to reverse as more residents choose to live in the more affordable areas within the MWA service area and these cities, as well as the unincorporated parts of the MWA area, and taxable sales growth in these regions overtakes the countywide average growth.

City	2009 to 2014	2015 YTD
Adelanto	40.1	-17.4
Apple Valley	15.8	-0.1
Barstow	31.2	-5.5
Hesperia	54.0	-1.1
Victorville	28.0	3.6
Yucca Valley	6.2	5.5
San Bernardino County	38.7	7.6

Source: California Board of Equalization

Residential construction is another area where the MWA service areas has lagged behind the rest of the County, however we expect this trend to reverse as well in the coming years. Since 2012, the incorporated region of the MWA service area has seen slower growth in permitting for new residential structures on an annual basis. For the first three quarters of 2015, however, residential permitting growth was slightly stronger in the MWA area. We should see more of that in the years to come as affordability continues to attract more residents and fuel population growth.

### Residential Construction Permits Q1-96 to Q3-15



Source: Construction Industry Research Board

## SUMMARY

The MWA service area is anticipated to experience population growth rates over the next several decades that are stronger than those anticipated for San Bernardino County overall. The broader Inland Empire region has seen strong economic and employment growth these last few years, and much of that has been due to its affordability advantage it holds over coastal counties of Southern California.

In similar fashion, the MWA service area is expected to see this kind of growth as well, relative to other parts of the Inland Empire, due to its affordability advantage relative to the broader region. The current data available for the incorporated cities of the MWA service area shows that the region has not yet transitioned to being one of the growth centers for San Bernardino County, but given its clear advantage in terms of home prices, Beacon Economics expects economic and population growth to pick up in the years to come and over the life of this forecast.

## APPENDIX 1: MWA INCORPORATED CITY FORECASTS

Year	Adelanto	Apple Valley	Barstow	Hesperia	Victorville	Yucca Valley
1990	6,751	46,159	24,260	50,705	50,579	16,442
2000	17,895	54,240	22,699	62,740	64,165	16,855
2010	31,760	69,144	22,757	90,170	115,913	20,656
2011	31,609	69,484	23,010	90,539	117,239	20,727
2012	30,918	69,769	23,161	90,739	118,933	20,783
2013	31,178	70,261	23,340	91,221	120,388	20,922
2014	32,472	70,743	23,517	91,541	120,882	20,992
2015	33,080	71,453	23,661	92,302	121,568	21,317
2020	35,476	75,731	24,239	99,716	132,153	22,211
2025	38,453	81,566	24,858	108,659	147,364	23,395
2030	42,221	87,767	25,475	118,976	163,486	24,720
2035	46,311	93,862	26,059	129,739	179,396	26,028
2040	50,182	99,189	26,604	139,849	194,677	27,190
2045	53,560	103,816	27,122	148,888	209,137	28,189
2050	56,555	108,352	27,648	157,422	222,675	29,123
2055	59,573	112,685	28,163	165,674	235,240	30,012
2060	62,482	116,772	28,674	173,574	246,817	30,846

Forecast by Beacon Economics



## APPENDIX 2: MWA SUB AREA FORECASTS

Year	Alto	Alto Transition Zone	Baja	Centro	Este	Morongo	Oeste
1990	165,100	17,468	5,782	35,046	5,167	31,001	5,501
2000	222,012	14,636	5,035	33,392	5,822	31,375	7,838
2010	334,862	23,366	4,729	34,167	7,370	38,177	10,595
2011	337,146	23,305	4,735	34,546	7,422	38,297	10,727
2012	339,478	22,909	4,739	34,774	7,454	38,391	10,807
2013	342,261	23,113	4,746	35,043	7,512	38,625	10,955
2014	343,913	23,957	4,753	35,308	7,568	38,744	11,098
2015	346,665	24,364	4,762	35,524	7,646	39,291	11,299
2020	371,356	26,132	4,812	36,393	8,073	40,795	12,406
2025	407,344	28,465	4,872	37,322	8,615	42,783	13,864
2030	449,520	31,413	4,933	38,248	9,196	44,995	15,504
2035	493,686	34,616	4,989	39,125	9,753	47,168	17,152
2040	535,002	37,663	5,036	39,943	10,244	49,092	18,667
2045	571,913	40,342	5,076	40,720	10,672	50,739	20,033
2050	607,027	42,744	5,112	41,510	11,086	52,273	21,398
2055	641,206	45,158	5,146	42,284	11,479	53,731	22,727
2060	674,042	47,489	5,177	43,050	11,851	55,094	24,018

Forecast by Beacon Economics

**APPENDIX 3: MWA WATER PURVEYOR FORECASTS**

Year	Apple Valley Ranchos Water Company	Bighorn-Desert View Water Agency	City of Adelanto Water District	County Service Area 64	County Service Area 70 J	Golden State Water Company - Barstow System
1990	37,228	1,200	6,751	5,353	3,328	29,905
2000	45,207	2,892	17,895	7,595	5,652	29,337
2010	57,847	3,839	31,760	9,075	9,467	30,173
2011	58,132	3,891	31,609	9,163	9,609	30,479
2012	58,370	3,922	30,918	9,216	9,695	30,662
2013	58,781	3,981	31,178	9,314	9,855	30,878
2014	59,185	4,037	32,472	9,408	10,009	31,090
2015	59,779	4,116	33,080	9,541	10,227	31,261
2020	63,357	4,554	35,476	10,267	11,433	31,951
2025	68,240	5,135	38,453	11,205	13,049	32,684
2030	73,427	5,794	42,221	12,236	14,906	33,412
2035	78,526	6,463	46,311	13,246	16,811	34,096
2040	82,983	7,082	50,182	14,156	18,597	34,732
2045	86,854	7,644	53,560	14,961	20,233	35,333
2050	90,649	8,209	56,555	15,753	21,891	35,940
2055	94,274	8,763	59,573	16,514	23,528	36,533
2060	97,693	9,303	62,482	17,243	25,135	37,116

Forecast by Beacon Economics

Year	Helendale Community Services District	Hesperia Water District	Hi-Desert Water District	Joshua Basin County Water District	PPHC East	PPHC West	Victorville Water District
1990	3,273	50,976	19,060	7,515	4,766	4,922	54,539
2000	4,704	62,592	19,198	8,062	7,004	6,766	69,095
2010	6,180	89,742	23,760	9,534	9,877	9,546	122,051
2011	6,247	90,110	23,842	9,590	10,016	9,666	123,448
2012	6,287	90,308	23,906	9,624	10,098	9,743	125,231
2013	6,362	90,788	24,065	9,687	10,253	9,881	126,763
2014	6,434	91,106	24,147	9,746	10,401	10,015	127,283
2015	6,535	91,864	24,520	9,830	10,611	10,203	128,005
2020	7,090	99,242	25,548	10,287	11,767	11,242	139,151
2025	7,812	108,143	26,911	10,860	13,306	12,614	155,167
2030	8,613	118,411	28,435	11,469	15,056	14,163	172,143
2035	9,407	129,123	29,939	12,047	16,836	15,725	188,896
2040	10,127	139,185	31,276	12,551	18,489	17,166	204,986
2045	10,769	148,181	32,425	12,986	19,993	18,469	220,212
2050	11,406	156,675	33,499	13,406	21,507	19,775	234,466
2055	12,020	164,888	34,522	13,801	22,993	21,050	247,697
2060	12,612	172,750	35,481	14,172	24,445	22,291	259,887

Forecast by Beacon Economics

## ABOUT BEACON ECONOMICS

Beacon Economics, LLC is a leading provider of economic research, forecasting, industry analysis, and data services. By delivering independent, rigorous analysis we give our clients the knowledge they need to make the right strategic decisions about investment, growth, revenue, and policy. Learn more at [www.BeaconEcon.com](http://www.BeaconEcon.com).

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Appendix I – Mojave Water Agency Ordinance No. 9

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MOJAVE WATER AGENCY  
ORDINANCE NO. 9

4/27/95  
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AN ORDINANCE OF THE MOJAVE WATER AGENCY ESTABLISHING  
RULES AND REGULATIONS FOR THE SALE AND DELIVERY  
OF STATE PROJECT WATER

WHEREAS, the Board of Directors of the Mojave Water Agency (MWA) hereby finds:

1. The Mojave Water Agency is organized and operated pursuant to the Mojave Water Agency Law, California Water Code Appendix 9;
2. Section 15(a) of the Mojave Water Agency Law authorizes the MWA to "do any and every act necessary to be done so that sufficient water may be available for any present or future beneficial use or uses of the lands or inhabitants of the Agency, including without limiting the generality of the foregoing, irrigation, domestic, fire protection, municipal, commercial, industrial and recreational uses and without limiting the generality of the authority given under subdivision (a) or under any other section of this Act, the Agency has the following additional powers: To enter into any contract with any person, corporation, utility, district, public corporation, the United States or the State of California, as the Board deems proper or advisable or in the interest of the lands and inhabitants of the Agency, to carry out or to execute any of the purposes of this Act."
3. In order to carry out the purposes of the Mojave Water Agency Law, the Mojave Water Agency does hereby adopt Rules and Regulations for the Sale and delivery of State of California Project Water by the MWA.

NOW, THEREFORE, be it ordained by the Board of Directors of the MWA as follows:

RULES AND REGULATIONS FOR SALE AND DELIVERY  
OF STATE OF CALIFORNIA PROJECT WATER BY THE MWA  
AS SET FORTH BE ADOPTED

## ARTICLE I

### TABLE OF CONTENTS

ARTICLE I	TABLE OF CONTENTS
ARTICLE II	DEFINITIONS
	Section 2.01 Definitions
ARTICLE III	QUALIFICATION FOR SERVICE
	Section 3.01 Application for Service
	Section 3.02 Term of Service
	Section 3.03 Identification of Applicant and Intended Use
	Section 3.04 Services to be Wholesale in Nature
	Section 3.05 Back-up Capacity of Applicant
	Section 3.06 Treatment Facilities
	Section 3.07 Power Generation Rights
	Section 3.08 Indemnity for Groundwater Recharge
	Section 3.09 Application for Groundwater Replenishment
	Section 3.10 Metering by End User
ARTICLE IV	INSTALLATION AND CONNECTION OF FACILITIES
	Section 4.01 General Authorization
	Section 4.02 Procedure
	Section 4.03 Facilities included; ownership by the Agency
	Section 4.04 Back-Flow
	Section 4.05 Pressure Surges (Water Hammer)
	Section 4.06 Deposit of Estimated Costs
	Section 4.07 Use of Deposit
	Section 4.08 Settlement upon Completion
	Section 4.09 Easement for Service Connection
	Section 4.10 Maintenance of Service Connection
	Section 4.11 Environmental Requirements
	Section 4.12 Fair Value of Outlet
ARTICLE V	WATER SERVICE AND OPERATIONS
	Section 5.01 Limitations of State Contract Service
	Section 5.02 Interruptible Service
	Section 5.03 Quality
	Section 5.04 Special Classes of Services
	Section 5.05 Water Rates

Section 5.06	Pressure and Flow Conditions
Section 5.07	Payment of Water Charges
Section 5.08	Meter Testing
Section 5.09	Estimates of Water Requirements and Schedules of Deliveries
Section 5.10	Contents of Estimates
Section 5.11	Revision of Estimates
Section 5.12	Order for Water
Section 5.13	Shortage in Water Supply
Section 5.14	Outside Sales

ARTICLE VI            GENERAL

Section 6.01	Liability and Indemnification
Section 6.02	Water Resources Management Requirements
Section 6.03	Design and Operating Criteria
Section 6.04	Indemnification for Water Spreading
Section 6.05	Appeal

ARTICLE II

DEFINITIONS

Section 2.01            Definitions. As used herein the terms set forth below shall be defined as follows and shall have such meaning unless the context indicates otherwise.

- (a)    APPLICANT: Any person or entity applying to the Agency for water service.
- (b)    BOARD: The Board of Directors of the Agency.
- (c)    CUSTOMER: An applicant for service, an approved applicant, or any person or entity receiving water service from the Agency.
- (d)    AGENCY: The Mojave Water Agency.
- (e)    GENERAL MANAGER: The General Manager of the Agency.
- (f)    PROJECT WATER: Water obtained from the State Water Project. Any customer requesting the sale and delivery of State Project Water shall be subject to the Agency's State Water Contract. The water available to the Agency is subject to the limitation that the supply of water is interruptible. The

Agency makes no representation to the customer as to the quantity or quality of water delivered to the customer. No vested rights are obtained or inferred to the Customer upon the sale and delivery of any water.

### ARTICLE III

#### QUALIFICATION FOR SERVICE

Section 3.01. Application for Service. Any applicant seeking to purchase water from the Agency shall make application therefor in such form as may be prescribed by the General Manager. The General Manager shall investigate each such application and may require the submission of additional information. The application and additional information as may be required, together with the General Manager's recommendations thereon, shall be submitted to the Board for action thereon.

Section 3.02 Term of Service. Service granted pursuant to an Application for Service shall be for a period of one year and shall be subject to annual renewal. For the purpose of annual renewals, existing customers shall be required to submit a renewal application to the Agency. Renewal of the sale of any water is for the period of one year and is temporary and interruptible in nature. No vested rights may be obtained or are inferred by the yearly renewal of water sales.

Section 3.03 Identification of Applicant and Intended Use. Each application shall state the legal capacity of the Applicant, e.g., public agency (indicating the type of agency and the law under which it was formed), corporation (indicating the state of incorporation and other pertinent information), partnership, or individual, and whether the Applicant is a public utility or mutual water company. The application shall state the nature of the ultimate intended use or uses to which the water will be put; e.g., municipal, industrial, agricultural, recreational, groundwater recharge, etc. The application shall contain such information as may be required by the General Manager to insure that the Applicants' ultimate intended use is consistent with Agency Policies and Constitutionally permitted uses. All applications shall be evaluated and deliveries authorized based upon the following priority uses: 1) municipal, 2) industrial, 3) agricultural, 4) recreational, 5) other. Service may be refused if the Board determines that the applicants ultimate intended use is not in accordance with Agency policies or permitted under the Constitution of the State of California.

Section 3.04. Services to be Wholesale in Nature. Each application shall contain such information as is necessary to assure the Board that the application is for service of a wholesale nature and that the Agency will not thereby become subject to the obligations of a water purveyor providing direct



retail service to consumers. In the event the Applicant seeks a waiver of such requirement, the application shall so state and there shall be attached thereto a statement of the reasons for seeking a waiver any documentary evidence in support thereof.

Section 3.05. Back-up Capacity of Applicant. Each application shall contain information indicating that the Applicant is capable of sustaining its service requirements from independent sources during the period of any interruption or curtailment of service from Agency facilities. In no instance shall the Agency be the sole source of water supply to any water purveyor for any development within the purveyor's service area.

Section 3.06 Treatment Facilities. Each application shall contain information indicating the Applicant has or will install such treatment facilities as may be required for the use or uses to which the Applicant intends to put the water.

Section 3.07. Power Generation Rights. Said rights shall extend to the generation of power as the water flows through Agency facilities only. It shall be the responsibility of the Agency to pay its expenses for any exercise of its right to generation of power pursuant hereto, and no Applicant shall be subjected to extra expense in connection therewith. In appropriate cases, the Agency and the Applicant may install joint facilities for power recovery purposes. In the event the Agency determines not to exercise its rights, the Applicant may undertake to install power recovery facilities for its own account.

Section 3.08. Indemnity for Groundwater Recharge. Each application shall contain the agreement of the Applicant to provide the Agency with indemnity for damages to lessees of the Applicant arising out of groundwater spreading operations of the Agency, or performed by others for it, in all circumstances in which the lease between the Applicant and the Applicant's lessee protects the Applicant against such damages.

Section 3.09. Application for Groundwater Replenishment. Except in cases in which the Agency undertakes to conduct groundwater replenishment operations on its own motion, an application shall be required whenever request is made that the Agency engage in groundwater replenishment operations, whether delivery is to be made to a customer, or such groundwater replenishment is to be conducted by or at the direction of the Agency without delivery to a customer.

Section 3.10 Metering by End User. All customers of the Agency shall be required to meter the use of water by all accounts (end users) served.

## ARTICLE IV

### INSTALLATION AND CONNECTION OF FACILITIES

Section 4.01 General Authorization. All service connections, including valves, pipe, meters and other equipment required, shall be installed at the expense of the Customer after authorization by the Board.

Section 4.02 Procedure. The Agency shall cause a service connection to be constructed pursuant to a written request by a customer in accordance with plans and specifications approved by the General Manager and by an authorized representative of the Customer. Except as otherwise specifically authorized by the Agency, all equipment and materials required for constructing the service connection shall be acquired by the Agency in its customary manner, or the Agency may utilize therefor suitable equipment and materials on hand.

Section 4.03 Facilities Included; Ownership by the Agency. The service connection shall include the facilities for diversion of water from the Agency's system and for delivery of such water into the pipeline distribution system of the Customer or the Customer's distributor. The service connection up to and including the fitting connecting with the pipeline through which the Customer will receive water delivered through the service connection, including any metering instruments and cabinets therefor, shall be and remain the property of the Agency and shall be operated, maintained and controlled by the Agency.

Section 4.04. Back-Flow. The Customer may be required to install adequate back-flow or back-siphonage equipment approved by the Agency or demonstrate adequate facilities exist to prevent back-flow into Agency facilities. The Agency solely shall determine when back-flow facilities are required and the type of device required. The device(s), when required, shall be installed at the service connection point and shall be maintained by means satisfactory to the Agency.

Section 4.05. Pressure Surges (Water Hammer). All service connection applications shall include data showing that any operation (gravity or pumping from pipeline, if required) will not damage any Agency facility. Such data shall include, but is not limited to surge analysis, structural calculation and hydraulic analysis for any pumping or delivery condition requested.

Section 4.06. Deposit of Estimated Costs. The costs of constructing the service connection shall be estimated by the General Manager, who shall cause a written estimate to be prepared and who shall inform the Customer's representative regarding the amount of such estimate. The total amount of such estimate shall be deposited by the Customer in advance of any action toward

construction of the service connection, including all items peculiar only to a given service connection, or it may be deposited in stages, upon approval of the Board. Costs shall include reasonable allowance for costs of design, supervision and overhead, in addition to direct costs of labor, equipment and materials.

Section 4.07. Use of Deposit. Such deposit or deposits shall be held and used to defray the costs of constructing the service connection, and the Agency shall not be required to proceed with the construction of the service connection in the absence of sufficient funds deposited therefor.

Section 4.08. Settlement Upon Completion. Upon completion of construction of the service connection, the Agency shall render to the Customer a statement of all costs, in accordance with the customary practice of the Agency, incurred by the Agency in constructing the service connection; if such costs shall exceed the sum of money deposited by the Customer with the Agency, the Customer promptly shall pay to the Agency the amount by which such costs shall exceed such deposit; and if such costs be less than the said sum of money so deposited, any unexpended balance of such deposit shall be returned by the Agency to the Customer.

Section 4.09. Easement for Service Connection. The Customer shall cause to be granted to the Agency or the Agency shall acquire at the Customer's expense, directly from the fee owner of the affected land, such easement as may be necessary in the opinion of the General Manager for the construction, operation, maintenance and repair of the service connection. Said easement and the grant thereof shall be approved by the Agency; provided, however, that fee title to the property required for such service connection may be acquired in the same manner as an easement and in lieu of an easement if the General Manager and Customer agree that it would be advantageous to do so. Customer shall provide, or the Agency may obtain at Customer's sole cost and expense, a policy of title insurance insuring that clear title to the easement, or fee, is vested in the Agency, subject to any encumbrances that have been approved in writing by the General Manager. The amount of title insurance shall be determined by the acquisition costs, unless the acquisition is made without costs or for less than the amount of the coverage which will be provided for the price paid for the title report, in which case the title policy shall be in the amount of such coverage or such amount as may be reasonably determined by the General Manager.

Section 4.10. Maintenance of Service Connection. Upon completion of the service connection, the Agency shall be responsible for any subsequent maintenance, alteration, reconstruction or relocation of such service connection except changes which are requested by the Customer, which changes shall be handled as a new service connection. However, prior to the release of water by the Agency into the pipeline distribution system of the Customer or of the Customer's affected distributor, the Agency and the Customer or Customer's

Distributor shall each install its own flow control device or devices as a means of maintaining uniform flow.

Section 4.11. Environmental Requirements. Public agency customers are responsible for ensuring that the obligations of lead agencies as described in the California Environmental Quality Act (CEQA) and its implementing guidelines are fulfilled. The Agency shall fulfill all other obligations that may arise from its involvement in construction of the service connection and shall provide such information as it has available which is necessary to ensure compliance with the Act and its implementing guidelines.

Section 4.12. Fair Value of Outlet. The fair value of an outlet installed during pipeline construction will be established by the General Manager at the time the service connection is constructed at the outlet, and the charge to a Customer for such an outlet will be based on this fair value; provided that any outlet larger than 24 inches or any outlet installed after a pipeline is placed in operation shall be charged for its actual cost.

## ARTICLE V

### WATER SERVICE AND OPERATIONS

Section 5.01. Limitations of State Contract Service. All water service made pursuant to the Agency's State Contract shall be subject to all of the terms and conditions of the said State Contract and to any conditions affecting the State's source of supply or the availability of supply.

Section 5.02. Interruptible Service. All water supplied by the Agency shall be served upon an interruptible basis. Interruption may be occasioned due to the terms of the Agency's State Contract by reason of the Agency's requirements for maintenance and operation of its facilities, including the design and operating criteria established pursuant to Section 5.05 or a demand by Agency's Customers in excess of State Water Project Water Entitlement pursuant to Section 6. The Agency shall notify its customers in advance of any nonstandard interruption to the extent reasonably feasible. Due to the nature of the Agency's facilities and the potential modes of service required, the Agency cannot guarantee any specific level of pressure. **CUSTOMERS SHOULD USE CAUTION IN THE ISSUANCE OF CAN OR WILL SERVE LETTERS FOR OTHER LAND USE ENTITLEMENT BASED UPON STATE PROJECT WATER.**

Section 5.03. Quality. Except as otherwise specifically agreed, all water served by the Agency is raw untreated water and shall not be supplied for domestic purposes by any customer without such treatment as may be required to comply with all applicable laws and regulations. The Agency makes no

representation as to the quality of the water it supplies as to its suitability for any particular purpose. Reference is hereby made to Article 19 of the Agency's State Contract, but the Agency does not undertake to monitor the extent of the State's compliance or noncompliance with such standards, but only to transport said supply to its customers. With respect to any exchange water or other supply available to the Agency, the Agency shall be responsible only to exercise ordinary care in transporting and safeguarding said supply and shall not be responsible for the quality of such water as it is received by the Agency. The Agency may, however, reject any supply which is unsuitable by reason of contamination or pollution which render it impractical for the Agency Customers to treat and use the same.

Section 5.04. Special Classes of Services. The Agency may from time to time establish special classes of service reflecting the special conditions applicable to such service. Such classes may include, but shall not be limited to the following:

- (a) Service outside the Agency.
- (b) Service to property not subject to Agency taxes.
- (c) Service with a special rate in accordance with the terms of annexation to the Agency.
- (d) Service pursuant to special contractual arrangement with the Agency.

Water supplied for delivery to property not subject to Agency taxes may be subject to a special outside rate as authorized by Water Code Section 71613. The outside rate may be applicable to any Agency delivery, wherever made, which makes water available for use on property not subject to Agency taxes, including (1) direct delivery to such property, (2) delivery to such property by exchange (e.g., delivery of Agency water within the Agency to make other water supplies otherwise used within the Agency available for use on property outside the Agency), and (3) any delivery ordered to make water available for use outside the Agency.

Section 5.05. Water Rates. All water rates for water service made by the Agency shall be established from time to time by resolution of the Board of Directors of the Agency.

Section 5.06. Pressure and Flow Conditions. All Applicants and Customers are required to accept such conditions of pressure and service as are provided by the distributing system at the location of the proposed connection, and shall agree to hold the Agency harmless from any damages arising out of low

pressure or high pressure conditions or interruptions of service. The Agency will not make deliveries at flows less than one cubic foot per second or for a period less than 24 hours. Orders for water must be placed one week in advance of actual delivery.

Section 5.07. Payment of Water Charges. Water charges are due and payable at the office of the Agency on date of mailing bill to the Customer or his agent as designated in the application and shall be delinquent 30 days thereafter. Service may be discontinued without further notice if payment of the water charge is not made prior to the date such charge becomes delinquent.

Section 5.08. Meter Testing. When the Accuracy of a water meter is questioned, the Agency upon request will cause an official test to be made at its own expense. The Customer shall be duly notified of the time and place of such test and may be present when any such test is made by the Agency. The meter will be tested on variable rates of delivery and if the average registration is more than two percent in excess of the actual quantity of water passing through the meter, the Agency shall refund to the Customer the overcharge based upon the test, for the prior twelve months, unless it can be shown that the error was due to some cause for which the date can be fixed. In the latter case, the overcharge shall be computed back to and not beyond such time. Any undercharge determined upon the basis of the test may be billed to the Customer on a similar basis. Requests for a test within 12 months of a prior test will be at the Customer's expense unless the meter is determined to be over registering deliveries as determined in this section.

Section 5.09. Estimates of Water Requirements and Schedules of Deliveries. Before August 1 of each year, each customer shall furnish the Agency in form provided by the Agency, with an estimate of the amounts of water to be furnished to such customer by the Agency. These estimates will be used by the Agency in planning the construction needed to complete the Agency's ultimate distribution system; in planning the future operation of such system; and in preparing notices for submission to the State Department of Water Resources which will be used by the State to order power for pumping on the State Water Project.

Section 5.10. Contents of Estimates. Each estimate furnished by a Customer pursuant to Section 4.09 shall contain, as a minimum, for each service connection for each month of the year beginning with succeeding July 1, and for the entire Customer for each month of the succeeding four year, the following information:

1. The quantity of water to be delivered by the Agency to the Customer.
2. The quantity of water to be used for:

- (a) Domestic, industrial, and municipal purposes, exclusive of groundwater replenishment by spreading or injecting.
- (b) Groundwater replenishment by spreading or injecting;
- (c) Agricultural purposes.
- (d) Recreational.
- (e) Other uses.

The estimate shall constitute the member public agency's request for deliveries for the first of the five years covered therein.

Section 5.11. Revision of Estimates. The Customer may make revisions to any of its estimates upon reasonable notice to the Agency.

Section 5.12. Order for Water. Any Customer requesting delivery of water from the Agency shall place such order in writing. The General Manager may prescribe a suitable form for use in placement of water orders and may revise the same from time to time. Any customer water order shall be accompanied by a copy of the ordinance, resolution, minute order, or other action of the Board or other governing body of the Customer which authorizes the placement of the order.

Section 5.13. Shortage in Water Supply. In any year in which there may occur a shortage in available supply of Project Water, the Agency shall reduce the delivery of Project Water proportionately to all parties to which the Agency supplies water, including Improvement District M of Division 2. It is provided that the Agency may apportion available Project Water on some other basis if such is required to meet minimum demands for domestic supply, fire protection, fire suppression or sanitation to a specific area of the Agency during the year. No vested rights are obtained by the Customer upon the sale and delivery of water apportioned by this Section nor are any such rights inferred by virtue of an Agency decision to provide water to a Customer in a specific year.

Section 5.14. Outside Sales. Water may be sold for use outside the Agency only when the Board finds there is a surplus above that required by consumers within the Agency, as authorized by Water Code Section 71612. All such sales shall be limited to the period of surplus and shall terminate when the water available is required for use within the Agency. Any sales for delivery within or without the Agency which makes water available for use on property outside the Agency shall be treated as an outside sale for such purposes, including (1) direct delivery to property outside the Agency, (2) delivery to property outside the Agency by exchange (e.g., delivery of Agency water within the Agency available to use on property outside the Agency), and (3) any delivery ordered to make water available for use outside the Agency.

## ARTICLE VI

### GENERAL

Section 6.01. Liability and Indemnification. Neither the Agency nor any of its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, or distribution water supplied by the Agency to a customer after such water has been delivered to such Customer; nor for claim of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water beyond the point of such delivery; and the Customer shall indemnify and hold harmless the Agency and its officers, agents, and employees from any such damages or claims of damages. Neither the Customer nor any of its officers, agents, or employees shall be liable for the control, carriage, handling, use, disposal, or distribution of water prior to such water being delivered to the Customer; nor for claim of damage of any nature whatsoever, including but not limited to property damage, personal injury or death, arising out of or connected with the control, carriage, handling, use, disposal, or distribution of such water prior to its delivery to such Customer and the Agency shall indemnify and hold harmless the Customer and its officers, agents, and employees from any such damages or claims of damages.

Section 6.02. Water Resources Management Requirements. In order to promote good water resources management and prevent waste of water resources, undesirable groundwater conditions, and unnecessary expense to the inhabitants and taxpayers of the Agency, the Agency may encourage or require the use of alternate supplies where such is required to prevent waste or undesirable groundwater conditions and/or to prevent unnecessary expense to the Agency's inhabitants and taxpayers. The Agency may also encourage the use of special conservation facilities or devices where appropriate.

Section 6.03. Design and Operating Criteria. The Agency's facilities have been designed and planned within the limits of available funding to meet water service and other needs within the Agency to the maximum extent feasible and to allow for maximum flexibility for use of facilities for different purposes and in different modes of operation. Such a system necessarily makes it impossible to always respond automatically to service demands when facilities are needed for conflicting demands or modes of service. It is the applicant's responsibility to consult with Agency staff to obtain information as to the Agency's requirements for connection and the capabilities of the Agency system before designing facilities for connection to the Agency system.



Section 6.04. Indemnification for Water Spreading. The Agency shall require execution of an agreement indemnifying the Agency and its officers, agents, and employees against liability for damages of any nature whatsoever, including but not limited to property damage, personal injury, or death, arising out of or resulting from, or connected with, groundwater replenishment by spreading or injecting which is conducted by or at the direction of the Agency pursuant to the application or request of a customer or water purveyor or in which water is to be delivered by the Agency to a Customer or water purveyor for such use.


Section 6.05. Appeal. A decision denying an Application for Service may be appealed to the Board by Applicant by notifying the General Manager in writing of Applicant's decision to appeal no later than fourteen (14) days from the date of denial of the Application for Service by the Board.

The decision of the Board on any appeal shall be final.


This Ordinance shall be in full force and effect upon the date of adoption, and shall be published in full in a newspaper of general circulation within ten (10) days from the date of adoption.

Passed and adopted this 25<sup>th</sup> day of April, 1995, by the following vote:

AYES: 7  
NOES:  
ABSTAIN:  
ABSENT:

  
\_\_\_\_\_  
John H. Russell, President  
Board of Directors  
Mojave Water Agency

ATTEST:

  
\_\_\_\_\_  
Peggy Sartor, Secretary  
Board of Directors  
Mojave Water Agency

## Appendix J – Groundwater Management Plan

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# MOJAVE WATER AGENCY



## 2004 REGIONAL WATER MANAGEMENT PLAN

INTEGRATED REGIONAL WATER MANAGEMENT PLAN  
GROUNDWATER MANAGEMENT PLAN  
URBAN WATER MANAGEMENT PLAN



### VOLUME 1: REPORT

September 2004  
Adopted February 24, 2005

**Schlumberger  
Water Services**



# TABLE OF CONTENTS

## VOLUME 1: REPORT

<b>CHAPTER 1: INTRODUCTION</b> .....	<b>1</b>
Purpose .....	2
Integrated Water Management Plan .....	4
Urban Water Management Plan.....	4
Groundwater Management Plan .....	5
Public Outreach .....	5
Interrelation of Plan Elements .....	5
Checklists.....	6
Integrated Regional Water Management Plan Checklist .....	7
Urban Water Management Plan Checklist .....	8
Groundwater Management Plan .....	12
<b>CHAPTER 2: AGENCY AND STAKEHOLDER BACKGROUND</b> .....	<b>1</b>
Mojave Water Agency .....	1
Adjudication .....	6
Mojave Basin Area .....	6
Warren Valley Basin .....	7
Summary of 1994 Regional Water Management Plan.....	7
Major Stakeholders .....	10
Water Agencies.....	10
State and Federal Agencies .....	11
Municipalities (cities, county, other).....	12
Miscellaneous Community Interests.....	12
<b>FIGURES</b>	
Figure 2-1: MWA Location .....	2
Figure 2-2: Base Map .....	4
Figure 2-3: Current and Future Facilities .....	5
<b>CHAPTER 3: PHYSICAL SETTING</b> .....	<b>1</b>
Physiographic Setting.....	1
Geology .....	9
Groundwater .....	11
DWR Documentation of Overdraft Conditions .....	18
Efforts to Eliminate Overdraft .....	18
Surface Water .....	19
Riparian Habitat/Wetlands.....	19
Exhibit H.....	19
Areas outside Exhibit H .....	20
Climate .....	23

Wastewater .....	23
The City of Adelanto .....	24
The City of Barstow .....	24
Victor Valley Wastewater Reclamation Authority .....	24
<b>TABLES</b>	
Table 3-1: DWR Groundwater Basins.....	5
Table 3-2: Groundwater Elevations Established in Exhibit H .....	20
Table 3-3: Total Wastewater Flow Projections (MGD) .....	25
Table 3-4: Recycled Water Projections (MGD) .....	25
<b>FIGURES</b>	
Figure 3-1: Hydrologic Setting.....	3
Figure 3-2: Groundwater Basins and Water Districts.....	6
Figure 3-3: Morongo Basin/Johnson Valley Area Subbasins .....	8
Figure 3-4: Typical Geologic Cross-Section of Mojave River Groundwater Basin .....	9
Figure 3-5: Geology of Mojave River Groundwater Basin.....	10
Figure 3-6: 1998 Water Level Contours .....	13
Figure 3-7: Riparian Habitat and Dry Lake Beds .....	22
<b>CHAPTER 4: WATER SUPPLY.....</b>	<b>1</b>
Mojave Basin Area.....	1
Gaged Surface Inflow and Outflow .....	1
Annual Variability of Water Supply .....	7
Ungaged Surface Inflow and Outflow .....	9
Subsurface Flow .....	10
Deep Percolation of Precipitation.....	11
Wastewater Imports .....	11
Phreatophyte Consumption.....	11
Groundwater .....	12
Dry Year and Multiple Dry Year Water Supply .....	16
Morongo Basin/Johnson Valley Area .....	17
Dry Year and Multiple Dry Year Water Supply .....	21
Well Data .....	21
State Water Project .....	24
Water Quality .....	28
Inconsistent Water Sources.....	29
Planned Water Supply Sources Through 2020 in Five-year Increments.....	29
Water Quality and Management Strategies .....	33
Water Quality and Supply Reliability .....	33
Opportunities for Short and Long-Term Transfers.....	33
Timeline for Implementation of Proposed Projects .....	34
<b>TABLES</b>	
Table 4-1: Mojave River Stream Gages.....	2
Table 4-2: Mojave Basin Area - Net Average Annual Water Supply .....	10

Table 4-3:	Mojave Basin Area - Average Annual Dry Year Water Supply .....	18
Table 4-4:	Mojave Basin Area - Average Annual Multiple Dry Year Water Supply .....	19
Table 4-5:	Morongo Basin/Johnson Valley Area Net Average Annual Water Supply .....	20
Table 4-6:	Morongo Basin/Johnson Valley Area Average Annual Dry Year Water Supply .....	21
Table 4-7:	Deliveries of State Water Project Water to the MWA 1978-2001 .....	25
Table 4-8:	Average Annual State Water Project Supplies .....	27
Table 4-9:	Available Water Supply Sources through 2020 .....	33
Table 4-10:	Permanent Transfers of Base Annual Production by Subarea WY94-02 .....	34

#### FIGURES

Figure 4-1:	Stream Gage Locations .....	4
Figure 4-2:	Annual Volume of Gaged Surface Water Entering and Exiting the Basin (1921-2001) .....	6
Figure 4-3:	Accumulated Departure from Base Period (1931-1990) average for seasonal discharge at the Forks .....	8
Figure 4-4:	Percent Exceedence at the Forks (1931-2001).....	9
Figure 4-5:	Historical Groundwater Levels for State Well Number 05N01E17D01, located in the Regional Aquifer in the Este Subarea .....	13
Figure 4-6:	Historical Groundwater Levels for State Well Number 05N05W22E02, located in the Regional Aquifer in the Alto Subarea .....	14
Figure 4-7:	Historical Groundwater Levels for State Well Number 11N03W28R02, located in the Regional Aquifer in the Centro Subarea .....	14
Figure 4-8:	Historical Groundwater Levels for State Well Number 5N04W11P03, located in the Floodplain Aquifer in the Alto Subarea .....	15
Figure 4-9:	Historical Groundwater Levels for State Well Number 90N03W13R01, located in the Floodplain Aquifer in the Centro Subarea.....	15
Figure 4-10:	Ground Water Wells Measuring Above 500 mg/L Total Dissolved Solids .....	23
Figure 4-11:	Total Dissolved Solids (TDS) with Water Level (feet above mean sea level) for State Well 08N03W05J01 .....	24
Figure 4-12:	Historical SWP Percent of Deliveries Requested by Contractors .....	26
Figure 4-13:	Percent Exceedence of SWP Deliveries in 2020.....	27
Figure 4-14:	Total Dissolved Solids .....	30
Figure 4-15:	Nitrates.....	30
Figure 4-16:	Manganese .....	31

Figure 4-17: Iron.....	31
Figure 4-18: Fluoride .....	32
Figure 4-19: Arsenic .....	32
<b>CHAPTER 5: WATER DEMAND .....</b>	<b>1</b>
Introduction.....	1
Current Water Demand.....	2
Demographics.....	2
Consumptive Use .....	4
Mojave Basin area .....	6
Alto (Figure 5-5) .....	7
Baja (Figure 5-6) .....	7
Centro (Figure 5-7) .....	7
Este (Figure 5-8) .....	7
Oeste (Figure 5-9) .....	7
Morongo Basin/Johnson Valley Area .....	12
Copper Mountain Valley (Figure 5-11) .....	14
Means/Ames Valley (Figure 5-12) .....	14
Warren Valley (Figure 5-12).....	14
Current Water Balance .....	17
Future Water Demand.....	18
Demographics.....	18
Consumptive Use .....	19
Mojave Basin Area .....	20
Alto (Figures 5-17 and 5-18) .....	24
Baja (Figures 5-19 and 5-20) .....	25
Centro (Figure 5-21).....	27
Este (Figures 5-22 and 5-23) .....	27
Oeste (Figures 5-24 and 5-25) .....	28
Morongo Basin/Johnson Valley Area .....	28
Copper Mountain Valley (Figure 5-27) .....	32
Mean/Ames Valley (Figure 5-28) .....	32
Warren Valley (Figure 5-29).....	32
Year 2020 Water Balance .....	32
Agriculture Scenario 1.....	32
Agriculture Scenario 2.....	36
Summary.....	37
Dry Year and Multiple Dry Year Water Balance in 2020.....	37
Future Supply Versus Demand in 5-Year Increments .....	39
<b>TABLES</b>	
Table 5-1: Comparison of Actual and Projected 2000 Population.....	2
Table 5-2: Year 2000 Demographic Data for Selected Cities .....	3
Table 5-3: 1995 and 2000 Projected and Actual Consumptive Use .....	4
Table 5-4: Mojave Basin Area Historical Consumptive Use (Acre-feet/year) .....	8



Table 5-5:	Morongo Basin/Johnson Valley Area Historical Consumptive Use .....	13
Table 5-6:	Year 2000 Average Annual Water Balance (Acre-feet/year) .....	17
Table 5-7:	Current and Projected Population Estimates .....	18
Table 5-8:	Projected Agricultural Consumptive Use (Acre-feet/year) ..	20
Table 5-9:	Mojave Basin Area Current and Projected Consumptive Use .....	23
Table 5-10:	Morongo Basin/Johnson Valley Area Projected Consumptive Use .....	31
Table 5-11:	Year 2020 Average Annual Water Balance under Agriculture Scenario 1 (Acre-feet/year) .....	35
Table 5-12:	Year 2020 Average Annual Water Balance under Agriculture Scenario 2 (Acre-feet/year) .....	36
Table 5-13:	Year 2020 Average Annual Dry Year Water Balance under Agriculture Scenario 2 (Acre-feet/year) .....	38
Table 5-14:	Year 2020 Multiple Dry Year Average Annual Water Balance under Agriculture Scenario 2 (Acre-feet/year) .....	39
Table 5-15:	Average Annual Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year) .....	40
Table 5-16:	Average Annual Dry Year Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year) .....	40
Table 5-17:	Average Annual Multiple Dry Year Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year) .....	41

## FIGURES

Figure 5-1:	Mojave Basin Area Actual Total and Urban Consumptive Use for 1990-2000 and 1994 RWMP Projected Use .....	5
Figure 5-2:	Mojave Basin Area Actual Total and Agricultural Consumptive Use or 1990-2000 and 1994 RWMP Projected Use .....	5
Figure 5-3:	Morongo Basin/Johnson Valley Area Actual Total Consumptive Use for 1990-2000 and 1994 RWMP Projected Use .....	6
Figure 5-4:	Mojave Basin Area Total Consumptive Use by Sector For 1995-2001 .....	9
Figure 5-5:	Alto Subarea Consumptive Use by Sector for 1995-2001 .....	9
Figure 5-6:	Baja Subarea Consumptive Use by Sector for 1995-2001 .....	10
Figure 5-7:	Centro Subarea Consumptive Use by Sector for 1995-2001 ..	10
Figure 5-8:	Este Subarea Consumptive Use by Sector for 1995-2001 .....	11
Figure 5-9:	Oeste Subarea Consumptive Use by Sector for 1995-2001 ...	11
Figure 5-10:	Morongo Basin/Johnson Valley Area total Consumptive Use by Sector for 1995-2000 .....	15
Figure 5-11:	Copper Mountain Valley Subbasin Consumptive Use by Sector for 1995-2000 .....	15
Figure 5-12:	Mean/Ames Valley Subbain Consumption Use by Sector for 1995-2000 .....	16

Figure 5-13: Warren Valley Subbasin Consumptive Use by Sector for 1995-2000 .....	16
Figure 5-14: Agricultural Consumptive Use from 2001 through 2020 Under Agriculture Scenario 2 Assumptions .....	21
Figure 5-15: Mojave Basin Area Total Consumptive use for the Year 2000 and Projections through Year 2020 under Agriculture Scenario 2 .....	22
Figure 5-16: Mojave Basin Area Total Consumptive Use for the Year 2000 and Projections through Year 2020 under Agriculture Scenario 2 .....	22
Figure 5-17: Alto Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1 .....	24
Figure 5-18: Alto Subarea Consumptive Use for the Year 2000 and Projections .....	25
Figure 5-19: Baja Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 1 .....	26
Figure 5-20: Baja Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 2 .....	26
Figure 5-21: Centro Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenarios 1 and 2 .....	27
Figure 5-22: Este Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 1 .....	29
Figure 5-23: Este Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 2 .....	29
Figure 5-24: Oeste Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 1 .....	30
Figure 5-25: Oeste Subarea Consumptive Use for the Year 2000 and Projections through Year 2020 Under Agriculture Scenario 2 .....	30
Figure 5-26: Morongo Basin/Johnson Valley Area Total Consumptive Use for the Year 2000 and Projections through Year 2020 ..	33
Figure 5-27: Copper Mountain Valley Subbasin Consumptive Use for The Year 2000 and Projections through Year 2020 .....	33
Figure 5-28: Means/Ames Valley Subbasin Consumptive Use for the Year 2000 and Projections through Year 2020 .....	34
Figure 5-29: Warren Valley Subbasin Consumptive Use for the Year 2000 and Projections through Year 2020 .....	34

<b>CHAPTER 6: WATER SHORTAGE CONTINGENCY PLANNING</b> .....	<b>1</b>
Mojave Water Agency .....	1
Cities and Water Agencies .....	2
Adelanto Water Authority .....	3
Apple Valley Ranchos Water Company .....	3
Hesperia Water District .....	3
Hi-Desert Water District .....	4
Joshua Basin Water District .....	4
Southern California Water Company .....	5
Victor Valley Water District .....	5
<b>CHAPTER 7: WATER CONSERVATION AND DEMAND MANAGEMENT MEASURES</b>	<b>1</b>
Coordinated Water Conservation Efforts .....	1
Alliance for Water Awareness and Conservation .....	1
Participants .....	2
MWA and Lewis Center for Education and Research MOU .....	2
MWA and Mojave Desert Resource Conservation District MOU .....	3
MWA and Mojave Weed Management Area MOU .....	3
MWA and Copper Mountain College MOU .....	4
MWA and Barstow Community College MOU .....	4
MWA and Victor Valley College MOU .....	4
MWA Mojave Desert Resource Conservation District Demonstration Project .....	4
Urban Water Management Plans .....	5
Demand Management Measures .....	6
<b>TABLES</b>	
Table 7-1: Demand Management Measures .....	6
Table 7-2: Implementation Status for DMMs .....	7
Table 7-3: Summary of Conservation Planning .....	8
Table 7-4: Conservation Savings for DMM1 .....	8
Table 7-5: Conservation Savings for DMM2 .....	9
<b>CHAPTER 8: STAKEHOLDER ASSESSMENT AND PUBLIC OUTREACH</b> .....	<b>1</b>
Assessment Approach .....	1
Summary of Stakeholder Issues .....	3
Issues Common to All Stakeholders .....	11
Key Water Management Issues .....	12
Coordination of IWMP, GMP and UWMP with Other Agencies .....	18
Method for Public Participation .....	18
<b>TABLES</b>	
Table 8-1: Baja Subarea Water Management Issues .....	14
Table 8-2: Centro Subarea Water Management Issues .....	15
Table 8-3: Alto Subarea Water Management Issues .....	16
Table 8-4: Oeste Subarea Water Management Issues .....	17
Table 8-5: Este Subarea Management Issues .....	17
Table 8-6: Morongo Basin/Johnson Valley Water Management Issues ...	18

<b>CHAPTER 9: BASIN MANAGEMENT OBJECTIVE AND ALTERNATIVES .....</b>	<b>1</b>
Mojave Water Agency .....	1
Basin Management Objectives .....	2
Performance Measures .....	3
Projects and Management Actions .....	3
Methodology .....	4
Normalized Project Cost Methodology .....	5
Supply Enhancement Projects and Management Action Groupings .....	5
Supply Enhancement Projects .....	10
SWS/Non-Floodplain Aquifer Recharge .....	10
SWP/Floodplain Aquifer Recharge .....	15
Baja Storm Flow Non-SWP/Increase Recharge Efficiency .....	19
Non-SWP/Change Source of Groundwater Supply .....	22
Management Actions.....	23
Water Treatment and Blending .....	23
Improve Riparian Health.....	27
Conservation and Storage Agreements .....	28
The MWA Screening Model.....	29
Alternative Overview .....	30
Initial Alternatives .....	30
Revised and Final Alternatives.....	32
Demands Met .....	33
Groundwater Storage.....	35
Groundwater Levels .....	35
Subarea Interaction.....	37
Water Quality.....	39
Alternative Cost .....	39
Recommended Alternatives .....	39
Common Features.....	40
Project and Management Action Priorities .....	40
<b>TABLES</b>	
Table 9-1: Abbreviated Normalized Cost Table (2003 Dollars) .....	7
Table 9-2: Supply Enhancement Project .....	8
Table 9-3: Management Actions .....	9
Table 9-4: Initial Alternative Assumptions and Results .....	31
Table 9-5: Revised and Final Alternative Assumptions and Results.....	32
Table 9-6: Representative Projects and Management Actions Included in each Revised and Final Alternatives.....	34
Table 9-7: Average Annual Change in Groundwater Storage.....	35
Table 9-8: Annualized Cost of Each Alternative .....	39
Table 9-9: Recommended Priority for each Project or Management Action .....	42
<b>FIGURES</b>	
Figure 9-1: Screening Model Aquifer Units.....	6
Figure 9-2: Time Series of Elevations in the Baja Regional Aquifer .....	36

Figure 9-3: Time Series of Elevations in the Alto Floodplain Aquifer .....	37
Figure 9-4: Average Annual Mojave River Flows .....	38
Figure 9-5: Average Annual Groundwater Flows.....	38
<b>CHAPTER 10: MANAGEMENT ACTIONS.....</b>	<b>1</b>
Management Authority .....	1
Management Actions.....	2
1. Monitoring.....	2
Role of the Mojave Basin Area Watermaster .....	3
Groundwater Levels .....	4
Water Quality .....	6
Water Supply Measurement .....	7
Population Growth and Development .....	8
Effectiveness of Water Conservation Measures .....	9
Evapotranspiration .....	10
Regional Water Level Changes and Land Subsidence .....	11
Data Management.....	12
Extraction Sites/Consumption .....	12
2. Improving Basin Understanding .....	13
Infiltration Rates.....	13
Aquifer Characterization .....	13
Modeling.....	14
Update Water Budget .....	15
3. Continue Long-Term Planning .....	15
Vulnerability Assessment .....	15
Review Land Use Plans.....	16
Identify Post 2020 Water Supply .....	16
State Water Project .....	17
Transportation Infrastructure.....	18
Regular Updates .....	18
4. Groundwater Projection .....	19
Recharge Site Management Activities .....	19
Identification and Destruction of Abandoned Wells.....	20
Hazardous Materials Response.....	21
Protection of Recharge Areas.....	21
5. Construction and Implementation .....	22
6. Financing .....	23
7. Public Participation/Community Outreach .....	24
Implementation Schedule .....	25
<b>FIGURES</b>	
Figure 10-1: Well Locations with Known Construction Data.....	4
Figure 10-2: Master Schedule for MWA Management Action Plan .....	26

References

## VOLUME 2: APPENDICIES

### Appendicies:

- Appendix A Judgment After Trial January 10, 1996, Mojave Basin Area Adjudication
- Appendix B Technical Memo 3
- Appendix C Water Demand Estimation
- Appendix D Issues Questionnaire, Summary of Responses to the Issues Questionnaire
- Appendix E Technical Advisory Committee to the Mojave Water Agency Minutes
- Appendix F *The Panorama* -A newsletter published by the Mojave Water Agency
- Appendix G Resolution approving the Mojave Water Agency 2004 Regional Water Management Plan
- Appendix H Existing Monitoring Protocols
- Appendix I Well Construction Data from MWA Well Database
- Appendix J AB 3030 - Groundwater Management Planning  
SB 1938 - Groundwater Management and State Funding  
California Urban Water Management Planning Act  
Proposition 50 - Water Security, Clean Drinking Water, Coastal and Beach Protection Act of 2002

# 1

## INTRODUCTION

The Mojave Water Agency (MWA) was formed in 1959 by an act of the California Legislature and was activated by a vote of the residents in 1960 to manage declining groundwater levels in the Mojave Basin Area, Lucerne Valley and El Mirage Basin. The Morongo Basin and Johnson Valley areas were annexed in 1965. MWA covers over 4,900 square miles, a hydrologically diverse region that has a unique set of water management issues. Over the last decade, much has been accomplished toward the development and implementation of a comprehensive water resources plan to address these issues. Key accomplishments and events of recent years include:

1. The 1993 Stipulated Judgment, 1996 Judgment After Trial and several court decisions that have followed
2. Adoption of the 1994 Regional Water Management Plan
3. Construction of a number of key facilities including the Morongo Basin Pipeline, Rock Springs Outlet, Hi-Desert Water District recharge facilities, Mojave River Pipeline and the Hodge, Lenwood and Dagget recharge facilities
4. Purchase of an additional 25,000 acre-feet of supply from the State Water Project
5. Completion of several studies by USGS including the report entitled “Simulation of Ground-Water Flow in the Mojave River Basin”

Essentially all water supplies within MWA are pumped from the local groundwater basins and groundwater levels generally have been declining for the past 50 years or more. Adjudication proceedings were initiated due to concerns that rapid population growth would lead to further overdraft. The resulting Warren Valley Basin Judgment and the Mojave Basin Area Judgment both require that additional surface water be imported to help balance the basins.

MWA has an annual contract for up to 75,800 acre-feet of water from the State Water Project (SWP) although due to variability in deliveries of SWP water, the average annual supply available to MWA is currently estimated to be 58,400 acre-feet. In order to balance the basin by the year 2020, it will be necessary for MWA to utilize its full SWP supply. 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.

## Purpose

MWA first prepared a Regional Water Management Plan in 1994 (Bookman-Edmonston Engineering, Inc. 1994). Since that time, several developments have prompted MWA to prepare a plan update. These developments include advancements in the basin adjudication process, a more refined understanding of the hydrology and hydrogeology of the service area, population increases, shifts in agricultural and urban water demands, and the growing realization that the Mojave region can be a strategic element in the long-term management of California's water supplies. The Mojave Groundwater Basin is located along the California Aqueduct and has nearly two million acre-feet of available storage, which could make the region a strategic player in solving state-wide water storage and conjunctive use problems while addressing its internal water resources needs. Recent additions to California law promote development of integrated water resource management plans and groundwater management plans by providing preference to agencies with such plans for funding through state grant programs. **This Plan serves as an Integrated Regional Water Management Plan, Groundwater Management Plan and Urban Water Management Plan and meets the requirements of SB 221, SB 610, SB 1938 and AB 901.**

The RWMP was supported through a March 22, 2001 Memorandum of Understanding (MOU) with the DWR Integrated Storage Investigation which requires a "Basin Advisory Panel" of local civic and technical leaders and other stakeholders. This update was prepared in three phases with input from a Technical Advisory Committee (TAC) convened as the advisory panel. Objectives were: 1) to review and revise, as necessary, previous estimates of water supply and demand, 2) identify and solicit input from stakeholders with interest in long-term reliable water supplies for the region, and 3) identify a suite of preliminary alternatives that will help MWA achieve its goals in water supply management for the next two decades. Proposed projects and management actions are tailored to address at least one key water management issue in the basin.

The following six key water management issues emerged as a result of this process:

- Current demand exceeds supply; future demand will also exceed supply unless corrective actions are taken
- Naturally occurring water quality problems affect drinking water supplies
- Many of the groundwater basins are in overdraft
- All but two of the subareas have riparian ecosystem maintenance issues



- Wastewater infrastructure issues affect the two subareas with the largest water demands
- Many subareas within MWA are impacted by activities in other subareas

Fundamental objectives established with the input of the TAC are to: 1) balance future water demands with available supplies and, 2) maximize the overall beneficial use of water throughout MWA. To compare expected performance of alternative combinations of projects and management alternatives, a screening model was developed. The screening model simulates the changes to groundwater hydrology, Mojave River flows, and pumping and return flows that would result from implementation of the identified projects and management actions. Each alternative was evaluated and ranked according to its effectiveness in meeting the long-term needs of the basin.

This draft Regional Water Management Plan incorporates the highest-ranking alternatives. The draft will undergo an environmental review and the MWA Board of Directors will adopt a final Plan. This Plan provides MWA with long-term direction for management and development of resources and describes MWA's resource management and development strategy through the year 2020. The Plan concludes with 60 Management Actions. Chapters of the Plan are summarized below.

***Chapter 2, Agency and Stakeholder Background***, describes the MWA and the adjudications of the Mojave Basin Area and Morongo Basin/Johnson Valley Area. The previous 1994 Regional Water Management Plan is summarized and the major stakeholders are identified.

***Chapter 3, Physical Setting***, describes geography, geology, groundwater conditions, aquifers, groundwater basins, water districts, surface water resources, climate, and wastewater systems.

***Chapter 4, Water Supply***, provides a detailed description of natural and imported water supplies and their variability within the MWA.

***Chapter 5, Water Demand***, describes current and projected future water demand in the Mojave Basin Area and Morongo Basin/Johnson Valley Area. Water balances for the year 2020 are presented for two different agricultural demand scenarios, including single dry year and multiple dry year scenarios.

***Chapter 6, Water Shortage Contingency Planning***, summarizes water shortage contingency plans of MWA and service area water purveyors.

*Chapter 7, Water Conservation and Demand Management Measures*, provides an overview of water conservation plans and practices of the MWA, cities, water agencies and other groups in the MWA service area.

*Chapter 8, Stakeholder Assessment and Public Outreach*, describes the public outreach efforts taken by the MWA during the development of this Plan and summaries water management issues of stakeholders in the MWA service area.

*Chapter 9, Basin Management Objectives and Alternatives*, describes the development of Basin Management Objectives and performance measures developed with the Technical Advisory Committee, a description of supply enhancement projects, and the development and evaluation of alternatives.

*Chapter 10, Management Actions*, contains 60 actions for implementation of the Plan.

## **Integrated Water Management Plan**

California Water Code Section 79562.5 (b) states that DWR shall establish standards that address, at a minimum “the major water related objectives and conflicts of the watersheds in the region covered by the plan, including water supply, groundwater management, ecosystem restoration, and water quality elements.” While specific standards for Integrated Regional Water Management Plans have not yet been developed, this Plan was developed to address all four Integrated Regional Water Management Plan elements identified in the Water Code.

MWA has developed this Regional Water Management Plan through a comprehensive systems approach. The Plan integrates components related to groundwater management, urban water management, agricultural water use, environmental habitat protection and restoration, water quality, and stakeholder and public outreach. The Plan meets requirements of the Urban Water Management Planning Act and requirements for Groundwater Management Plans pursuant to the Water Code and components recommended by DWR as elaborated below.

## **Urban Water Management Plan**

This Regional Water Management Plan was prepared for the MWA in order to comply with 2003 California Urban Water Management Act requirements including amendments made by Senate Bill 610 and Assembly Bill 901. The California Urban Water Management Planning Act (Division 6 Part 2.6 of the Water Code) requires water suppliers with over 3,000 customers or that supply over 3,000 acre-feet of water annually to prepare Urban Water Management Plans (UWMP). MWA does not supply water directly, but holds the State Water Project contract and imports water to replenish groundwater basins and to meet obligations of the Mojave Basin Area

and Warren Valley judgments. Seven water supply agencies within the MWA have developed UWMPs. The checklist at the end of this chapter indicates where in this Plan specific UWMP components are located.

### Groundwater Management Plan

This Plan contains components included in California Water Code Sections 10750-10753.10 related to Groundwater Management Plans. The California State Legislature passed Assembly Bill 3030 (AB 3030) during the 1992 legislative session allowing local agencies to develop Groundwater Management Plans. 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. Senate Bill 1938 was passed by the Legislature September 16, 2002 and made changes and additions to sections of the Water Code created by AB 3030. This Plan addresses all the relevant components related to Groundwater Management Plans in the Water Code, as well as the components recommended by DWR in *California's Groundwater*, Bulletin 118 (DWR, 2003).

The Water Code sections related to Groundwater Management Plans apply to all groundwater basins identified in the California Department of Water Resources (DWR) Bulletin 118 (DWR, 1980), except those basins already subject to groundwater management by a local agency or a watermaster unless approved by the watermaster. The MWA overlies several groundwater basins (see Chapter 3), as defined by DWR in Bulletin 118. Nothing in this Plan supercedes the Mojave Basin or Warren Valley Basin adjudications. The checklist at the end of this chapter indicates where in this Plan specific Groundwater Management Plan components are located.

### Public Outreach

Significant public outreach efforts were made during development of this Plan. These efforts involved evaluation of questionnaires and holding meetings with individuals, groups and a Technical Advisory Committee. Outreach efforts were directed at stakeholders from local water agencies, state and federal agencies, municipalities, San Bernardino County, and 13 local community groups. Lists of stakeholders are included in Chapter 2 of this Plan. Stakeholder assessment and public outreach efforts are discussed in Chapter 8.

### Interrelation of Plan Elements

There is overlap in the requirements of Integrated Regional Water Management Plans, Urban Water Management Plans and Groundwater Management Plans. New laws now require UWMPs of water suppliers that utilize groundwater (all urban suppliers in MWA use groundwater) to

include a description of the groundwater basin and location and amounts of groundwater pumped. Plan elements specific to Integrated Regional Water Management Plans, Urban Water Management Plans and Groundwater Management Plans are located throughout this Plan, placed in chapters according to general subject.

## Checklists

Three checklists are contained on the following pages. The first relates to Integrated Regional Water Management Plans, the second relates to Urban Water Management Plans and the third relates to Groundwater Management Plans. The checklists contain a summary of Water Code elements to be addressed, section numbers of the Water Code where the requirement can be found, and the location in this Plan where the subject is addressed. Copies of the relevant Water Code sections are included in Appendix J.

# Integrated Regional Water Management

## Plan Checklist

Items to Address	Section of Law	Location in Plan
Water related objectives and conflicts	79562.5(b)	Chapter 9
Water supply	79562.5(b)	Chapter 4
Groundwater management	79562.5(b)	Chapter 10
Ecosystem Restoration	79562.5(b)	Chapter 10
Water quality	79562.5(b)	Chapter 10

# Urban Water Management Plan Checklist

## Checklist Organized According to Subject

Items to Address	Section of Law	Location in Plan
<b>Public and Stakeholder Outreach</b>		
Make plan available for public inspection before its adoption.	10642	Chapter 8 Appendix F
Adopt plan as prepared or as modified after the public hearing.		Appendix G
Coordinate the preparation of its plan with other appropriate agencies, including direct and indirect suppliers, wastewater, groundwater, and planning agencies (refer to Section 10633).	10620 (d) (2)	Pg. 2 - 8
<b>Demand, Supply, Reliability and Contingency Planning</b>		
Provide current and projected population in 5-year increments to 20 years.	10631 (a)	Table 5 - 20
Describe the climate and demographic factors.		Pg. 3 - 25
Identify and quantify the existing and planned sources of water available in 5-year increments to 20 years	10631 (b)	Table 4 - 9
Describe opportunities for exchanges or transfers of water on short-term or long-term basis.	10631 (d)	Pg. 4 - 36
Quantify current and past water use in 5-year increments to 20 years.	10631 (e) (1)	Pg. 5 - 21
Identify projected water uses among water use sectors in 5-year increments to 20 years.	10631 (e) (2)	Pg. 5 - 21
Describe average, single dry and multiple dry water year data.	10631 (c)	Tables 4 - 3, Pg. 4 - 4
Describe any plans to replace inconsistent water sources.		Pg. 4 - 30
Provide minimum water supply estimates based on driest three-year historic sequence.	10632 (b)	Table 4 - 4
Describe the reliability of water supply.	10631 (c)	Pg. 4 - 30
Describe the vulnerability of water supply to seasonal or climatic shortage.		Pg. 4 - 30
Provide an assessment of the reliability of the water supplier's water service to its customers during normal, single dry, and multiple dry water years.	10635 (a)	Pg. 4 - 17
Compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in 5-year increments (refer to 10631 (c)).		Table 5 - 15

Items to Address	Section of Law	Location in Plan
Compare normal, single dry, and multiple dry water year projected water supply sources available to the water supplier with the normal, single dry, multiple dry water year projected water uses (refer to 10631 (c)).		Table 5 - 14
Provide actions a water supplier will take to prepare for a catastrophe.	10632 (c)	Chapter 6
Provide a copy of a draft water shortage contingency resolution or ordinance	10632 (h)	
Provide water shortage stages of action, including up to a 50 percent reduction outlining specific water supply conditions at each stage.	10632 (a)	Chapter 6
Provide mandatory prohibitions.	10632 (d)	Chapter 6
Provide penalties or charges.	10632 (f)	Chapter 6
Provide consumption reduction methods	10632 (e)	Chapter 6
Provide an analysis of the impacts on the water supplier revenues and expenditures	10632 (g)	Chapter 6
Provide measures to overcome revenue and expenditure impacts.		Chapter 6
Provide a mechanism for determining actual reductions in water use.	10632 (i)	Chapter 6

## Wastewater and Reclamation

Describe the wastewater collection and treatment systems in the supplier's service area.	10633 (a)	Pg. 3 - 25
Quantify the amount of wastewater collected and treated in the supplier's service area.		Pg. 3 - 27
Describe the methods of wastewater disposal in the supplier's service area.		Pg. 3 - 25
Describe the type, place, and quantity of recycled water currently used in the supplier's service area.	10633 (b)	Pg. 3 - 25
Describe and quantify potential uses of recycled water in 5-year increments to 20 years.	10633 (c) (d)	Table 3 - 4
Describe the technical and economic feasibility of serving the potential users of recycled water.		Pg. 3 - 27
Describe the actions that may be taken to encourage recycled water use.	10633 (e)	Pg. 3 - 25
Provide the projected acre-feet results of recycled water used per year.	10633 (e)	Table 3 - 4
Provide a plan for optimizing the use of recycled water in the supplier's service area.	10633 (f)	Pg. 3 - 25
Provide actions to facilitate the installation of dual distribution systems and to promote recirculating uses.		Pg. 3 - 25

Items to Address	Section of Law	Location in Plan
<b>Groundwater</b>		
Identification of groundwater as a water supply source.	10631 (b)(1)	Pg. 4 - 12
Groundwater management plan preparation.		Pg. 1 - 2
Groundwater management plan adoption.		Appendix G
Copy of the groundwater management plan.		This Plan
Describe groundwater basin(s).	10631 (b)(2)	Pg. 3 - 5
Identify the groundwater basin(s).		Pg. 3 - 6
Identify adjudicated basins.		Pg. 2 - 3
Copy of order or decree of adjudication.		Appendix A
Describe the amount of groundwater the supplier has the legal right to pump.		Appendix A
Describe and analyze location of groundwater pumped for past 5 years based on information that is reasonably available.	10631 (b) (3)	Appendix H
Describe and analyze amount of groundwater pumped for past 5 years based on information that is reasonably available.		
Describe and analyze sufficiency of groundwater pumped for past 5 years based on information that is reasonably available.		Pg. 4 - 13
Describe and analyze location of groundwater that is projected to be pumped based on information that is reasonably available.	10631 (b)(4)	Appendix H
Describe and analyze amount of groundwater that is projected to be pumped based on information that is reasonably available.		Chapter 5

### **Water Supply Projects and Water Supply Programs**

The description explains how all the water supply projects and water supply programs increase the water supplies to meet the total projected water use as established pursuant to subdivision (a) of Section 10635.	10631 (h)	Chapter 9
Identify specific future water supply projects and water supply programs that may be implemented to increase the amount of water available during average, single-dry and multiple-dry water years.		Chapter 9
Describe the increase in water supply that is expected to be available from each of the specific future water supply projects and water supply programs.		Chapter 9
Describe the estimated implementation timeline for each future water supply project and water supply program.		Chapter 9



**Items to Address**

**Section of Law**

**Location in Plan**

**Water Quality**

Includes information, to the extent practicable, relating to the quality of existing water supply sources over the next 20 years in five year increments.

10634

Pg. 4 - 29

Describes the manner in which water quality affects water management strategies.

Chapter 10

Describes the manner in which water quality affects supply reliability.

Chapter 10

# Groundwater Management Plan

## Checklist Organized According to Required and Recommended Components

Items to Address	Section of Law	Location in Plan
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### Required Components

Provide documentation that a written statement was provided to the public describing the manner in which interested parties may participate in developing the groundwater management plan.	10753.4(b)	Appendix F
Provide basin management objectives for the groundwater basin that is subject to the plan.	10753.7 (a)(1)	Chapter 9
Describe components relating to the monitoring and management of groundwater levels, groundwater quality, inelastic land surface subsidence and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by pumping.	10753.7 (a)(1)	Chapter 10 Appendix H
Describe plan to involve other agencies that enables the local agency to work cooperatively with other public entities whose service area or boundary overlies the groundwater basin.	10753.7 (a)(2)	Ch 8
Adoption of monitoring protocols for the components in Water Code Section 10753.7 (a)(1)	10753.7 (a)(4)	Appendix H
Provide a map showing the area of the groundwater basin as defined by DWR Bulletin 118 with the area of the local agency subject to the plan as well as the boundaries of other local agencies that overlie the basin in which the agency is developing a groundwater management plan.	10753.7 (a)(3)	Fig 3 - 2

### Recommended Components

Manage with the guidance of an Advisory Committee.		Chapter 8 Appendix E
Describe the area to be managed under the plan including historical data related to groundwater levels, quality, subsidence, groundwater/surface water interactions, issues of concern and a discussion of supplies and demands.		Chapter 3
Describe how each of the management objectives helps meet goals.		Chapter 9
Provide a map showing locations of monitoring sites for groundwater levels and quality and stream gauges.		Appendix H
Summarize types of monitoring, types and frequency of measurements.		Appendix H
List monitoring well characteristics including well depth, screened intervals and well type.		Appendix I

# 2

## AGENCY AND STAKEHOLDER BACKGROUND

### Mojave Water Agency

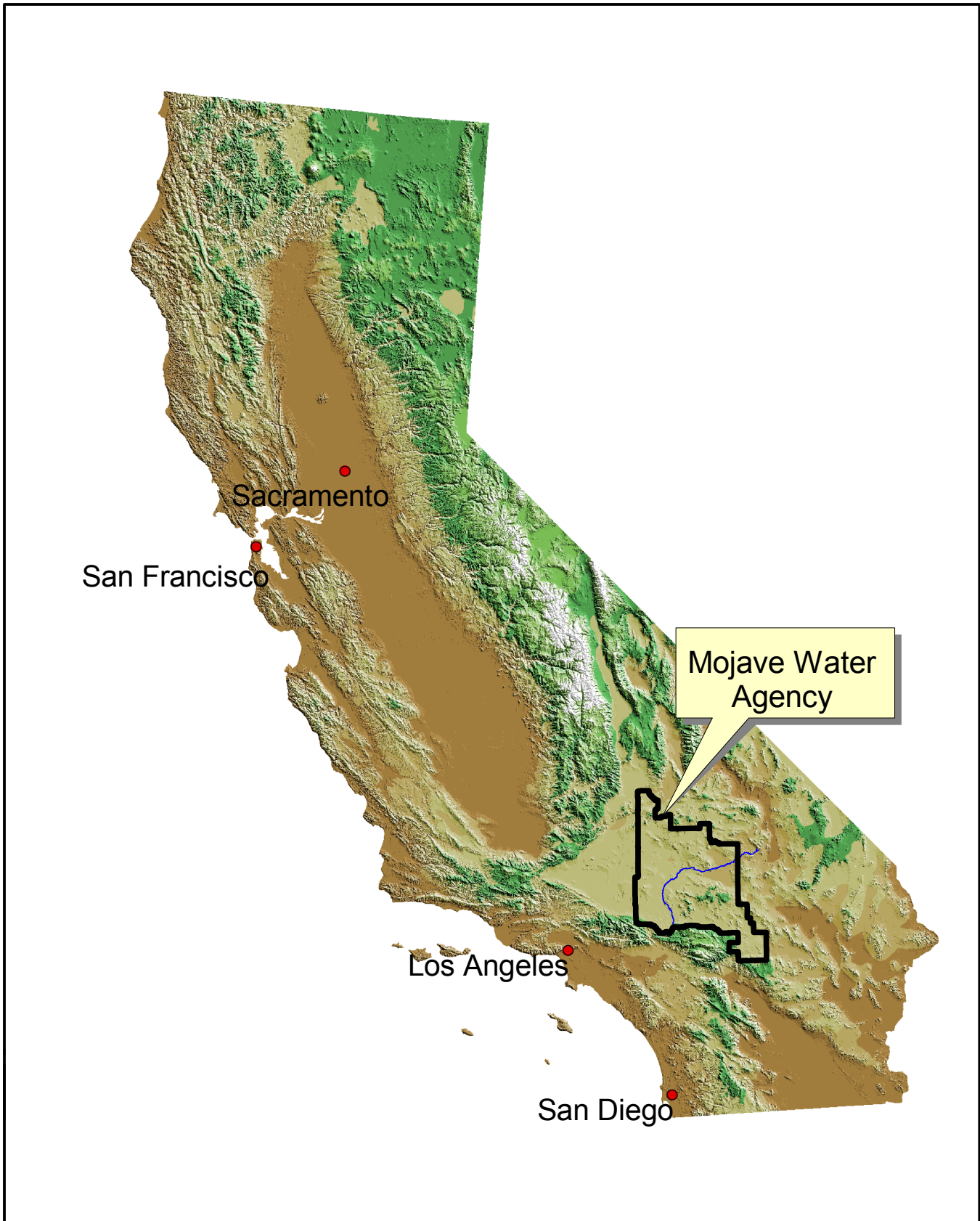
The California State Legislature authorized the formation of the Mojave Water Agency (MWA) in 1959 for the purpose of managing declining groundwater levels in the Mojave Basin Area, El Mirage Basin, and Lucerne Basin. The Legislature’s act required the vote of the residents within the boundaries of the 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. Today, MWA covers an area of over 4,900 square miles, as seen in Figure 2-1.

MWA was formed to manage groundwater levels that have been in decline since the early 1950s. Today, overdraft has reduced groundwater stored in the region by nearly two million acre-feet. The enabling act authorizes MWA to do “any and every act necessary, so that sufficient water

*MWA was formed to manage groundwater levels that have been in decline since the early 1950s.*

may be available for any present or future beneficial use of the lands and inhabitants within MWA's jurisdiction.” Clearly, MWA needed to find ways to assure a long-term, reliable water supply and where possible, reverse the overdraft of the groundwater basin.

The first step MWA took to reduce the water shortage within its jurisdiction was to become a SWP contractor, which entitled it to 50,800 acre-feet per year of water delivered via the California Aqueduct. Later, MWA purchased an additional 25,000 acre-feet of entitlement from Berrenda Mesa Water District to bring its total annual entitlement to 75,800 acre-feet.



**Schlumberger  
Water Services**

**MWA Location**

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 2-1

Date: January 2004

Prepared By: KTW

For management purposes under the Mojave Basin Area Judgment, MWA split the Mojave River watershed and associated groundwater basins into five separate “subareas.” The locations of the five subareas (Oeste, Este, Alto, Centro, and Baja) are shown in Figure 2-2. The subarea boundaries are based on hydrologic divisions defined in previous studies (DWR 1967), evolving over time based on a combination of hydrologic, geologic, engineering and political considerations. Also for the purposes of implementing the Judgment, the northern part of the

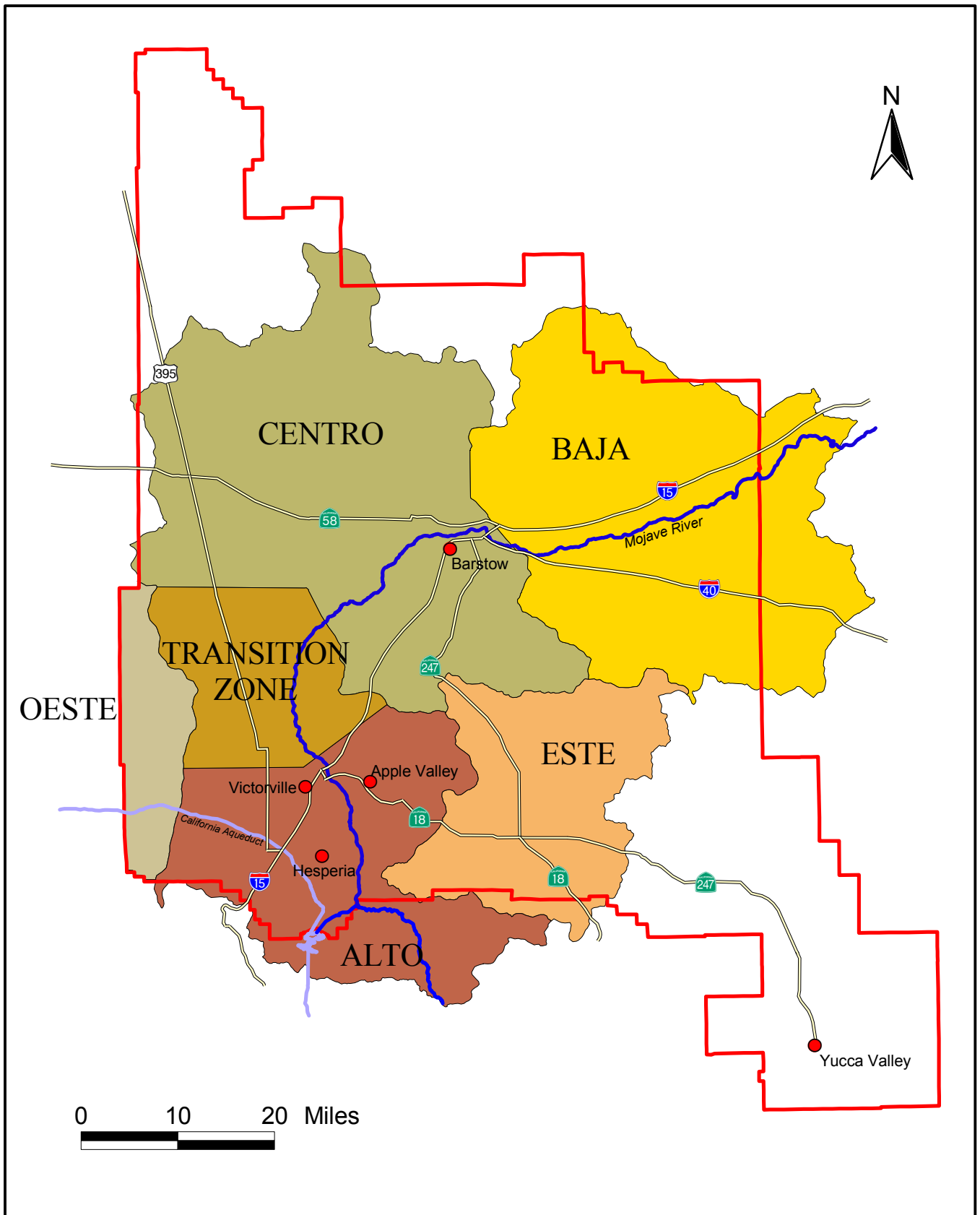


Alto Subarea was defined as a sub-management unit – the Alto Transition Zone; this zone was created to acknowledge local geology and to better address the water flow from Alto to Centro.

To distribute the water to the points of need, MWA has taken a central role in designing and constructing the Morongo Basin and Mojave River pipelines, which extend from the California Aqueduct. The Morongo Basin Pipeline was completed in 1994 and deliveries began in 1995 to the Hi-Desert Water District. Water flowing through the pipeline is diverted to recharge ponds in an effort to reduce overdraft in the Warren Valley Basin. The MWA also financed and

constructed the oversize of reach 1 of the Morongo Basin Pipeline to facilitate artificial recharge of the Alto Subarea along the Mojave River in the vicinity of Hesperia and Apple Valley. The Mojave River pipeline is being built in phases. Facilities have been constructed from the California Aqueduct to the vicinity of Barstow. The Hodge and Lenwood Recharge Sites, located west of Barstow, have also been constructed and received a total of 3,842 acre-feet of water during 1999-2000. The Daggett Recharge Site, east of Barstow, was completed in 2001. Investigations are underway to site additional recharge basins in the Baja Subarea. Figure 2-3 shows the locations of MWA’s current and future conveyance and recharge features.

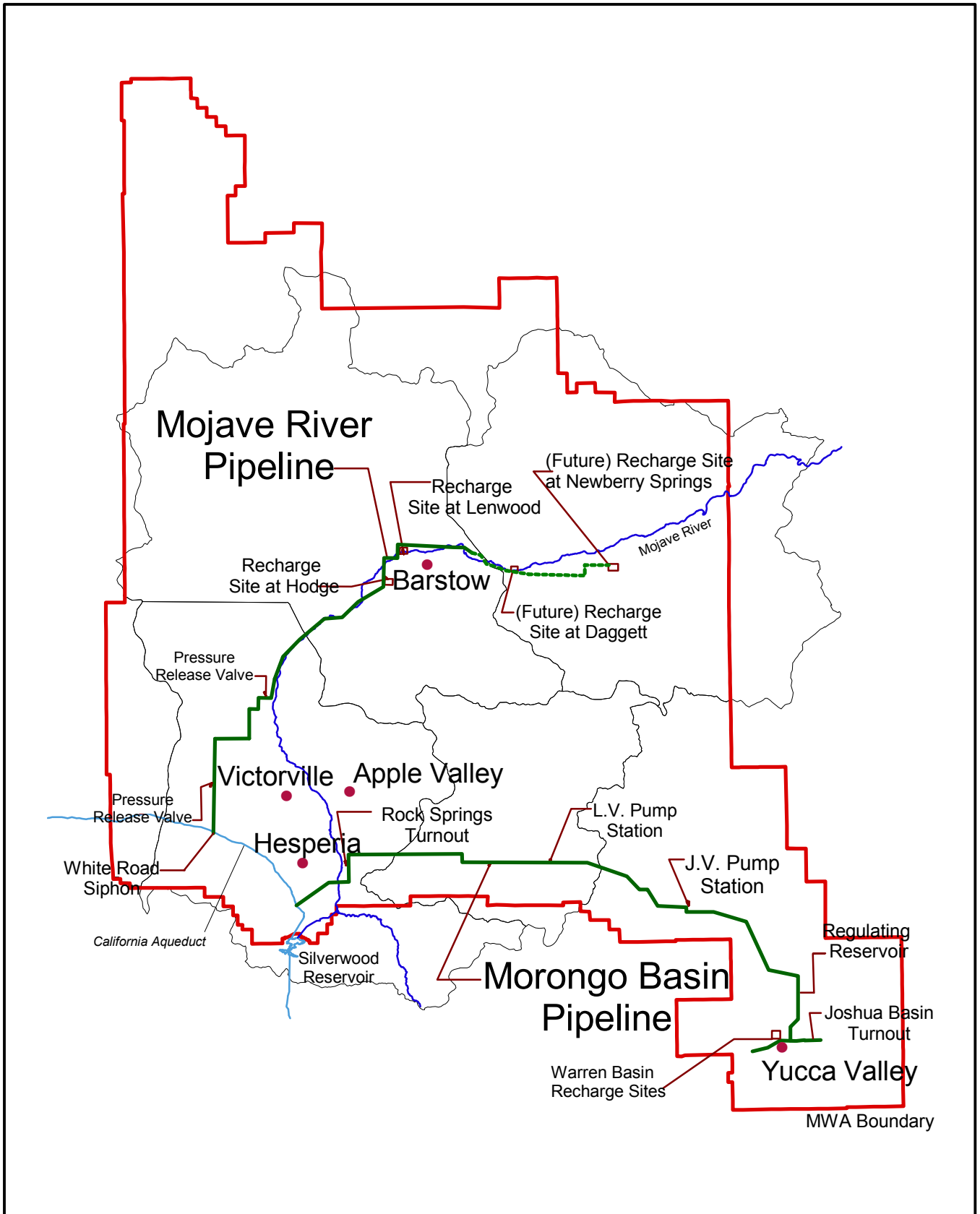
MWA roles and responsibilities have expanded since 1960. Today, MWA is involved with educational programs, water rights administration, and data collection. Adjudication of water rights within the Mojave Basin Area is a major role of the agency today and will be discussed in greater detail later in this chapter. MWA also has gradually assembled the data necessary to better understand the dynamic interaction between surface water and groundwater flows in the basins, and in particular, the significant role that the geology in the area plays in the migration of groundwater from south to north. Teaming with the U.S. Geological Survey (USGS), MWA has



**Schlumberger  
Water Services**

**Base Map**  
Mojave Water Agency  
2004 Regional Water Management

Figure 2-2  
Date: January 2004  
Prepared By: KTW



**Schlumberger  
Water Services**

**Current and Future Facilities**

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 2-3

Date: January 2004

Prepared By: KTW

constructed monitoring wells to measure groundwater quality and water levels, run geophysical surveys to understand variations in subsurface geology, installed an auxiliary Lower Narrows low flow gage on the bank opposite the main gage, took over as USGS cooperator for some gages that the California Department of Water Resources (DWR) had funded until the early 1990's, and established weather stations to monitor rainfall and evaporation. MWA also assumed responsibility for assignment of local well numbers in cooperation with DWR.

## Adjudication

### Mojave Basin Area

Fearing uncontrolled overdraft of the Mojave Basin, adjudication proceedings were initiated in the mid-1960s, but were never finalized. Triggered by the rapid growth within the Mojave Water Agency service area, particularly in the Victor Valley area, the City of Barstow and the Southern California Water Company filed a complaint in 1990 against upstream water users claiming that the increased withdrawals and lowering of groundwater levels reduced the amount of natural water available to downstream users. The complaint requested that 30,000 acre-feet of water be made available to the Barstow area annually and that MWA obtain supplemental water for use in other areas of MWA's service area.

About a year later, the Mojave Water Agency filed a cross-complaint which declared that the native waters of the Mojave River and underlying groundwater were insufficient to meet the current and future demands made upon them. The cross-complaint asked the court to determine the water rights of all surface water and groundwater users within the Mojave Basin Area and the Lucerne and El Mirage Basins. During the following two years, negotiations resulted in a proposed Stipulated Judgment that: 1) formed a minimal class of producers using 10 acre-feet or less per year who were dismissed from the litigation, and 2) offered a physical solution for water production by the remaining producers. The Superior Court bound the stipulating parties to the Stipulated Judgment in September 1993. The Court further bound the non-stipulating parties to the terms of the Stipulated Judgment in January 1996 following trial. The text of the Stipulated Judgment can be found in Appendix A.

Some of the non-stipulating parties appealed the Judgment of the Superior Court and the Appellate Court issued a final decision in June 1998. The final decision of the Appellate Court held the stipulating parties to the terms of the Stipulated Judgment, but excluded the appealing parties, with the exception of one appellant who sought a revised water production right under the Judgment. MWA requested the California Supreme Court to review the Appellate Court's decision in July 1998. The Supreme Court affirmed the Appellate Court's decision in August



2000 regarding the Stipulated Judgment and the exclusion of the appealing parties from the Judgment, but over-turned the decision of the Appeals Court as to the one party seeking additional production rights.



The Mojave Basin Judgment assigned Base Annual Production (BAP) quotas to each producer using 10 acre-feet per year or more, based on historical production. Users are assigned a variable Free Production Allowance (FPA), which is a uniform percentage of BAP set for each subarea. This percentage is reduced, or “ramped-down” over time until total FPA comes into balance with available supplies. This percentage was set at 70% for most subareas as of June 2003. Any water user that pumps more than their FPA is compelled to purchase replenishment water from MWA equal to the amount of production in excess of the FPA.

## Warren Valley Basin

Groundwater from the Warren Valley Basin is used to supply Yucca Valley and its environs. Extractions from the Basin began exceeding extractions in the 1950s. The progressively increasing overdraft led to adjudication of the Basin in 1977.<sup>1</sup> In its Judgment, the court appointed the Hi-Desert Water District as Watermaster and ordered it to develop a physical solution for halting overdraft. Objectives identified by the Watermaster Board included managing extraction, importing water supplies, conserving stormwater, encouragement of conservation and reclamation, and protecting groundwater quality. A Basin Management Plan<sup>2</sup> was adopted that called for importing SWP water from MWA through the then-proposed Morongo Basin Pipeline to balance demand and replenish past overdraft. The text of the Warren Valley Judgment can be found in Appendix A.

## Summary of 1994 Regional Water Management Plan

The first Regional Water Management Plan (RWMP) was completed in June 1994 by Bookman-Edmonston Engineering, Inc. The plan developed recommendations that followed the following broad objectives:

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<sup>1</sup> Hi-Desert Water District v. Yucca Water Company Ltd., Case Number 172103, San Bernardino, California, September 16, 1977.

<sup>2</sup> Warren Valley Basin Management Plan, Kennedy/Jenks/Chilton, January 31, 1991. Adopted by Watermaster May 10, 1991.

1. Eliminate overdraft and meet future demands on the groundwater basins by obtaining additional imported water supplies and/or reducing consumptive use demands.
2. Protect the groundwater basins from degradations in water quality.
3. Participate in implementation of any judgment resulting from ongoing Mojave River adjudication.
4. Be responsive to changing conditions by modifying the present plan as necessary.
5. Work closely with local agencies and water purveyors on key issues, particularly water conservation.
6. Accomplish the above in a cost-effective and environmentally sound manner.

The plan provided the details for structural and non-structural projects that could be completed in part or in full over three phases. Phase 1 projects were proposed for development over the ensuing 5 years. Phase 2 projects were anticipated during the following 5 to 10 years, as financing would allow. Phase 3 projects were considered long-term goals scheduled for completion by the year 2015. The recommended projects for Phases 1, 2, and 3 are listed below, along with the current status of each.

#### **Phase 1 (Structural)**

- Drilling wells for monitoring program  
*Status:* incomplete; more wells are needed away from Mojave River and deeper beneath the river
- Rock Springs recharge facility & turnout  
*Status:* completed
- Increase recharge of natural supplies  
*Status:* no action
- Groundwater recharge in the Centro and Baja subareas from Mojave River Pipeline  
*Status:* Centro has two recharge basins (Hodge & Lenwood) and Baja has (Daggett). One additional basin is planned for Baja and siting studies are ongoing.
- Groundwater recharge in Este (Lucerne) from Morongo Basin Pipeline  
*Status:* incomplete; no recharge, purchased land in Lucerne Valley, prepared preliminary design and performed environmental review
- Groundwater recharge in Oeste (El Mirage)  
*Status:* no action, except for USGS feasibility of recharge in Sheep Creek
- Recharge in Morongo Basin with Morongo Basin Pipeline Extension  
*Status:* recharge taking place in Warren Valley Basin

### **Phase 1 (Non-structural)**

- Release to Mojave River from Lake Silverwood  
*Status:* releases discontinued since the completion of the Rock Springs Turnout
- Water monitoring programs  
*Status:* completed, but expanding
- Purchase of State Water Project (SWP) Water  
*Status:* ongoing; however not all available water has been purchased due to financial constraints
- Legislative changes to MWA Act  
*Status:* Act amended to allow MWA to implement well programs in furtherance of the Judgment
- Water Quality Protection Programs  
*Status:* water quality monitoring for recharge programs at Rock Springs Outlet, Hodge, Lenwood and Warren Basin; MWA wells used to support water quality monitoring for Mojave Watershed program with State Board.
- Water conservation program to reduce consumptive use  
*Status:* ongoing through education programs and demonstration gardens
- Investigation of additional water importation projects  
*Status:* ongoing; purchased 25,000 acre-feet/yr of SWP entitlement from Berrenda-Mesa Water District; executed water exchange agreement with Solano County Water Agency
- Zones of Benefit to collect benefit assessments  
*Status:* no action
- Improvement districts to finance facilities  
*Status:* no action

### **Phase 2 (Structural)**

- Groundwater extraction & delivery to Mojave River Aqueduct  
*Status:* no action

### **Phase 2 (Non-Structural)**

- Zones of Benefit to collect benefit assessments  
*Status:* no action
- Improvement districts to finance facilities  
*Status:* no action
- Contracts with purveyors  
*Status:* ongoing

### Phase 3 (Structural)

- Delivery of imported water and groundwater to water users  
*Status:* Ordinance 9 water sale approved for City of Victorville from Mojave River Pipeline, ongoing deliveries to Hi-Desert Water District, Makeup and Replacement Water deliveries under the Judgment
- Meeting peaking requirements and constructing water treatment facilities  
*Status:* no action

### Phase 3 (Non-Structural)

- Contracts with purveyors  
*Status:* ongoing
- Water allocation policies  
*Status:* hierarchy of water delivery priorities during shortages identified through Ordinance 9; ongoing

## Major Stakeholders

Success of any water management plan depends on the degree of involvement with the stakeholder community. In developing the water management alternatives for evaluation, MWA has been careful to involve stakeholders from the beginning of the process. This involvement

*Success of any water management plan depends on the degree of involvement with the stakeholder community.*

has included one-on-one interviews, group meetings, and evaluation questionnaires. Water users form the core of the stakeholder group in the basin, including water districts, cities, private water agencies, and agribusiness. Additional essential stakeholder involvement includes environmental organizations, regulatory agencies, development interests, and community associations.

The stakeholders noted in the following list have been notified regarding the outreach process organized by MWA during the RWMP update. Some of the common interests of the stakeholders in each group are also noted in the list. Chapter 8 provides a more detailed list of the stakeholder issues developed from the individual/group meetings and questionnaire process.

### Water Agencies

Local water agencies share many issues related to local and regional water supplies. They are all interested in the ability of their individual systems to meet the needs of their customers. Each agency has its own set of quantity and quality needs and each agency has individual goals for the regional water system.

- Apple Valley Foothill County Water District
- Apple Valley Heights County Water District
- Apple Valley Ranchos Water Company
- Apple Valley View Water District
- Baldy Mesa Water District
- Bar H Mutual Water Company
- Bighorn-Desert View Water Agency
- Chamisal Mutual Water Company
- Daggett Community Services District
- Hesperia Water District
- Hi-Desert Water District
- Joshua Basin Water District
- Jubilee Mutual Water Company
- Juniper Riviera County Water District
- Lucerne Valley County Service Area 29
- Lucerne Valley Mutual Water Company
- Lucerne Vista Municipal Water Company
- Mariana Ranchos County Water District
- Newberry Community Services District
- Rancharitos Mutual Water Company
- San Bernardino County Special Districts
- Sheep Creek Water Company
- Silver Lakes Association
- Southern California Water Company
- Spring Valley Lake Association
- Thunderbird County Water District
- Victor Valley Water District
- Victor Valley Water Reclamation Authority
- Willow Wells Mutual Water
- Yermo Community Services District

### **State and Federal Agencies**

The state regulatory agencies are charged with enforcing the State's laws associated with water rights, environmental protection, and the protection of water quality. The California Department of Water Resources has provided financial assistance for preparation of this plan. The U.S. Geological Survey has provided a variety of services for over 100 years, including stream gaging, hydrogeologic assessment and modeling. It is imperative that MWA works cooperatively with these agencies.

- California Department of Water Resources
- California Department of Fish and Game
- State Water Resources Control Board
- Lahontan Regional Water Quality Control Board
- U.S. Geological Survey

### **Municipalities (cities, county, other)**

Municipalities may or may not be water purveyors. Regardless, all municipalities share a keen interest in their local and regional water supplies. The economic health of a region is tied to its ability to demonstrate that affordable high quality water is going to be available as the region develops.

- City of Adelanto
- City of Barstow
- City of Hesperia
- City of Victorville
- San Bernardino County Department of Public Works and Flood Control
- San Bernardino County Planning Department
- Town of Apple Valley
- Town of Yucca Valley

### **Miscellaneous Community Interests**

Local community groups have an opportunity to provide input on issues and needs associated with their particular location. This type of specific input is very beneficial to the regional planning process.

- El Mirage Property Owners Association
- Public Works Advisory Committee, City of Hesperia
- Silver Valley Realty
- Mojave Basin Area Judgment Subarea Advisory Committees
- MWA Technical Advisory Committee (TAC)
- The Bradco Companies (real estate)
- Citizens for a Better Community
- Jess Ranch
- Newberry Springs – Harvard Property Owners Association
- Palisades Ranch
- Rancho Los Flores
- Silver Lakes Association
- Spring Valley Lakes Association

# 3

## PHYSICAL SETTING

Much has been written about the geology and hydrology of the Mojave area, with some information dating back to the early 1900s. The U.S. Geological Survey (USGS), in cooperation with the Mojave Water Agency (MWA), conducted the most recent work in the area.<sup>3</sup> Their

*Developing viable alternatives requires a clear understanding of the region's physical setting.*

report culminated several years of intense field work that included installation of groundwater monitoring wells along the Mojave River, geophysical surveys, surface water hydrology measurements, groundwater level measurements, groundwater quality sampling, meteorological measurements, and well production tests. The final component of this effort was the development of a comprehensive groundwater flow simulation model, used as an analysis tool to evaluate past and present groundwater conditions, as well as a predictive tool to evaluate the effects of future water usage and management scenarios.

This chapter summarizes the pertinent findings regarding the physical setting for the Mojave Basin Area and the Morongo Basin/Johnson Valley Area. The principal objective of this chapter is to highlight conclusions regarding the physical setting that have been developed since the publication of the 1994 Regional Water Management Plan (RWMP). The latest USGS study contains a more thorough presentation of these subjects.<sup>4</sup>

### Physiographic Setting

The MWA service area lies in the California High Desert, which is part of the Mojave Desert (Figure 3-1). The High Desert Area is located on the northeastern flanks of the San Bernardino and San Gabriel Mountains, which separate the High Desert from the coastal basins and inland valleys of the greater Los Angeles area. These mountains, which reach elevations of over 10,000 feet above sea level, were uplifted along the San Andreas Fault. The High Desert Area is

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<sup>3</sup> Stamos et al. 2001

<sup>4</sup> *ibid*

characterized overall as an alluvial plain. This plain consists of valleys and closed basins composed of water-bearing unconsolidated sediments. Hills and low mountains consisting of non-water-bearing consolidated bedrock separate these valleys and basins. The plain is criss-crossed by a series of northwest-trending geologic faults, resulting in offsets of geologic layering and barriers to groundwater flow. Overall, land surface elevations within the MWA service area range from 5,500 feet above sea level in the San Bernardino Mountains on the southern boundary to 1,500 feet near Afton Canyon on the eastern boundary.

The MWA service area is divided into two major surface water drainage areas:

- the Mojave River Area that drains into the Mojave River or local terminal dry lakes. The Mojave River Area is the larger and more developed of the two.
- the Morongo Basin/Johnson Valley Area that drains into the Colorado River drainage or local terminal dry lakes.

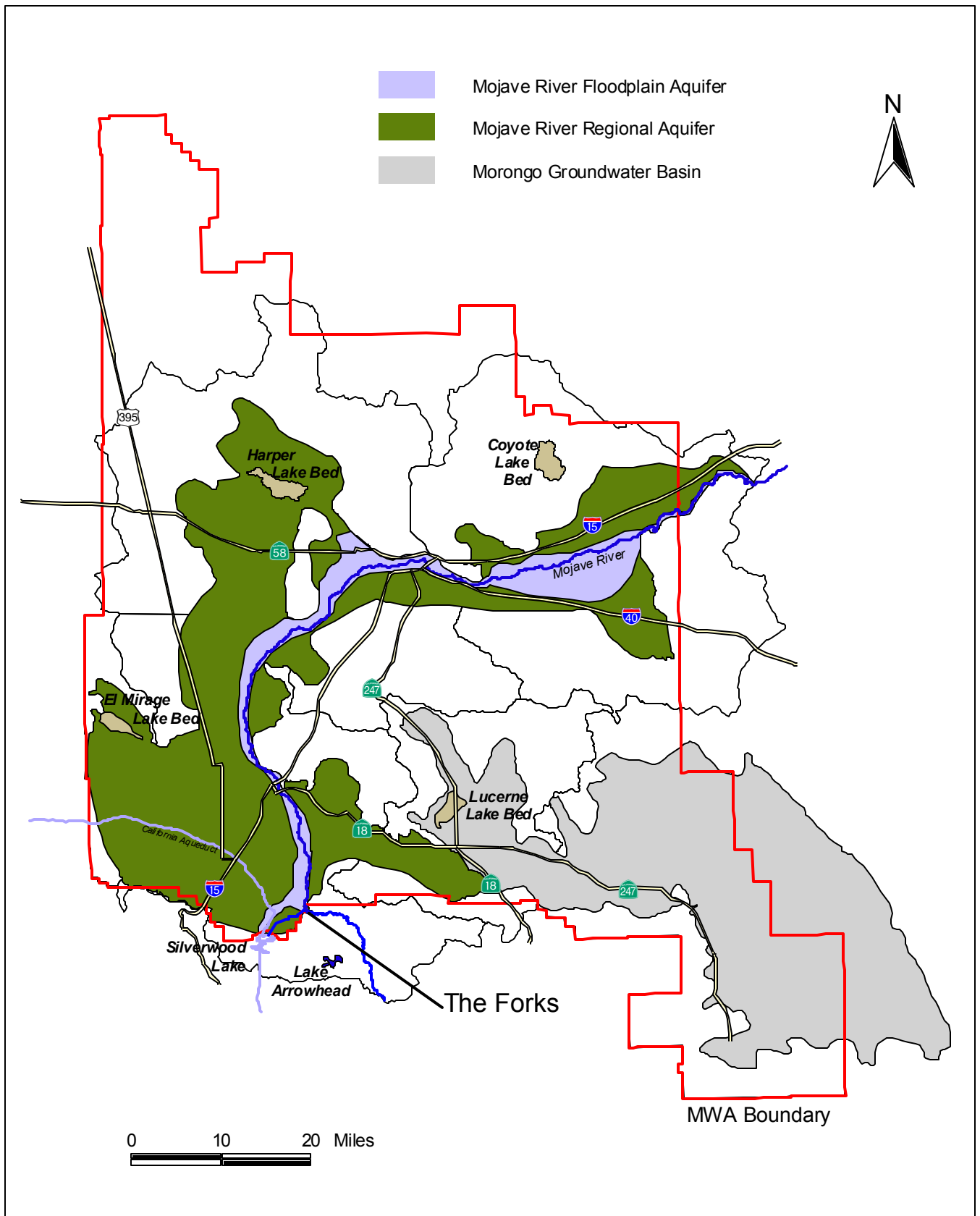
Terminal dry lakes (often referred to as playas) are lake beds that collect water only during periods when there is sufficient runoff, have no outlet, and lose all their water to evaporation.

The Mojave River is the main surface water drainage feature within the MWA service area. The surface water drainage of the Mojave River covers an area of 3,800 square miles.<sup>5</sup> It is fed by rainfall and snow pack from the San Bernardino Mountains. The river is formed by the confluence of two smaller streams descending from the mountains at a place called The Forks (Figure 3-1).

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<sup>5</sup> *ibid*





### Hydrologic Setting

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-1

Date: June 2002

Prepared By: BCW

The river then runs north and then east for about 100 miles, where it flows through Afton Canyon and terminates at Soda and East Cronese Lakes; these lakes pond water only after major storm events. At present the Mojave River is perennial (continuously flowing) only along a short section downstream of The Forks, in the vicinity of Upper and Lower Narrows and Afton Canyon, and in the section immediately downstream of the Victor Valley Wastewater Reclamation Authority's treatment plant, about 4 miles downstream of the Lower Narrows. However, during and immediately after storms (principally during the winter), the Mojave River flows along several (sometimes all) of its reaches. Most of the river flow occurs immediately after storms.

The Morongo Basin/Johnson Valley area has no sizeable rivers, only small ephemeral streams that collect runoff from surrounding mountains during storms. The mountain stream runoff either percolates into the stream bed or, during large storm events, flows to dry lake beds where it evaporates. The area encompasses parts of five separate surface water drainages – Warren, Copper Mountain, Emerson, Means, and Johnson.

The groundwater basins have been designated in a number of ways. The Department of Water Resources Bulletin 118-03 defines 22 groundwater basins within the two broad hydrologic regions overlying the Mojave Water Agency area. The Mojave River Basin lies within the South Lahontan hydrologic region. The Warren Valley/Johnson Valley area and the portion of the Lucerne Valley east of the Helendale Fault lie in the Colorado River hydrologic region. The DWR basins are listed in Table 3-1. The DWR basins and the overlying water suppliers are displayed in Figure 3-2.

The DWR Coyote Lake Valley, Caves Canyon Valley, Kane Wash Area and Lower Mojave River Valley groundwater basins lie primarily in the Baja subarea. The Middle Mojave River Valley includes parts of the Transition Zone and Centro subarea. The Harper Valley groundwater basin is within the Centro subarea. The Upper Mojave River Valley basin includes parts of the Transition Zone, Alto, and Este subareas. The El Mirage Valley groundwater basin is primarily within the Oeste subarea. The Mojave River Valley basins cover an area of 1,400 square miles (Figure 3-1).

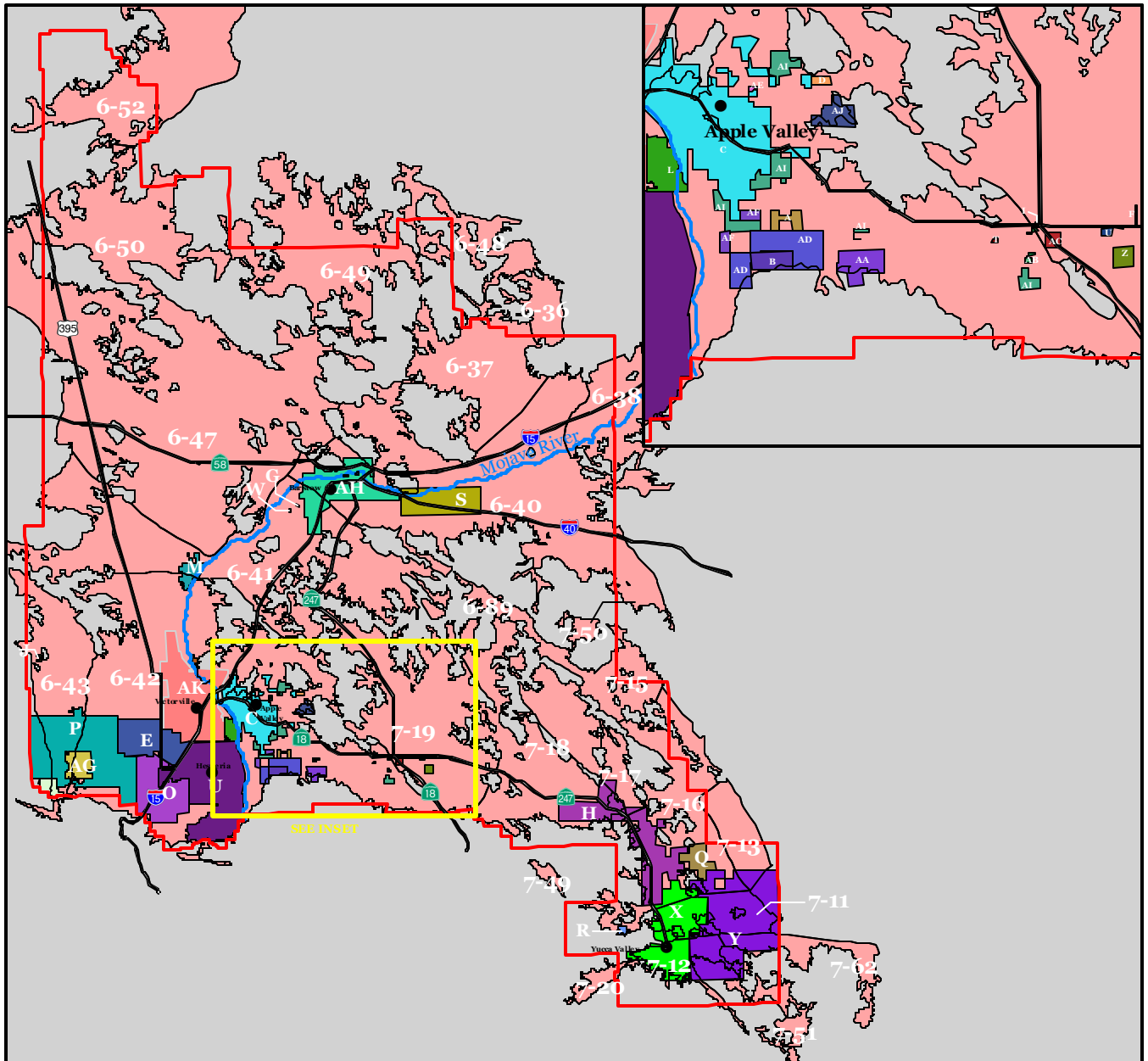
Table 3-1: DWR Groundwater Basins

Basin Number	Basin Name	Area <sup>6</sup> (acres)	Groundwater Budget Type <sup>7</sup>
<b>South Lahontan Hydrologic Region</b>			
6-37	Coyote Lake Valley	88,200	A
6-38	Caves Canyon Valley	73,100	A
6-40	Lower Mojave River Valley	286,000	A
6-41	Middle Mojave River Valley	211,000	A
6-42	Upper Mojave River Valley	413,000	A
6-43	El Mirage Valley	75,900	A
6-47	Harper Valley	410,000	A
6-49	Superior Valley	120,000	C
6-50	Cuddeback Valley	94,900	C
6-52	Searles Valley	197,000	C
6-89	Kane Wash Area	5,960	C
<b>Colorado River Hydrologic Region</b>			
7-11	Copper Mountain Valley	30,300	A
7-12	Warren Valley	17,200	A
7-13	Deadman Valley	118,500	C
7-15	Bessemer Valley	39,100	C
7-16	Ames Valley	110,000	C
7-17	Means Valley	15,000	C
7-18	Johnson Valley Area	111,600	C
7-19	Lucerne Valley	148,000	A
7-20	Morongo Valley	7,240	C
7-50	Iron Ridge Area	5,250	C
7-62	Joshua Tree	33,800	A

<sup>6</sup> Total area of basin both in and outside of MWA boundary

<sup>7</sup> Type A – either a groundwater budget or model exists, or actual extraction data is available

Type C – not enough available data to provide an estimate of the groundwater budget or basin extraction



	DWR groundwater basin in (#-#)		County Svc Area-64		Joshua Basin WD
	MWA boundary		County Svc Area-70c		Jubilee Mutual Water Co
	Apple Valley Foothill Company WD		County Svc Area-70g		Juniper Riviera Co WD
	Apple Valley Heights (South)		County Svc Area-70j		Lucerne Valley Mutual Water Co
	Apple Valley Ranchos Water Co		County Svc Area-70l		Lucerne Vista Mutual Water Co
	Apple Valley View Mutual Water Co		County Svc Area-w1		Mariana Ranchos Co
	Baldy Mesa WD		County Svc Area-w4		Navajo Mutual Water Co
	Bar 'H' Mutual Water Co		Daggett Community Svcs District		Rancharitos Mutual Water Co
	Bar Len Mutual Water Co		Desert Dawn Mutual Water Co		Sheep Creek Water Co
	Bighorn Desert View WA		Desert Springs Mutual Water Co		So Cal Water Co- North
	Center Water Co		Hesperia WD		So Cal Water Co- South
	Chamisa Mutual Water Co		Hi Desert Mutual Water Co		Thunderbird Co WD
	County Svc Area-42		Hi Desert WD		Victor Valley Water District

**Schlumberger  
Water Services**

## Groundwater Basins and Water Districts

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-2

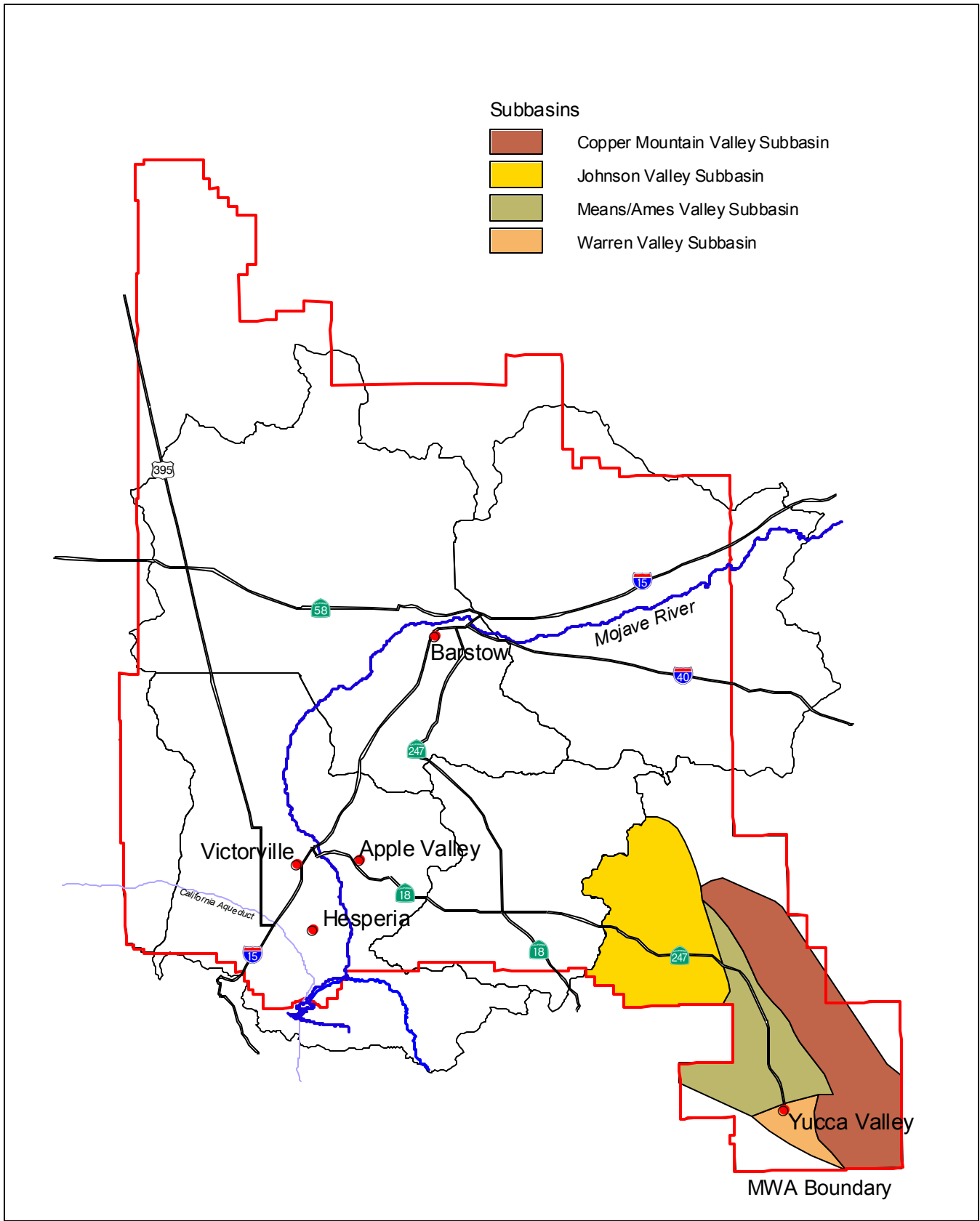
Date: October 2003

Prepared By: KTW

The northern portion of MWA also overlies portions of the Searles Valley, Cuddeback Valley, and Superior Valley groundwater basins. These areas are mostly unpopulated Federal lands administered by the Bureau of Land Management (BLM).

During recent investigations, USGS has grouped the other basins within the MWA service area into the Morongo Groundwater Basin. Including the portion of the Lucerne Valley east of the Helendale Fault in the Este subarea, this grouping encompasses nearly 1,000 square miles (Figure 3-1). The Morongo Groundwater Basin has been divided into as many as 17 subbasins by investigators in the past. All or part of 11 of these groundwater basins are within the MWA boundary. Three of these, Deadman Valley, Bessemer Valley, and Iron Ridge groundwater basins are mostly unpopulated Federal lands administered by BLM and lie near MWA's eastern boundary. Bulletin 118-03 states that there is not enough available data to provide either an estimate of groundwater budgets nor extractions from these basins. These basins are not further considered in this Plan.

There have been many different and conflicting references to the basins and subbasins within the MWA service area. For the purposes of this report, major "basins" are referred to as the Mojave Basin Area and the Morongo Basin/Johnson Valley Area. The Mojave Basin Area subbasin classifications used in this report are the: Este, Alto, Oeste, Centro, and Baja subareas defined in the Mojave Basin Judgment. The Morongo Basin/Johnson Valley Area subbasin classifications are shown in Figure 3-3. The subbasin classifications are Johnson Valley, Means/Ames Valley, Warren Valley, and Copper Mountain Valley. These are the same classifications used in the 1994 RWMP. *Groundwater* basins defined in DWR Bulletin 118 are different from the major basins and are shown in Figure 3-2. This figure also shows the boundaries of the overlying water supply agencies.



**Morongo Basin/Johnson Valley  
Area Subbasins**

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-3  
Date: January 2004  
Prepared By: KTW

## Geology

The geology of the Mojave Basin Area is characterized by sedimentary alluvial basins bordered by igneous and metamorphic mountain ranges and uplands; the uplands dominated by the San Gabriel and San Bernardino Ranges along the Mojave Basin's southern border. A typical geologic cross-section depicting the geologic sequence is shown in Figure 3-4. The recently updated geologic map for the basin is shown in Figure 3-5.<sup>8</sup> The ranges and uplands are composed of pre-Tertiary (greater than 65 million years ago) igneous and metamorphic rocks (labeled as pTb in accompanying figures), and Tertiary (1.64 to 65 million years ago) volcanic and sedimentary rocks (Tv and Ts, respectively). Numerous extensive strike-slip faults trend northwest to southeast across the basin, causing predominantly horizontal displacement (but also vertical displacement for some faults) in the geologic section.

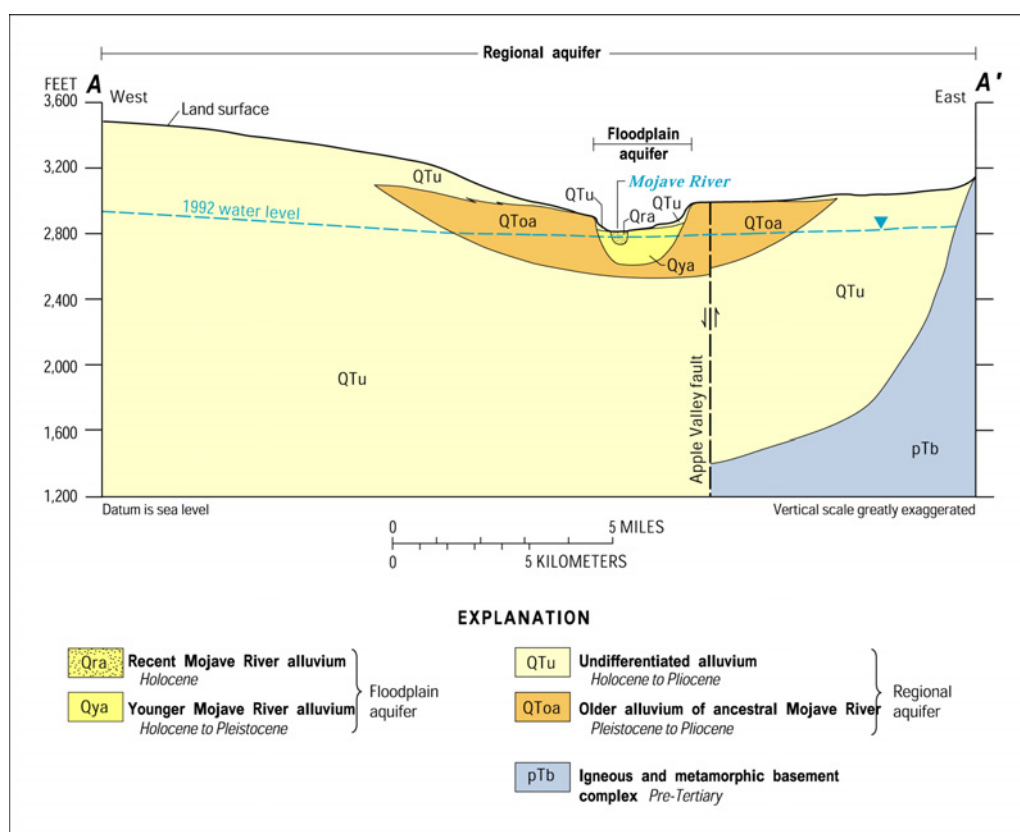
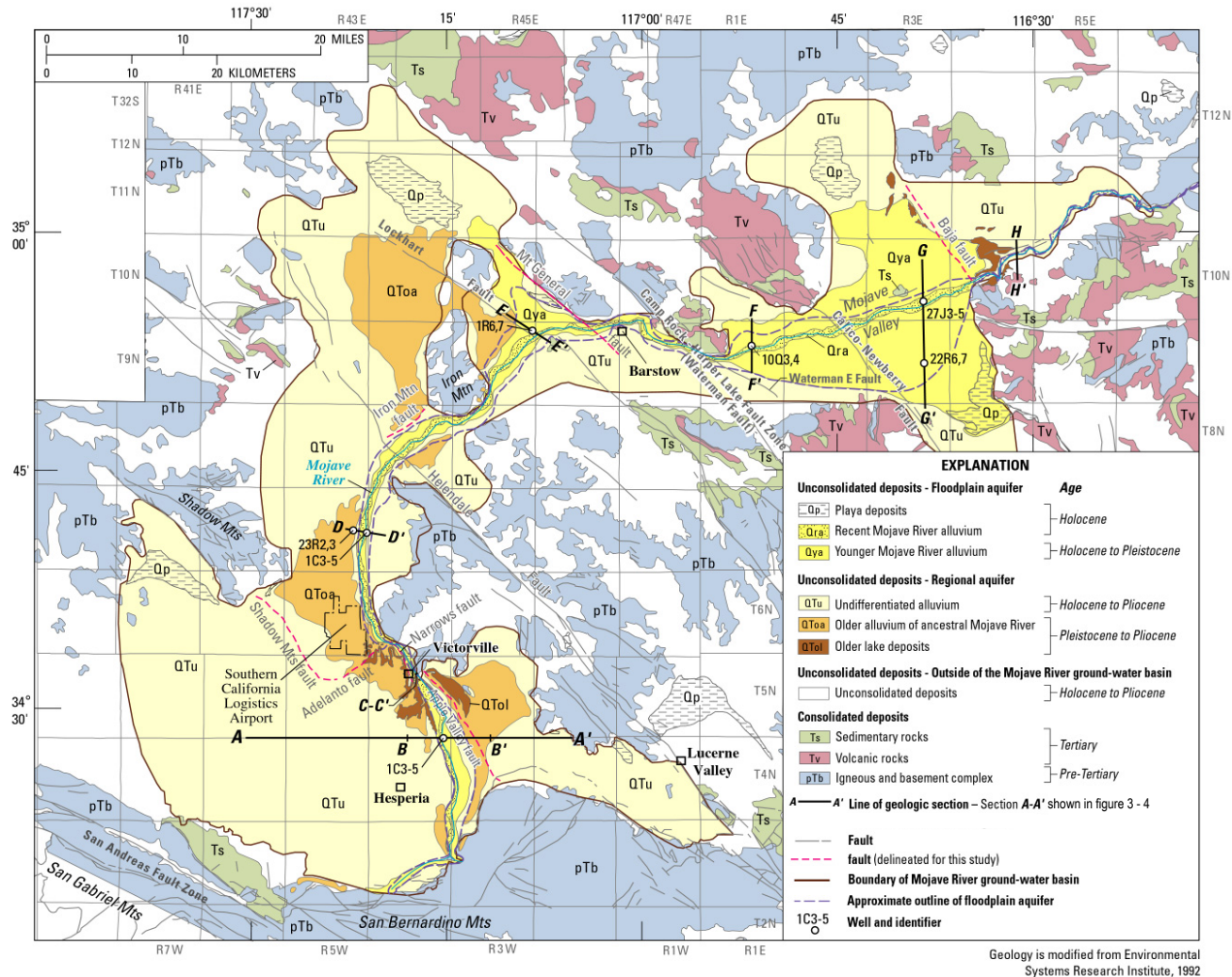


Figure 3-4: Typical Geologic Cross-Section of Mojave River Groundwater Basin<sup>9</sup>

<sup>8</sup>Stamos, et al., 2001

<sup>9</sup>ibid



Source: Stamos et al., 2001

## Geology of Mojave River Groundwater Basin

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-5

Date: January 2004

Prepared By: KTW

**Schlumberger**  
**Water Services**



The alluvial basins are composed of Quaternary (0 to 1.64 million years ago) unconsolidated river, lake, and playa deposits. The river deposits comprise different ages of granitic sand, silt, and gravel laid down by the Mojave River and its predecessors – the youngest deposits directly surrounding the current river bed, with progressively older deposits further from the river or deeper below it. Surrounding and underlying the current and ancestral Mojave River alluvium are poorly sorted alluvial deposits from ancestral alluvial fans, braided-streams, lakes or playas.

The geology of the Morongo Basin/Johnson Valley Area has not been investigated to the same degree as the Mojave Basin Area. In general, the area is similar to the Mojave Basin Area – sedimentary basins surrounded by igneous/metamorphic mountain ranges/uplands. The sedimentary basins are composed of Quaternary and Tertiary continental deposits (Smith and Pimentel 2000).<sup>10</sup> The mountain ranges include the Ord and Granite Mountains in the north, Bullion Mountains in the east, San Bernardino Mountains in the southwest, and Pinto and Little San Bernardino Mountains in the south. As in the Mojave Basin Area, numerous northwest to southeast trending strike-slip faults traverse the Morongo Basin/Johnson Valley Area.

## Groundwater

The predominant groundwater basin within the MWA service area is the Mojave River Groundwater Basin, encompassing 1,400 square miles as outlined in Figure 3-1, and having an estimated total water storage capacity of nearly 5 million acre-feet.<sup>11</sup> This basin is essentially a closed basin – very little groundwater enters or exits the basin. However, within the basin groundwater movement occurs between the different subareas, as well as groundwater-surface

water and groundwater-atmosphere interchanges. Groundwater is recharged into the basin predominantly by (1) infiltration of water from the Mojave River, accounting for 80% of the total basin natural recharge<sup>12</sup> (2) infiltration of storm runoff from the mountains, and (3) manmade recharge (from irrigation, wastewater, fish hatcheries, and imported water).

*The Mojave River Groundwater Basin has nearly 5 million acre-feet of storage capacity.*

Over 90% of the basin groundwater recharge originates in the San Gabriel and San Bernardino Mountains.<sup>13</sup> Groundwater is discharged from the basin primarily by well pumping, evaporation through the soil, transpiration by plants, seepage into dry lakes where accumulated water evaporates, and seepage into the Mojave River.

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<sup>10</sup> Smith and Pimentel 2000

<sup>11</sup> Bookman-Edmonston Engineering, Inc. 1994

<sup>12</sup> Stamos et al. 2001b

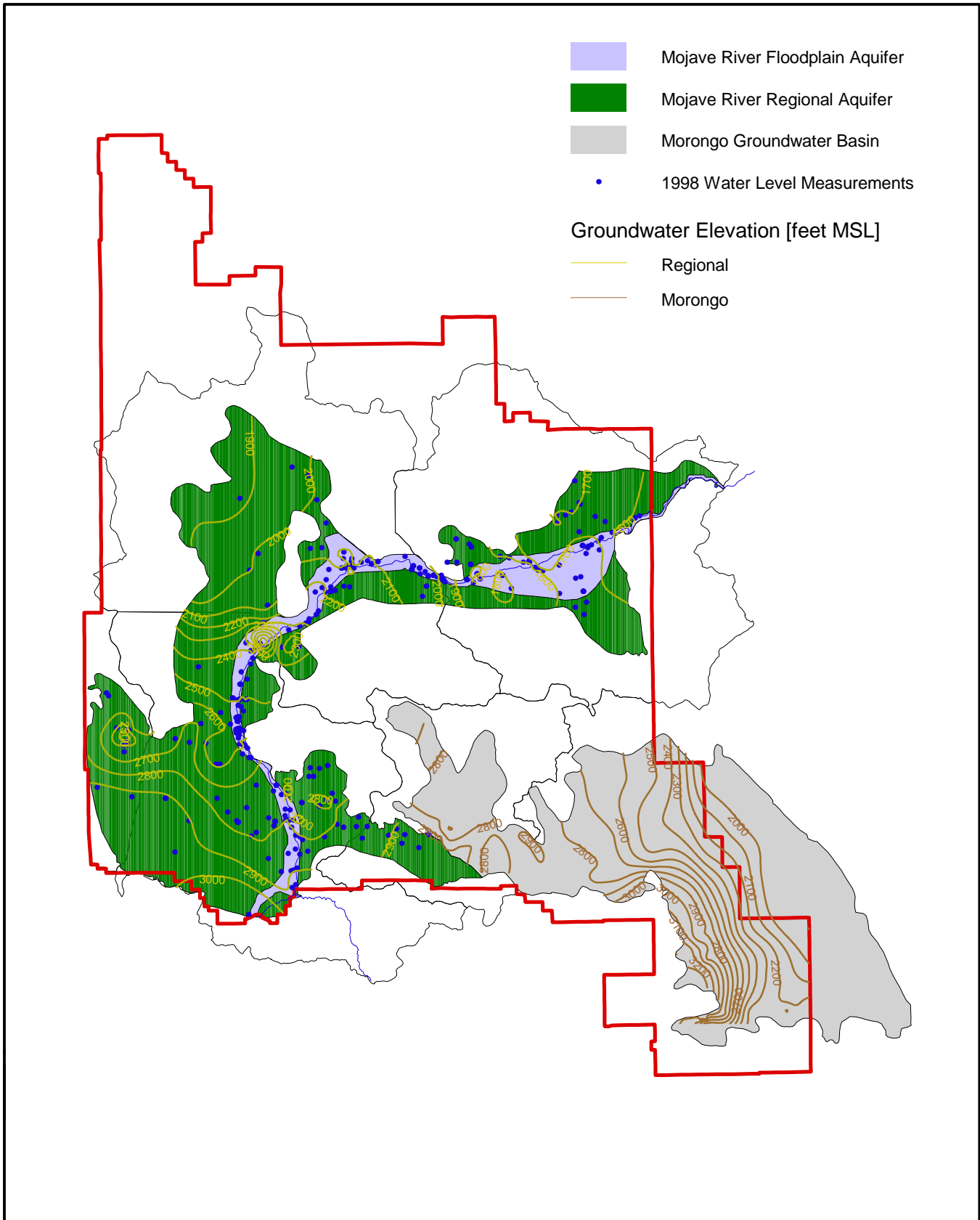
<sup>13</sup> Hardt 1971

The Morongo Groundwater Basin (including a portion of the Lucerne Basin which is in the Este Subarea) encompasses 1,000 square miles, of which about 60% lies within the MWA service area (Figure 3-1). This basin is composed of a large number of both closed and connected subbasins. Groundwater is recharged into the basin primarily by (1) infiltration of water from ephemeral streams and (2) manmade recharge. In 1995, artificial recharge ponds were installed by MWA near Yucca Valley in the Warren Valley subbasin with funding provided by a DWR loan which is currently being repaid by Hi-Desert Water District customers.

Groundwater is discharged from the Morongo Groundwater Basin primarily by well pumping, evaporation through the soil, transpiration by plants, and seepage into dry lakes where accumulated water evaporates.

Figure 3-6 shows a water table contour map of the Mojave River and Morongo Groundwater basins determined from well water level measurements in 1998. The direction of groundwater flow is perpendicular to the contours. Within the Mojave Basin Area, the groundwater flow direction is generally to the north from the base of the San Gabriel and San Bernardino mountains to near Iron Mountain; the flow then changes to the east from Iron Mountain to Afton Canyon. On a subbasin scale, the groundwater flow direction is as follows:

- Este Subarea – east to west on the southwest side of the Helendale Fault, changing to more northward at the Alto Subarea boundary. The Helendale Fault acts as a groundwater flow barrier, resulting in higher groundwater levels on the southwest side of the fault. On the northeast side of the fault, flow is radially inwards towards the northeast part of Lucerne (dry) Lake – an evaporation discharge site
- Oeste Subarea – south to north/northeast, with a dry lake in the northern part of the subarea (El Mirage Lake) that acts as an evaporation discharge site
- Alto Subarea – south to north/northeast
- Centro Subarea – south to north on the west side of Iron Mountain, leading to Harper Lake that acts as an evaporation discharge site. East of Iron Mountain there is flow south to north and northwest around the mountain, ending at Harper Lake, as well as flow to the east/northeast
- Baja Subarea – west to east/northeast towards Afton Canyon, with some flow heading northward to Coyote Lake – another evaporative discharge site



**1998 Water Level Contours**

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-6

Date: January 2004

Prepared By: KTW

Groundwater flow in the Morongo Groundwater Basin east of the Este Subarea is generally from west to east-northeast (Figure 3-6). Natural recharge influx originates from the mountains on the southern and western boundaries of the basin – resulting in groundwater flow gradients to the north, east, and south adjacent to these boundaries, before turning to the east-northeast.

Groundwater is almost universally flowing in an east-northeast direction to the eastern boundary of MWA. There is no water level data to verify whether the flow continues in this direction beyond MWA boundary. Localized groundwater flow conditions exist in the vicinity of the developed area of Yucca Valley, where there is an artificial recharge site.

The Regional Aquifer in the Morongo Groundwater Basin is composed of Quaternary and Tertiary sediments of continental origin, bounded and traversed by faults in many of the subbasins.<sup>14</sup> The sediments are unconsolidated near the surface, becoming partly consolidated and less permeable at depth; most well production comes from the unconsolidated section. Aquifer thickness is not well known throughout the basin, but is known to be greater than 750 feet near Yucca Valley and Joshua Tree based on well depths and is believed to be as much as 10,000 feet thick.<sup>15</sup> The aquifer system in the Morongo Groundwater Basin has not been characterized in detail. Water quality is not known at depth.

The major development in understanding the geology and hydrogeology of the Mojave Basin Area in the past few years has been a better differentiation of the alluvial aquifers that lie beneath and near the Mojave River, and in particular, the nature of groundwater flow through these units. In the past, the conceptual model for the alluvium that lies beneath the Mojave River has been more or less a homogeneous unit of interbedded sands, gravels, silts and clays. Recently studies have led researchers to conclude that the permeability of the alluvium changes significantly with horizontal and vertical distance from the river course, resulting in two interconnected aquifers: the Floodplain Aquifer and the Regional Aquifer.<sup>16</sup>

The new conceptual model is illustrated by the USGS cross-section<sup>17</sup> presented herein as Figure 3-4. Directly beneath the river, unconsolidated alluvium up to 250 feet thick called Recent Mojave River Alluvium (Qra) and Younger Mojave River Alluvium (Qya) has relatively high permeability with mostly clean sands and gravels, which results in rapid percolation of surface flow. In some places Qra and Qya are separated by a low permeability, clay-rich layer; this layer is most pervasive in the Alto Transition Zone. This alluvium (Qra and Qya) has been designated

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<sup>14</sup> Smith and Pimentel 2000

<sup>15</sup> Moyle 1984

<sup>16</sup> Stamos, et al., 2001

<sup>17</sup> *ibid*

the Floodplain Aquifer. The aquifer extends in width from 120 feet at the Upper Narrows to more than five miles in parts of the Baja Subarea, as shown in Figure 3-1.<sup>18</sup>

One of the formations comprising the Regional Aquifer is an older unconsolidated alluvial unit called the Older Alluvium of the Ancestral Mojave River (QToa). This unit lies directly beneath and alongside the Qya alluvium, extending up to five miles on each side of the present river course – not always outcropping at the surface (Figure 3-4). The thickness of the unit is about

*The unique characteristics of the Floodplain and Regional Aquifers are important considerations for developing alternatives.*

400 to 500 feet south of the Southern California Logistics Airport and about 25 to 80 feet north of that point.<sup>19</sup> The Older Alluvium has lower permeability than the Floodplain Aquifer units and is made up of fluvial sands, gravels, and silts deposited by the ancestral Mojave River during the middle Pleistocene (about 800,000 years ago).

The other unit comprising the Regional Aquifer is the Undifferentiated Alluvium (QTu), which is generally less influenced by the recent and ancestral Mojave River. This is by far the largest alluvial unit in the basin, consisting of poorly sorted sands, gravels, silts, and clays. The Undifferentiated Alluvium has lower permeability than the alluvium deposited by the recent and ancestral Mojave River due to the accumulation of secondary cementing agents and poor grain sorting. Also, the permeability in this unit decreases with increasing depth, resulting in reduced flow between the upper 300 to 800 feet and lower zones (as deep as 2,000 feet). The surface boundaries of the two aquifers approximated by USGS are shown in Figure 3-1.

The difference in groundwater flow characteristics between the Floodplain and Regional aquifers is well illustrated by the difference in representative hydrologic properties. The two most important characteristics describing the occurrence and movement of groundwater are the rate at which water can move through a cross-section of the aquifer and the amount of water that can be drained from a volume of the aquifer; these characteristics are quantified by the properties of transmissivity and specific yield, respectively.

Transmissivity is directly proportional to a particular aquifer's thickness. Comparison of transmissivity estimates in the two aquifers, determined from well pumping analysis<sup>20</sup> and calibration of the USGS simulation model,<sup>21</sup> indicate that as much as a 10 to over 1,000 times greater amount of water can be moved across an identical width of the Floodplain Aquifer within

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<sup>18</sup> *ibid*

<sup>19</sup> *ibid*

<sup>20</sup> Hardt 1971

<sup>21</sup> Stamos, et al., 2001

the same time period as compared to the Regional Aquifer. Comparison of specific yield estimates determined from calibration of the USGS simulation model<sup>22</sup> indicate that the Floodplain Aquifer can store about two to four times as much removable water per unit volume than the Regional Aquifer.



While the Floodplain and Regional aquifers have different hydrologic properties, they are connected hydraulically; that is, water and fluid pressure responses are transmitted between the aquifers.<sup>23</sup> Unlike many of the faults in the area that are barriers to flow, there is not a continuous impermeable barrier between the two aquifers; the geologic conceptual model is that the younger, higher permeability, unconsolidated alluvium of the Floodplain Aquifer lays directly on top of the older, lower

permeability, unconsolidated alluvium of the Regional Aquifer.<sup>24</sup> The hydraulic connection between aquifers is supported by chemical and isotopic data which indicate that in areas near the river the Regional Aquifer contains water that was recharged by the Mojave River less than 50 years ago.<sup>25</sup> However, the same study concludes that the earliest the water at some distance from the Mojave River (located within the Regional Aquifer) has been recharged is on the order of thousands of years.

Recent groundwater simulation model runs by the USGS have shown that in the Alto, Transition Zone and Baja subareas the groundwater flowed from the Regional Aquifer to the Floodplain Aquifer during predevelopment conditions and from the Floodplain Aquifer to the Regional Aquifer (a reversal of flow) during the adjudication period from 1931-90.<sup>26</sup> In the Centro Subarea groundwater flowed from the Floodplain Aquifer to the Regional Aquifer during both periods, but the rate of flow increased significantly during the adjudication period. These results indicate that pumpage can cause changes in fluid pressure that can dramatically reverse and increase the amount of groundwater flowing from the Floodplain to the Regional Aquifer – further supporting the contention that the aquifer systems are connected. However, the results do not necessarily show that the reverse scenario is plausible – that changes in the pumpage or recharge can cause a large inflow of groundwater from the Regional to the Floodplain Aquifer.

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<sup>22</sup> *ibid*

<sup>23</sup> Stamos et al. 2001b

<sup>24</sup> *ibid*

<sup>25</sup> Izbicki et al. 1995

<sup>26</sup> Stamos et al. 2001b

Nor do the results indicate how far into the Regional Aquifer, and at what rate, the inflow from the Floodplain Aquifer reaches.

The USGS has applied their model to simulate the effect of artificial recharge on groundwater levels in the Mojave River Groundwater Basin.<sup>27</sup> These modeled results show that 20 years of artificial recharge at eight sites along the Mojave River and a few locations in the Regional Aquifer markedly mitigate the decline in groundwater levels within a ten mile radius of the recharge sites, particularly compared to drought conditions. The simulation does not explicitly account for the movement of the artificial recharge water through the unsaturated zone to the water table, a process that could take a long time and result in considerable water losses. A chemical tracer study performed by the USGS at a potential artificial recharge site near Victorville (Alto Subarea)<sup>28</sup> in a wash off the main Mojave River channel concludes that it takes about 200 years for natural recharge water from an intermittent stream bed to infiltrate to the water table 130 meters below the surface. However, it should be noted that constant wetting from artificial recharge should considerably decrease the time required for water to reach the water table.

The significance of the recent geologic and hydrogeologic findings from a regional water management standpoint is that water moves through the Floodplain Aquifer at much higher rates than through the Regional Aquifer, although the two aquifers appear to be hydraulically linked. As a consequence, stresses originating from either of the aquifers can significantly affect groundwater flow direction and rates in the Floodplain Aquifer, as well as recharge rates from the Mojave River into the Floodplain Aquifer – which accounts for 80% of the total recharge to the Mojave River Groundwater Basin.<sup>29</sup>

The slow groundwater flow rates in the Regional Aquifer and the preferential groundwater flow path along the much more permeable Mojave River may make it difficult to recharge the pumping depressions in the Regional Aquifer by way of percolation ponds along the river. Therefore, overcoming low groundwater levels in pumping depressions that are away from the river will require recharge facilities overlying the Regional Aquifer. Further, because of the very low permeability zones layered within the undifferentiated alluvium that might restrict vertical migration of recharge water, injection wells should be investigated as a mechanism to recharge these areas.

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<sup>27</sup> *ibid*

<sup>28</sup> Izbicki et al. 2000

<sup>29</sup> Stamos et al. 2001b

Another key finding is how significantly the numerous geologic faults impede groundwater flow in the basin. At least 12 of the faults that cross the basin (faults are shown in Figure 3-4), mostly in a northwest-southeast direction, are horizontal barriers, or partial barriers, to flow in the Regional Aquifer and, in some cases, the Floodplain Aquifer.<sup>30</sup> These faults are characterized by large, “stair step” drops in the water table across the faults and, in some cases, significant changes in the groundwater flow direction – indicating limited groundwater movement across the faults.

### **DWR Documentation of Overdraft Conditions**

The Department of Water Resources’ Bulletin 118 series documents conditions in California’s groundwater basins. The 1980 edition of Bulletin 118 states that there is evidence of overdraft in the following basins: Lower Mojave River Valley, Middle Mojave River Valley, Upper Mojave River Valley, Harper Valley, Warren Valley and Lucerne Valley.

The 2003 edition of Bulletin 118 did not include an evaluation of individual groundwater basins to determine if they were in overdraft.

### **Efforts to Eliminate Overdraft**

Each of the groundwater basins that are identified as being in overdraft in Bulletin 118 has been subjected to adjudication. The Lucerne Valley and Upper, Middle, and Lower Mojave River Valley basins are included in the Mojave Basin Area Judgment. The Warren Valley Basin is adjudicated by the Warren Valley Basin Judgment. The Mojave Basin Area and Warren Valley adjudications mandate that the groundwater extractions from each basin do not exceed the estimated annual supplies, and empower the Watermasters of each basin to enforce pumping limits to ensure that the groundwater basins are not overdrafted.

One of the fundamental objectives of this Plan is to “balance future water demands with available supplies recognizing the need to stabilize the groundwater basin storage balance over long-term hydrologic cycles.” As part of preparation of this Plan update, projects and management actions were identified that would allow MWA to meet this objective by 2020 while also meeting a second objective to “maximize the overall beneficial use of water throughout MWA by supplying water in quantity and of quality suitable to the various beneficial uses.” These objectives are described in greater detail in Chapter 9.

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<sup>30</sup> *ibid*



## Surface Water

### Riparian Habitat/Wetlands

Within the Mojave Water Agency boundaries are various habitat types that are mostly characterized by desert plants and animals. However, there are some important wetland and riparian areas that exist along the Mojave River, Harper Dry Lake, portions of Sheep Creek, and various other drainages. How the agency addresses these areas is mostly dependent on whether they lie within, or outside, the Mojave Basin adjudicated area and Exhibit H to the Judgment. Exhibit H outlines a Biological Resource Mitigation Trust Fund that provides funding to support water table elevations that DFG proposes as necessary to maintain the riparian habitat of these areas, including specific species. Specific wells and monitoring locations are established in Exhibit H. A biological mitigation fund is described which will be expended for mitigation if certain criteria aren't met. For a detailed list of species, monitoring requirements, and biological trust fund conditions please refer to Exhibit H of the Mojave River Area Judgment located in Appendix A of this Plan.

### Exhibit H

Exhibit H of the Mojave River Area Judgment defines riparian areas to be maintained in the Mojave River Floodplain from approximately the Upper Narrows to the Lower Narrows, the Lower Narrows to the Helendale Fault, Transition Zone, and the Baja Subarea reach of the Mojave River also referred to as the Camp Cady area (refer to habitat figures in Exhibit H). Mitigations defined for these riparian areas consist of hydrologic flow requirements and groundwater or surface water elevations.

Exhibit H specifies the flow desired by Fish and Game to maintain riparian habitat in the Transition Zone to be 21,000 acre-feet per year. Much of the flow in the Transition Zone comes from the wastewater treatment facility owned and operated by the Victor Valley Wastewater Reclamation Authority (VWVRA) who is not a party to the adjudication. In order to assure maintenance of the riparian area in the Transition Zone, DFG entered into a Memorandum of Understanding with VWVRA in July 2003 to maintain flows from the wastewater treatment facility that will, in conjunction with base flow, provide 15,000 acre-feet per year to the Transition Zone. VWVRA discharge obligations will be limited to 9,000 acre-feet per year from the treatment facility. This MOU was entered into to ensure that any construction and operation of sub-regional treatment facilities would not adversely affect the riparian areas of the Transition Zone.

Riparian areas between the Upper and Lower Narrows consist mostly of Cottonwood Willow habitat that is in fairly good condition. The San Bernardino County Flood Control District does regular mechanical maintenance of the channel, and the area is highly urbanized. DFG is not currently concentrating efforts to restore habitat in this area.<sup>31</sup>

As recent as the mid-1970s, the Camp Cady area had thriving Mesquite groves with three ponds in the central and eastern sections. Since then, groundwater elevations have dropped about 40 feet and most of the Mesquite trees on the western end are dead or dying. Flood flows in the 1990s damaged earthen dikes impounding water in the channel and the ponds have since emptied leaving little water in the river channel. DFG has purchased property at the western edge of this area and is focusing efforts on maintaining channel flows, and perhaps reestablishing surface water ponding, to provide habitat for terrestrial animals.

Groundwater levels were established in Exhibit H for key wells in the Mojave River floodplain. These wells, and their associated groundwater levels as measured from the ground surface to standing water are included below in Table 3-2.

**Table 3-2: Groundwater Elevations Established in Exhibit H**

<b>Well</b>	<b>Location</b>	<b>Groundwater Level (feet)</b>
H1-1	Victorville/Alto zone (upper Narrows area)	7.0 below surface
H1-2	Victorville/Alto zone (upper Narrows area)	7.0 below surface
H2-1	Lower Narrows/Transition Zone zone	10.0 below surface
H3-1	Harvard/Eastern Baja Riparian Forest Habitat (Camp Cady Area)	7.0 below surface
H3-2	Harvard/Eastern Baja Riparian Forest Habitat (Camp Cady Area)	1.0 above surface

Note: Of these wells, only H3-1 has been installed; other monitoring is accomplished using surrogate wells or gauging stations (L. Eckhart, personal communication, November 26, 2003).

### Areas outside Exhibit H

There are also riparian areas outside of the adjudicated area boundary both within and outside the MWA service area. Most notably are riparian areas from Big Bear to the adjudicated area along the Deep Creek, the Western Fork of the Mojave River from Silverwood Lake, the Afton Canyon area on the eastern end of the adjudicated area, and areas in Harper Dry Lake and Lucerne Valley.<sup>32</sup>

Most of the land along Deep Creek is owned and managed by the U.S. Forest Service. The riparian habitat from the Fish Hatchery to the adjudicated area is in good condition. An area known as Rancho Los Flores has riparian habitat in good condition that is currently under

<sup>31</sup> T. Billhorn, personal communication, Nov. 17, 2003

<sup>32</sup> B. Jones, personal communication, Nov. 24, 2003

pressure from development. The DFG is working with the developers to address these issues. The Fish Hatchery diverts about 9,000 acre-feet per year of water, but most of this is returned to the river after flowing through the hatchery.

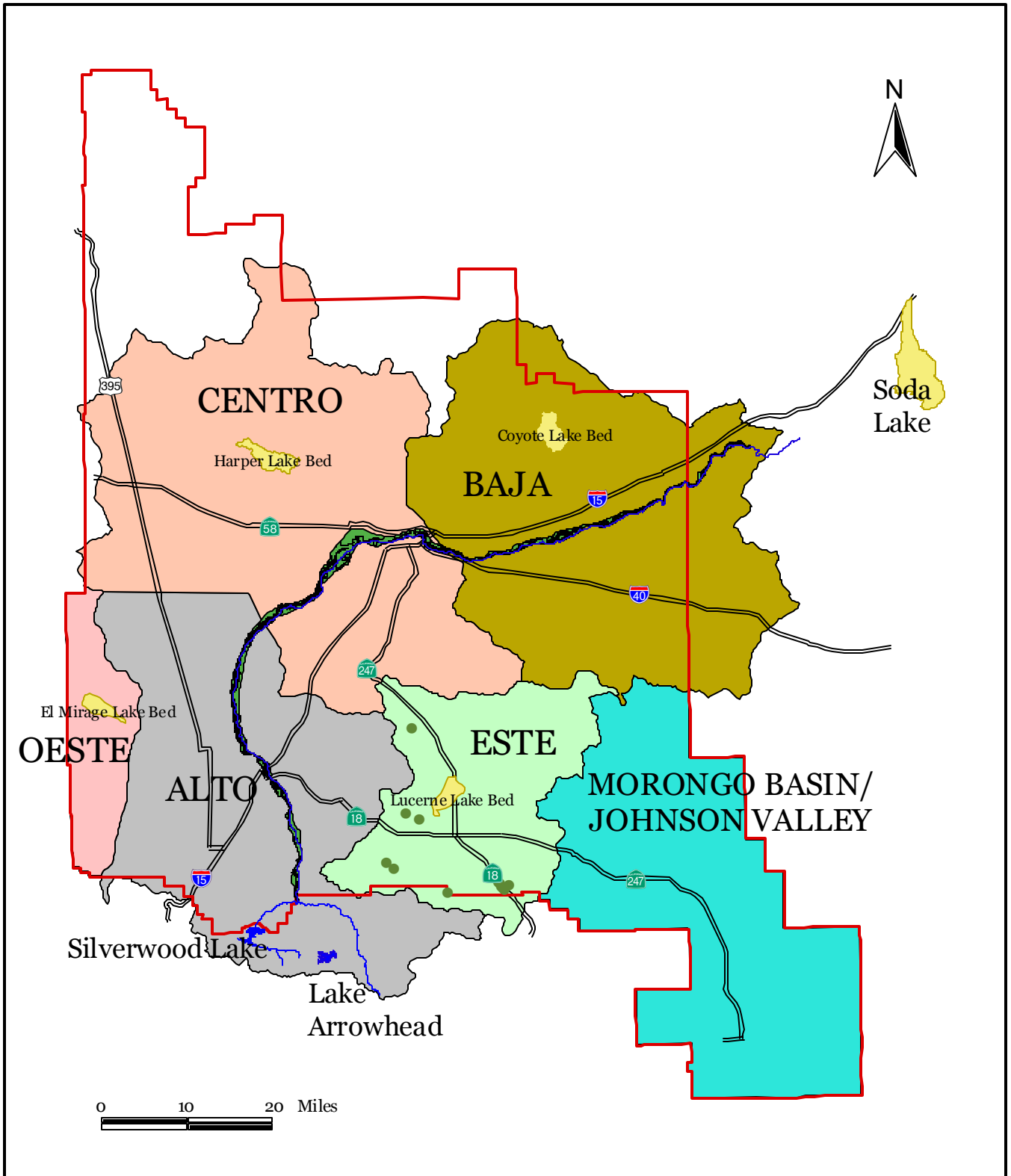
Harper Dry Lake has federally-designated wetlands (marked by emergent vegetation) that historically were maintained mostly by agricultural irrigation runoff from the Most agricultural property that went out of business in the early 1990s. Since then, the Bureau of Land Management (BLM) has been working with FPL Energy Operating Services, a company that manages a nearby solar power plant, to reestablish flows to specific marsh areas, mostly the southeastern portion of Harper Dry Lake. The California Energy Commission made enhancement of the marsh areas a condition of the power plant permit and incorporated this into the mitigation measures. BLM designated this area a Watchable Wildlife Area, which has abundant wildlife species including migrant waterfowl. BLM is currently looking to acquire more property in the area to further enhance the wetland areas.

Lucerne Valley has some riparian areas scattered mainly around washes and springs along the mountain ranges to the south. These areas include Rabbit Springs, Old Woman Springs, and various washes. Most of these properties, such as Rabbit Springs, are in private ownership. The habitat is marked by Cottonwood/Willow habitat with many sensitive species. The source of water for these areas is naturally occurring springs that continue to produce good quality water. Most of the habitat is located at spots along the Helendale fault. There are groups of individuals working with the property owners to preserve portions of the riparian areas on the property.<sup>33</sup>

Afton Canyon Natural Area is located 37 miles northeast of Barstow along Interstate 15 between the Afton Road and Basin Road exits. Afton Canyon is designated as an Area of Critical Environmental Concern to protect plant and wildlife habitat, and to preserve scenic values of the riparian area within the canyon. Afton Canyon is one of two stretches of the Mojave River that maintains continuous flow throughout the year. The BLM is currently in the fourth year of a multi-year effort to restore the riparian and wetland values in the area. Riparian areas determined by MWA are shown in Figure 3-7.

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<sup>33</sup> C. Bell, personal communication, Nov. 25, 2003



**Riparian Habitat and Dry Lake Beds**

Mojave Water Agency  
2004 Regional Water Management Plan

Figure 3-7  
November 2003  
Prepared by: KTW

## Climate

The Mojave Water Agency maintains a Climatology Network that consists of 14 weather stations collecting various weather data on temperature, precipitation, and evaporation. Rain gages are mostly located within the Mojave Basin Area and the surrounding mountains. Runoff in the upper watershed contributes substantially more to the recharge of the basin than precipitation falling in the basin. Average rainfall within the lower lying areas of the Mojave Basin Area and Morongo Basin/Johnson Valley area is roughly five inches per year. Data for precipitation at the Lake Arrowhead gage, located in the San Bernardino Mountains, was analyzed to evaluate the extreme annual variations in stream flow. The average yearly precipitation at this gage is 43.2 inches per year. The standard deviation about the mean is 19.7 inches per year. This high standard deviation correlates to large fluctuations in the annual amount of rainfall received in the San Bernardino and San Gabriel Mountains – the former being the primary source of recharge for the groundwater basin. The large variation in annual rainfall within the surrounding mountains directly affects the annual water supply of the basin, and is further discussed in Chapter 4 of this Plan.

## Wastewater

Wastewater is imported to the Mojave Basin Area from the Lake Arrowhead Community Services District, Big Bear Area Regional Wastewater Agency, and Crestline Sanitation District.<sup>34</sup> In 2000, the Alto Subarea received 1,941 acre-feet from the Lake Arrowhead CSD, discharged into the Mojave River about two miles downstream of the Forks. The Crestline Sanitation District discharged 863 acre-feet into the Alto subarea upstream of the West Fork gage at the Los Flores Ranch. In 2000, the Este Subarea received 2,600 acre-feet from Big Bear ARWWA, discharged near Camp Rock Road and Highway 247 in the Lucerne Valley.

The City of Adelanto, the City of Barstow, and the Victor Valley Wastewater Reclamation Authority (VWVRA) provide wastewater collection and treatment services within the Mojave Water Agencies boundaries. The VWVRA serves Victorville, Hesperia, Apple Valley, and San Bernardino County Service Areas 42 and 64. VWVRA is by far the largest of the wastewater agencies with a current treatment capacity of 11.0 million gallons per day (MGD) with plans to expand by another 7.0 to 8.5 MGD by 2020. The City of Adelanto treats 1.2 MGD while the City of Barstow treats 0.066 MGD. County Service Area 70-C serves Silver Lakes. The USMC camp at Nebo also provides wastewater treatment services. There are currently no users of reclaimed wastewater in the MWA service area, although there are a number of entities identified to receive reclaimed wastewater in the future.

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<sup>34</sup> Mojave Basin Area Watermaster 2001

## The City of Adelanto

The City of Adelanto currently treats 1.2 MGD of wastewater and discharges this quantity to percolation ponds.

## The City of Barstow

The City of Barstow collects wastewater through a system constructed starting in 1939. Barstow currently contracts the operation of its wastewater collection and treatment system. The system has the capacity to treat 7.5 MGD through aeration basins, secondary clarifiers, a chlorine contact chamber, and a chlorine contact lagoon. After treatment, the effluent is discharged to the Mojave River adjacent to the treatment facilities. Currently the City collects and treats 66 thousand gallons per day (0.066 MGD) of wastewater. With anticipated growth, the treatment plant is anticipated to treat 1.75 MGD by 2020. There is currently no wastewater recycling activity nor are there plans to recycle wastewater in the future.<sup>35</sup>

## Victor Valley Wastewater Reclamation Authority

VVWRA conveys wastewater using 40.5 miles of interceptor sewer and two pump stations to its Regional Wastewater Reclamation Plant. Approximately 9.8 MGD is currently treated at the VVWRA facility which has a capacity of 11.0 MGD. Processes employed 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 reclaimed water is then discharged directly into the Mojave River channel or percolated into ponds in the Floodplain Aquifer. VVWRA and the Department of Fish and Game entered into an MOU to provide minimum discharge of approximately 9,000 acre-feet per year (24.7 acre-feet per day) to the Mojave River Channel to support riparian vegetation and habitat.

VVWRA estimates that its capacity to collect and treat wastewater with the existing facilities will be surpassed around 2006.<sup>36</sup> VVWRA estimates that the wastewater flow by 2020 will be approximately 18.62 MGD. The current plan for dealing with the additional growth and increase in wastewater treatment requirements is to construct two sub-regional recycled water facilities by the year 2005. Another two sub-regional facilities are projected to be built by 2010. These facilities will provide additional wastewater treatment and at the same time, produce recycled

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<sup>35</sup> City of Barstow General Plan – Part C, Chapter VI.2 Utilities and Public Services, Technical Report 4/20/1997

<sup>36</sup> Sewerage Facilities Plan Update, Year 2000 Amendment, Adopted by the VVWRA Board of Commissioners October 26, 2000.

water for the surrounding communities. There are currently no off-site consumers of reclaimed wastewater in the VVWRA service area although in June 2003 the Lahontan Regional Water Quality Control Board granted VVWRA a permit to use recycled water to irrigate the golf course and landscaped areas at the Southern California Logistics Airport. The project represents VVWRA's first off-site recycled water use project (landscaping at the treatment facility on Shay Road is already irrigated with recycled water, and recycled water is used for processing, dust control, and fire protection at the on-site regional compost facility). 131 potential recycled water customers have been identified with a combined need for about 37,400 acre-feet per year (afy). Twenty-two large customers were identified with a total need for 8,677 afy including several golf courses, parks, municipalities, and schools. The quantity of expected wastewater flows is described in Table 3-3 in 5-year increments to 2020.

**Table 3-3: Total Wastewater Flow Projections (MGD)**

<b>Member Agency</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Victorville including SCLA	5.38	6.33	7.58	8.96	10.29
CSA 42	0.05	0.05	0.05	0.05	0.05
CSA 64	0.74	0.89	1.04	1.21	1.28
Apple Valley	1.46	1.87	2.26	2.80	3.42
Hesperia	1.06	1.52	2.07	2.75	3.58
<b>Total</b>	<b>8.69</b>	<b>10.66</b>	<b>13.00</b>	<b>15.77</b>	<b>18.62</b>

Based on the assumption that all of the additional flows would be recycled, and the identified possible users, the projected recycled wastewater that will be produced and used is shown in Table 3-4.

**Table 3-4: Recycled Water Projections (MGD)**

<b>Member Agency</b>	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Victorville including SCLA	0.00	0.95	2.20	3.58	4.91
CSA 42	0.00	0.00	0.00	0.00	0.00
CSA 64	0.00	0.15	0.30	0.47	0.54
Apple Valley	0.00	0.41	0.80	1.34	1.96
Hesperia	0.00	0.46	1.01	1.69	2.52
<b>Total</b>	<b>0.00</b>	<b>1.97</b>	<b>4.31</b>	<b>7.08</b>	<b>9.93</b>

The estimated cost to provide facilities to reclaim the projected amount of wastewater is \$75 million to \$125 million. Annual operation and maintenance costs for each subregional facility ranges from \$0.55 to \$1.13 million. The project is to be funded from a number of federal or state grants and low-interest loans obtained through the State Revolving Fund. Consultants have been retained to provide engineering and environmental documentation services for the four

subregional treatment facilities. The cost of providing reclaimed water, transmission infrastructure, and ownership of distribution facilities has yet to be determined.

The Wastewater Reclamation and Recycling Program address a number of issues in the VVWRA service area. The need for additional collection and transmission facilities, the desire of the member agencies to use water as wisely as possible, and the need for additional treatment capacity have all contributed to the aggressive pursuit of this program.



# 4

## Water Supply

This chapter reviews the current understanding of the water supply within the Mojave Water Agency (MWA). The variability of water supply and delivery capability of the State Water Project (SWP) are summarized. Actual water deliveries from the SWP to the MWA from 1978-2001 are also presented.

### Mojave Basin Area

A summary of the water supply for the Mojave Basin Area is included in this section based on the average and median surface water inflows. The average and median water supplies are compared to illustrate the extreme variations in annual water supply for the Basin. Elements of

*Water supplies in the Mojave Water Agency service area are highly variable - an important factor in developing project alternatives.*

water supply examined in this section include: gaged surface flow, ungaged surface flow, subsurface flow, deep percolation of precipitation, wastewater imports, and phreatophyte consumption.

### Gaged Surface Inflow and Outflow

The average water supply to the basin during the period 1931-2001 was determined in part from U.S. Geological Survey (USGS) stream gage records. A review of these records indicates the flow of the river and thus the Basin water supply is highly variable.

A number of sites on the Mojave River have historically been monitored for surface flow. Records for some sites extend as far back as 1900. Consistent records are available from 1931 when USGS established gaging stations on the Mojave River. Consequently, data from 1931 and forward are utilized for water supply planning purposes.

Five stream gage locations with records to at least 1931 are currently monitored on the Mojave River. Table 4-1 summarizes these gages, indicating the period of record, average, median, peak and minimum flow at each gage. The stream gages are maintained and operated by the USGS

under a cooperative program with MWA. All gages currently in operation record river stage data in fifteen-minute increments. USGS personnel take a direct stream measurement at least once a month and more frequently during storm events. The Lower Narrows Gage has direct measurements taken at least once a week.

Table 4-1: Mojave River Stream Gages

Gage Name and Station Number	Period of Record <sup>1</sup>	Average Flow <sup>2</sup>	Median Flow <sup>2</sup>	Peak Flow <sup>2</sup> (Year)	Minimum Flow <sup>2</sup> (Year)
West Fork Near Hesperia (10261000) <sup>3</sup>	1930	23,500	6,200	134,400 (1978)	0 (1951)
Deep Creek Near Hesperia (10260500)	1905	47,800	21,000	304,400 (1993)	2,200 (1951)
Lower Narrows Near Victorville (10261500) <sup>4</sup>	1900	52,400	23,200	298,500 (1969)	5,300 (2001)
Barstow (10262500)	1931	16,700	0	151,800 (1969)	0 (Many)
Afton (10263000)	1930-32, 1952-78, 1981-02 <sup>5</sup>	8,100	900	75,600 (1969)	200 (1975)

<sup>1</sup>All gages listed are currently operational.

<sup>2</sup>For period of record 1931-2001. Flow refers to acre-feet per year.

<sup>3</sup>The USGS has operated two gages at West Fork since 1930, 10261000 and 10260950.

<sup>4</sup>The Lower Narrows Gage was located about 3 miles upstream from its current location and operated there from 1900-1906 and 1931-36.

<sup>5</sup>USGS has estimated the record for the missing periods.

Three additional sites on the Mojave River were previously gaged to monitor stream flow. These sites were eventually determined to be unsuitable primarily due to unstable controls and changing stage-discharge relationships, and were abandoned. The sites and their periods of record include Below Forks Near Hesperia (1972– 96), Wild’s Crossing Near Helendale (1967-70) and Hodge (1931, 1971-92).

Figure 4-1 shows the location of the operating stream gages summarized in Table 4-1. The Deep Creek station is located about 1 mile upstream of the confluence with the West Fork of the Mojave River (known as the “Forks”). The drainage area tributary to the Deep Creek Gage is 134 square miles.

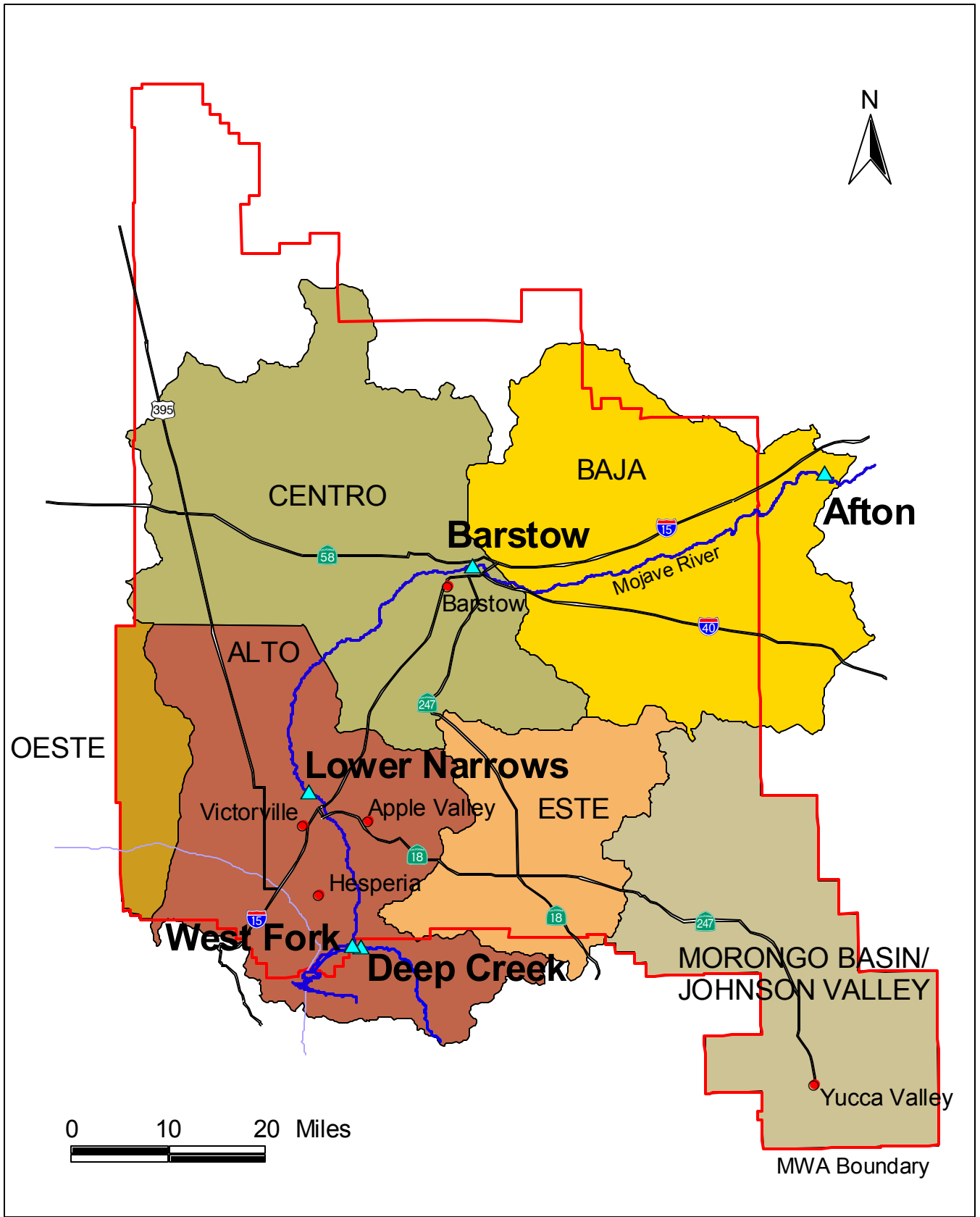
Two gaging stations have been operated on the West Fork of the Mojave River. The first station (10261000) was located approximately 0.5 mile upstream of the Forks and operated from 1930-71, before the construction of the Cedar Springs Dam at Silverwood Lake and the Mojave River Dam at the Forks. The second station (10260950) is located approximately 0.6 mile upstream of

the Forks and has been operated since 1974. The drainage area tributary to the West Fork Gage is 70.3 square miles.

The dam at the Forks is ungated and serves to attenuate peak flows during large storm events and prevent downstream flooding. The flow at this location constitutes the primary water supply to the main stem of the Mojave River; consequently, the combined data from the Deep Creek and West Fork gages represent the total flow at the headwaters of the Mojave River. The average annual discharge at the Forks is 71,300 acre-feet for the period 1931 through 2001.

The source of water at the Forks is runoff from snowmelt and rainfall originating in the San Bernardino Mountains. Lower velocity flows from snowmelt and smaller storm events usually percolate into the riverbed a short distance downstream of the Forks. The surface water tends to flow in a northerly direction within the river channel towards the Narrows, which is approximately five miles in length and is subdivided into the Upper and Lower Narrows. The groundwater gradient is in the same general direction and groundwater is discharged into the River upstream of the Upper Narrows about 12 miles below the Forks. This occurs due to shallow bedrock that forces groundwater back into the River channel.

The Lower Narrows gage is located approximately 18 miles downstream of the Forks near the City of Victorville. The drainage area tributary to the gage is 513 square miles. A second gage was installed at this site in 1996 to refine recordings of low flows. The low flow gage was washed out in the winter of 1998 and replaced the following summer.



**Stream Gauge Locations**  
 Mojave Water Agency  
 Regional Water Management Plan Update

Figure 4-1  
 Date: January 2004  
 Prepared By: KTW

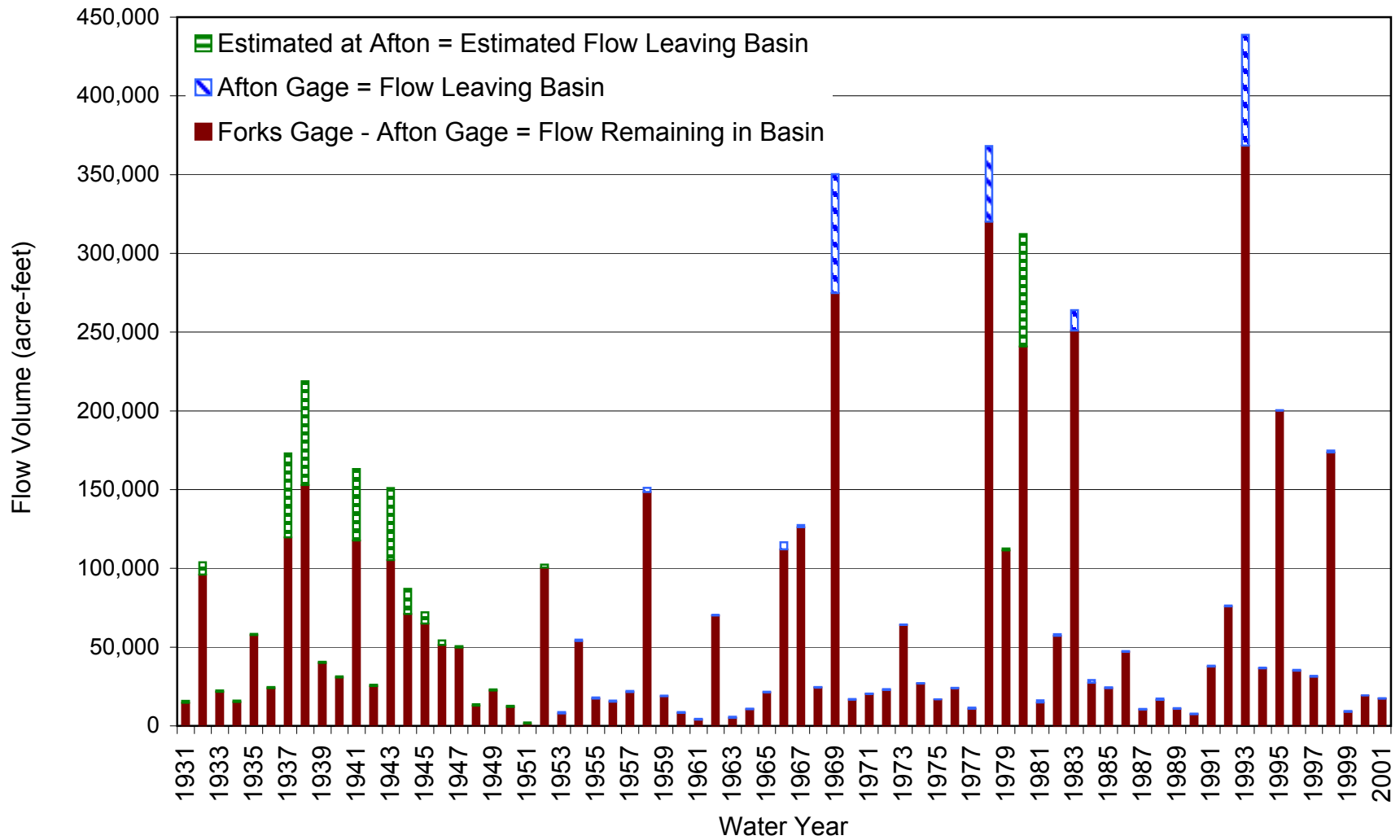
Data from this site is used to determine compliance with obligations for the maintenance of a certain minimum base flow from the Alto to the Centro Subarea as mandated by the Mojave Basin Area Judgment (1996). Base flow is defined by the Judgment as “that portion of the total surface flow measured annually at Lower Narrows which remains after subtracting storm flow.” The average annual discharge of total flows at Lower Narrows is 52,400 acre-feet for the period from 1931 to 2001. Base flow there has historically been as high as 26,700 acre-feet in Water Year 1940-41 and averaged approximately 21,000 acre per year for the period 1931-90. The base flow at the Lower Narrows in Water Year 2001 is at a historic low of 5,345 acre-feet.

Base flow leaving the Lower Narrows region quickly infiltrates back into the river channel. Surface flows are augmented about 22 miles downstream of the Forks (4 miles downstream of the Lower Narrows) by discharges from the Victor Valley Wastewater Reclamation Authority (VWVRA). The discharges from the treatment plant continue as surface flows for about 4 miles nearly to the community of Silver Lakes. Discharges from the VWVRA totaled 9,006 acre-feet in Water Year 2000.

The Barstow gage is approximately 53 miles downstream from the Forks. This gage site is typically dry because the River flows at Barstow only in response to large storm events in the watershed. The average annual discharge at this location is 16,700 acre-feet for the period from 1931 to 2001. The Barstow gage has recorded surface flow in 35 of the 71 years of operation. The tributary drainage area is 1,291 square miles.

The Afton gage is located about 100 miles downstream of the Forks and is about 6 miles downstream (east) of the eastern boundary of the Baja Subarea, providing a measure of surface water exiting the Mojave Basin Area. The Afton gage generally has a small component of baseflow, caused by thinning of the aquifer and associated low groundwater discharge. In some years the base flow has ceased, but averages about 400 acre-feet per year. The combined baseflow and stormflow results in an average annual discharge of 8,100 acre-feet at the Afton gage between 1931 and 2001. The drainage area for the Afton site is 2,121 square miles.

The stream gage data demonstrate that the majority of flow in the Mojave River is retained (recharged) in the Basin. During approximately 80% of the recorded years, discharge at the Afton gage averaged less than 1,000 acre-feet. The average difference between flow entering the Basin at the Forks and flow leaving the Basin at Afton is roughly 63,200 acre-feet per year during 1931 through 2001. Figure 4-2 compares the total flow entering the Basin to the total flow exiting the Basin annually. In most years, almost all of the surface water entering the Basin infiltrates within the Basin. Records show that a few large flows pass the Afton gage every nine



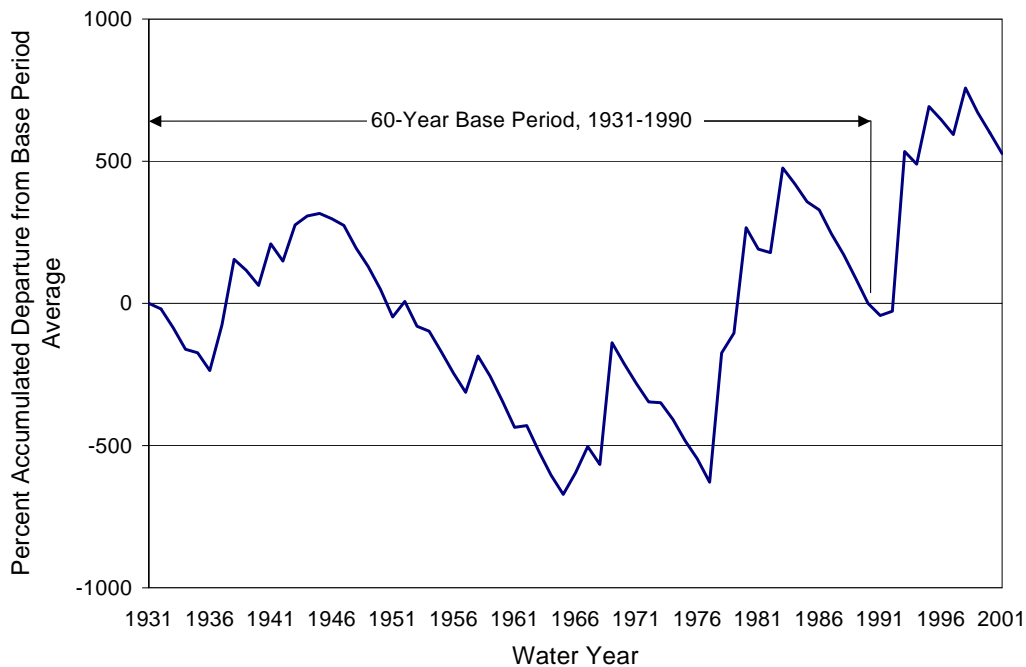
years on average. However, the recharge from these large storm event years (inflows minus outflows) contributes substantial amounts of water to the regional groundwater supply, and almost all of the water supply to the Centro and Baja subareas.

### **Annual Variability of Water Supply**

Average water supplies derived from a specific period of record are typically selected to be representative of long-term water supply conditions. Precipitation and runoff are highly variable and reliance upon an inappropriate period of record will misrepresent the quantity of water that may be available over the longer term. A representative hydrologic base period should contain a distribution of wet, dry and normal years. Determining average water supplies in this manner provides some certainty to the process of planning for the quantity of water that should be available and can accrue to groundwater storage.

The 1994 RWMP and the Mojave Basin Area Judgment utilize the hydrologic base period encompassing Water Years 1931 through 1990. This period was selected because the data available for the gages was continuous. The average flow at the Forks from 1931-90 was 65,000 acre-feet, with annual flows ranging from less than 6,500 acre-feet to more than 360,000 acre-feet. The median flow at the Forks for this same period was 24,700 acre-feet. Given the range of measured annual flows during this 60-year period, the median flow is the best representation of the amount of supply that can be expected in any given year over a long-term period.

A plot of the accumulated annual departure from the base period (1931-1990) average of 65,000 acre-feet for surface flows measured at the Forks is shown in Figure 4-3. This plot illustrates water supply trends on an annual basis for inflow recorded at the Forks. A negative sloping line from one water year to the next indicates a below average inflow and a positive sloping line indicates an above average inflow. The purpose of Figure 4-3 is to illustrate that since the base period (1931-1990) average of 65,000 acre-feet was established, the basin has experienced a wetter hydrologic period relative to that established average. This report recognizes the recent wet period (1991-2001) and utilizes this hydrologic data to calculate an updated basin water supply.



**Figure 4-3: Accumulated Departure from Base Period (1931-1990) Average for Seasonal Discharge at the Forks**

Extreme variations in streamflow have occurred at the Forks during the period of record. Annual values have ranged from 6,380 acre-feet to 428,700 acre-feet between 1931 and 2001. The extreme variations in streamflow at the Forks result in large annual fluctuations in available groundwater recharge.

Figure 4-4 displays a plot of exceedence probabilities for discharge at the Forks. The exceedence probability plot illustrates how often an annual flow of a certain magnitude is expected to occur. As an example, the average annual flow at the Forks is 71,300 acre-feet for 1931-2001. As shown on Figure 4-4, this average is weighted by the larger events that occur sporadically. Approximately 68% of the annual recorded flows have been below this average and 32% have been above this average. This should be considered for planning periods of five years or less because annual inflows less than the average volume are likely to occur in two out of three years. Statistically, three to five-year periods will occur where inflows to the basin will be well below the average total inflow. The basin is more likely to receive annual inflows closer to the median inflow of 27,200 acre-feet per year based on the period of record from 1931-2001. This means that half of the time the basin will receive more than 27,200 acre-feet per year and



less than 27,200 acre-feet per year the rest of the time. Water supply planning alternatives should consider the effect that variations from the average supply might have on any proposed alternatives.

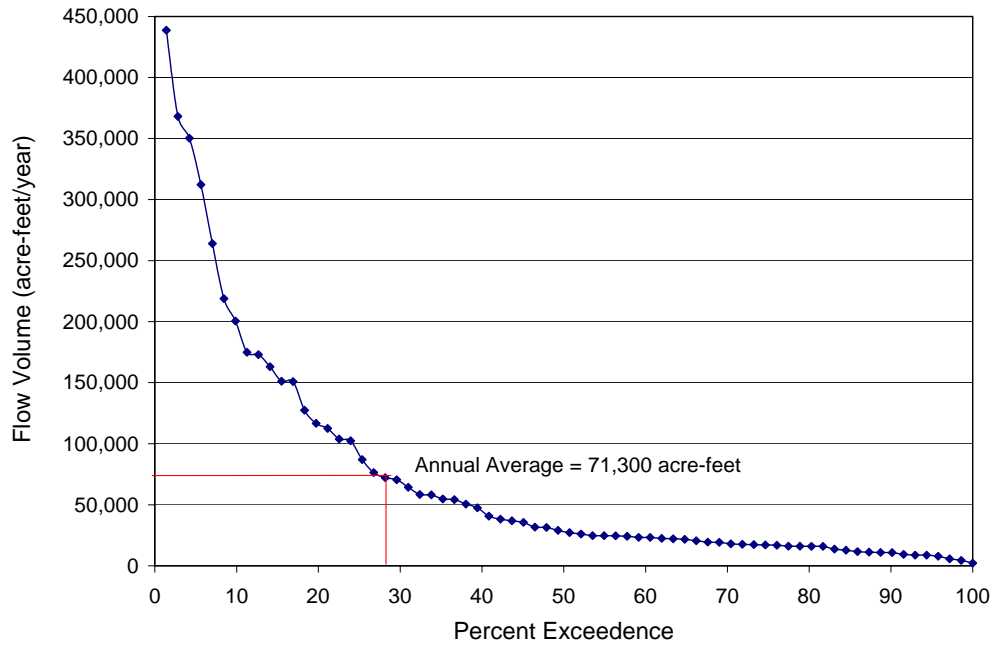


Figure 4-4: Percent Exceedence at the Forks (1931-2001)

### Ungaged Surface Inflow and Outflow

Table 4-2 shows that an estimated 7,200 acre-feet of ungaged water flows annually into the Este, Oeste, Alto, and Baja subareas of the Mojave Basin Area (Webb 2000). The only surface water outflow in the Mojave Basin Area is gaged through Afton Canyon.

Table 4-2: Mojave Basin Area - Net Average Annual Water Supply

	Este	Oeste	Alto	Centro	Baja	Entire Basin
<b>WATER SUPPLY</b>						
Surface Water Inflow						
Gaged	0	0	71,300 <sup>a</sup>	0	0	71,300
Ungaged	1,700	1,500	3,600	34,700 <sup>1</sup>	14,400 <sup>2</sup>	7,200 <sup>3</sup>
Subsurface Inflow	0	0	1,200	2,000	1,200	0 <sup>4</sup>
Deep Percolation of Precipitation	0	0	3,500	0	100	3,600 <sup>5</sup>
Import Wastewater						
Lake Arrowhead CSD	0	0	1,900	0	0	1,900 <sup>6</sup>
Big Bear ARWWA	2,600	0	0	0	0	2,600 <sup>6</sup>
Crestline Sanitation District	0	0	900	0	0	900 <sup>6</sup>
<b>Total:</b>	<b>4,300</b>	<b>1,500</b>	<b>82,400</b>	<b>36,700</b>	<b>15,700</b>	<b>87,500</b>
<b>OUTFLOW AND LOSSES</b>						
Surface Water Outflow						
Gaged	0	0	0	0	8,100 <sup>b</sup>	8,100
Ungaged	0	0	34,700 <sup>1</sup>	14,000 <sup>7</sup>	0	0 <sup>4</sup>
Subsurface Outflow	800	400	2,000	1,200	0	0 <sup>4</sup>
Phreatophyte Consumption	0	0	11,000 <sup>8</sup>	3,000 <sup>8</sup>	2,000 <sup>8</sup>	16,000
<b>Total:</b>	<b>800</b>	<b>400</b>	<b>47,700</b>	<b>18,200</b>	<b>10,100</b>	<b>24,100</b>
<b>NET AVERAGE ANNUAL WATER SUPPLY:</b>						<b>63,400</b>

<sup>1</sup>Estimates taken from Webb 2000

<sup>2</sup>Includes 14,000 ac.ft. of Mojave River flow from Centro and 400 ac.ft. of inflow from Kane Wash and Boom Creek; estimates taken from Webb 2000

<sup>3</sup>Sum of ungaged surface water inflows less ungaged surface water outflows; estimates taken from Webb 2000

<sup>4</sup>All subsurface flow is assumed to exchange within subareas (no external inflows or outflows). No external ungaged surface water outflow

<sup>5</sup>Estimates taken from Webb 2000

<sup>6</sup>Mojave Basin Area Watermaster 2001

<sup>7</sup>From reported flows at USGS gaging station, Mojave River at Barstow

<sup>8</sup>Phreatophyte consumption taken from Lines and Bilhorn (1996)

a Period of record from 1931-2001

b Period of record from 1931-2001; 1931-1952 are estimated values

## Subsurface Flow

Table 4-2 summarizes the subsurface inflow for the subareas within the Mojave Basin Area. No significant amount of groundwater is exchanged with areas outside the Mojave Basin Area. However, subsurface exchange does occur between subareas within the Basin (Webb 2000).

Approximately 1,200 acre-feet of groundwater combined annually flows from Este and Oeste to Alto; 2,000 acre-feet flows from Alto to Centro; and 1,200 acre-feet per year flows from Centro to Baja.

### **Deep Percolation of Precipitation**

An estimated 3,600 acre-feet of deep percolation of precipitation occurs annually in the Mojave Basin Area as shown on Table 4-2 (Webb 2000). The majority of the deep percolation of precipitation takes place in the Alto Subarea (3,500 acre-feet per year) and a minor component takes place in the Baja Subarea (100 acre-feet per year).

### **Wastewater Imports**

Wastewater is imported to the Mojave Basin Area from the Lake Arrowhead Community Services District, Big Bear Area Regional Wastewater Agency, and Crestline Sanitation District (Mojave Basin Area Watermaster 2001). In 2000, the Alto Subarea received 1,941 acre-feet from the Lake Arrowhead CSD, discharged into the Mojave River about 2 miles downstream of the Forks near the City of Hesperia. The Crestline Sanitation District discharged 863 acre-feet into Alto upstream of the West Fork gage at the Los Flores Ranch. In 2000, the Este Subarea received 2,600 acre-feet from Big Bear ARWWA, discharged near Camp Rock Road and Highway 247 in the Lucerne Valley.

### **Phreatophyte Consumption**

The most recent estimate of annual phreatophyte consumption is 16,000 acre-feet for 10,000 acres of riparian vegetation. The data is derived from analysis prepared in 1995 in a cooperative effort between the USGS, California Department of Fish and Game and the MWA (Lines and Bilhorn 1996). The analysis determined that 1995 was considered an average year of water consumption for the existing riparian vegetation, and noted that annual water use by riparian vegetation will vary by up to 50% from the average. Variation would depend on available water supply, with up to 50% more water than the average consumed during wet years and up to 50% less consumed during dry years. As shown in Table 4-2, the average consumption by riparian vegetation within Alto is 11,000 acre-feet per year, 3,000 acre-feet per year in Centro, and 2,000 acre-feet per year in Baja. The analysis found that of the 11,000 acre-feet average in Alto, 5,000 acre-feet is consumed above the Lower Narrows and 6,000 acre-feet is consumed between the Lower Narrows and the boundary with Centro (an area referred to as the “Transition Zone”). Another 600 acre-feet of average annual water consumption by riparian vegetation were also identified in the Afton Canyon area, outside of the MWA.

## Groundwater

Essentially all of the water used within the MWA is supplied by pumping groundwater. The Physical Solution to the Mojave Basin Area Judgment set limits on the amount of groundwater production that can occur in each subarea without incurring an obligation to buy imported water. Subareas upstream have an annual obligation to subareas downstream based on long-term averages between 1931 and 1990. Each major producer has an established Free Production Allowance (FPA) that is currently 80% of its Base Annual Production (BAP), which is defined as the producer's highest annual use verified for the 5-year base period from 1986-90, for all

*Essentially all of the water used within the MWA is supplied by pumping groundwater.*

uses other than municipal and industrial use in Alto. FPA for Alto municipal and industrial use has been reduced to 70% of BAP for the 2003-04 water year, with an additional reduction to 65% of BAP scheduled for the 2004-05 water year. The allocated FPA represents each producer's share of the water supply available for that subarea. The Judgment requires that reductions in FPA occur in increments of 5% per year until the available FPA in each subarea is in balance with the available water supply. Producers are required to replace any water pumped above their FPA determined for that year. Replacement can occur either by paying the Mojave Basin Area Watermaster to purchase supplemental water from MWA or by transferring unused production rights within that subarea from another party to the Judgment.

As described in the previous chapter, the Alto, Centro and Baja subareas contain two interconnected aquifers referred to as the Floodplain Aquifer and the Regional Aquifer; Oeste and Este subareas only contain the Regional Aquifer. The Floodplain Aquifer is located along the path of the Mojave River and is directly recharged by the river. The Regional Aquifer underlies and surrounds the Floodplain Aquifer, encompassing the remainder of the Mojave River Groundwater Basin. Prior to development in the area, groundwater flowed primarily from the Regional Aquifer to the Floodplain Aquifer. However, the groundwater flows have reversed in recent years, and the groundwater flow from the Floodplain Aquifer is currently the primary recharge component for the Regional Aquifer (Stamos et al. 2001b). The Regional Aquifer is also recharged to a lesser degree by deep percolation of precipitation and storm runoff from ungaged tributaries.

Groundwater production was initially developed along the Mojave River in the early 1900s. By the mid-1950's, when long-term overdraft is recognized to have commenced, groundwater production was about 190,000 acre-feet, with the majority occurring along the Mojave River. By 1994, about half of the pumping came from wells located away from the River in the Regional Aquifer (Stamos et al. 2001b). As noted in Chapter 3, the increase in water production in the

basin has significantly influenced the interaction between the Floodplain and Regional Aquifers. The changes in location of production indicate that Plan alternatives will need to recharge heavily pumped areas within the Regional Aquifer.

Figures 4-5 through 4-7 show historical water level data for wells within the Regional Aquifer. The decline in groundwater levels range from 50 feet to 100 feet for the three wells displayed. These figures illustrate the steady decline in water levels over the past 50 years, and that the Regional Aquifer is generally in a state of overdraft.

Figures 4-8 and 4-9 display historical water level data for wells within the Floodplain Aquifer. These figures illustrate the direct affect the Mojave River has on groundwater levels within the Floodplain Aquifer. During the 1980s, annual flows in the Mojave River were below average and groundwater levels within the Floodplain Aquifer declined. Conversely, the 1990s were a much wetter period and groundwater levels within the Floodplain Aquifer increased. It is important to note that while groundwater levels in the Floodplain Aquifer respond relatively rapidly to hydrologic conditions as compared to the Regional Aquifer, the long-term average water level in the Floodplain Aquifer is also declining.

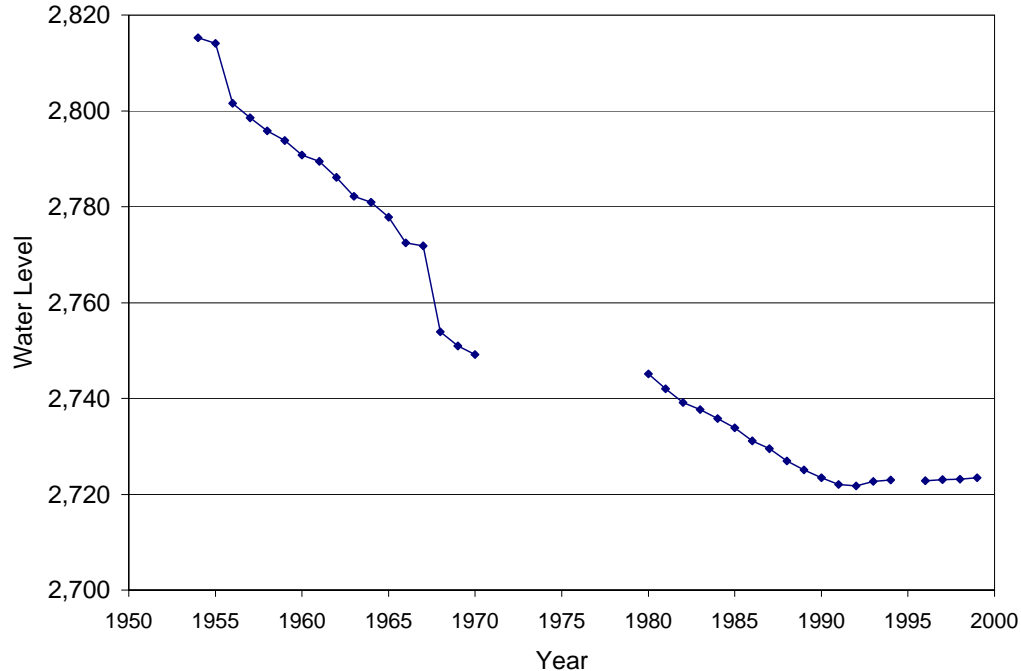


Figure 4-5: Historical Groundwater Levels for State Well Number 05N01E17D01, located in the Regional Aquifer in the Este Subarea

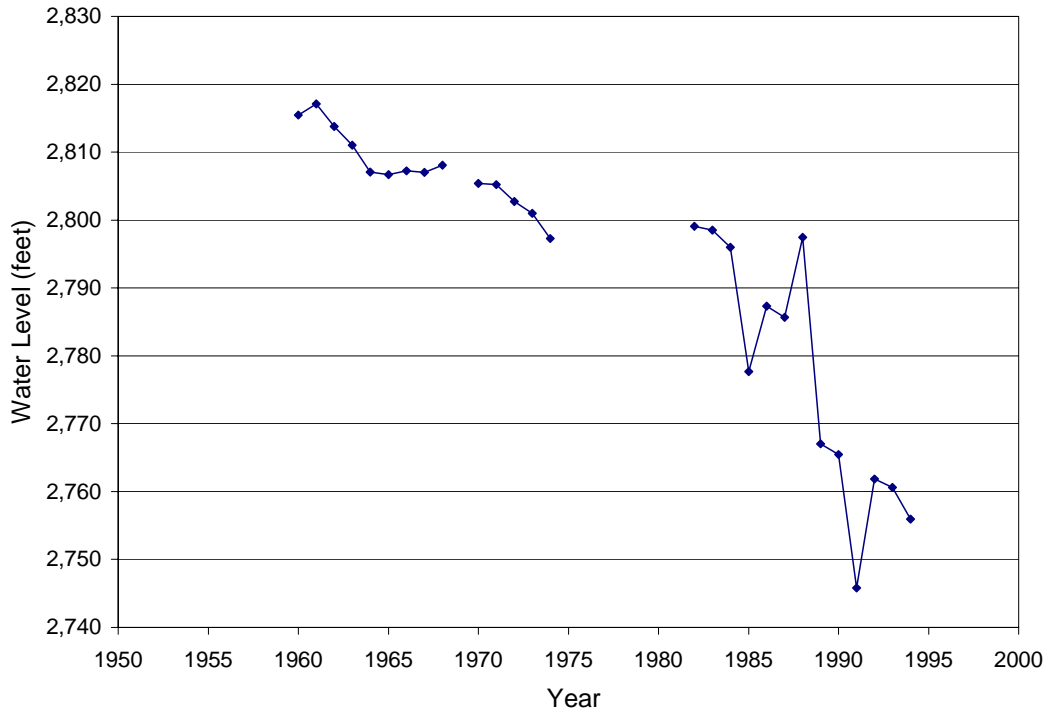


Figure 4-6: Historical Groundwater Levels for State Well Number 05N05W22E02, located in the Regional Aquifer in the Alto Subarea

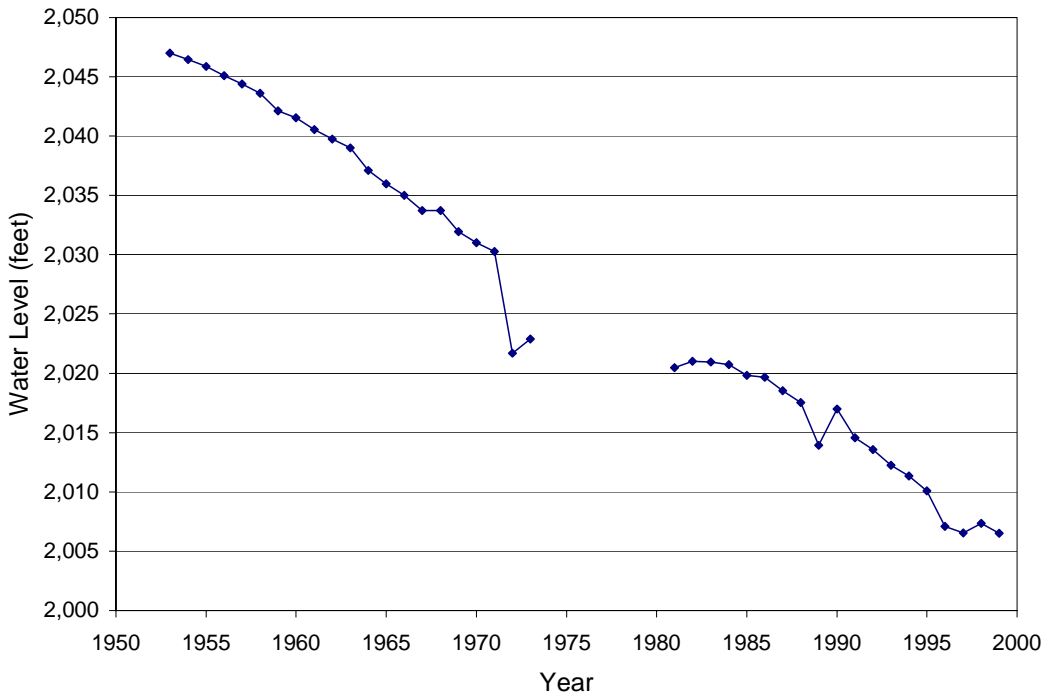
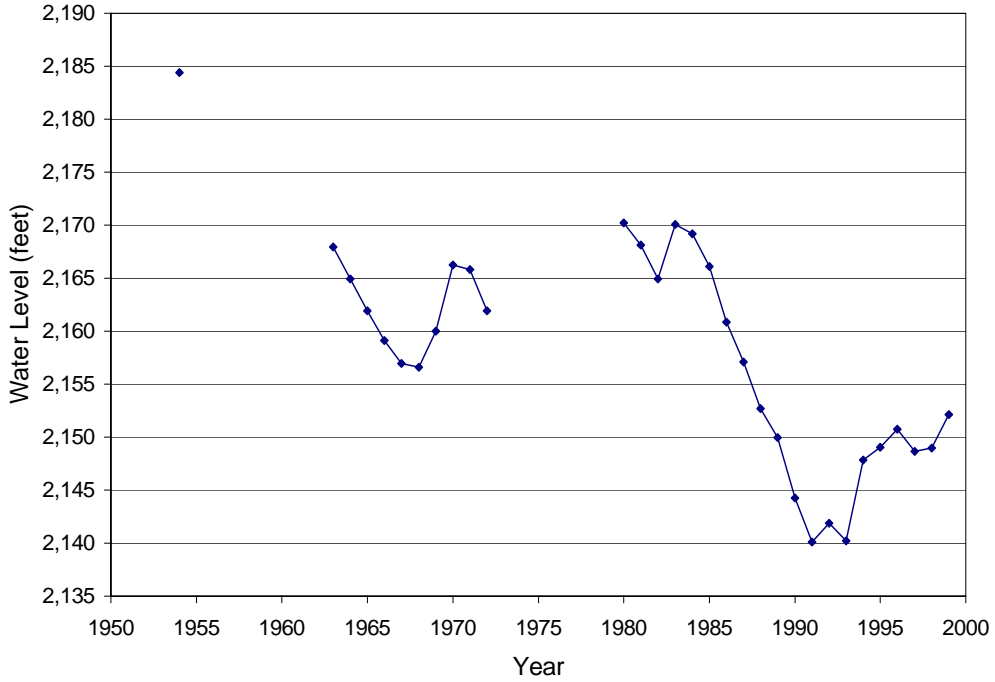
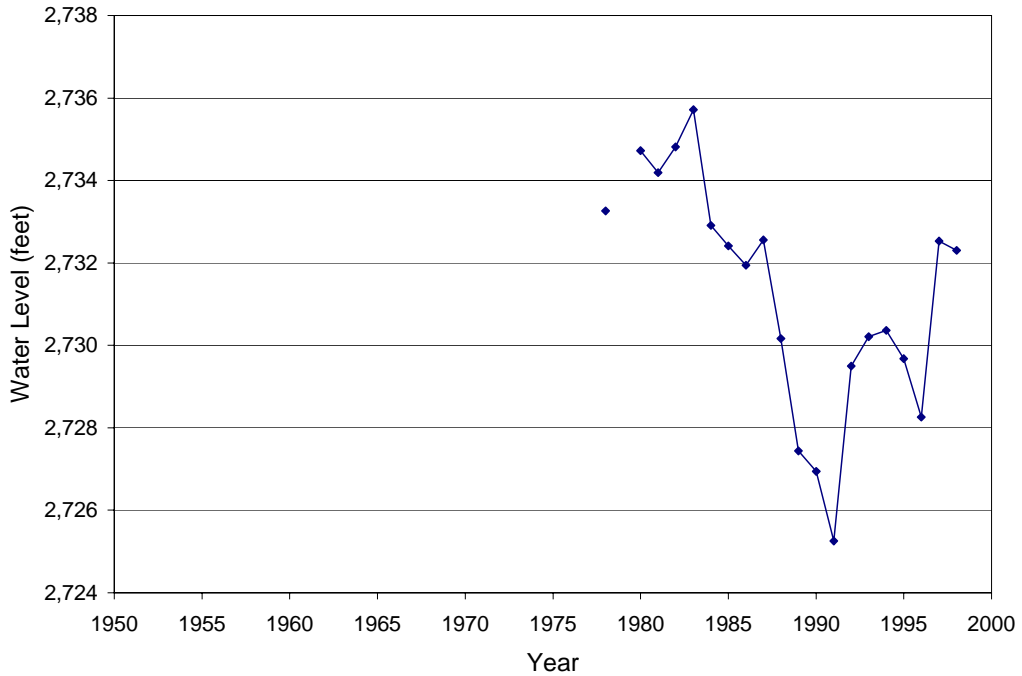


Figure 4-7: Historical Groundwater Levels for State Well Number 11N03W28R02, located in the Regional Aquifer in the Centro Subarea



**Figure 4-8: Historical Groundwater Levels for State Well Number 5N04W11P03, located in the Floodplain Aquifer in the Alto Subarea**



**Figure 4-9: Historical Groundwater Levels for State Well Number 09N03W13R01, located in the Floodplain Aquifer in the Centro Subarea**

The average annual net water supply for the Mojave Basin Area is estimated in Table 4-2. The volume of water available to meet water supply needs averages 63,400 acre-feet annually for the period 1931-2001. The Alto Subarea has the largest water supply, primarily due to proximity to the headwaters of the Mojave River. The Centro and Baja subareas are dependent upon infrequent, very large storm events for groundwater recharge. The Este and Oeste subareas have the least amount of supply, most of which originates from ungaged surface water. The Este Subarea receives the majority of its current water supply from wastewater imports. Table 4-2 reflects averaged values and does not take into account the annual variation in water supply.

The average annual water supply estimates in Table 4-2 are higher than estimates from the 1994 RWMP for the period 1931-90. This analysis averages USGS stream gage data from 1931 to 2001. The increase is attributed to above average streamflow and increased wastewater imports since 1990. 1993 was the highest year of record for inflow at the Forks. The inflow of about 428,700 acre-feet was 660% of the 1931-90 average of 65,000 acre-feet. 1995 and 1998 were also substantially wetter than average. The period 1931-2001 was about 10% wetter than the period 1931-1990. Generally, the previous 35 years have been considerably wetter than average when compared to the 1931-1990 period; conversely, the period 1945-1965 was considerably drier than average. This illustrates the extreme variation in annual water supply.

### **Dry Year and Multiple Dry Year Water Supply**

An estimate of the average annual dry year water supply for each subarea within the Mojave Basin Area is shown on Table 4-3. Dry year water supplies are assumed to be equal to the median water supply values on the Mojave River. By this definition, half of all years would be considered dry, or less than 22,100 acre-feet per year. Median values for gaged surface flow cover the period of record, 1931-2001. Median values for ungaged surface flows are adjusted from the average values found in Table 4-2, to median values based on the percent difference (62%) between average and median flow at the Forks. This assumption was made based on the correlation that over 90% of ungaged surface flow entering the Basin originates in the same mountains as the gaged surface flow measured at the Forks. Thus, it is assumed that the difference between the average and median flow at the Forks provides a reasonable correlation to the difference between the average and median flow of ungaged surface water entering the Mojave Basin.

An estimate of the average annual multiple dry year water supply for each subarea within the Mojave Basin Area is shown on Table 4-4. Multiple dry year estimates represent the average Mojave River flow during the period 1988-1990. Values for ungaged surface flows are reduced from the average values found in Table 4-2 by the same method described above.



While the annual average net water supply is 63,400 acre-feet per year, average annual dry year water supply is only 22,100 acre-feet and average annual multiple dry year water supply is only 3,900 acre-feet. This demonstrates the area's dependence on large, infrequent storm events to provide the majority of groundwater recharge. Dry year water supply probabilities should be taken into consideration when evaluating the near-term implications of water supply alternatives. Decreases in groundwater levels caused by temporary declines in annual water supply may not harm the long-term water supply of a basin but can have adverse impacts. Evaluating the dry year water supply for near-term implications may be important for a number of reasons. Temporary declines in groundwater can increase pumping costs, diminish groundwater quality, and harm riparian habitat by decreasing the amount of water available in the root zone. Management issues concerned with near-term implications should consider the dry year water supply of the Mojave River Basin since it is a better representation of the expected annual water supply for any three- to five-year period. When evaluating long-term water supply management issues, the average values summarized in Table 4-2 are appropriate.

## **Morongo Basin/Johnson Valley Area**

The groundwater basins within the Morongo Basin/Johnson Valley Area are bounded by the Ord and Granite Mountains to the north; the Bullion Mountains to the east; the San Bernardino Mountains to the Southwest; and the Pinto and Little San Bernardino Mountains to the south. Different investigations have divided the region's groundwater basins into 17 subbasins, but not all of them are contained within MWA (Smith and Pimentel 2000). The water supply estimates prepared for the 1994 Regional Water Management Plan compiled water supply data for the region into 4 subbasins. Table 4-5 summarizes the net average annual water supply estimates for each of the groundwater basins that comprise the Morongo Basin/Johnson Valley Area.

**Table 4-3: Mojave Basin Area - Average Annual Dry Year Water Supply**

	<b>Este</b>	<b>Oeste</b>	<b>Alto</b>	<b>Centro</b>	<b>Baja</b>	<b>Entire Basin</b>
<b>WATER SUPPLY</b>						
Surface Water Inflow						
Gaged	0	0	27,200 <sup>a</sup>	0	0	27,200
Ungaged	650 <sup>1</sup>	550 <sup>1</sup>	1,400 <sup>1</sup>	13,200 <sup>1</sup>	200 <sup>1</sup>	2,800 <sup>2</sup>
Subsurface Inflow	0	0	1,200	2,000	1,200	0 <sup>3</sup>
Deep Percolation of Precipitation	0	0	1,750	0	50	1,800 <sup>4</sup>
Import Wastewater						
Lake Arrowhead CSD	0	0	1,900	0	0	1,900
Big Bear ARWWA	2,600	0	0	0	0	2,600
Crestline Sanitation District	0	0	900	0	0	900
<b>Total:</b>	<b>3,250</b>	<b>550</b>	<b>34,350</b>	<b>15,200</b>	<b>1,450</b>	<b>37,200</b>
<b>OUTFLOW AND LOSSES</b>						
Surface Water Outflow						
Gaged	0	0	0	0	900 <sup>b</sup>	900
Ungaged	0	0	13,200 <sup>1</sup>	0	0	0
Subsurface Outflow	800	400	2,000	1,200	0	0
Phreatophyte Consumption	0	0	5,500 <sup>5</sup>	1,500 <sup>5</sup>	1,000 <sup>5</sup>	8,000
<b>Total:</b>	<b>800</b>	<b>400</b>	<b>20,700</b>	<b>2,700</b>	<b>1,900</b>	<b>8,900</b>
<b>NET MEDIAN ANNUAL WATER SUPPLY:</b>						<b>28,300</b>

<sup>1</sup>Estimates based on ratio of dry year inflow to average inflow

<sup>2</sup>Sum of Este (700 ac.ft.), Oeste (600 ac.ft.), Alto (1,400 ac.ft.) and Baja (200 ac.ft from Kane Wash and Boom Creek).

<sup>3</sup>All subsurface flow is assumed to exchange within subareas (no external inflows or outflows)

<sup>4</sup>Because historical precipitation during dry years has been approximately 50% of the long-term average, deep percolation of precipitation during dry years is assumed to be equal to 50% of the long-term average deep percolation

<sup>5</sup>Phreatophyte consumption taken from Lines and Bilhorn (1996)

a Period of record from 1931-2001

b Period of record from 1931-2001; 1931-1952 are estimated values

**Table 4-4: Mojave Basin Area  
Average Annual Multiple Dry Year Water Supply**

	<b>Este</b>	<b>Oeste</b>	<b>Alto</b>	<b>Centro</b>	<b>Baja</b>	<b>Entire Basin</b>
<b>WATER SUPPLY</b>						
Surface Water Inflow						
Gaged	0	0	10,800 <sup>a</sup>	0	0	10,800
Ungaged	100 <sup>1</sup>	100 <sup>1</sup>	200 <sup>1</sup>	2,000 <sup>1</sup>	0 <sup>1</sup>	400 <sup>2</sup>
Subsurface Inflow	0	0	1,200	2,000	1,200	0 <sup>3</sup>
Deep Percolation of Precipitation	0	0	1,750	0	50	1,800 <sup>4</sup>
Import Wastewater						
Lake Arrowhead CSD	0	0	1,900	0	0	1,900
Big Bear ARWWA	2,600	0	0	0	0	2,600
Crestline Sanitation District	0	0	900	0	0	900
<b>Total:</b>	<b>2,700</b>	<b>100</b>	<b>16,750</b>	<b>4,000</b>	<b>1,250</b>	<b>18,400</b>
<b>OUTFLOW AND LOSSES</b>						
Surface Water Outflow						
Gaged	0	0	0	0	300 <sup>a</sup>	300
Ungaged	0	0	2,000 <sup>1</sup>	0 <sup>1</sup>	0	0
Subsurface Outflow	800	400	2,000	1,200	0	0
Phreatophyte Consumption	0	0	5,500 <sup>5</sup>	1,500 <sup>5</sup>	1,000 <sup>5</sup>	8,000
<b>Total:</b>	<b>800</b>	<b>400</b>	<b>9,500</b>	<b>2,700</b>	<b>1,300</b>	<b>8,300</b>
<b>MULTIPLE DRY YEAR NET ANNUAL WATER SUPPLY:</b>						<b>10,100</b>

<sup>1</sup>Estimates based on ratio of multiple dry year inflow to average inflow

<sup>2</sup>Sum of Este (100 ac.ft.), Oeste (100 ac.ft.), and Alto (200 ac.ft.)

<sup>3</sup>All subsurface flow is assumed to exchange within subareas (no external inflows or outflows)

<sup>4</sup>Because historical precipitation during dry years has been approximately 50% of the long-term average, deep percolation of precipitation during dry years is assumed to be equal to 50% of the long-term average deep percolation

<sup>5</sup>Phreatophyte consumption taken from Lines and Bilhorn (1996)

a Period of record from 1988-1990

**Table 4-5: Morongo Basin/Johnson Valley Area  
Net Average Annual Water Supply**

<b>Basin</b>	<b>Net Average Annual Supply (Acre-feet per Year)</b>
Means/Ames Valley	600
Copper Mountain Valley	600
Johnson Valley	2,300
Warren Valley	900*

Source: Boyle Engineering Corporation 1993 (for Copper Mountain 550 was rounded to 600)

\* Hi-Desert Water District reports unpublished USGS estimates of 200 acre-feet per year net average annual supply in Warren Valley.

The net average water yield of the entire Morongo Basin/Johnson Valley Area is about 4,400 acre-feet per year. However, the net average water supply for the relatively uninhabited Johnson Valley is relatively undeveloped and has water quality constraints in some areas. The 1994 RWMP estimated that the Johnson Valley Basin net average annual water supply is about 2,300 acre-feet per year. The Johnson Valley supply was not considered in the net water supply balance, resulting in a net average water supply of 2,100 acre-feet per year for the developed groundwater basins.

The water supply is derived primarily from precipitation in the tributary areas within the Little San Bernardino and San Bernardino Mountains. Major ephemeral streams in the area include the Pipes Wash and Yucca Creek.

A great portion of water water supply needs relies on MWA’s ability to provide State Water Project water through the Morongo Basin Pipeline. Without that water or a different source of supplemental water, overdraft of the Warren Valley Basin is likely to occur once again. In 1995 the Morongo Basin Pipeline was completed from the California Aqueduct near the City of Hesperia to the Town of Yucca Valley. Two recharge sites have been developed to take water from this facility and are receiving imported State Water Project water. The quantities of water imported to date for the Hi-Desert Water District are presented in Table 4-5. The imported water supplies recharge the previously overdrafted Warren Valley Basin. The Pipeline has capacity to also deliver water to the benefit of the Big Horn-Desert View Water Agency, the Joshua Basin Water District and the County of San Bernardino.

## Dry Year and Multiple Dry Year Water Supply

The dry year and multiple dry year water supplies in the Morongo Basin/Johnson Valley area are assumed to be reduced proportionally to the reduction in surface water flows at the Forks. These values are shown for each subbasin in Table 4-6. Excluding the Johnson Valley subbasin, the net annual dry year water supply is 800 acre-feet/year during an average dry year and 110 acre-feet/year during a multiple dry year period.

**Table 4-6: Morongo Basin/Johnson Valley Area  
Average Annual Dry Year Water Supply**

<b>Basin</b>	<b>Dry Year Average Annual Supply (Acre-feet per Year)</b>	<b>Multiple Dry Year Average Annual Supply (Acre-feet per Year)</b>
Means/Ames Valley	230	30
Copper Mountain Valley	230	30
Johnson Valley	880	130
Warren Valley	340	50

## Well Data

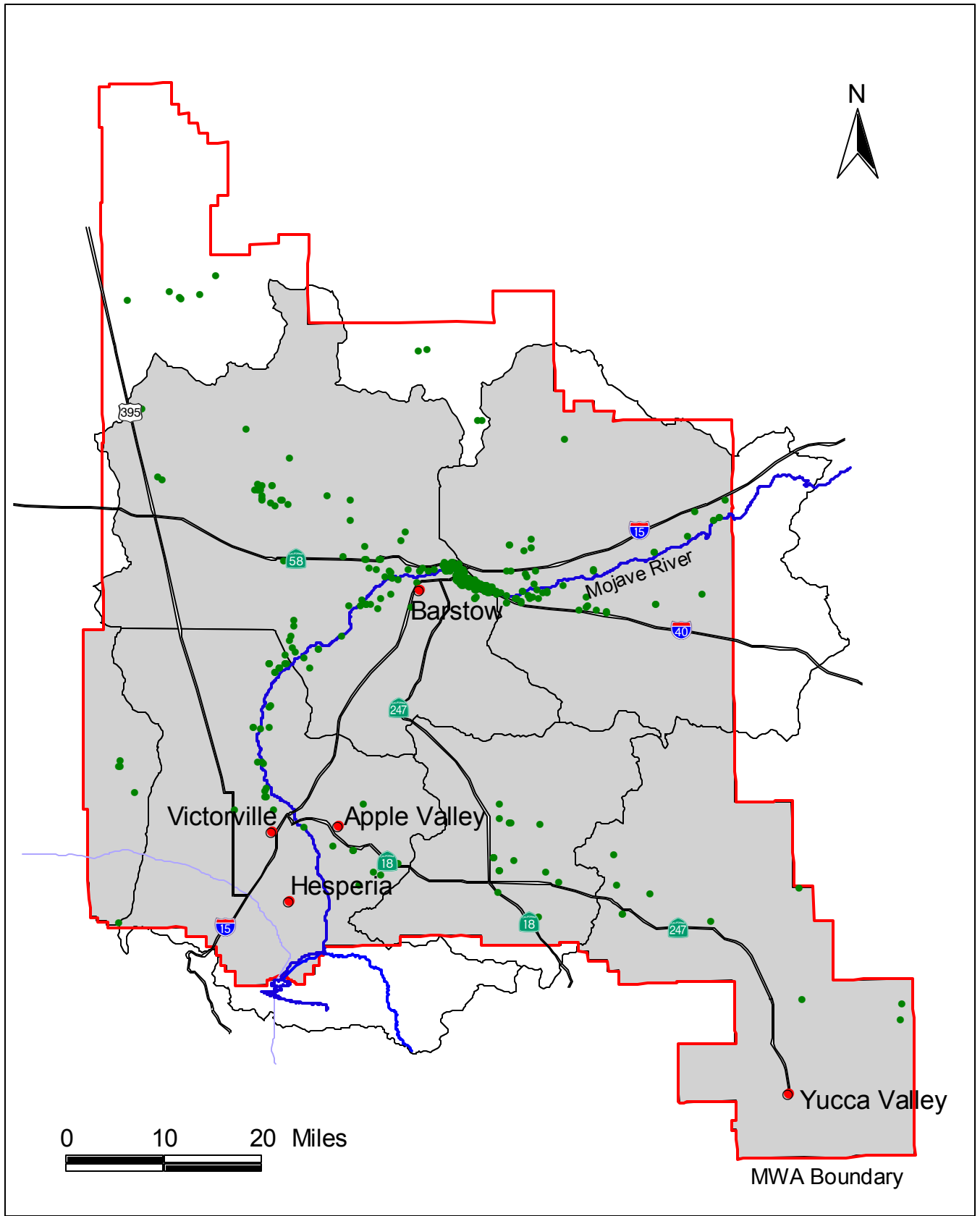
Digital well data provided by MWA was compiled in a database for data query and analysis. Data attributes in the database include water quality, water levels, well production, and GPS locations. The GPS well locations supplied by MWA were compared to the water quality, water level, and water production data to assess data spatial distribution within the MWA. A database query that contains well number, well depth, perforated interval, well type and status is included as Appendix I.

Samples of spatial and temporal analyses utilizing the database and a geographic information system (GIS) are provided on Figures 4-10 and 4-11. A complete analysis of water quality within the Basin is extremely labor intensive and beyond the scope of this Plan, but the Agency anticipates undertaking this effort in the near future.

Figure 4-10 displays the wells within the current database that have at least one historical measurement for total dissolved solids (TDS) above 500 mg/L. Using GIS to analyze water quality is beneficial for locating areas with particular water quality concerns. As seen on the plot the densest concentration of wells with TDS measurements above 500 mg/L is in the Barstow area. It is important to note that the majority of monitoring wells are concentrated in the Floodplain Aquifer and thus the majority of water quality measurements are taken from the Floodplain Aquifer.

Additional monitoring wells in the Regional Aquifer would help evaluate differences in water quality between the two aquifers. Besides spatial analysis, a temporal analysis can be done to evaluate how water level fluctuations affect water quality. Figure 4-11 displays the water level and TDS measurements for State Well 08N03W05J01.

As part of future efforts, the entire database could be linked to a GIS to provide spatial analyses of water level data and all water quality parameters within the Basin. Additional work could also focus on collecting, filtering, and adding supplementary water quality data available from the Department of Health Services and local agencies within the MWA service area.



**Groundwater Wells Measuring Above  
500 mg/L Total Dissolved Solids**

Mojave Water Agency  
Regional Water Management Plan Update

Figure 4-10  
Date: January 2004  
Prepared By: KTW

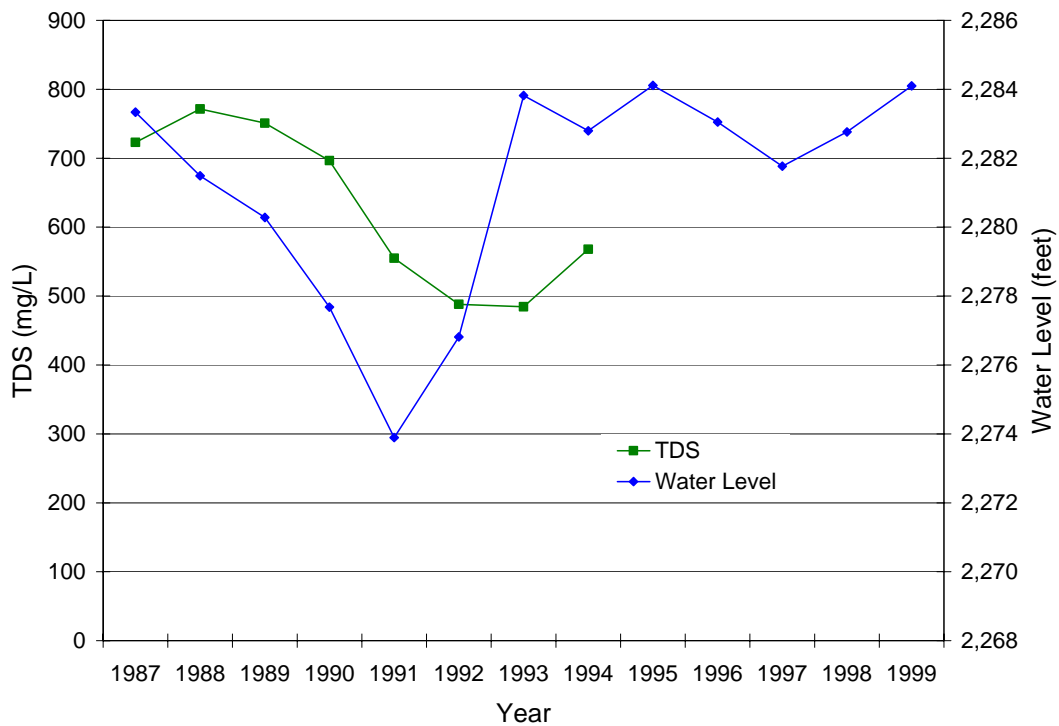


Figure 4-11: Total Dissolved Solids (TDS) with Water Level (feet above mean sea level) for State Well 08N03W05J01

## State Water Project

MWA is entitled to 75,800 acre-feet of State Water Project (SWP) water per year. This includes the addition of 25,000 acre-feet of entitlement that was purchased from the Berrenda-Mesa Water District in 1998. Imported SWP water has historically been supplied to the MWA through the Mojave Basin and Morongo Basin pipelines and releases from Silverwood Lake. The State Water Project has delivered approximately 150,000 acre-feet of water to MWA from 1972 through 2001 (DWR 2001, and MWA). Table 4-7 summarizes the imported State Water Project water delivered to MWA.



**Table 4-7: Deliveries of State Water Project Water to the MWA, 1978-2001**

<b>Year</b>	<b>Lake Silverwood<sup>1</sup></b>	<b>Rock Springs<sup>2</sup></b>	<b>Kramer Junction (AVEK)<sup>3</sup></b>	<b>Hodge<sup>4</sup></b>	<b>Lenwood<sup>5</sup></b>	<b>Hi-Desert Pipeline<sup>6</sup></b>	<b>Total</b>
1978	22,500	0	0	0	0	0	22,500
1979	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	0
1981	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0
1983	24,489	0	0	0	0	0	24,489
1984	0	0	0	0	0	0	0
1985	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0
1987	0	0	0	0	0	0	0
1988	0	0	0	0	0	0	0
1989	0	0	0	0	0	0	0
1990	0	0	0	0	0	0	0
1991	2,032	0	1,391	0	0	0	3,423
1992	9,334	30	1,310	0	0	0	10,674
1993	9,973	0	1,514	0	0	0	11,487
1994	819	15,434	1,399	0	0	0	17,652
1995	0	4,503	1,227	0	0	3,010	8,740
1996	0	2,134	1,316	0	0	3,977	7,427
1997	0	7,134	1,405	0	0	5,501	14,040
1998	0	2,190	1,345	0	0	2,357	5,892
1999	0	283	1,439	994	2,673	2,682	8,071
2000	0	2,451	1,361	2,144	1,476	3,930	11,362
2001	0	57	1,385	0	0	2,878	4,320
<b>TOTAL</b>	<b>69,147</b>	<b>34,216</b>	<b>15,092</b>	<b>3,138</b>	<b>4,149</b>	<b>24,335</b>	<b>150,077</b>

<sup>1</sup>Lake Silverwood releases do not include releases made by DWR for purposes other than delivery to MWA. Prior to construction of the Morongo Basin Pipeline, the only means to deliver SWP water to MWA was through releases at Cedar Springs Dam at Silverwood Lake, upstream of the West Fork Gage in the Alto Subarea. The 1978 releases were part of a conjunctive use demonstration project with the DWR. The 1983 releases were non-entitlement water purchased from the Central Valley and delivered by SWP facilities.

<sup>2</sup>The Rock Springs Outlet was constructed on the Morongo Basin Pipeline in 1994 to release SWP water into the Mojave River in the Alto Subarea near the City of Hesperia at Rock Springs Road approximately 5 miles downstream of the Forks. All subsequent deliveries to Alto have been made here.

<sup>3</sup>The MWA has an agreement with the Antelope Valley-East Kern Water Agency (AVEK) to transfer MWA entitlement to AVEK each year sufficient to allow AVEK to transport the MWA entitlement to a power plant in the Kramer Junction area within the MWA boundary (Centro Subarea).

<sup>4</sup>The Hodge recharge facility, located about 40 miles downstream of the Forks, was constructed in 1999 to deliver SWP water to the Centro Subarea from the Mojave River Pipeline.

<sup>5</sup>The Lenwood recharge facility, located about 48 miles downstream of the Forks, was constructed in 1999 to deliver SWP water to the Centro Subarea from the Mojave River Pipeline.

<sup>6</sup>The Morongo Basin Pipeline was completed to Landers in the Morongo Basin/Johnson Valley Area in 1994, and the Hi-Desert Pipeline extension was completed to the Town of Yucca Valley in 1995.

The only internal allocations of SWP water within MWA is for a maximum of 7,257 acre-feet to Improvement District M (IDM) located in the Morongo Basin/Johnson Valley Area. These allocation deliveries may be limited to the same percentage of total entitlement that MWA is approved to receive from the State Water Project by the State Department of Water Resources. Limitations have not occurred to date because neither MWA nor the IDM member entities have approached maximum delivery capability. MWA also has an existing agreement to transfer up to 2,250 acre-feet per year to the Antelope Valley-East Kern Water Agency (AVEK). The water is transported by AVEK to a power plant located near Kramer Junction within the MWA. One of the major issues raised by stakeholders in the basin is how the remaining SWP entitlement will be distributed in the basin.

Figure 4-12 displays historical deliveries of SWP water for the years 1978 to 2001 to all State Water Project Contractors (DWR 2001b). The figure shows the percent of water requested by the Contractors that was delivered. The SWP Contractors have received the entire amount of water requested 75% of the time. On average, Contractors received 88% of the water requested. There were six years during the early 90's, 2000 and 2001 when deliveries were less than 100 percent of request. The allocation of entitlement for 2001 was 39%. At this level of allocation, MWA would have been able to receive 29,600 acre-feet of water.

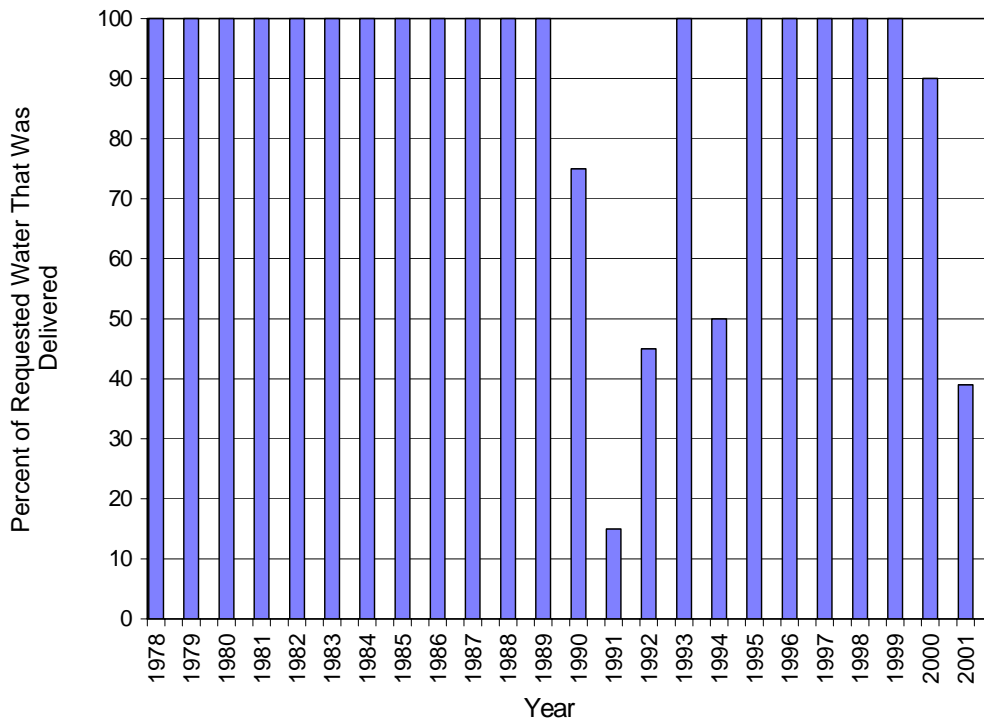
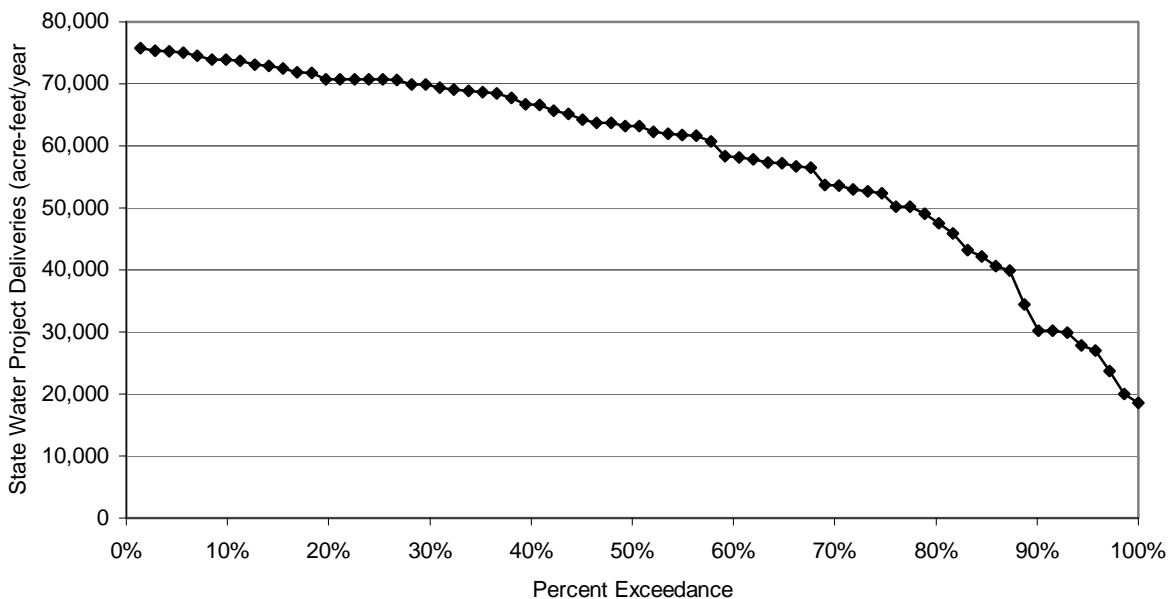


Figure 4-12: Historical SWP Percent of Deliveries Requested by Contractors

The variability of SWP deliveries is expected to increase in the future as Contractors request larger amounts of their maximum entitlement. System constraints such as Delta export restrictions and competition for the available water supply will increase management challenges. Even if MWA chooses to purchase its full entitlement of 75,800 acre-feet annually, its full entitlement will not be available every year. According to the State Water Project Reliability Report (DWR 2002), MWA can expect to receive an average of 58,400 acre-feet of its SWP supply under 2020 conditions. This estimate is based on 2020 demand projections with the current facilities in place. During a dry or critical year as defined by the Sacramento River Index, the SWP will be able to supply an average of 43,200 acre-feet. During a multiple dry year period (1988-1990), MWA's SWP supply will be about 22,900 acre-feet/year. Table 4-8 shows the average annual SWP supply available during all years, dry years, and in a multiple dry-year period. Figure 4-13 shows the projected probability of exceedance of SWP deliveries to MWA in 2020.

**Table 4-8: Average Annual State Water Project Supplies**

<b>Year Type</b>	<b>State Water Project Supply (Acre-feet per Year)</b>
Average	58,400
Dry Year	43,200
Multiple Dry Year	22,900



**Figure 4-13: Percent Exceedance of SWP Deliveries in 2020**

The recent history of deliveries and current efforts to improve system flexibility and reliability indicate that deliveries from the SWP will continue to be variable for the next ten to fifteen years. Efforts to meet water supply delivery objectives continue to be developed by the Department of Water Resources and the State Water Contractors. For example, contract provisions allow for the delivery of “interruptible” water supplies to Contractors during periods of abundant water supply after other SWP water supply and storage objectives have been met. The Contractors and the Department also continue to develop programs allowing transfers of entitlement between Contractors to maximize storage of Project water supplies when available.

MWA currently has an entitlement exchange program in place with the Solano County Water Agency (SCWA). This Agreement allows MWA to receive entitlement deliveries from the SCWA during hydrologic periods when the SCWA has approved entitlement in excess of their needs. MWA will subsequently allow the SCWA to utilize some of their approved entitlement during periods of drought, but not more than half of the quantity of SCWA entitlement that has previously been delivered to MWA. It is possible that in some years MWA could receive more than its full entitlement due to these programs. Therefore basin recharge alternatives designed to use SWP water should consider the effects of a variable water supply.

## Water Quality

MWA’s groundwater basins contain numerous areas with water quality issues. These issues are described in Chapter 8. Key contaminants include arsenic, nitrates, iron, manganese, Chromium VI, total dissolved solids (TDS), total petroleum hydrocarbons (TPH), and volatile organic compounds (VOC’s). Measurements in excess of drinking water standards have been found for many of these constituents within each subarea in the Mojave Basin Area and each subbasin within the Morongo Basin/Johnson Valley area. Groundwater in these areas will have to be treated or replaced.

Another potential water quality issue facing MWA is the accumulation of salt in the groundwater basins. Because the Mojave River Basin and Morongo Basin/Johnson Valley areas are closed basins, salt contained in imported reclaimed wastewater and State Water Project (SWP) supplies are mostly not removed from the basin. An average of about 5,400 acre-feet of reclaimed wastewater is discharged into the MWA from outside its boundary and about 8,400 acre-feet of State Water Project water are currently imported each year. MWA is planning to increase its SWP utilization to 58,000 acre-feet per year, which will further increase the introduction of salts into the system.

MWA has initiated efforts 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.

Digital well data provided by MWA was compiled in a Microsoft® Access 2000 Database for data query and analysis. Data attributes in the database include water quality, water levels, well production, and GPS locations. The GPS well locations supplied by MWA were compared to the water quality, water level, and water production data to assess data spatial distribution within the MWA. Groundwater quality for a number of constituents and for each subarea are presented in Figures 4-3 through 4-9.

## Inconsistent Water Sources

Because water use within the MWA service area is supplied entirely by groundwater, MWA does not have any inconsistent water sources that cause reduced deliveries to users within the service area. A potential exception is areas where water quality could limit use as a potable supply. Wellhead treatment or provision of an alternative supply is planned for these areas. While many of the sources that recharge the groundwater basin have high annual variability, including flows on the Mojave River and supplies from the State Water Project, the groundwater basins used within the MWA service area are sufficiently large to allow for continued water use during dry periods with only a temporary decline in groundwater levels.

## Planned Water Supply Sources Through 2020 in Five-year Increments

The amount of available water supply to the Mojave Water Agency is not expected to change between now and 2020. In addition to its net average annual supply of 63,400 acre-feet per year, MWA has an average annual SWP supply of 58,400 acre-feet per year, for a total supply of 121,800 acre-feet per year. Table 4-9 shows the availability of each of these types of water in five-year increments through 2020.

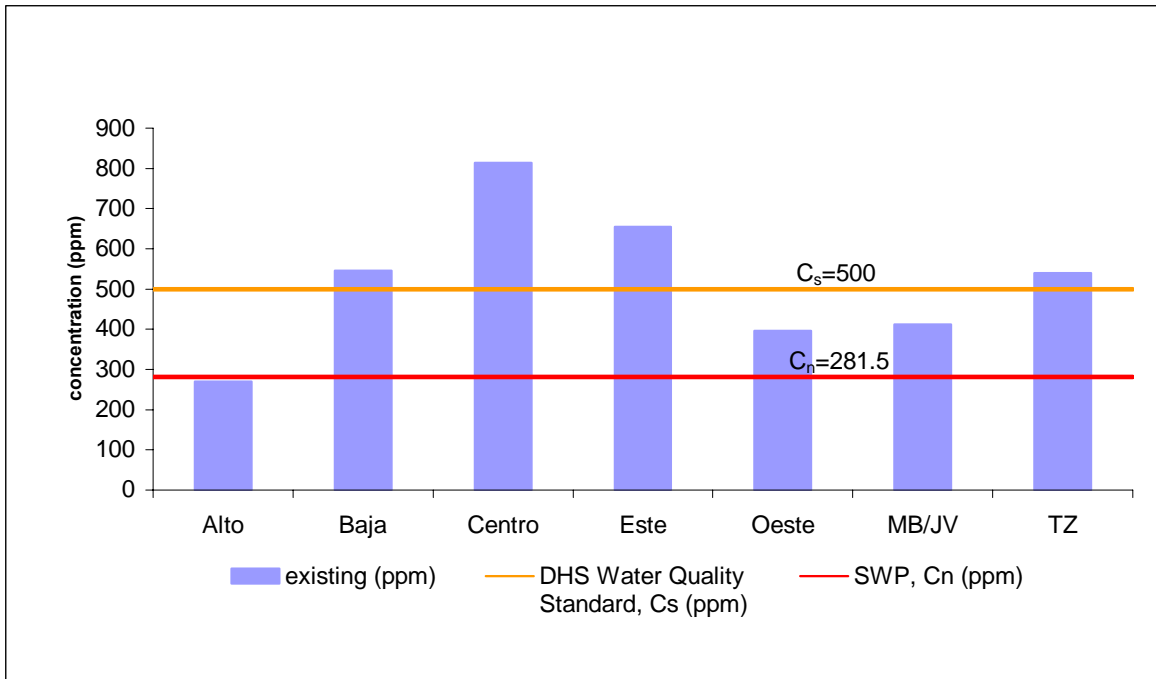


Figure 4-14: Total Dissolved Solids

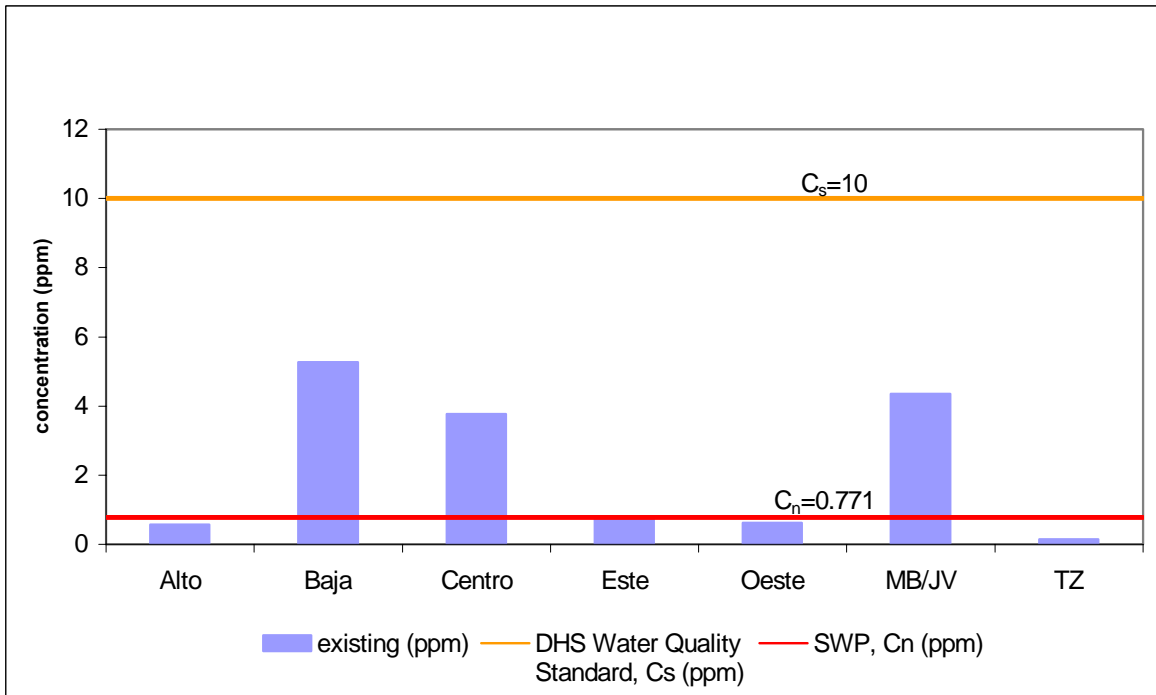


Figure 4-15: Nitrates

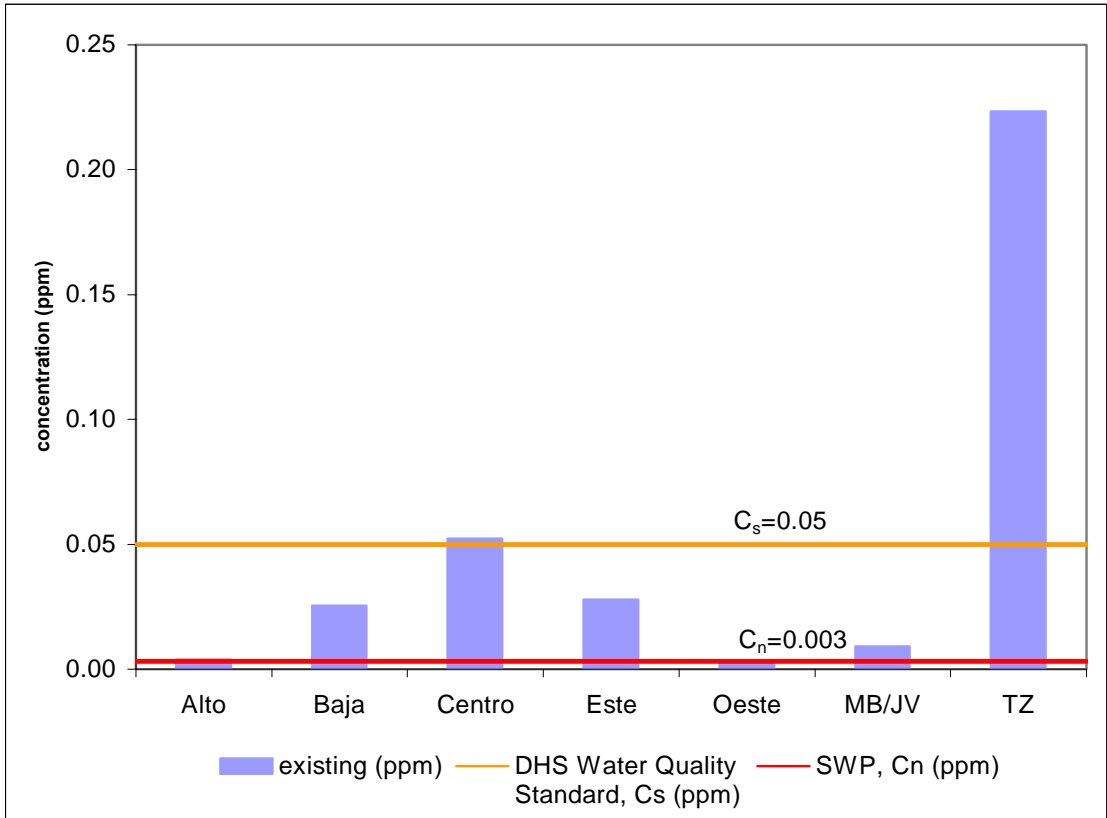


Figure 4-16: Manganese

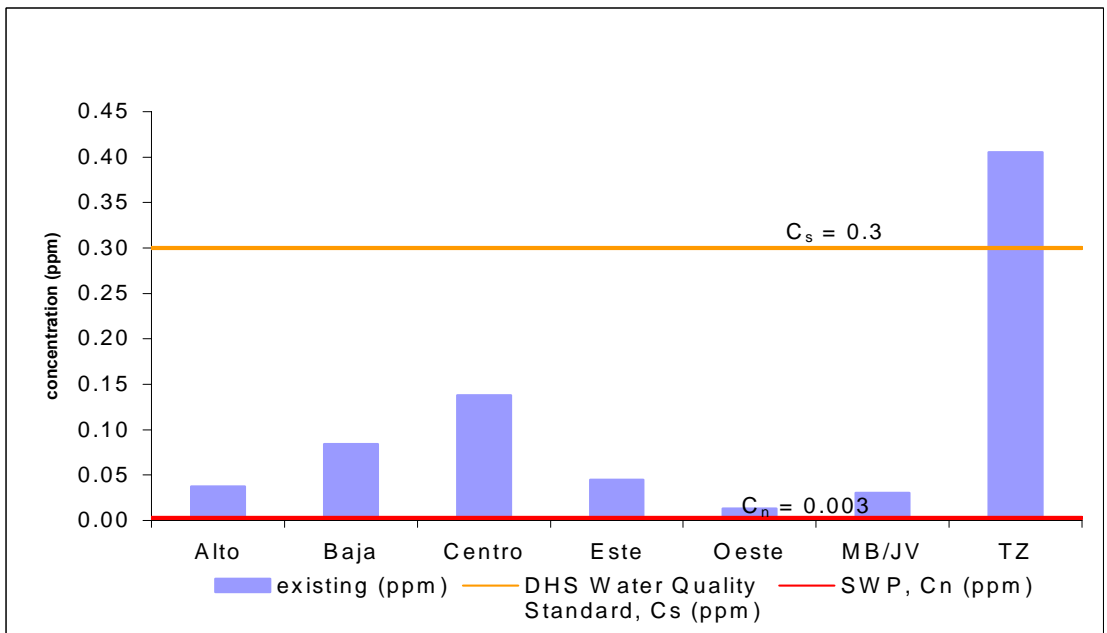


Figure 4-17: Iron

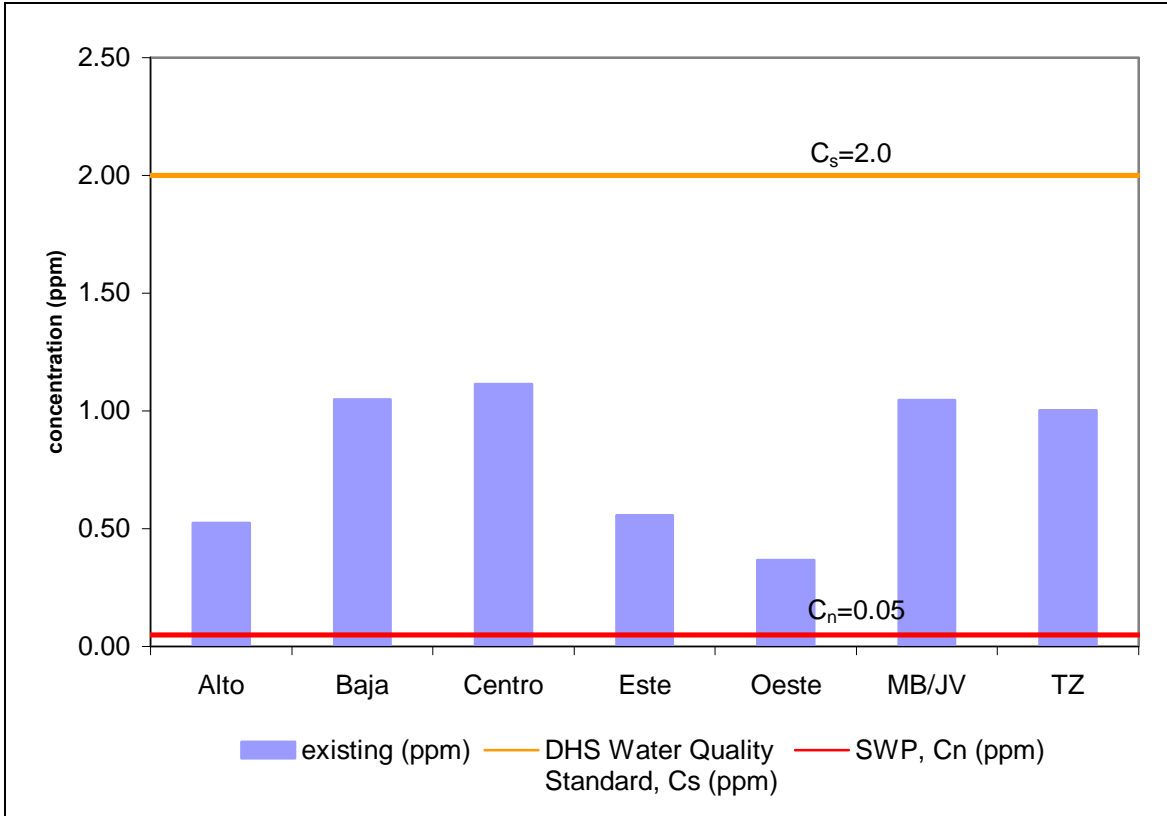


Figure 4-18: Fluoride

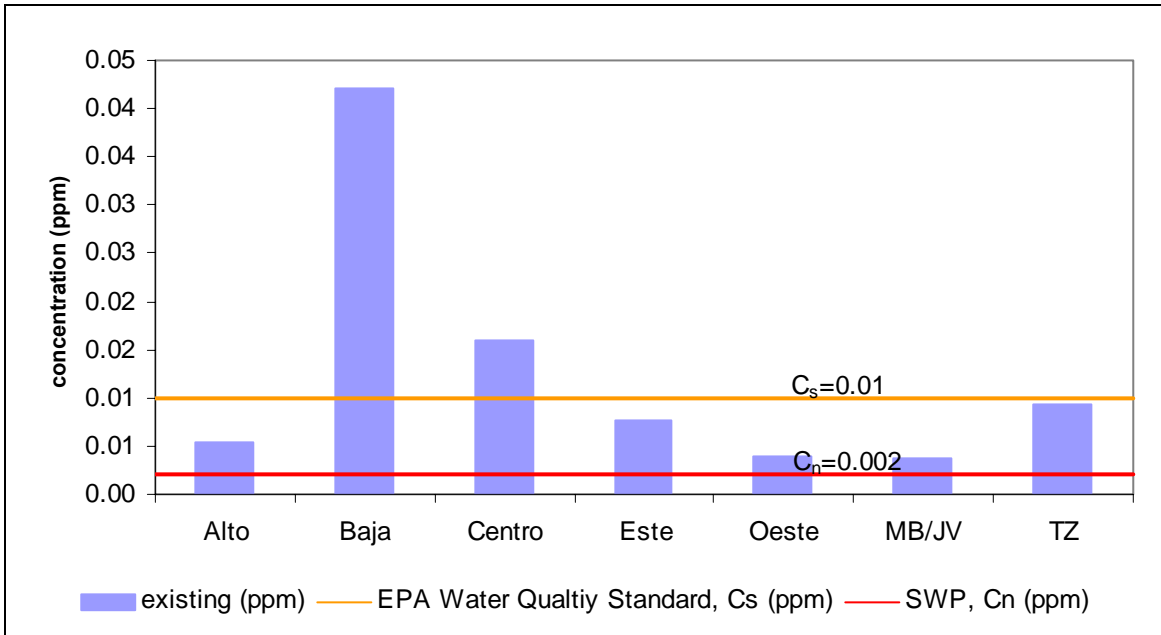


Figure 4-9: Arsenic



## Water Quality and Management Strategies

The quality of water dictates numerous management strategies a water purveyor will implement, including, but not limited to, the selection of raw water sources, treatment alternatives, blending options, and modifications to existing treatment facilities. Maintaining and utilizing high quality sources of water simplifies management strategies by increasing water supply alternatives, water supply reliability, and decreasing the cost of treatment. The source water supplies are of good quality. Maintaining high quality source water allows for efficiently management of water resources by minimizing costs while distributing high quality water.

## Water Quality and Supply Reliability

Maintaining the quality of water supplies increases the reliability of each source by ensuring that deliveries are not interrupted due to water quality concerns. A direct result from the degradation of a water supply source is increased treatment cost before consumption. The poorer the quality of the source water, the greater the treatment cost. Groundwater may degrade in quality to the point that is not economically feasible for treatment. In this scenario the degraded source water is taken off-line. This in turn decreases water supply reliability by decreasing the total supply and increasing demands on alternative water supplies.

Currently, water quality does not affect water supply reliability. Maintaining the current level of quality is vital to maintaining a reliable water supply.

Table 4-9: Available Water Supply Sources Through 2020

Supply Type	2000	2005	2010	2015	2020
Natural*	63,400	63,400	63,400	63,400	63,400
SWP	58,400	58,400	58,400	58,400	58,400
Total	121,800	121,800	121,800	121,800	121,800

\*Average annual natural water supply data as shown in Table 4-2

## Opportunities for Short and Long-Term Transfers

MWA is expected to have an estimated 400,000 acre-feet of unused State Water Project supply between now and 2020. One option for utilizing this supply would be to transfer a portion of it to another party as part of a storage agreement or exchange program. MWA and the Metropolitan Water District of Southern California (Metropolitan) recently agreed on a Water Exchange Pilot Program with the goals of facilitating a water exchange in the short term and helping to determine the feasibility of a similar long-term exchange program between the two parties. Under the terms of the Pilot Program, Metropolitan will deliver to Mojave up to 75,000 acre-feet of its SWP deliveries or other water. In exchange, in years when Metropolitan requests

water, MWA will provide Metropolitan water through exchange of MWA’s SWP deliveries for that year.

In addition, the rules of the Mojave Basin Area Adjudication allow for the possibility of in-basin transfers. Under the rules of the Judgment producers are allowed to sell unused Base Annual Production (BAP) and Free Production Allowance (FPA) to other parties within the same subarea. This mechanism allows industrial and municipal users to purchase BAP from agricultural or other users to augment their ability to pump water. Table 4-10 summarizes the amount of transfers that have occurred in each subarea through 2002.

**Table 4-10: Permanent Transfers of Base Annual Production by Subarea WY94-02**

<b>Year Type</b>	<b>BAP Transfers (Acre-feet)</b>
Alto	22,941
Baja	24,928
Centro	28,566
Este	5,248
Oeste	1,247
Total	82,930

## **Timeline for Implementation of Proposed Projects**

As part of the RWMP Update, 19 projects and management actions were identified to address the water supply and water quality issues that MWA must address to provide a sustainable water supply through 2020. These projects and management actions can be found in Appendix B. This list includes both MWA and non-MWA projects, as well as projects and actions that might be developed in partnership with MWA. The following projects have been identified as having the highest priority:

- implementing 10% municipal conservation in the Mojave Basin and 5% in Morango Basin/Johnson Valley
- wastewater reclamation in Alto
- wellhead treatment in Alto
- recharge in the Alto Floodplain and Regional and Warren Valley aquifers
- providing a new water supply for Pioneertown

Each of these projects will begin implementation within the next 3-5 years.

The following projects have lower priority, but are being evaluated for possible implementation by 2020:

- a regional treatment plant in Alto
- recharge in the Alto Transition Zone, Baja, Centro, Este, Oeste, Copper Mountain Valley, and Means/Ames Valley
- providing a new water supply for Hinkley



# 5

## WATER DEMAND

### Introduction

As discussed in Chapter 3, the Mojave Water Agency (MWA) consists of two distinct hydrologic planning areas referred to as the Mojave Basin Area and the Morongo Basin/Johnson Valley Area. The Mojave Basin Area is further sub-divided into five subareas (hydrologic subbasins) known as Alto, Baja, Centro, Este, and Oeste. The Morongo Basin/Johnson Valley Area also contains four hydrologic subbasins referred to as Johnson Valley, Means/Ames Valley, Copper Mountain Valley and Warren Valley Basins. These subareas are used for planning purposes to determine safe yield and to report groundwater well production.

Since 1994, MWA has tabulated production in these planning subareas organized by demand sector. The demand sectors include agriculture, municipal, industrial, golf courses and parks, and recreational lakes. These data are used to characterize the current water demand within each subarea and also to project possible future water production within each sector in each subarea.

Groundwater production is an accurate measure of the water demand within each subarea, but it cannot be compared directly with the water supply estimates presented in Chapter 4. A portion of the water pumped is returned to the groundwater aquifer and becomes part of the available

water supply. For example, much of the water applied to agriculture, golf courses, and parks percolates back to the groundwater aquifer. The portion of the groundwater pumped that does not return to the aquifer is referred to as consumptive use. In this chapter, consumptive use totals are presented rather than groundwater production to allow for a direct comparison with the estimated water supply in each subarea. The consumptive use rates used in this report are derived from Webb (2000), which performed a detailed analysis of the production and consumptive use for each subarea within the Mojave Basin Area.

*Production and consumptive use are two important concepts. Consumptive use values are presented in this chapter.*

This chapter presents the current and projected future consumptive use for each subarea. All of the data contained in this chapter is presented by water year. For a detailed discussion of the data available and of the methods used to generate the numbers presented in this chapter, please refer to Appendix C.

## Current Water Demand

### Demographics

Table 5-1 shows the 1990 and 2000 estimated populations for each subarea in the Mojave Basin Area and for each subbasin in the Morongo Basin/Johnson Valley Area in 1990 and 2000. The population increased in every subarea in the Mojave.

Table 5-1: Comparison of Actual and Projected 2000 Population

	1990 Actual <sup>1</sup>	2000 Actual	Annual Pct Change	2000 Projected <sup>1</sup>	Percent Difference
<b>Mojave Basin Area</b>					
Alto	180,700	236,600	+2.7%	259,200	-8.7%
Baja	8,800	5,100	-5.3%	12,600	-59.5%
Centro	33,000	33,700	+0.2%	47,300	-28.8%
Este	5,300	6,000	+1.2%	7,600	-21.1%
Oeste	5,800	7,400	+2.5%	8,300	-10.8%
<b>Subtotal Mojave</b>	<b>233,600</b>	<b>288,800</b>	<b>+2.1%</b>	<b>335,000</b>	<b>-13.8%</b>
<b>MB/JV Area<sup>2</sup></b>					
Copper Mtn. Valley	10,200	9,600	-0.6%	11,500	-27.5%
Johnson Valley	N/A	400	N/A	N/A	N/A
Means/Ames Valley	4,700	7,500	+4.8%	5,900	+27.0%
Warren Valley	24,300	14,700	-4.9%	32,700	-55.0%
<b>Subtotal MB/JV</b>	<b>39,200</b>	<b>32,200</b>	<b>-1.9%</b>	<b>51,900</b>	<b>-37.9%</b>
<b>Total</b>	<b>272,800</b>	<b>321,000</b>	<b>+1.6%</b>	<b>386,900</b>	<b>-17.0%</b>

<sup>1</sup>1990 actual and 2000 projected population estimates from 1994 RWMP.

<sup>2</sup>Morongo Basin/Johnson Valley subbasin populations represent the population served by each subbasin, not the population that overlies the subbasin. This assumption is consistent with the 1994 RWMP.

Basin Area except for Baja. The largest increase was in Alto, which experienced an annual percent growth rate of 2.7% per year between 1990 and 2000. Baja showed a population reduction of 5.3% per year between 1990 and 2000. The overall population of the Mojave Basin Area increased from about 234,000 to about 289,000 between 1990 and 2000.

The 2000 population of the Morongo Basin/Johnson Valley area is estimated to be about 32,000 in 2000, which is about 7,000 less than the estimate for 1990 in the 1994 RWMP. However, many people in the area suspect that the 1990 population was overestimated. The population

estimates shown in Table 5-1 represent the population served by the production in each groundwater basin. These estimates do not therefore necessarily represent the population living in any particular geographic area. This assumption is consistent with the 1994 RWMP. For example, the Hi-Desert Water District (HDWD) operates production wells that draw from both the Means/Ames Valley and Warren Valley subbasins. Between 1990 and 2000, the quantity of water that was extracted by HDWD in the Means/Ames Valley subbasin was greatly increased due to the operation of the newly drilled Well #24, and the extractions from the Warren Valley subbasin were correspondingly reduced. This shift in production is the reason why the Means/Ames subbasin shows a 4.8% average annual increase in population and the Warren Valley subbasin shows a 4.9% decrease in population between 1990 and 2000. If HDWD had continued to pump primarily from the Warren Valley subbasin in 2000 as it had in 1990, the population served by both the Means/Ames and Warren Valley subbasins would have been less in 2000 than it was in 1990.

Table 5-1 also shows the projected 2000 populations from the 1994 Regional Water Management Plan (RWMP). Every subarea and subbasin in the Mojave Water Agency except for the Means/Ames subbasin experienced less growth than was projected in the 1994 RWMP. The increase in population shown for the Means/Ames Valley subbasin does not represent an increase in actual population, but a shift in service for a portion of HDWD from the Warren Valley subbasin.

The overall population of the Mojave Water Agency increased from about 273,000 in 1990 to about 321,000 in 2000, which represents an average annual growth rate of 1.6% per year. The year 2000 population was 17% less than what was projected in the 1994 RWMP.

Table 5-2 shows year 2000 estimates of population, housing units, average household size, land area and population per acre for individual cities within the Mojave Water Agency.

**Table 5-2: Year 2000 Demographic Data for Selected Cities**

<b>City</b>	<b>Subarea</b>	<b>Population*</b>	<b>Housing Units*</b>	<b>Average Household Size*</b>	<b>Land Area (sq. miles)</b>	<b>Population per acre</b>
Adelanto	Alto	18,130	5,547	3.53	63	0.45
Apple Valley	Alto	54,239	20,163	2.90	73	1.16
Barstow	Centro	21,119	9,153	2.71	33	1.00
Hesperia	Alto	62,582	21,348	3.12	67	1.45
Victorville	Alto	64,029	22,498	3.03	74	1.35
Yucca Valley	MB/JV Area	16,865	7,952	2.38	40	0.66

\*Population, Housing Unit and Household Size data from 2000 U.S. Census

## Consumptive Use

Table 5-3 summarizes the difference between the projected consumptive use estimates for 1995 and 2000 by the 1994 RWMP and actual consumptive use estimates for those two years. Figures 5-1, 5-2 and 5-3 graphically present the Mojave Basin Area data from Table 5-3. The actual urban consumptive use in the Mojave Basin Area was 7% higher than the projected amount for 1995 while agricultural consumptive use was 23% less than the projected amount. The Mojave Basin Area urban consumptive use for year 2000 was 14% greater than projected and the agricultural consumptive use was about 44% less than projected. In the Morongo Basin/Johnson Valley area, the actual consumptive use was 17% less than the projected consumptive use in 1995 and 32% less in 2000.

Table 5-3: 1995 and 2000 Projected and Actual Consumptive Use  
(Acre-feet/year)

	1995 Projected	1995 Actual	Difference	Percent Difference
<b>Mojave Basin Area</b>				
Urban Uses*	53,800	57,500	3,700	7%
Agricultural Uses	70,500	54,400	-16,100	-23%
<b>Subtotal Mojave</b>	<b>124,300</b>	<b>111,900</b>	<b>-12,400</b>	<b>-10%</b>
<b>MB/JV Area</b>				
Urban Uses*	3,270	2,700	-570	-17%
<b>Total</b>	<b>127,600</b>	<b>114,600</b>	<b>-13,000</b>	<b>-10%</b>
	2000 Projected	2000 Actual	Difference	Percent Difference
<b>Mojave Basin Area</b>				
Urban Uses*	61,700	70,300	8,600	14%
Agricultural Uses	62,600	34,900	-27,700	-44%
<b>Subtotal Mojave</b>	<b>124,300</b>	<b>105,200</b>	<b>-19,100</b>	<b>-15%</b>
<b>MB/JV Area</b>				
Urban Uses*	3,810	2,600	-1,210	-32%
<b>Total</b>	<b>128,100</b>	<b>107,800</b>	<b>-20,300</b>	<b>-16%</b>

\*Urban uses include municipal, industrial, golf course, and recreational water uses



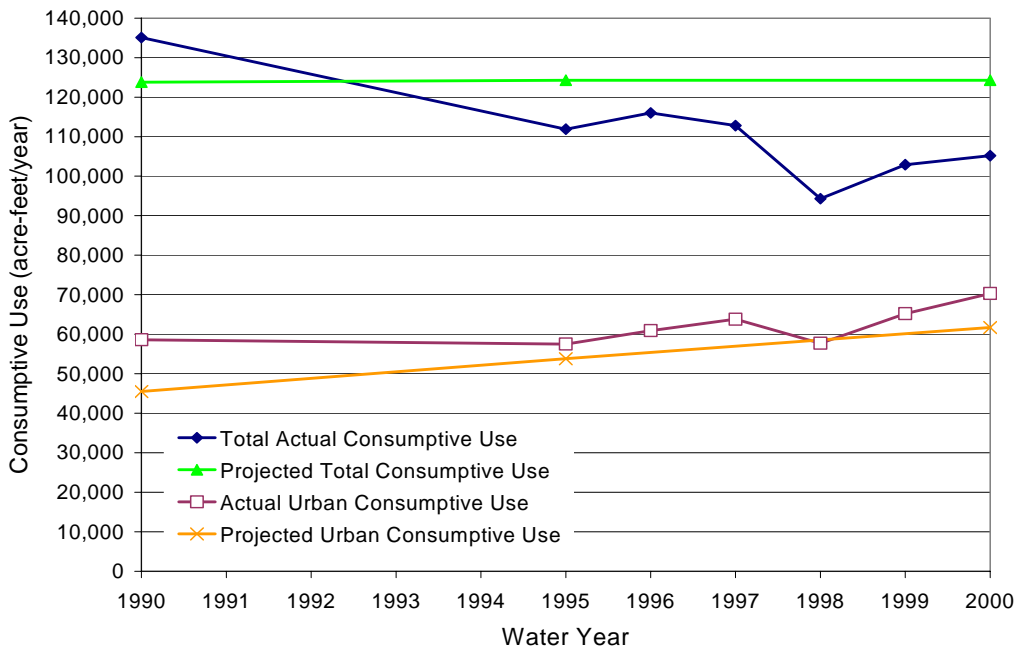


Figure 5-1: Mojave Basin Area Actual Total and Urban Consumptive Use for 1990 - 2000 and 1994 RWMP Projected Use

The 1994 RWMP projected a 1.1% total increase in total Mojave Water Agency consumptive use between 1990 and 2000. The actual consumptive use during this period decreased by 14.9%, which represents a decline of about 18,700 acre-feet.

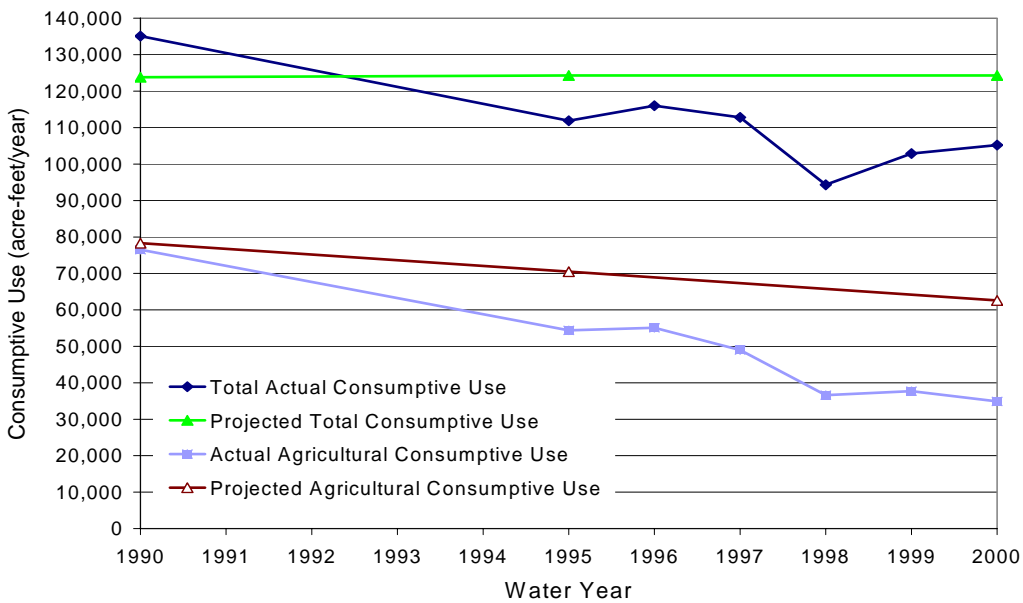


Figure 5-2: Mojave Basin Area Actual Total and Agricultural Consumptive Use for 1990-2000 and 1994 RWMP Projected Use

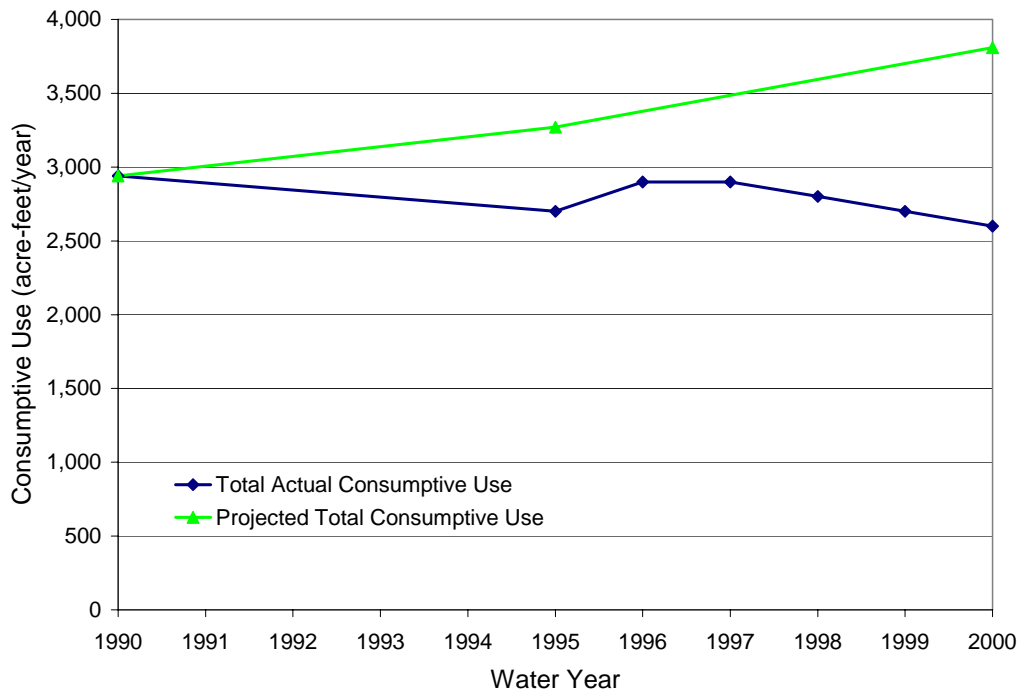


Figure 5-3: Morongo Basin/Johnson Valley Area Actual Total Consumptive Use for 1990-2000 and 1994 RWMP Projected Use

### Mojave Basin Area

The urban consumptive use amounts cited above include all of the non-agricultural uses such as industrial, municipal, golf courses and parks, and recreational lakes. MWA has more recently estimated production for each of these uses separately. Table 5-4 shows estimates of historical consumptive use from 1995 to 2001 for each subarea in the Mojave Basin Area for the various water uses identified above. Figure 5-4 shows the total Mojave Basin Area consumptive use estimates during this time period. The municipal consumptive use estimates in Alto and Oeste have been adjusted to account for the operation of County Service Area (CSA) 70L. While the population of CSA 70L is almost evenly split between Alto and Oeste, about 80% of the production is in Oeste. As a result, the municipal consumptive use estimates in Oeste are greater than 50% of production while the estimates for Alto are less than 50% of production.

Agricultural consumptive use has been declining in all subareas in the Mojave Basin Area since about 1990 while other consumptive uses have remained fairly constant since 1995. The additional decrease in consumptive use of applied water during 1998 as shown on Figure 5-4 was possibly the result of an unusually large amount of local precipitation during that year.

Figures 5-5 through 5-9 show the consumptive use in Alto, Baja, Centro, Este, and Oeste for the various types of use from 1995 through 2001. The recent trends within each subarea are discussed briefly below.

#### *Alto (Figure 5-5)*

Since 1995, municipal consumptive use has increased 16.5% from 28,400 acre-feet to 33,100 acre-feet. During the same time period, however, agricultural consumptive use in Alto has decreased by 72.2%, from 9,000 acre-feet to 2,500 acre-feet. As a result, total consumptive use in Alto has remained fairly steady in recent years.

#### *Baja (Figure 5-6)*

Agriculture is the primary use of water in the Baja Subarea. Between 1995 and 2001, agricultural consumptive use in Baja declined by 31.4%, from 22,300 acre-feet to 15,300 acre-feet. Industrial consumptive use has increased by 350% since 1995, from 1,400 acre-feet to 6,300 acre-feet in 2001, due mostly to an increase in water use by power generating facilities in the area. Between 1995 and 2001 total consumptive use in the Baja Subarea declined by 1,900 acre-feet.

#### *Centro (Figure 5-7)*

In Centro, both agricultural and urban consumptive use has been declining in recent years. Between 1995 and 2001, municipal and industrial use declined by about 11.6% from 8,600 acre-feet to 7,600 acre-feet. Agricultural consumptive use declined by 59.2%, from 16,900 acre-feet to 6,900 acre-feet. Total consumptive use in Centro has declined from 25,700 acre-feet to 14,700 acre-feet between 1995 and 2001.

#### *Este (Figure 5-8)*

Agricultural water use has been decreasing in recent years in Este. Between 1995 and 2001 agricultural consumptive use decreased by 29.3%, from 4,100 acre-feet to 2,900 acre-feet. Urban consumptive use remained fairly constant during these years. Total consumptive use in Este was about 4,600 acre-feet in 2001, compared to 6,300 acre-feet in 1995.

#### *Oeste (Figure 5-9)*

Oeste agricultural consumptive use in 2001 was 1,000 acre-feet, compared to 2,100 acre-feet in 1995. Municipal consumptive use has increased between 1995 and 2001 from 1,500 acre-feet to 1,900 acre-feet. Because the decrease in agricultural consumptive use has been greater than the increase in urban use, total consumptive use in Oeste decreased by 700 acre-feet between 1995 and 2001.

**Table 5-4: Mojave Basin Area Historical Consumptive Use  
(Acre-feet/year)**

<b>Alto</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	9,000	8,200	9,100	4,800	4,500	3,800	2,500
Industrial	5,300	4,000	3,700	3,100	4,000	4,200	3,900
Municipal	28,400	32,000	31,900	28,800	31,300	34,400	33,100
Golf Courses	2,500	2,300	2,200	2,300	2,800	2,200	2,400
Recreational	2,800	3,800	4,100	4,900	6,100	6,900	5,800
<b>Total</b>	<b>48,000</b>	<b>50,300</b>	<b>51,000</b>	<b>43,900</b>	<b>48,700</b>	<b>51,500</b>	<b>47,700</b>
<b>Baja</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	22,300	24,900	21,000	18,300	18,800	17,700	15,300
Industrial	1,400	1,100	3,300	2,500	4,300	5,500	6,300
Municipal	2,000	2,800	2,200	1,700	2,400	2,500	2,400
Golf Courses	0	0	0	0	0	0	0
Recreational	2,600	2,300	3,200	3,900	2,600	2,500	2,400
<b>Total</b>	<b>28,300</b>	<b>31,100</b>	<b>29,700</b>	<b>26,400</b>	<b>28,100</b>	<b>28,200</b>	<b>26,400</b>
<b>Centro</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	16,900	14,900	12,600	8,400	9,800	8,900	6,900
Industrial	2,500	2,500	2,700	1,600	1,800	1,900	1,900
Municipal	6,100	6,600	6,500	5,700	5,900	6,300	5,700
Golf Courses	200	200	200	100	200	200	200
Recreational	0	0	0	0	0	0	0
<b>Total</b>	<b>25,700</b>	<b>24,200</b>	<b>22,000</b>	<b>15,800</b>	<b>17,700</b>	<b>17,300</b>	<b>14,700</b>
<b>Este</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	4,100	4,800	4,000	3,300	3,200	3,200	2,900
Industrial	1,500	800	1,300	800	1,000	900	700
Municipal	700	900	900	900	900	900	1,000
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
<b>Total</b>	<b>6,300</b>	<b>6,500</b>	<b>6,200</b>	<b>5,000</b>	<b>5,100</b>	<b>5,000</b>	<b>4,600</b>
<b>Oeste</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	2,100	2,300	2,300	1,800	1,400	1,300	1,000
Industrial	0	0	0	0	0	0	0
Municipal	1,500	1,600	1,600	1,400	1,900	1,900	1,900
Golf Courses	0	0	0	0	0	0	0
Recreational	0	0	0	0	0	0	0
<b>Total</b>	<b>3,600</b>	<b>3,900</b>	<b>3,900</b>	<b>3,200</b>	<b>3,300</b>	<b>3,200</b>	<b>2,900</b>
<b>Total Mojave Basin Area</b>							
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>
Agricultural	54,400	55,100	49,000	36,600	37,700	34,900	28,600
Industrial	10,700	8,400	11,000	8,000	11,100	12,500	12,800
Municipal	38,700	43,900	43,100	38,500	42,400	46,000	44,100
Golf Courses	2,700	2,500	2,400	2,400	3,000	2,400	2,600
Recreational	5,400	6,100	7,300	8,800	8,700	9,400	8,200
<b>Total</b>	<b>111,900</b>	<b>116,000</b>	<b>112,800</b>	<b>94,300</b>	<b>102,900</b>	<b>105,200</b>	<b>96,300</b>

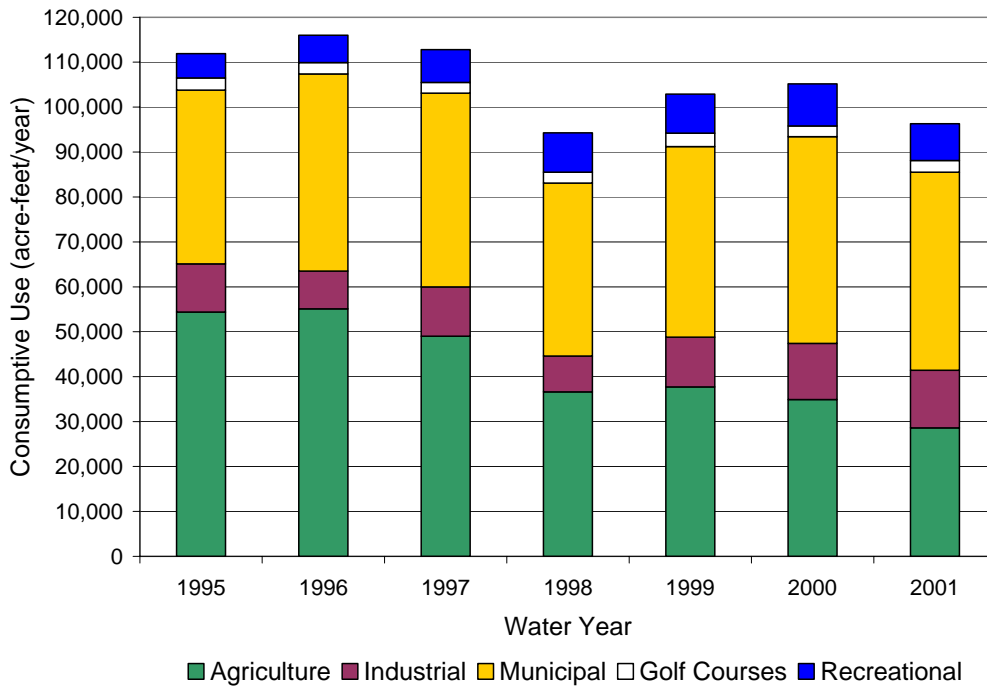


Figure 5-4: Mojave Basin Area Total Consumptive Use by Sector for 1995-2001

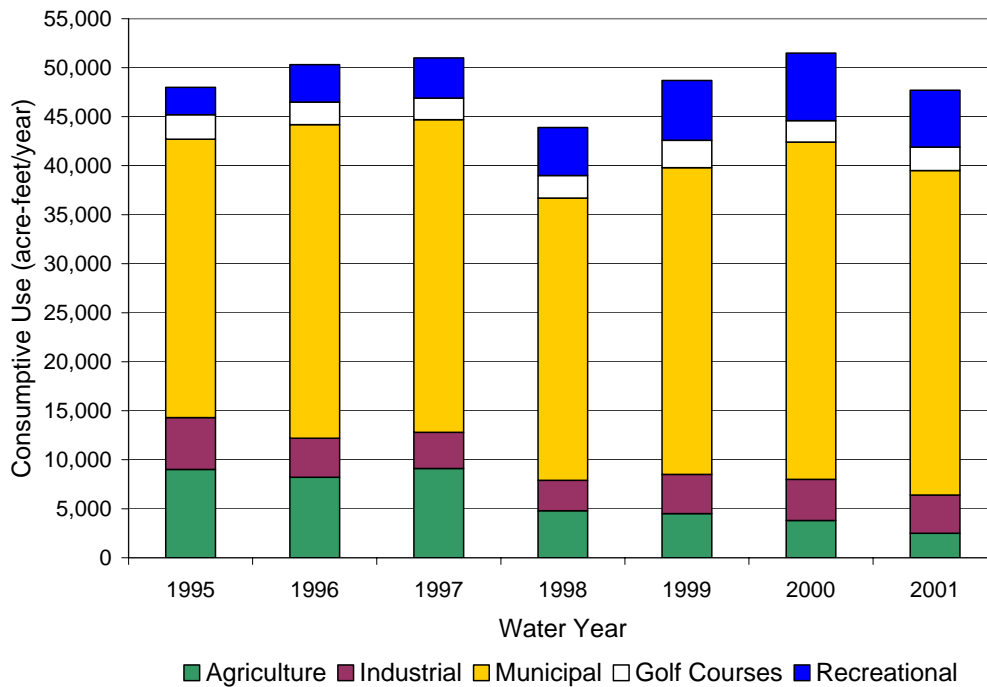


Figure 5-5: Alto Subarea Consumptive Use by Sector for 1995-2001

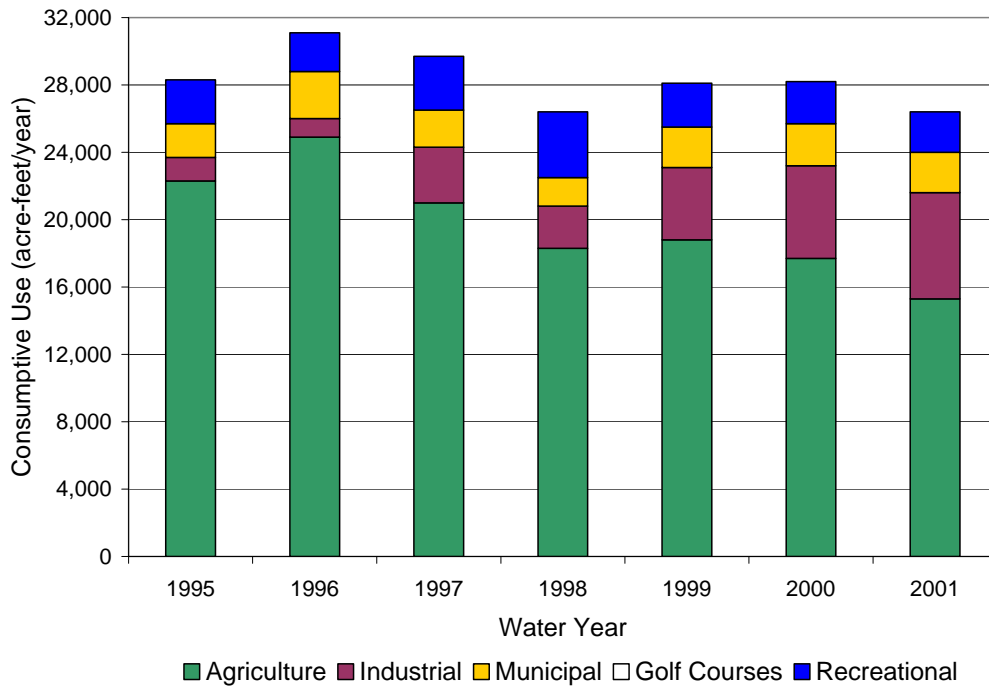


Figure 5-6: Baja Subarea Consumptive Use by Sector for 1995-2001

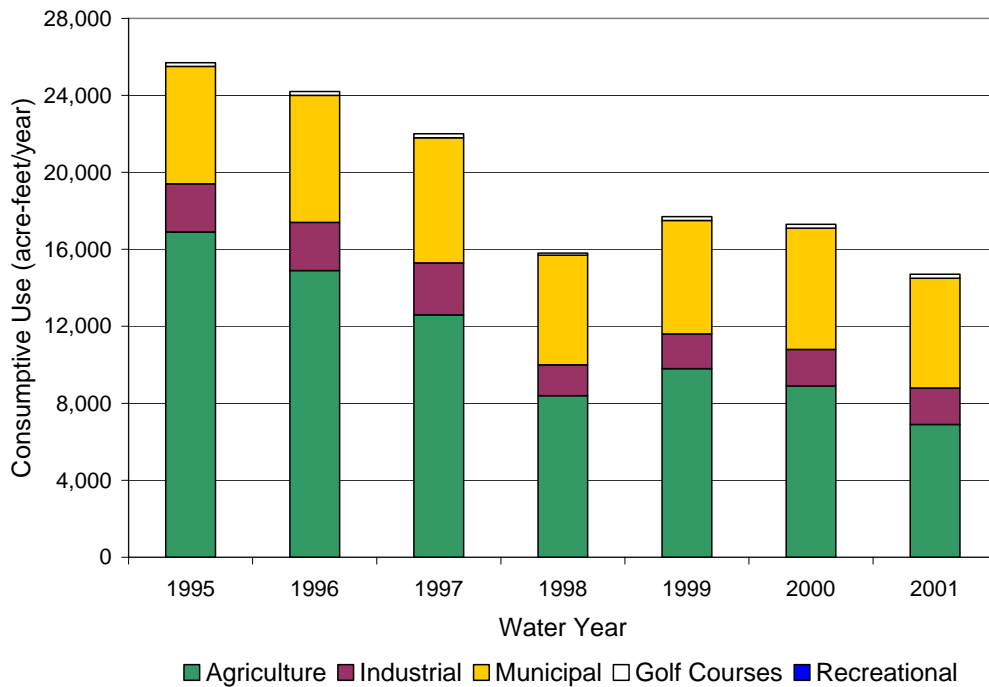


Figure 5-7: Centro Subarea Consumptive Use by Sector for 1995-2001

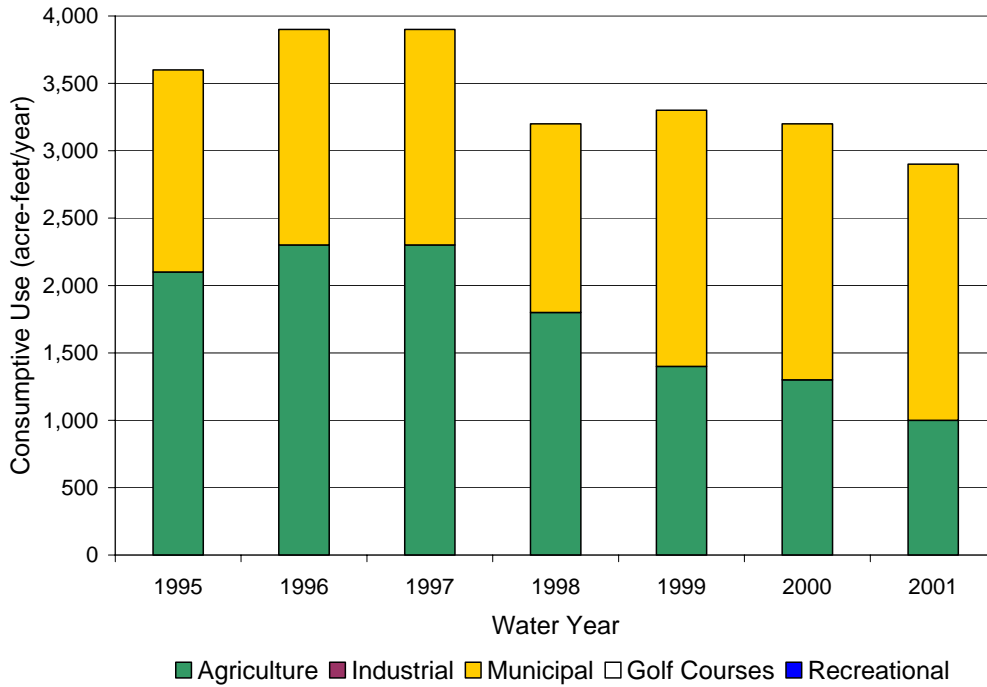


Figure 5-8: Este Subarea Consumptive Use by Sector for 1995-2001

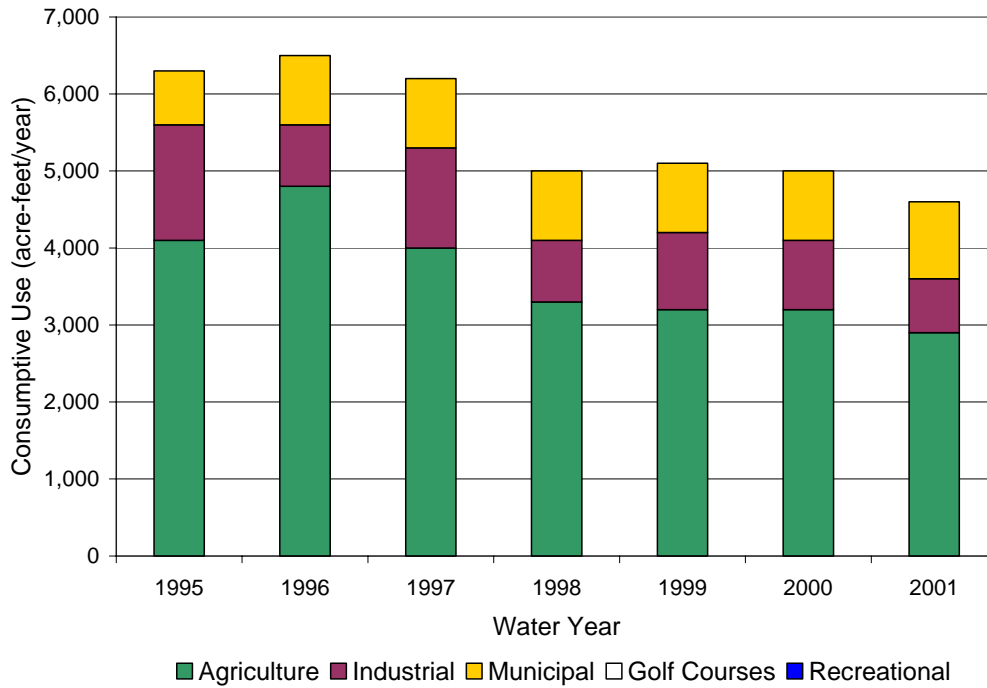


Figure 5-9: Oeste Subarea Consumptive Use by Sector for 1995-2001

## Morongo Basin/Johnson Valley Area

Table 5-5 shows consumptive use estimates for each demand sector within each subbasin in the Morongo Basin/Johnson Valley Area. Because production estimates were not available in the Morongo Basin/Johnson Valley Area for 2001, Table 5-5 shows consumptive use estimates from 1995-2000. Production data is not available for the Johnson Valley subbasin. The consumptive use estimate for the Johnson Valley Area for 2000 was determined using the 2000 population estimate shown in Table 5-1 and assuming that the per capita use was the same as the remainder of the Morongo Basin/Johnson Valley Area.

The municipal consumptive use in the Means/Ames Valley and Warren Valley subbasins has not necessarily been proportional to the production in each of those subbasins. This is due to: (1) the pumping operation of the HDWD, which overlies both subbasins and has production wells in each subbasin, and (2) the operation of the Bighorn Desert View Intertie, through which water pumped outside of HDWD in the Means/Ames Valley subbasin was transferred to HDWD in 1995, 1996 and 2000. In 2000, 81% of the population of HDWD resided on top of the Warren Valley subbasin, with the remainder residing on top of the Means/Ames Valley subbasin. It is therefore assumed that the 81% of the return flow from total HDWD production would return to the Warren Valley subbasin. However, the proportion of HDWD's production that was extracted from each subbasin has been variable, with as little as 61% being extracted from the Warren Valley subbasin in 1996 and as much as 79% in 2000. Because a higher proportion of population than production in the HDWD service area has been in the Warren Valley subbasin, the consumptive use as a percent of production has been higher in the Means/Ames Valley subbasin than in the Warren Valley subbasin. The Bighorn Desert View Intertie operation had the further effect of increasing the consumptive use in the Means/Ames subbasin and reducing it in the Warren Valley subbasin because all of the production passing through the Intertie occurred in the Means/Ames Valley subbasin but 81% of the return flow went to the Warren Valley subbasin.



Table 5-5: Morongo Basin/Johnson Valley Area Historical Consumptive Use  
(Acre-feet/year)

<b>Copper Mountain Valley</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Agricultural	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Municipal	700	800	800	700	800	800
Golf Courses	0	0	0	0	0	0
Recreational	0	0	0	0	0	0
<b>Total</b>	<b>700</b>	<b>800</b>	<b>800</b>	<b>700</b>	<b>800</b>	<b>800</b>
<b>Johnson Valley</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Agricultural	N/A	N/A	N/A	N/A	N/A	0
Industrial	N/A	N/A	N/A	N/A	N/A	0
Municipal	N/A	N/A	N/A	N/A	N/A	30
Golf Courses	N/A	N/A	N/A	N/A	N/A	0
Recreational	N/A	N/A	N/A	N/A	N/A	0
<b>Total</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>30</b>
<b>Means/Ames Valley</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Agricultural	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Municipal	1,200	1,700	900	1,200	900	600
Golf Courses	0	0	0	0	0	0
Recreational	0	0	0	0	0	0
<b>Total</b>	<b>1,200</b>	<b>1,700</b>	<b>900</b>	<b>1,200</b>	<b>900</b>	<b>600</b>
<b>Warren Valley</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Agricultural	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Municipal	600	200	1,000	700	800	1,100
Golf Courses	200	200	200	200	200	100
Recreational	0	0	0	0	0	0
<b>Total</b>	<b>800</b>	<b>400</b>	<b>1,200</b>	<b>900</b>	<b>1,000</b>	<b>1,200</b>
<b>Total Morongo Basin/Johnson Valley Area*</b>						
	<b>1995</b>	<b>1996</b>	<b>1997</b>	<b>1998</b>	<b>1999</b>	<b>2000</b>
Agricultural	0	0	0	0	0	0
Industrial	0	0	0	0	0	0
Municipal	2,500	2,700	2,700	2,600	2,500	2,500
Golf Courses	200	200	200	200	200	100
Recreational	0	0	0	0	0	0
<b>Total</b>	<b>2,700</b>	<b>2,900</b>	<b>2,900</b>	<b>2,800</b>	<b>2,700</b>	<b>2,600</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley Area totals because the supply is not included as noted in Chapter 4.

Figure 5-10 shows the total Morongo Basin/Johnson Valley Area consumptive use estimates during this time period. Consumptive use in the Morongo Basin/Johnson Valley area has stayed fairly constant in these years, fluctuating between about 2,600 acre-feet and about 2,900 acre-feet. About 95% of the consumptive use in the Morongo Basin/Johnson Valley area is municipal use, with the remainder being used for a golf course in the Warren Valley. The area contains only minimal agricultural, industrial, or recreational lakes uses.

Figures 5-11 through 5-13 show the consumptive use in the Copper Mountain Valley, Means/Ames Valley, and Warren Valley subbasins for each type of use from 1995 through 2000. The recent trends within each subbasin are discussed briefly below.

#### *Copper Mountain Valley (Figure 5-11)*

All of the production from the Copper Mountain Valley subbasin is for municipal uses. The consumptive use in the Copper Mountain Valley subbasin has been fairly stable in recent years, ranging from a low of 700 acre-feet in 1998 to a high of 800 acre-feet in 1996.

#### *Means/Ames Valley (Figure 5-12)*

Consumptive use in the Means/Ames Valley has been highly variable because of fluctuations in the production ratio of HDWD and the operation of the Bighorn Desert View Intertie. In 1996, the Means/Ames Valley consumptive use was very high because 39% of the HDWD pumping was out of the Means/Ames Valley subbasin and an additional 700 acre-feet was pumped from the subbasin and transferred to HDWD. However, from 1997-1999 the Bighorn Desert View Intertie did not operate and only 27 acre-feet were transferred in 2000. Furthermore, in 1997, 1999, and 2000 less than 30% of HDWD's production was out of the Means/Ames Valley subbasin. As a result of these differences in operation, the consumptive use in the Means/Ames Valley subbasin was 1,700 acre-feet in 1996 but 900 acre-feet or less in 1997, 1999, and 2000.

#### *Warren Valley (Figure 5-13)*

Consumptive use in the Warren Valley has been highly variable for the same reasons as in the Means/Ames Valley. The effects of these changes in operation have been the opposite in the Warren Valley than those in the Means/Ames Valley. In 1996, for example, while the Means/Ames Valley had a very high consumptive use, the Warren Valley subbasin had only about 400 acre-feet of consumptive use. In 1997, 1999 and 2000, by contrast, the Warren Valley had at least 1,000 acre-feet of consumptive use each year.

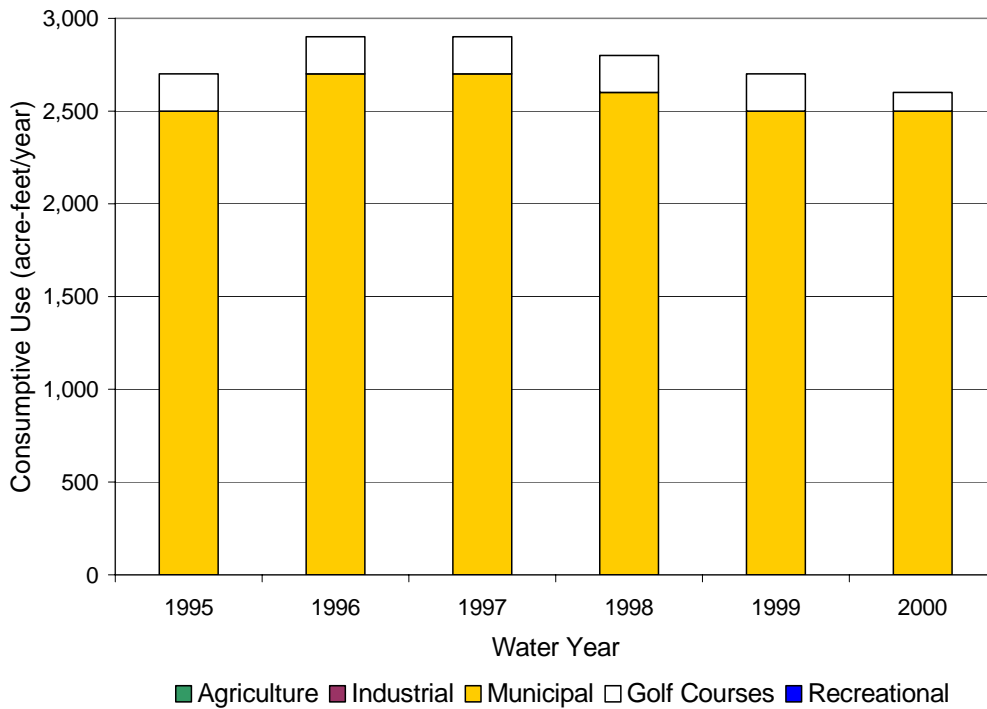


Figure 5-10: Morongo Basin/Johnson Valley Area Total Consumptive Use by Sector for 1995-2000

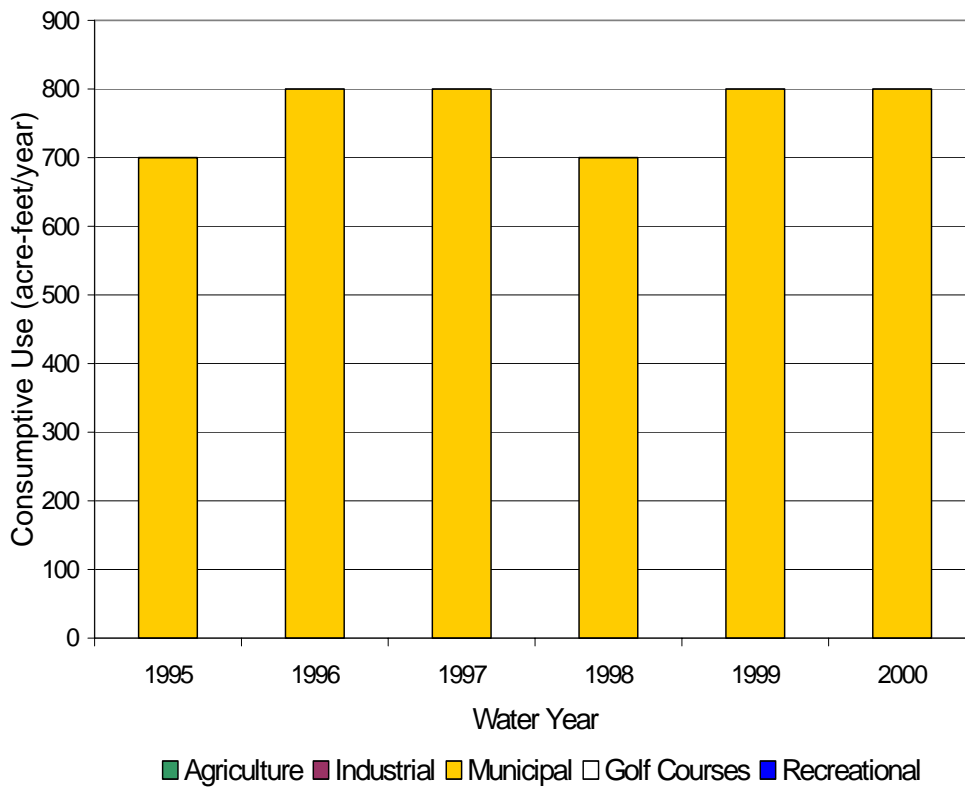


Figure 5-11: Copper Mountain Valley Subbasin Consumptive Use by Sector for 1995-2000

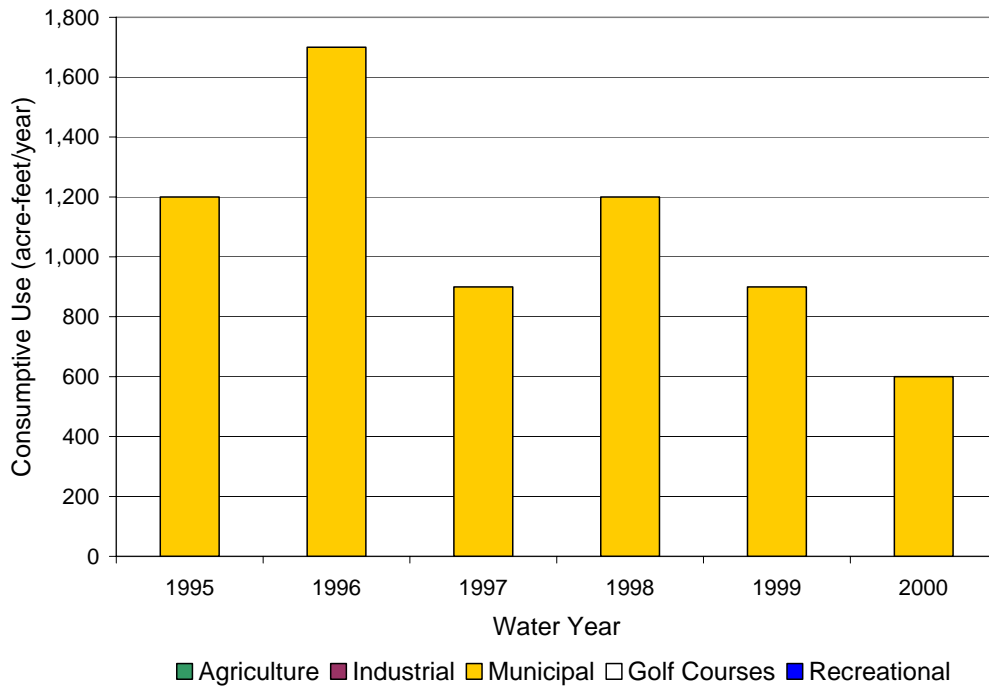


Figure 5-12: Means/Ames Valley Subbasin Consumptive Use by Sector for 1995-2000

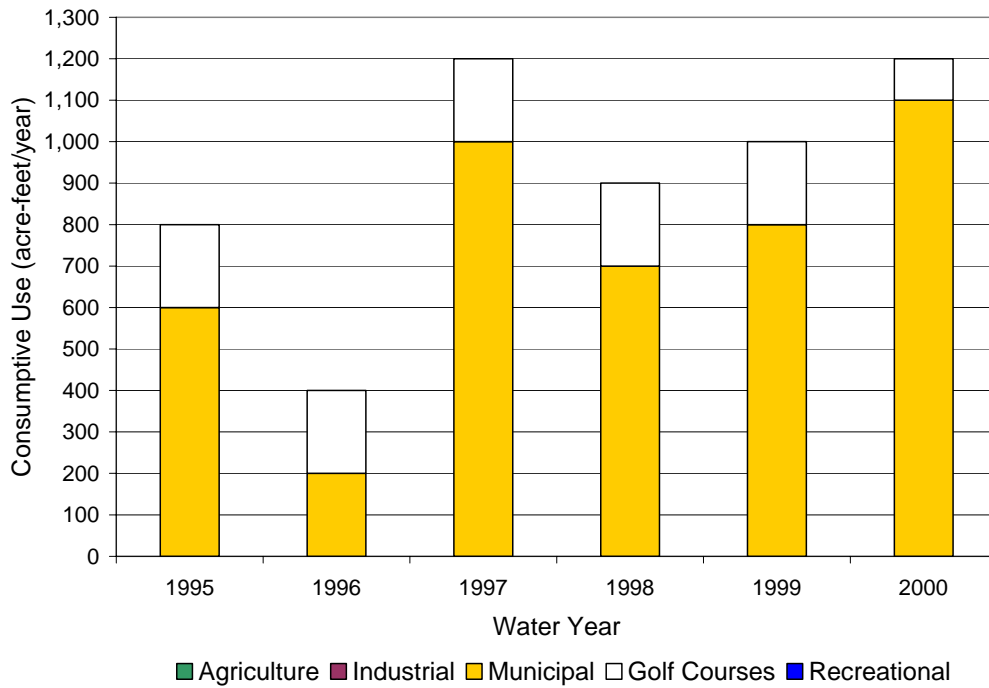


Figure 5-13: Warren Valley Subbasin Consumptive Use by Sector for 1995-2000

## Current Water Balance

MWA's current water demand, as discussed above, is compared with the average annual water supply discussed in Chapter 4 to develop the water balance shown in Table 5-6.

Table 5-6: Year 2000 Average Annual Water Balance (Acre-feet/year)

	Net Average Annual Water Supply <sup>1</sup>	Consumptive Use			Surplus/ Deficit
		Agricultural	Urban <sup>2</sup>	Total	
<b>Mojave Basin Area</b>					
Alto	34,700	3,800	47,700	51,500	-16,800
Baja	5,600	17,700	10,500	28,200	-22,600
Centro	18,500	8,900	8,400	17,300	+1,200
Este	3,500	3,200	1,800	5,000	-1,500
Oeste	1,100	1,300	1,900	3,200	-2,100
<b>Subtotal Mojave</b>	<b>63,400</b>	<b>34,900</b>	<b>70,300</b>	<b>105,200</b>	<b>-41,800</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	600	0	800	800	-200
Johnson Valley	2,300	0	30	30	+2,270
Means/Ames Valley	600	0	600	600	0
Warren Valley	900 <sup>3</sup>	0	1,200	1,200	-300
<b>Subtotal MB/JV<sup>4</sup></b>	<b>2,100</b>	<b>0</b>	<b>2,600</b>	<b>2,600</b>	<b>-500</b>
<b>Total</b>	<b>65,500</b>	<b>34,900</b>	<b>72,900</b>	<b>107,800</b>	<b>-42,300</b>
<b>Average Annual SWP Supply:</b>					<b>8,000</b>
<b>Surplus/Deficit with SWP Supply:</b>					<b>-34,300</b>

<sup>1</sup>Net average annual water supply data as shown in Tables 4-2 and 4-5 of Chapter 4.

<sup>2</sup>Urban uses include municipal, industrial, golf course, and recreational water uses.

<sup>3</sup>Hi-Desert Water District reports unpublished USGS estimates of 200 acre-feet per year net average annual supply in the Warren Valley subbasin.

<sup>4</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

As shown in Table 5-6, the average water deficit in the Mojave Basin Area without State Water Project (SWP) supply for the year 2000 is approximately 41,800 acre-feet per year. Baja, with a deficit of 22,600 acre-feet, and Alto, at 16,800 acre-feet, constitute most of the current water deficit. Centro currently has slightly more water supply than demand. Este has a water deficit of approximately 1,500 acre-feet per year and Oeste has a deficit of approximately 2,100 acre-feet per year.

Outside of the Johnson Valley, the Morongo Basin/Johnson Valley Area has an average water deficit of approximately 500 acre-feet per year without SWP supply. The Warren Valley subbasin has the largest deficit, at about 300 acre-feet per year.

Since 1999, an average of about 8,000 acre-feet per year of SWP water has been imported into the Mojave Water Agency. Of this amount, about 3,500 acre-feet has been purchased by the Hi-Desert Water District and delivered to the Warren Valley subbasin by the Morongo Basin Pipeline to offset the deficit and to add to groundwater in storage.

When the current average annual SWP delivery is included, the Mojave Water Agency currently has a long-term average annual water deficit of approximately 34,300 acre-feet per year.

## Future Water Demand

### Demographics

Table 5-7 shows the estimated 2000 population and projected future population for each subarea and the average annual percent increase between 2000 and 2020. These population estimates were determined using data provided by the Southern California Association of Governments and data contained in stakeholder surveys.

Table 5-7: Current and Projected Population Estimates

	2000	2005	2010	2015	2020	Annual Percent Change
<b>Mojave Basin Area</b>						
Alto	236,600	266,700	303,700	348,900	407,700	+2.8%
Baja	5,100	5,300	5,600	5,900	6,200	+1.0%
Centro	33,700	36,100	41,500	47,100	54,100	+2.4%
Este	6,000	6,800	8,100	9,400	11,300	+3.2%
Oeste	7,400	8,300	9,400	11,300	13,600	+3.1%
<b>Subtotal Mojave</b>	<b>288,800</b>	<b>323,200</b>	<b>368,300</b>	<b>422,600</b>	<b>492,900</b>	<b>+2.7%</b>
<b>MB/JV Area*</b>						
Copper Mtn. Valley	9,600	10,300	11,000	11,800	12,700	+1.4%
Johnson Valley	400	400	500	500	600	+2.0%
Means/Ames Valley	7,500	8,300	9,300	10,400	11,700	+2.2%
Warren Valley	14,700	16,600	18,600	21,000	23,600	+2.4%
<b>Subtotal MB/JV</b>	<b>32,200</b>	<b>35,600</b>	<b>39,400</b>	<b>43,700</b>	<b>48,600</b>	<b>+2.1%</b>
<b>Total</b>	<b>321,000</b>	<b>358,800</b>	<b>407,700</b>	<b>466,300</b>	<b>541,500</b>	<b>+2.6%</b>

\*Morongo Basin/Johnson Valley Area subbasin populations represent the population served by each subbasin, not the population that overlies the subbasin. This assumption is consistent with the 1994 RWMP.

## Consumptive Use

The following assumptions were used to estimate the future consumptive use through 2020 for various water uses:

- Industrial and recreational lakes water uses were assumed to remain constant at year 2000 levels. The one exception was industrial use in Alto, which was assumed to increase by 4,000 acre-feet due to the expected operation of the new Hi-Desert Power Project.
- Municipal water use was assumed to change in direct proportion to the population in each subarea. The population estimates used are shown in Table 5-6. Total water use was determined by multiplying these population estimates by per capita water use rates calculated for the year 2000.
- Golf course consumptive use was assumed to change in direct proportion with the change in municipal consumptive use.
- Agricultural consumptive use was estimated under two possible scenarios intended to provide a maximum and minimum estimate of future agricultural demand.

Agriculture Scenario 1: assumes that agricultural water use does not change from the year 2000 estimates through 2020. Under this assumption, any current non-agricultural water deficit within the subarea and all increases in non-agricultural water uses would have to be supplied by imported water.

Agriculture Scenario 2: assumes that rampdown under the Mojave Basin Area Judgment (1996) resumes in 2002 at 5% per year until balance is achieved between production rights and available supply as required by the Judgment. Non-agricultural water use was assumed to be met by existing non-agricultural Free Production Allowances and through voluntary transfers of agricultural free production allowance. It was assumed, however, that at least 1,300 acre-feet of agricultural consumptive use (2,100 acre-feet of production) would remain in Alto, 300 acre-feet of consumptive use (500 acre-feet of production) would remain in Oeste, and 600 acre feet of consumptive use (900 acre-feet of production) would remain in Baja.

These two scenarios result in significantly different estimates of future agricultural consumptive use, especially in Baja. Projected agricultural consumptive uses can be seen for each scenario in Table 5-8. Under Agriculture Scenario 1, the year 2000 values remain unchanged through the year 2020. Under Agriculture Scenario 2, there are significant decreases in agricultural consumptive use because of the assumption that agriculture will voluntarily transfer its free production allowance to non-agricultural uses in-lieu of purchasing replacement water. Figure 5-

14 graphically shows the projected future agricultural consumptive use in each subarea under Scenario 2.

**Table 5-8: Projected Agricultural Consumptive Use (Acre-feet/year)**

	Ag Scenario 1		Ag Scenario 2			
	All years	2000	2005	2010	2015	2020
<b>Mojave Basin Area</b>						
Alto	3,800	3,800	1,300	1,300	1,300	1,300
Baja	17,700	17,700	17,700	6,700	600	600
Centro	8,900	8,900	8,900	8,900	8,900	8,900
Este	3,200	3,200	3,200	3,200	3,200	1,400
Oeste	1,300	1,300	1,300	1,300	1,300	300
<b>Subtotal Mojave</b>	<b>34,900</b>	<b>34,900</b>	<b>34,900</b>	<b>32,400</b>	<b>15,300</b>	<b>12,500</b>
<b>MB/JV Area</b>						
Copper Mtn. Valley	0	0	0	0	0	0
Johnson Valley	0	0	0	0	0	0
Means/Ames Valley	0	0	0	0	0	0
Warren Valley	0	0	0	0	0	0
<b>Subtotal MB/JV</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
<b>TOTAL</b>	<b>34,900</b>	<b>34,900</b>	<b>32,400</b>	<b>21,400</b>	<b>15,300</b>	<b>12,500</b>

It should be noted that agricultural use has already declined in every subarea relative to year 2000 levels. However, these data are still considered to be valid for planning purposes because Agriculture Scenarios 1 and 2 are intended to provide low and high estimates of future agricultural use. The Technical Advisory Committee for the RWMP Update has determined that Agriculture Scenario 2 is the most appropriate to be used as the basis for the Plan.

### Mojave Basin Area

As a result of the differences in agricultural use, the two scenarios show very different pictures of future consumptive use in the Mojave Basin Area. Table 5-9 shows the projected consumptive use for the non-agricultural demand sectors in each subarea in the Mojave Basin Area. Table 5-8 also shows the total consumptive use for each subarea under each scenario when the agricultural estimates from Table 5-8 are added to the totals. The projected total consumptive use in the Mojave Basin Area can also be seen for each scenario in Figures 5-15 and 5-16. Between 2000 and 2020, municipal consumptive use is projected to increase by about 31,600 acre-feet, an increase of 2.6% per year. In addition, golf course and park use is projected to increase by about 1,700 acre-feet, and industrial use is projected to increase by about 4,000 acre-feet. Therefore, when agricultural consumptive use is held constant as in Agriculture



Scenario 1, the overall water demand would increase by about 37,300 acre-feet. Under Agricultural Scenario 2, however, much of the increase in municipal consumptive use is offset by reductions in agricultural use, resulting in a total increase of only about 14,900 acre-feet between 2000 and 2020.

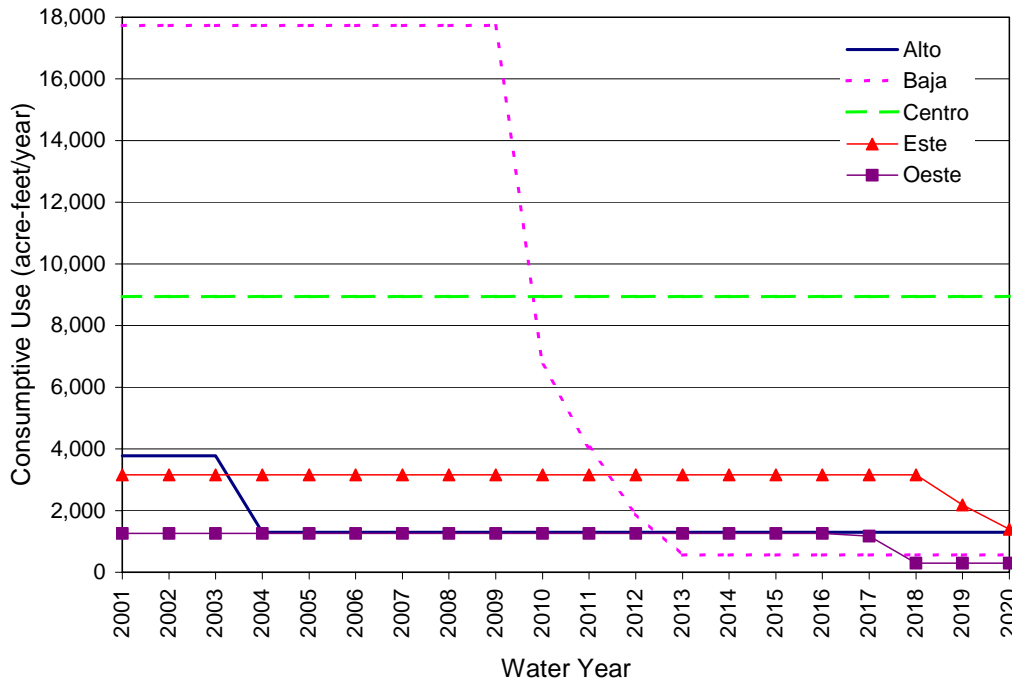


Figure 5-14: Agricultural Consumptive Use From 2001 Through 2020 Under Agriculture Scenario 2 Assumptions

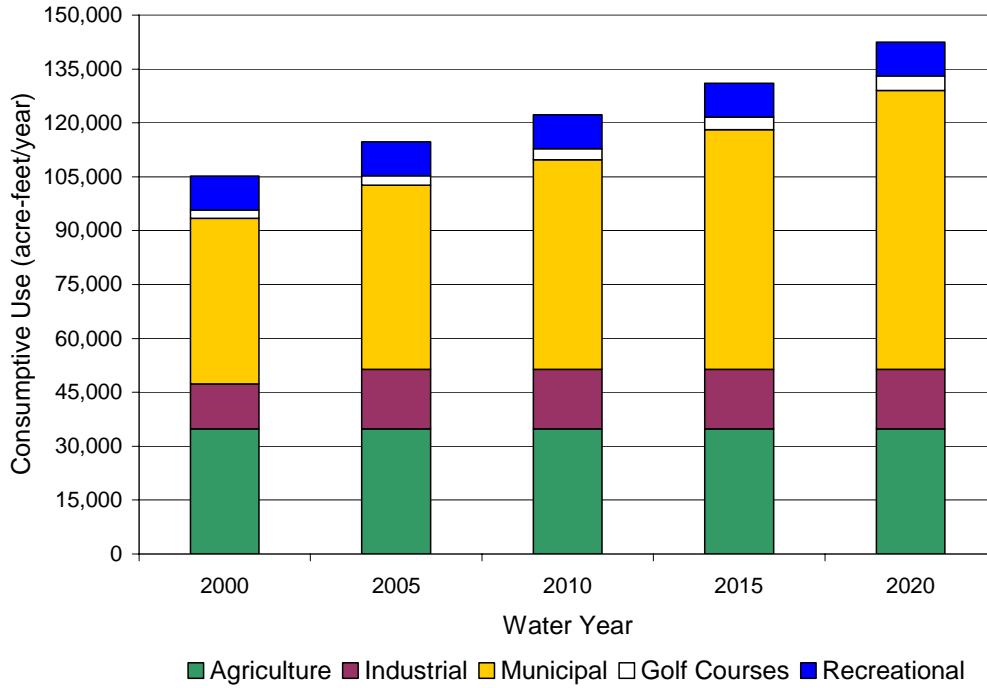


Figure 5-15: Mojave Basin Area Total Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1

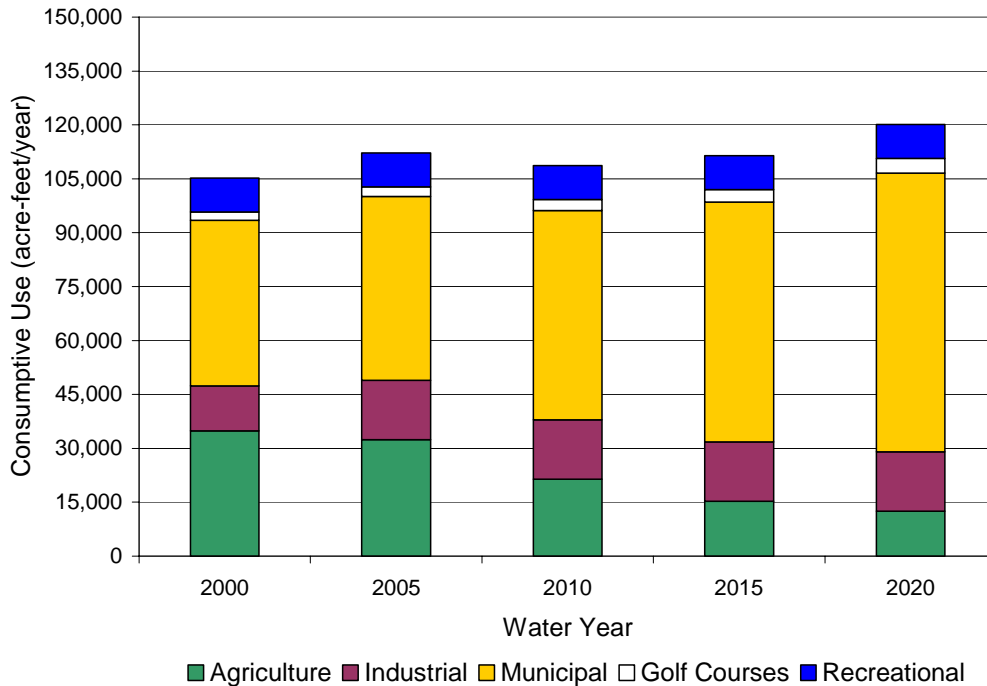


Figure 5-16: Mojave Basin Area Total Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 2

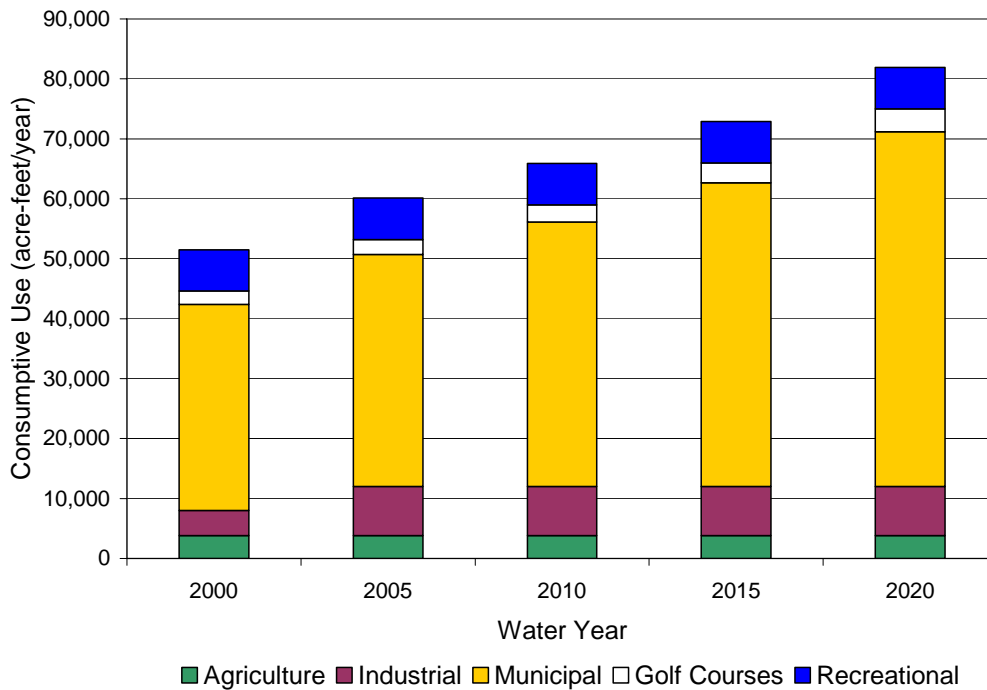
Table 5-9: Mojave Basin Area Current and Projected Consumptive Use  
(Acre-feet/year)

<b>Alto</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	4,200	8,200	8,200	8,200	8,200
Municipal	34,400	38,700	44,100	50,700	59,200
Golf Courses	2,200	2,500	2,900	3,300	3,800
Recreational	6,900	6,900	6,900	6,900	6,900
<b>Total: Including Ag Scenario 1</b>	<b>51,500</b>	<b>60,100</b>	<b>65,900</b>	<b>72,900</b>	<b>81,900</b>
<b>Total: Including Ag Scenario 2</b>	<b>51,500</b>	<b>57,600</b>	<b>63,400</b>	<b>70,400</b>	<b>79,400</b>
<b>Baja</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	5,500	5,500	5,500	5,500	5,500
Municipal	2,500	2,600	2,800	2,900	3,100
Golf Courses	0	0	0	0	0
Recreational	2,500	2,500	2,500	2,500	2,500
<b>Total: Including Ag Scenario 1</b>	<b>28,200</b>	<b>28,300</b>	<b>28,500</b>	<b>28,600</b>	<b>28,800</b>
<b>Total: Including Ag Scenario 2</b>	<b>28,200</b>	<b>28,300</b>	<b>17,500</b>	<b>11,500</b>	<b>11,700</b>
<b>Centro</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	1,900	1,900	1,900	1,900	1,900
Municipal	6,300	6,700	7,700	8,800	10,100
Golf Courses	200	200	200	200	300
Recreational	0	0	0	0	0
<b>Total: Including Ag Scenario 1</b>	<b>17,300</b>	<b>17,700</b>	<b>18,700</b>	<b>19,800</b>	<b>21,200</b>
<b>Total: Including Ag Scenario 2</b>	<b>17,300</b>	<b>17,700</b>	<b>18,700</b>	<b>19,800</b>	<b>21,200</b>
<b>Este</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	900	900	900	900	900
Municipal	900	1,000	1,200	1,400	1,700
Golf Courses	0	0	0	0	0
Recreational	0	0	0	0	0
<b>Total: Including Ag Scenario 1</b>	<b>5,000</b>	<b>5,100</b>	<b>5,300</b>	<b>5,500</b>	<b>5,800</b>
<b>Total: Including Ag Scenario 2</b>	<b>5,000</b>	<b>5,100</b>	<b>5,300</b>	<b>5,500</b>	<b>4,000</b>
<b>Oeste</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	0	0	0	0	0
Municipal	1,900	2,200	2,500	2,900	3,500
Golf Courses	0	0	0	0	0
Recreational	0	0	0	0	0
<b>Total: Including Ag Scenario 1</b>	<b>3,200</b>	<b>3,500</b>	<b>3,800</b>	<b>4,200</b>	<b>4,800</b>
<b>Total: Including Ag Scenario 2</b>	<b>3,200</b>	<b>3,500</b>	<b>3,800</b>	<b>4,200</b>	<b>3,800</b>
<b>Total Mojave Basin Area</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Industrial	12,500	16,500	16,500	16,500	16,500
Municipal	46,000	51,200	58,300	66,700	77,600
Golf Courses	2,400	2,700	3,100	3,500	4,100
Recreational	9,400	9,400	9,400	9,400	9,400
<b>Total: Including Ag Scenario 1</b>	<b>105,200</b>	<b>114,700</b>	<b>122,200</b>	<b>131,000</b>	<b>142,500</b>
<b>Total: Including Ag Scenario 2</b>	<b>105,200</b>	<b>112,200</b>	<b>108,700</b>	<b>111,400</b>	<b>120,100</b>

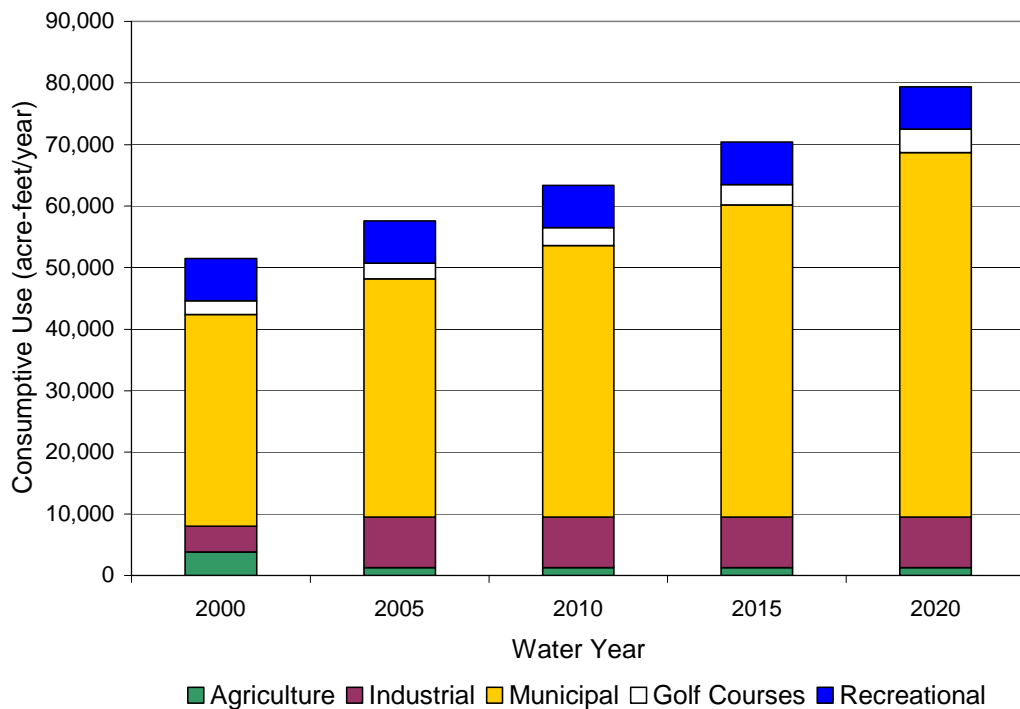
In the following sections, projected changes in consumptive use are discussed for each subarea.

*Alto (Figures 5-17 and 5-18)*

Figures 5-17 and 5-18 show projected consumptive use in Alto under each scenario. Municipal use is projected to increase by about 24,800 acre-feet between 2000 and 2020. This represents a growth rate of 2.8% per year on average. Consumptive use by golf courses and parks is projected to increase by about 1,600 acre-feet and industrial use is projected to increase by about 4,000 acre-feet. Therefore, total consumptive use would increase by approximately 30,400 acre-feet if agricultural use were to remain constant at its current total of about 3,800 acre-feet. If agricultural consumptive use were reduced to about 1,300 acre-feet, as it would be under Agriculture Scenario 2, total consumptive use in Alto would still increase by approximately 27,900 acre-feet.



**Figure 5-17: Alto Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1**



**Figure 5-18: Alto Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 2**

***Baja (Figures 5-19 and 5-20)***

Figures 5-19 and 5-20 show future consumptive use in Baja under each scenario. If agricultural consumptive use remains constant, as in Figure 5-18, total consumptive use is projected to increase by about 600 acre-feet due to a small increase in municipal water use, which is projected to increase at an annual average of 1.0%. Under Agriculture Scenario 2, as shown on Figure 5-20, agricultural consumptive use would be reduced to about 600 acre-feet by 2015 and remain constant at that level through 2020. This would cause the total consumptive use in the subarea to decline from about 28,200 to 11,700 acre-feet between 2000 and 2020.

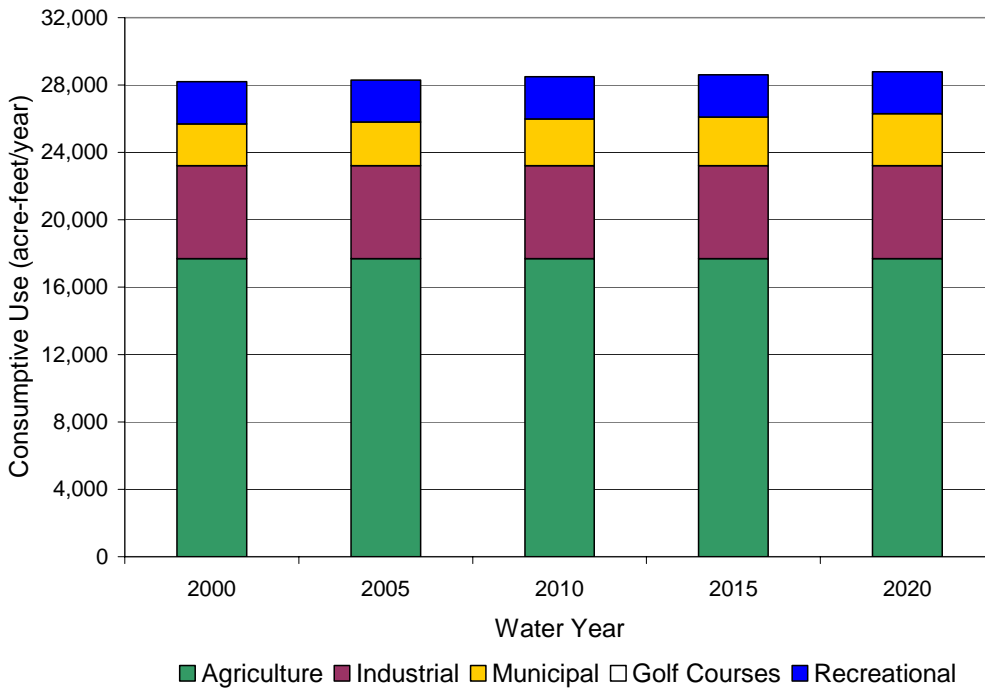


Figure 5-19: Baja Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1

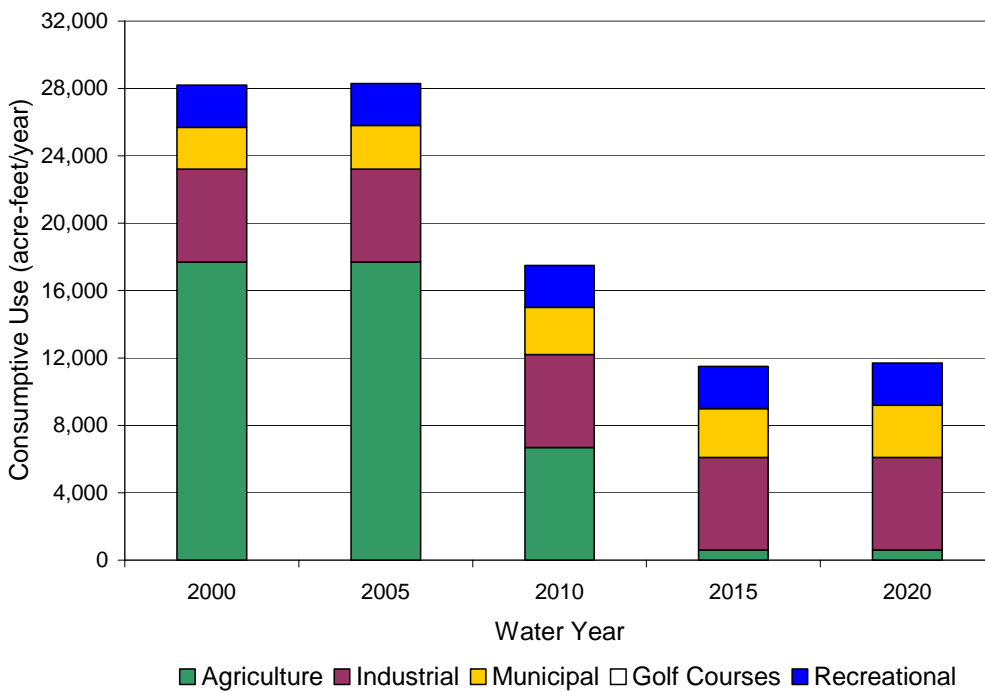
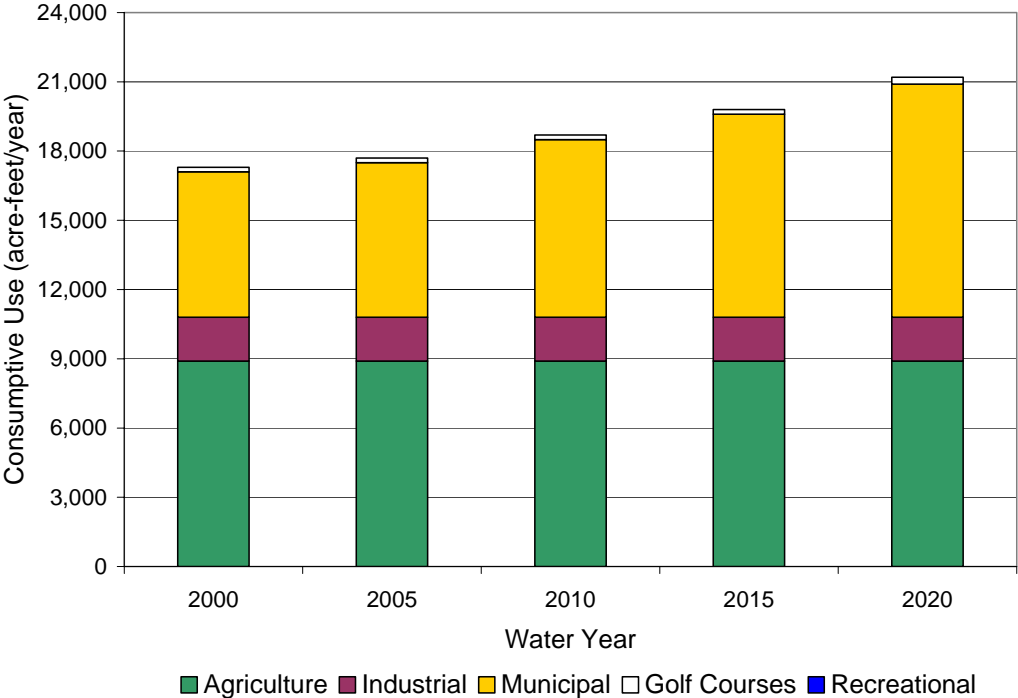


Figure 5-20: Baja Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 2

*Centro (Figure 5-21)*

No reduction in agricultural use is expected in Centro under either scenario. Figure 5-21 shows that municipal consumptive use for Centro is projected to increase by about 3,800 acre-feet and that golf course use is projected to increase by about 100 acre-feet between 2000 and 2020, assuming an average annual growth rate of 2.4%.



**Figure 5-21: Centro Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenarios 1 and 2**

*Este (Figures 5-22 and 5-23)*

Figures 5-22 and 5-23 show projected consumptive use in Este under each scenario. Municipal consumptive use is projected to increase in Este by about 800 acre-feet between 2000 and 2020, assuming an annual average growth rate of 3.2%. Under Agriculture Scenario 2, agricultural consumptive use is projected to decrease by about 1,800 acre-feet, which would result in a net reduction in Este consumptive use of about 1,000 acre-feet between 2000 and 2020.

### *Oeste (Figures 5-24 and 5-25)*

Figures 5-24 and 5-25 show the projected consumptive use in Oeste under each scenario. Municipal consumptive use is expected to increase by about 1,600 acre-feet between 2000 and 2020, assuming an annual average growth rate of 3.1%. Under Scenario 2, agricultural consumptive use would decline from about 1,300 acre-feet to approximately 300 acre-feet, resulting in a net increase in total annual consumptive use of about 600 acre-feet.

### *Morongo Basin/Johnson Valley Area*

The Morongo Basin/Johnson Valley area contains very little agriculture. Table 5-10 shows the projected consumptive use for each subbasin in the Morongo Basin and Johnson Valley. Figure 5-26 shows the total projected Morongo Basin/Johnson Valley consumptive use projections. Between 2000 and 2020, municipal consumptive use is projected to increase from about 2,500 acre-feet to about 3,700 acre-feet (an increase of 2.1% per year). Golf course consumptive use is projected to increase by about 100 acre-feet. The total projected increase for the entire area is about 1,300 acre-feet between 2000 and 2020.



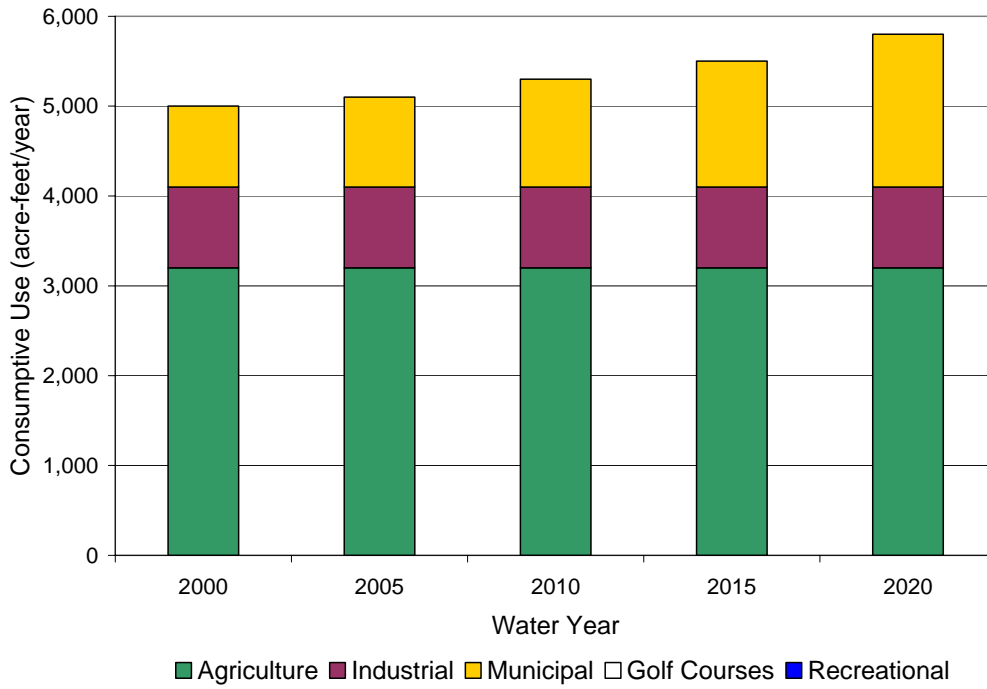


Figure 5-22: Este Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1

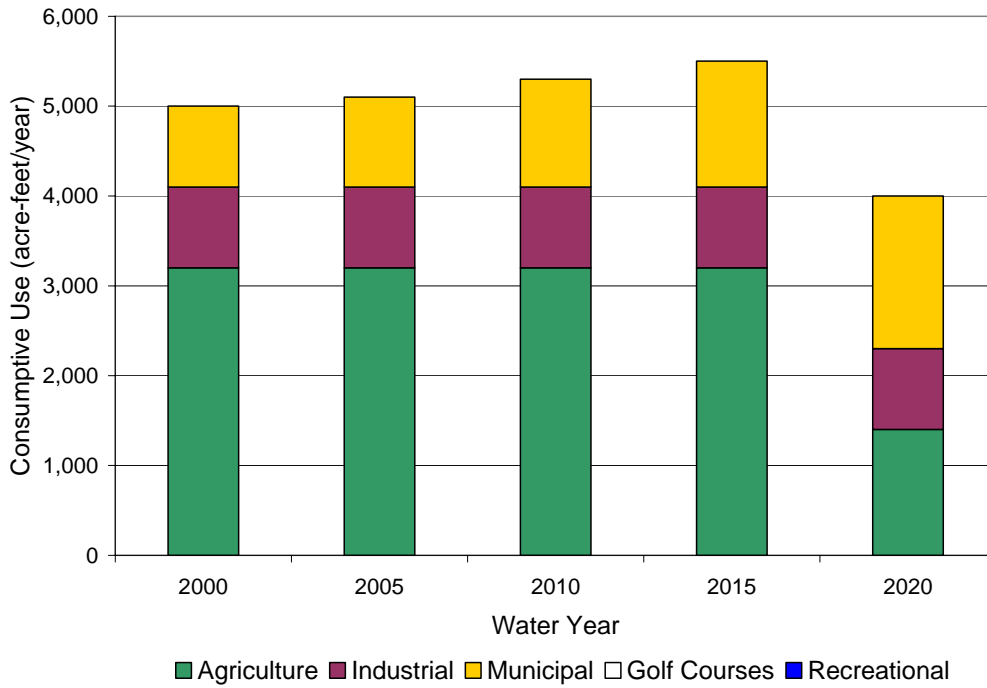
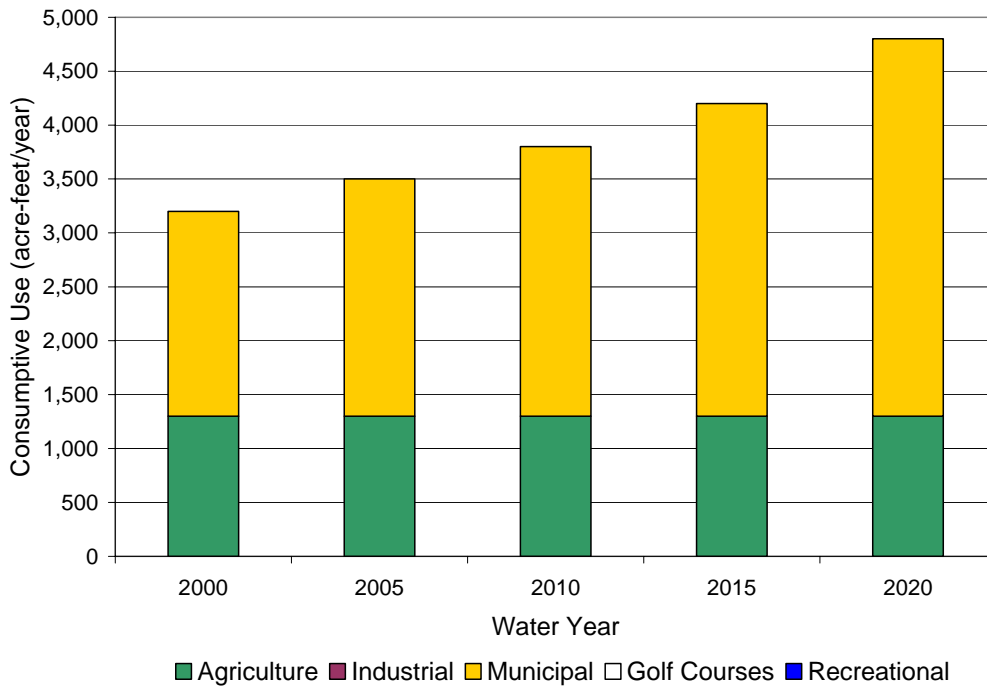
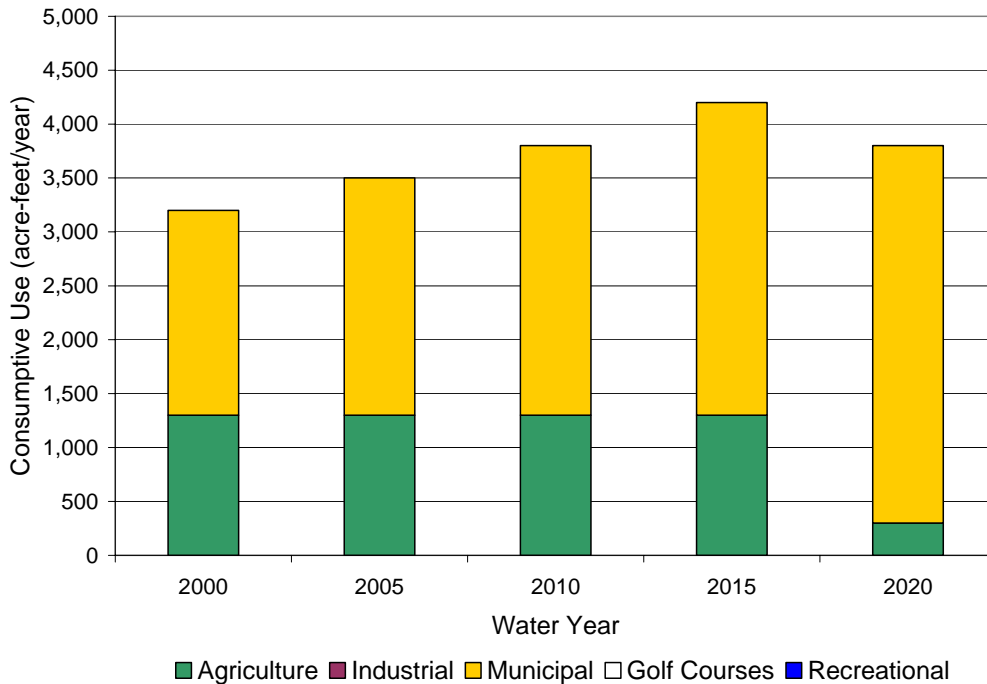


Figure 5-23: Este Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 2



**Figure 5-24: Oeste Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 1**



**Figure 5-25: Oeste Subarea Consumptive Use for the Year 2000 and Projections Through Year 2020 Under Agriculture Scenario 2**

**Table 5-10: Morongo Basin/Johnson Valley Area Projected Consumptive Use  
(Acre-feet/year)**

<b>Copper Mountain Valley</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Agricultural	0	0	0	0	0
Industrial	0	0	0	0	0
Municipal	800	900	900	1,000	1,000
Golf Courses	0	0	0	0	0
Recreational	0	0	0	0	0
<b>Total</b>	<b>800</b>	<b>900</b>	<b>900</b>	<b>1,000</b>	<b>1,000</b>
<b>Johnson Valley</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Agricultural	0	0	0	0	0
Industrial	0	0	0	0	0
Municipal	30	30	40	40	50
Golf Courses	0	0	0	0	0
Recreational	0	0	0	0	0
<b>Total</b>	<b>30</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>	<b>N/A</b>
<b>Means/Ames Valley</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Agricultural	0	0	0	0	0
Industrial	0	0	0	0	0
Municipal	600	700	700	800	900
Golf Courses	0	0	0	0	0
Recreational	0	0	0	0	0
<b>Total</b>	<b>600</b>	<b>700</b>	<b>700</b>	<b>800</b>	<b>900</b>
<b>Warren Valley</b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Agricultural	0	0	0	0	0
Industrial	0	0	0	0	0
Municipal	1,100	1,300	1,400	1,600	1,800
Golf Courses	200 <sup>1</sup>	200	200	300	300
Recreational	0	0	0	0	0
<b>Total</b>	<b>1,200</b>	<b>1,500</b>	<b>1,600</b>	<b>1,900</b>	<b>2,100</b>
<b>Total Morongo Basin/Johnson Valley Area<sup>2</sup></b>					
	<b>2000</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>
Agricultural	0	0	0	0	0
Industrial	0	0	0	0	0
Municipal	2,500	2,900	3,000	3,400	3,700
Golf Courses	200	200	200	300	300
Recreational	0	0	0	0	0
<b>Total</b>	<b>2,700</b>	<b>3,100</b>	<b>3,200</b>	<b>3,700</b>	<b>4,000</b>

<sup>1</sup>For the purpose of projecting consumptive use, year 2000 golf course use in the Warren Valley is set at 200 acre-feet (the average from 1995-99), due to a temporary reduction in pumping during 2000 caused by mechanical problems with the well.

<sup>2</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Figures 5-27 through 5-29 show the projected future consumptive use in the Copper Mountain Valley, Means/Ames Valley, and Warren Valley subbasins.

#### *Copper Mountain Valley (Figure 5-27)*

Municipal consumptive use in the Copper Mountain Valley subbasin is projected to increase from about 800 acre-feet in 2000 to about 1,000 acre-feet in 2020, which represents a growth rate of 1.4% per year.

#### *Means/Ames Valley (Figure 5-28)*

Municipal consumptive use in the Means/Ames Valley subbasin is projected to increase by about 300 acre-feet between 2000 and 2020, from 600 to 900 acre-feet. This represents a growth rate of about 2.2% per year.

#### *Warren Valley (Figure 5-29)*

Municipal consumptive use in the Warren Valley subbasin is projected to increase at a rate of 2.4% per year, from about 1,100 acre-feet in 2000 to about 1,800 acre-feet in 2020. Golf course use is projected to increase by 100 acre-feet. The total projected increase in consumptive use is approximately 800 acre-feet.

## **Year 2020 Water Balance**

### **Agriculture Scenario 1**

Table 5-11 shows the projected total consumptive use under Agriculture Scenario 1 using the average annual water supply values presented in Chapter 4.

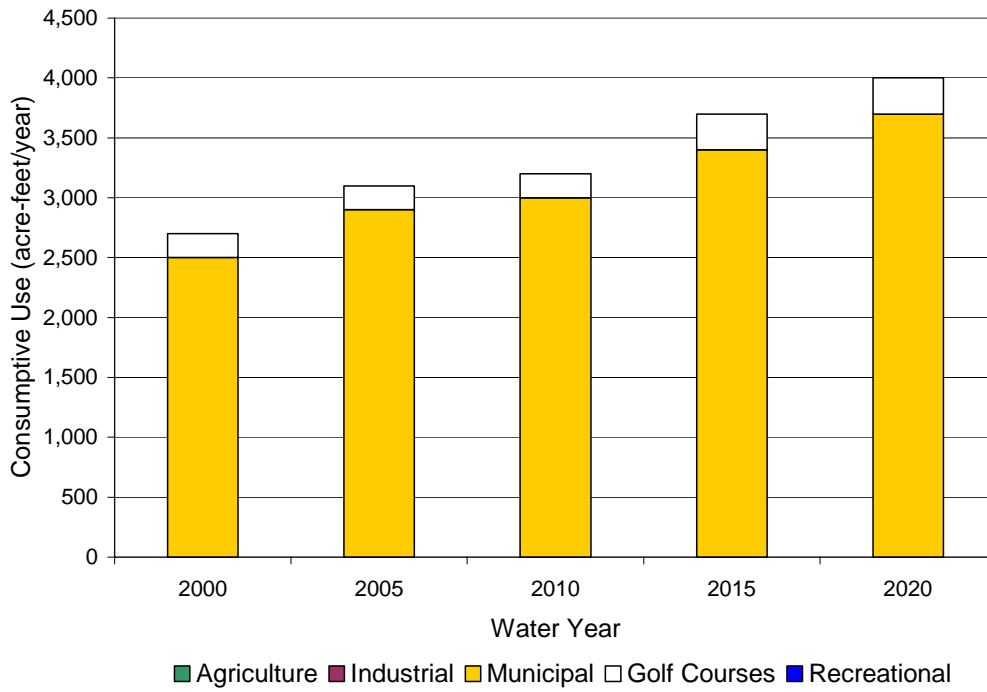


Figure 5-26: Morongo Basin/Johnson Valley Area Total Consumptive Use for the Year 2000 and Projections Through Year 2020

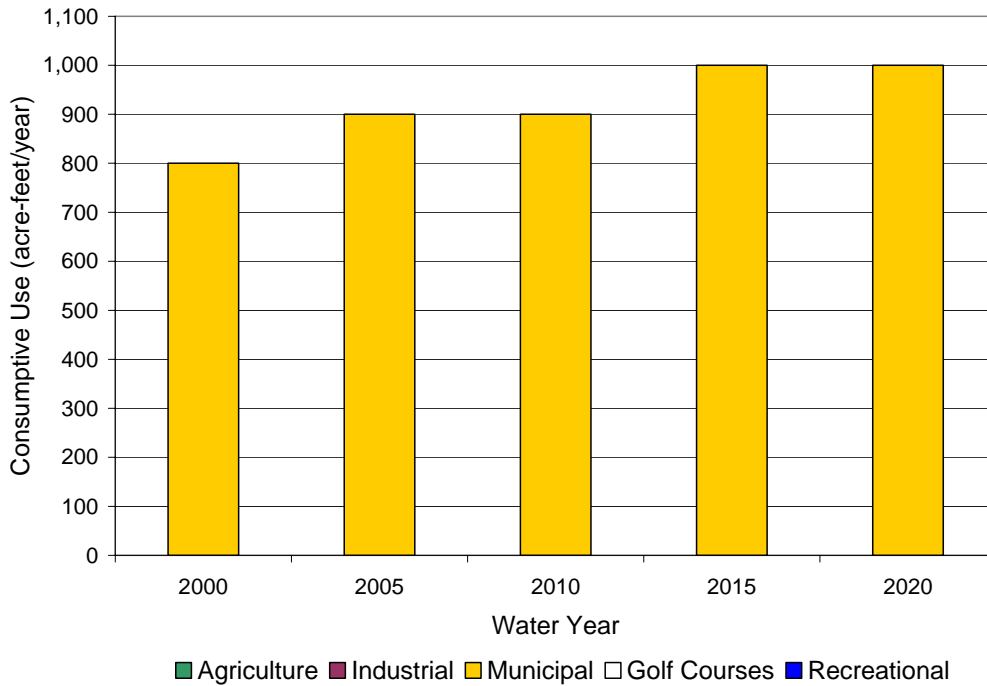


Figure 5-27: Copper Mountain Valley Subbasin Consumptive Use for the Year 2000 and Projections Through Year 2020

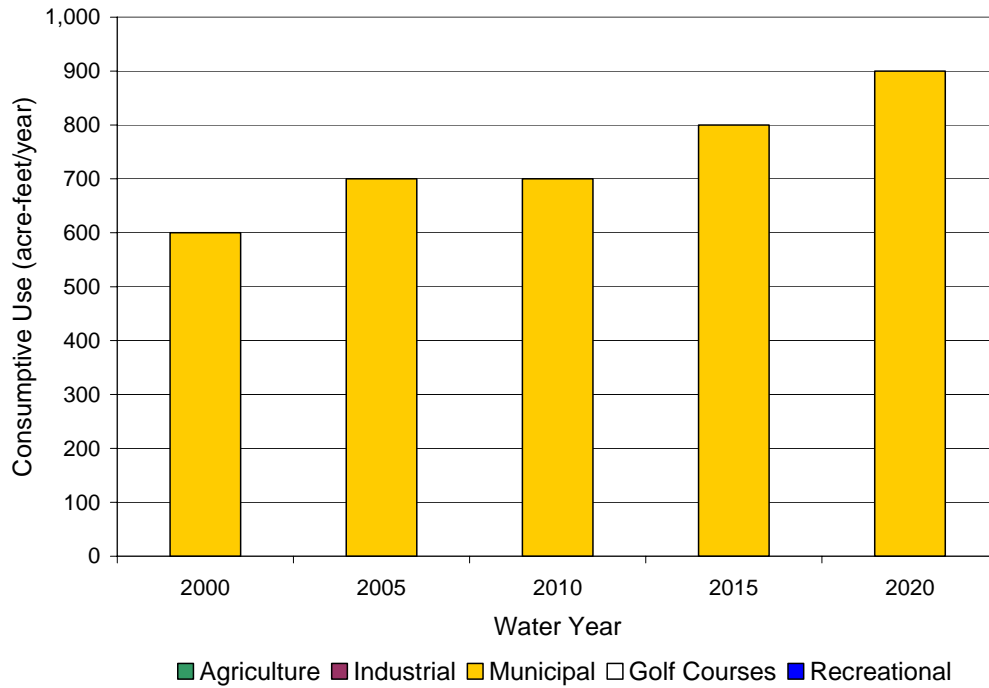


Figure 5-28: Means/Ames Valley Subbasin Consumptive Use for the Year 2000 and Projections Through Year 2020

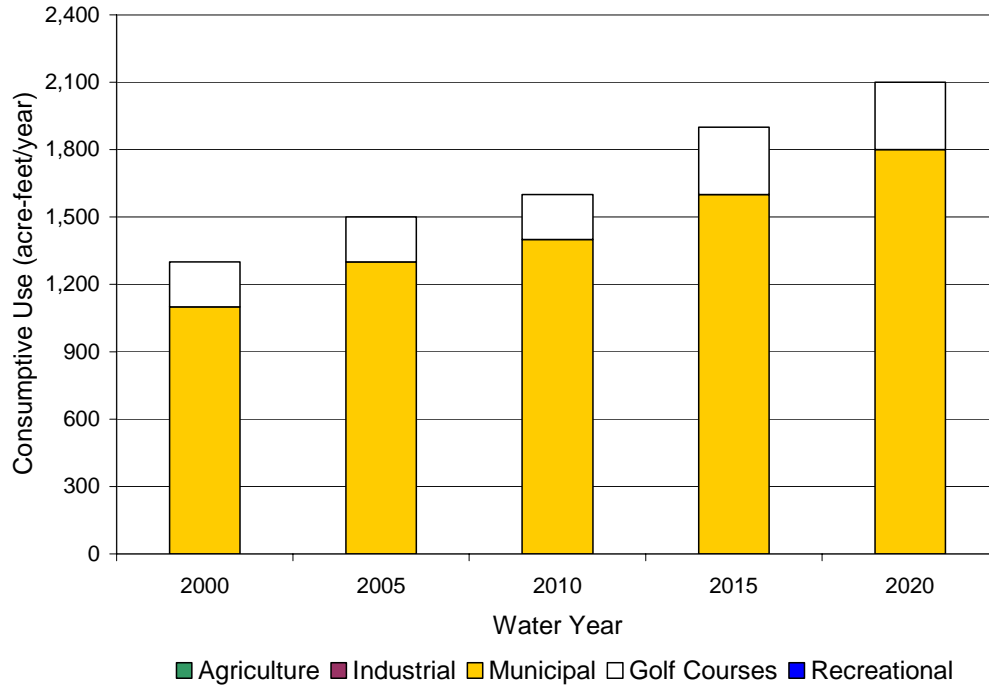


Figure 5-29: Warren Valley Subbasin Consumptive Use for the Year 2000 and Projections Through Year 2020

**Table 5-11**  
**Year 2020 Average Annual Water Balance Under Agriculture Scenario 1**  
**(Acre-feet/year)**

	Net Average Annual Water Supply <sup>1</sup>	Agricultural	Water Use Urban <sup>2</sup>	Total	Surplus/ Deficit
<b>Mojave Basin Area</b>					
Alto	34,700	3,800	78,100	81,900	-47,200
Baja	5,600	17,700	11,100	28,800	-23,200
Centro	18,500	8,900	12,300	21,200	-2,700
Este	3,500	3,200	2,600	5,800	-2,300
Oeste	1,100	1,300	3,500	4,800	-2,900
<b>Subtotal Mojave</b>	<b>63,400</b>	<b>34,900</b>	<b>107,600</b>	<b>142,500</b>	<b>-79,100</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	600	0	1,000	1,000	-400
Johnson Valley	2,300	0	50	50	+2,250
Means/Ames Valley	600	0	900	900	-300
Warren Valley	900 <sup>3</sup>	0	2,100	2,100	-1,200
<b>Subtotal MB/JV<sup>4</sup></b>	<b>2,100</b>	<b>0</b>	<b>4,000</b>	<b>4,000</b>	<b>-1,900</b>
<b>Total</b>	<b>65,500</b>	<b>34,900</b>	<b>111,600</b>	<b>146,500</b>	<b>-81,000</b>
<b>Average Annual SWP Supply:</b>					<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>					<b>-22,600</b>

<sup>1</sup>Net average annual water supply data as shown in Tables 4-2 and 4-5 of Chapter 4.

<sup>2</sup>Urban uses include municipal, industrial, golf course, and recreational water uses.

<sup>3</sup>Hi-Desert Water District reports unpublished USGS estimates of 200 acre-feet per year net average annual supply in the Warren Valley subbasin.

<sup>4</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

All of the regions are projected to have larger water deficits in 2020 than they had in 2000. The largest difference occurs in Alto, where the average annual water deficit is projected to increase from 16,800 acre-feet in 2000 to 47,200 acre-feet in 2020. In Centro, the water demand is projected to exceed the average annual supply in 2020, causing the year 2000 water surplus to be replaced with a water deficit of about 2,700 acre-feet. Overall, under Agriculture Scenario 1, the Mojave Basin Area is projected to have a water deficit of 79,100 acre-feet per year on average in 2020.

In the Morongo Basin/Johnson Valley Area, all of the subbasins except for Johnson Valley are projected to have water deficits in 2020. The largest of these is in the Warren Valley, where an average annual deficit of about 1,200 acre-feet is projected. Excluding the Johnson Valley, the Morongo Basin/Johnson Valley Area is projected to have a total average annual deficit of about 1,900 acre-feet per year in 2020.

Including the water deficit expected in the Morongo Basin/Johnson Valley area, the Mojave Water Agency is projected to face an average annual water deficit of about 81,000 acre-feet per year under Agriculture Scenario 1. If MWA were to fully utilize its average annual SWP supply of 58,400 acre-feet per year, the total deficit would be approximately 22,600 acre-feet per year.

## Agriculture Scenario 2

Table 5-12 compares the projected total consumptive use under Agriculture Scenario 2 with the average annual water supply.

**Table 5-12**  
**Year 2020 Average Annual Water Balance under Agriculture Scenario 2**  
**(Acre-feet/year)**

	Net Average Annual Water Supply <sup>1</sup>	Agricultural	Water Use Urban <sup>2</sup>	Total	Surplus/ Deficit
<b>Mojave Basin Area</b>					
Alto	34,700	1,300	78,100	79,400	-44,700
Baja	5,600	600	11,100	11,700	-6,100
Centro	18,500	8,900	12,300	21,200	-2,700
Este	3,500	1,400	2,600	4,000	-500
Oeste	1,100	300	3,500	3,800	-2,700
<b>Subtotal Mojave</b>	<b>63,400</b>	<b>12,500</b>	<b>107,600</b>	<b>120,100</b>	<b>-56,700</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	600	0	1,000	1,000	-400
Johnson Valley	2,300	0	50	50	+2,250
Means/Ames Valley	600	0	600	600	0
Warren Valley	900	0	2,100	2,100	-1,200
<b>Subtotal MB/JV<sup>3</sup></b>	<b>2,100</b>	<b>0</b>	<b>4,000</b>	<b>4,000</b>	<b>-1,900</b>
<b>Total</b>	<b>65,500</b>	<b>12,500</b>	<b>111,600</b>	<b>124,100</b>	<b>-58,600</b>
<b>Average Annual SWP Supply:</b>					<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>					<b>-200</b>

<sup>1</sup>Net average annual water supply data as shown in Tables 4-2 and 4-5 of Chapter 4.

<sup>2</sup>Urban uses include municipal, industrial, golf course, and recreational water uses.

<sup>3</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

In the Mojave Basin Area, Alto, Baja, Este and Oeste would all have smaller water deficits in 2020 under Agriculture Scenario 2 than they would under Agriculture Scenario 1. The largest difference is in Baja, which would have an average annual water deficit of only about 6,100 acre-feet. In Centro the projected average annual water deficits are the same under Agriculture Scenario 2 as in Agriculture Scenario 1. Because the Morongo Basin/Johnson Valley area has



very little agriculture, the projected consumptive uses for all subbasins under Agriculture Scenario 2 are the same as for Agriculture Scenario 1.

Overall under Agriculture Scenario 2, the Mojave Basin Area would have an average annual water deficit of about 56,700 acre-feet per year in 2020. The Mojave Water Agency as a whole has a projected average annual water deficit of about 59,000 acre-feet per year. If MWA were to fully utilize its average annual SWP supply of 58,400 acre-feet per year, under the assumptions outlined above, the total deficit would be approximately 200 acre-feet per year.

## Summary

Agriculture Scenarios 1 and 2 represent the low and high estimates of consumptive use in the Mojave Water Agency. Under Agriculture Scenario 1, the projected long-term average annual water deficit in the Mojave Water Agency in 2020 is about 22,600 acre-feet per year with full utilization of MWA's current SWP supply. Under Agriculture Scenario 2, the projected long-term average annual water deficit in 2020 is about 200 acre-feet per year. The Technical Advisory Committee for the RWMP Update has determined that Agriculture Scenario 2 is the most appropriate to be used as the basis for the Plan.

## Dry Year and Multiple Dry Year Water Balance in 2020

Table 5-13 shows the projected total consumptive use under Agricultural Scenario 2 with the average annual dry year water supply values presented in Chapter 4. With the net natural water supply reduced to 22,900 acre-feet per year and the average State Water Project supply reduced to 43,200 acre-feet per year, the total MWA deficit during dry years is projected to be 58,000 acre-feet per year in an average dry year.

Table 5-13: Year 2020 Average Annual Dry Year Water Balance under Agriculture Scenario 2 (Acre-feet/year)

	Net Average Annual Dry Year Water Supply <sup>1</sup>	Agricultural	Water Use Urban <sup>2</sup>	Total	Surplus/ Deficit
<b>Mojave Basin Area</b>					
Alto	9,900	1,300	78,100	79,400	-69,500
Baja	-1,400	600	11,100	11,700	-13,100
Centro	11,000	8,900	12,300	21,200	-10,200
Este	2,450	1,400	2,600	4,000	-1,550
Oeste	150	300	3,500	3,800	-3,650
<b>Subtotal Mojave</b>	<b>22,100</b>	<b>12,500</b>	<b>107,600</b>	<b>120,100</b>	<b>-98,000</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	230	0	1,000	1,000	-770
Johnson Valley	880	0	50	50	+830
Means/Ames Valley	230	0	900	900	-670
Warren Valley	340	0	2,100	2,100	-1,760
<b>Subtotal MB/JV<sup>3</sup></b>	<b>800</b>	<b>0</b>	<b>4,000</b>	<b>4,000</b>	<b>-3,200</b>
<b>Total</b>	<b>22,900</b>	<b>12,500</b>	<b>111,600</b>	<b>124,100</b>	<b>-101,200</b>
<b>Average Annual SWP Supply:</b>					<b>43,200</b>
<b>Surplus/Deficit with SWP Supply:</b>					<b>-58,000</b>

<sup>1</sup>Net average annual dry year water supply data as shown in Tables 4-3 and 4-6 of Chapter 4.

<sup>2</sup>Urban uses include municipal, industrial, golf course, and recreational water uses.

<sup>3</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Table 5-14 shows the projected total consumptive use under Agricultural Scenario 2 and average annual water supply during a multiple dry-year period (1988-1990) using values presented in Chapter 4. With the net natural water supply reduced to 4,010 acre-feet per year and the average State Water Project supply reduced to 22,900 acre-feet per year, the total MWA deficit during dry years is projected to be 97,190 acre-feet per year during the multiple dry-year period.

Table 5-14: Year 2020 Multiple Dry Year Average Annual Water Balance under Agriculture Scenario 2 (Acre-feet/year)

	Net Annual Multiple Dry Year		Water Use		Surplus/ Deficit
	Water Supply <sup>1</sup>	Agricultural	Urban <sup>2</sup>	Total	
<b>Mojave Basin Area</b>					
Alto	3,500	1,300	78,100	79,400	-75,900
Baja	-1,000	600	11,100	11,700	-12,700
Centro	-200	8,900	12,300	21,200	-21,400
Este	1,900	1,400	2,600	4,000	-2,100
Oeste	-300	300	3,500	3,800	-4,100
<b>Subtotal Mojave</b>	<b>3,900</b>	<b>12,500</b>	<b>107,600</b>	<b>120,100</b>	<b>-116,200</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	30	0	1,000	1,000	-970
Johnson Valley	130	0	50	50	+80
Means/Ames Valley	30	0	900	900	-870
Warren Valley	50	0	2,100	2,100	-2,050
<b>Subtotal MB/JV<sup>3</sup></b>	<b>110</b>	<b>0</b>	<b>4,000</b>	<b>4,000</b>	<b>-3,890</b>
<b>Total</b>	<b>4,010</b>	<b>12,500</b>	<b>111,600</b>	<b>124,100</b>	<b>-120,090</b>
<b>Average Annual SWP Supply:</b>					<b>22,900</b>
<b>Surplus/Deficit with SWP Supply:</b>					<b>-97,190</b>

<sup>1</sup>Net average annual dry year water supply data as shown in Tables 4-4 and 4-6 of Chapter 4.

<sup>2</sup>Urban uses include municipal, industrial, golf course, and recreational water uses.

<sup>3</sup>Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

These deficits represent the amount of groundwater overdraft that MWA can expect during a dry year and during a multiple dry-year period. However, because MWA overlies a very large groundwater basin, the Agency should be able to weather such dry periods with only a temporary decline in groundwater levels. If the supply and demand are in approximate long-term balance, as they are under Agriculture Scenario 2 with full utilization of MWA's projected 2020 SWP supply, groundwater levels could be maintained at relative long-term balance with no reduction in the ability to supply MWA water users.

## Future Supply Versus Demand in 5-Year Increments

Table 5-15 shows the average annual surplus or deficit for each for each subarea in the Mojave Basin Area and subbasin in the Morongo Basin/Johnson Valley area in five-year increments through 2020. Tables 5-16 and 5-17 show the same data for an average annual dry year and an average annual multiple dry year. The data shown in these tables are equal to the supply values shown in Chapter 4 minus the incremental demand values shown in Tables 5-9 and 5-10.

Table 5-15: Average Annual Surplus or Deficit under Agriculture  
Scenario 2 in 5-Year Increments (Acre-feet/year)

	2000	2005	2010	2015	2020
<b>Mojave Basin Area</b>					
Alto	-16,800	-22,900	-28,700	-35,700	-44,700
Baja	-22,600	-22,700	-11,900	-5,900	-6,100
Centro	+1,200	+800	-200	-1,300	-2,700
Este	-1,500	-1,600	-1,800	-2,000	-500
Oeste	-2,100	-2,400	-2,700	-3,100	-2,700
<b>Subtotal Mojave</b>	<b>-41,800</b>	<b>-48,800</b>	<b>-45,300</b>	<b>-48,000</b>	<b>-56,700</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	-200	-300	-300	-400	-400
Johnson Valley	+2,270	+2,270	+2,260	+2,260	+2,250
Means/Ames Valley	0	-100	-100	-200	-300
Warren Valley	-400	-600	-700	-1,000	-1,200
<b>Subtotal MB/JV*</b>	<b>-600</b>	<b>-1,000</b>	<b>-1,100</b>	<b>-1,600</b>	<b>-1,900</b>
<b>Total</b>	<b>-42,400</b>	<b>-49,800</b>	<b>-46,400</b>	<b>-49,600</b>	<b>-58,600</b>
<b>Average Annual SWP Supply:</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>	<b>58,400</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>+16,000</b>	<b>+8,600</b>	<b>+12,000</b>	<b>+8,800</b>	<b>-200</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Table 5-16: Average Annual Dry Year Surplus or Deficit under Agriculture  
Scenario 2 in 5-Year Increments (Acre-feet/year)

	2000	2005	2010	2015	2020
<b>Mojave Basin Area</b>					
Alto	-41,600	-47,700	-53,500	-60,500	-69,500
Baja	-29,600	-29,700	-18,900	-12,900	-13,100
Centro	-6,300	-6,700	-7,700	-8,800	-10,200
Este	-2,550	-2,650	-2,850	-3,050	-1,550
Oeste	-3,050	-3,350	-3,650	-4,050	-3,650
<b>Subtotal Mojave</b>	<b>-83,100</b>	<b>-90,100</b>	<b>-86,600</b>	<b>-89,300</b>	<b>-98,000</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	-570	-670	-670	-770	-770
Johnson Valley	+850	+850	+840	+840	+830
Means/Ames Valley	-370	-470	-470	-570	-670
Warren Valley	-960	-1,160	-1,260	-1,560	-1,760
<b>Subtotal MB/JV*</b>	<b>-1,900</b>	<b>-2,300</b>	<b>-2,400</b>	<b>-2,900</b>	<b>-3,200</b>
<b>Total</b>	<b>-85,000</b>	<b>-92,400</b>	<b>-89,000</b>	<b>-92,200</b>	<b>-101,200</b>
<b>Average Annual SWP Supply:</b>	<b>43,200</b>	<b>43,200</b>	<b>43,200</b>	<b>43,200</b>	<b>43,200</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>-41,800</b>	<b>-49,200</b>	<b>-45,800</b>	<b>-49,000</b>	<b>-58,000</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.

Table 5-17: Average Annual Multiple Dry Year Surplus or Deficit under Agriculture Scenario 2 in 5-Year Increments (Acre-feet/year)

	2000	2005	2010	2015	2020
<b>Mojave Basin Area</b>					
Alto	-48,000	-54,100	-59,900	-66,900	-75,900
Baja	-29,200	-29,300	-18,500	-12,500	-12,700
Centro	-17,500	-17,900	-18,900	-20,000	-21,400
Este	-3,100	-3,200	-3,400	-3,600	-2,100
Oeste	-3,500	-3,800	-4,100	-4,500	-4,100
<b>Subtotal Mojave</b>	<b>-101,300</b>	<b>-108,300</b>	<b>-104,800</b>	<b>-107,500</b>	<b>-116,200</b>
<b>MB/JV Area</b>					
Copper Mtn. Valley	-770	-870	-870	-970	-970
Johnson Valley	+100	+100	+90	+90	+80
Means/Ames Valley	-570	-670	-670	-770	-870
Warren Valley	-1,250	-1,450	-1,550	-1,850	-2,050
<b>Subtotal MB/JV*</b>	<b>-2,590</b>	<b>-2,990</b>	<b>-3,090</b>	<b>-3,590</b>	<b>-3,890</b>
<b>Total</b>	<b>-103,890</b>	<b>-111,290</b>	<b>-107,890</b>	<b>-111,090</b>	<b>-120,090</b>
<b>Average Annual SWP Supply:</b>	<b>22,900</b>	<b>22,900</b>	<b>22,900</b>	<b>22,900</b>	<b>22,900</b>
<b>Surplus/Deficit with SWP Supply:</b>	<b>-80,990</b>	<b>-88,390</b>	<b>-84,990</b>	<b>-88,190</b>	<b>-97,190</b>

\*Johnson Valley is not included in the Morongo Basin/Johnson Valley totals because the supply is not included as noted in Chapter 4.



# 6

## WATER SHORTAGE CONTINGENCY PLANNING

This chapter describes water shortage planning efforts of the Mojave Water Agency and summarizes water shortage planning efforts of individual water purveyors in the MWA service area.

Cities and water agencies within MWA rely on large groundwater reserves to meet potable water supply needs. During previous drought periods, municipal water suppliers continued to draft from these reserves to meet customer needs without imposing restrictions on water use, but at rates exceeding natural replenishment in most areas. The large groundwater basin in the area serves as a reservoir and buffers the impacts of seasonal and year-to-year variations in precipitation and surface water deliveries. By 2020 when this Plan is fully implemented, the area aquifers are expected to be in balance due to the combination of water imports and/or production rampdown. During multiple-year droughts or State Water Project outages, the basin will continue to be pumped to meet demands. Actions of the MWA to address water shortages are summarized below.

### Mojave Water Agency

The Mojave Water Agency was formed to manage declining groundwater levels within the Agency's service area. In this capacity, MWA has been planning and implementing projects to increase water supply reliability and prevent future water shortages. MWA became a State Water Project (SWP) contractor and has an annual entitlement of 75,800 acre-feet. This water is diverted from the California Aqueduct and distributed to recharge sites throughout the area (see Chapter 2) in order to replace groundwater withdrawn by producers. Deliveries from the SWP are variable and MWA's full entitlement is not available every year. During dry and multiple dry years, it is expected that SWP deliveries will be significantly reduced.

The Mojave Basin Judgment calls for charging producers for use above their production allowance and using these funds to import water so that over time extractions come into balance with available supplies. Production allowances may also be reduced to achieve this balance. Similar principles are employed in the Warren Valley Basin to achieve long-term balance of supply and demand. Once the basin is in balance it will be less impacted by fluctuations in deliveries of water from the SWP.

As part of this Plan, MWA will construct facilities to utilize the full SWP contract supplies. This will enable the MWA to recharge the groundwater basins in wetter years and therefore enable water purveyors to meet demands during dry years without exceeding safe yield. This Plan includes an estimate of the reliability of deliveries of water from the SWP. The volume of SWP water recharged to the basin is computed based on this reliability.

MWA is not a direct purveyor of municipal water supplies and does not have the authority to implement water shortage plans within its boundaries but relies instead on efforts of the individual cities and water agencies.

## Cities and Water Agencies

To meet the requirements of the Urban Water Management Planning Act, plans must address a number of topics including current and future water supply availability, projected demands for the next 20 years, reliability of supplies, supply and demand comparisons, the potential for recycling, implementation of Demand Management (water conservation) Measures, and water shortage contingency planning.

Cities and water agencies within the MWA service area that have developed and adopted Urban Water Management Plans are listed below:

- Adelanto Water Authority (serving Adelanto)
- Apple Valley Ranchos Water Company (serving Apple Valley)
- Hesperia Water District (serving Hesperia)
- Hi-Desert Water District (serving Yucca Valley)
- Joshua Basin Water District (serving Joshua Tree)
- Southern California Water Company (serving Barstow, parts of Apple Valley and Lucerne Valley)
- Victor Valley Water District (serving Victorville)

All of these entities have Water Shortage Contingency Plans included in their Urban Water Management Plans.



Water Shortage Contingency Plans of these entities utilize a variety of methods to reduce water demand including mandatory prohibitions on water wasting, voluntary water conservation measures, mandatory water conservation measures and prohibitions on certain uses of water during severe shortages, specific triggering mechanisms for determining the appropriate stage of alert, and water supply allotments for each stage of alert. The plans are summarized below.

### **Adelanto Water Authority**

The Adelanto Water Authority (Authority) has adopted, via resolution, a four-stage plan of action to address a long-term drought condition or loss of supply. Stage 1 becomes effective when the Authority declares a water shortage exists and involves increased public outreach and education to seek a 10% reduction in water use through voluntary measures. Stage 2 is entered into when the Stage 1 reduction goal has not been met for two consecutive years of a drought. Public awareness efforts will continue and a survey will be conducted on Stage 1 efforts. The Authority will establish a water conservation advisory committee comprised of officials from the Authority and the City of Adelanto. Stage 3 goes into effect if the water shortage continues for four consecutive years; this stage recommends 10% mandatory and 20% voluntary reductions. A plan and ordinance to enforce penalties for excessive water use will be developed as part of Stage 3. The Authority will examine the impact conservation has on revenue and expenditures and propose corrective measures as necessary. In addition to the water conservation efforts of the Authority, the City of Adelanto has a water conservation ordinance (adopted in 1984) designed to achieve a 10% reduction in water use.

### **Apple Valley Ranchos Water Company**

During a declared water shortage, Apple Valley Ranchos Water Company (AVR) would base individual customer allotments on a recorded base year. According to their plan, AVR, as a private water utility, is unable to enforce conservation stages, adopt ordinances or administer penalties or charges for excessive use. Their plan includes rules from the California Public Utilities Commission (CPUC) related to water conservation and discontinuation and restoration of service. The Town of Apple Valley adopted, via ordinance, a Water Conservation Plan that includes water regulations prohibiting wasteful water use practices including excessive runoff of landscape irrigation water and washing driveways and walkways with water. Penalties have been established for violation of water regulations. In accordance with CPUC rules, AVR has established a conservation memorandum account to offset loss of revenues due to conservation.

### **Hesperia Water District**

The Hesperia Water District (HWD) and the City of Hesperia developed and adopted, via ordinances, a three-stage drought-related water shortage plan. Stage 1 is in effect during normal conditions and involves voluntary wise water use practices and mandatory timed irrigation

systems and drought tolerant plants for new developments. Stage 2 is triggered in the event of a water supply shortage that threatens HWD's ability to provide water. During this stage, conservation measures will include at least the following: prohibiting runoff from irrigated landscapes, use of the most efficient agricultural irrigation practices, development of conservation plans by commercial facilities, irrigation of parks, golf courses and school grounds only between the hours of 11:00 p.m. and 5:00 a.m., requiring covers for swimming pools and prohibiting washing driveways, sidewalks and other hard surfaces with water. In the event of a disaster or other disruption in the water supply, Stage 3 will be in effect and mandatory conservation measures will be implemented. Measures include prohibiting landscape irrigation or filling of swimming pools, and suspension of issuance of new construction permits. The HWD Board of Directors will determine the appropriate stages of alert during noticed public hearings. Violations of mandatory water conservation measures may result in criminal penalties, monetary fines and discontinuation of service. To make up for decreased revenues associated with conservation, HWD will consider reducing operating and maintenance costs, deferring certain capital improvement projects until revenues increase, deferring certain purchases and utilizing facility replacement reserve funds.

### **Hi-Desert Water District**

The Urban Water Management Plan for the Hi-Desert Water District is comprised of the Warren Valley Basin Management Plan and associated addenda. The plan contains a description of their Emergency Stage Response Plan (ESRP) to implement more stringent water conservation measures during times when water demand exceeds supply. The initial, although undefined, provisions of the ESRP are implemented when the water supply system reaches 80 percent of capacity for three consecutive days. When demand increases further, Stage 2 becomes effective and places increasing, yet undefined, restrictions on water use, particularly outdoor water use. If delivery capacity continues to be inadequate, Stage 3 becomes effective and requests unspecified, voluntary conservation measures until such time as delivery problems can be mitigated.

### **Joshua Basin Water District**

The Joshua Basin Water District (District) has developed a four-stage plan for responding to water shortages. The plan was a component of their Urban Water Management Plan, adopted via ordinance. The plan includes voluntary and mandatory stages to address a reduction in water supply that exceeds 60%. The Stage 1 reduction goal of 10% is triggered when water supplies are 60-75% of normal. The Stage 2 reduction goal of 15% is triggered when water supplies are 45-60% of normal. The Stage 3 reduction goal of 20% is triggered when supplies are 40-50% of normal and Stage 4 reduction goal of 25% is triggered when supplies are 40% of normal. Stages of alert may be triggered by groundwater shortages, equipment failures or catastrophes. The

District has developed an allocation method that will be used by the General Manager to determine consumption limits by customer type in the event of a water supply shortage. During all declared water shortage emergencies, customers who exceed their established allotment will be required to pay a surcharge of two times the highest rate for excess water used during the first or second billing cycle and a surcharge of four times the highest rate for subsequent billing periods. Approximately 47% of the District's annual water revenues are from meter charges with water sales making up the remainder. The plan indicates annual water system revenue declines due to conservation during the 4 stages of alert range from 3% to 9%. Financial reserves of the District are adequate to offset these modest decreases in revenue.

### **Southern California Water Company**

The Southern California Water Company (SCWC) has developed a water shortage contingency plan with four stages of action to address up to a 50% water supply shortage. Stage 1 is a voluntary effort to reduce demand by 10% through increased community outreach. Stage 2 addresses shortages of 10 to 20% and involves voluntary and mandatory water conservation efforts such as prohibitions on cleaning sidewalks and other hard surfaces with water, washing cars, irrigating non-permanent agriculture, uncorrected plumbing leaks, gutter flooding and filling swimming pools. SCWC is an investor-owned utility and is subject to regulation by the California Public Utilities Commission (CPUC) and must gain approval from CPUC prior to imposing water consumption regulations and restrictions. During stages when water shortages require restricting water use, SCWC will first obtain permission from the CPUC. Stage 3 consists of water allotments and mandatory conservation rules. Stage 4 intensifies all previous conservation efforts and monitors daily compliance with required reductions. The SCWC District Manager will determine the appropriate stage of alert during water supply shortages. Their plan includes Mandatory Water Conservation, Restrictions and Rationing Program rules from the CPUC. The CPUC authorizes utilities to establish memorandum accounts for revenues and expenses due to water conservation. A surcharge may be implemented to cover revenue reductions due to conservation.

### **Victor Valley Water District**

The Victor Valley Water District's (VVWD) water shortage contingency plan has four stages of action to address up to a 50% water supply shortage. The Stage 1 demand reduction goal of 10% is triggered when water shortages are 10% or less. The Stage 2A demand reduction goal of 20% is triggered when water shortages are 11-20%. The Stage 2B reduction goal of 30% is triggered when water shortages are 21-35% and Stage 3 demand reduction goal of 50% and greater is triggered when water shortages are 36-50%. VVWD would address water supply shortages with voluntary and mandatory conservation efforts targeting specific water allocations associated with

each of the stages of alert. Penalties have been set for non-compliance with the allocations set in each of the stages of alert. The plan was adopted via ordinance.

The District does not anticipate adverse financial impacts due to conservation during water supply shortages. Fixed monthly service charges account for approximately 30% of total revenue. Reduced pumping expenses would offset decreased revenues from water consumption charges. Penalties for exceeding water allotments in Stages 3 and 4 would provide additional revenues that would help offset revenues lost through conservation.

# 7

## WATER CONSERVATION AND DEMAND MANAGEMENT MEASURES

This chapter describes the water conservation practices of the Mojave Water Agency, individual cities and water agencies, and groups of entities in the basin.

### Coordinated Water Conservation Efforts

In addition to the water conservation efforts of individual water agencies and cities, there are a number of cooperative efforts underway in the basin. These efforts include cooperative partnerships between MWA and a number of individual entities and groups of entities such as water agencies, cities, colleges, other educational institutions, and the Mojave Desert Resource Conservation District. These partnerships, formed through Memoranda of Understanding (MOUs), are described below.

### Alliance for Water Awareness and Conservation

Based on findings in Phase 2 of this Regional Water Management Plan in 2003, local stakeholders decided that a united regional water conservation program was needed to improve water use efficiency. To this end, the Alliance for Water Awareness and Conservation (AWAC) was formed in August of 2003. According to the enabling MOU, the purpose of the AWAC is to “provide a vehicle to attract support for a regional water conservation program and coordinate implementation of activities by forming partnerships to obtain common measurable goals.”

Goals of the Alliance, as provided in the MOU, are listed below:

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

The AWAC will determine the appropriate mix, market penetration, budget and schedule for implementation of demand management measures in order to achieve the desired water reduction goals. Initially the AWAC is targeting outdoor irrigation where there is the greatest potential for significant reduction in water use. The primary targeted audiences are:

- New and existing home owners
- Commercial, industrial and institutional water users
- Landscape suppliers
- Professional and commercial landscapers
- Retail water providers and cities
- Developers

Cities and water agencies, through the AWAC, will determine actual reductions in water use. This can be accomplished by establishing baseline annual per capita water use in the cities and comparing this to annual per capita water use data as programs are implemented.

### Participants

Current participants in the Alliance for Water Awareness and Conservation are listed in the sidebar table.

*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
- Mojave 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

### MWA and Lewis Center for Education and Research MOU

The MWA and the Lewis Center for Education and Research (LCER) have entered into an MOU for raising water awareness of the High Desert community. According to the MOU, topics include improving understanding of:

- the role water resources play in supporting beneficial uses by all consumers within the High Desert
- sensitive biotic components of the High Desert ecosystem that are dependant on surface and near surface water
- concerns and consequences related to a declining water table

- best resource conservation practices for reducing consumptive uses of water
- how land use activities can impact water supply, water quality and biotic resources

According to the MOU, the two entities are working together in order to:

- coordinate an educational program that will expose students and citizens throughout the region to the value and benefit natural water resources provide to the community, thereby increasing the community's understanding of the importance of long-term management of the region's water resources
- provide a learning environment for LCER students in an attempt to further understanding of the region's water resources and their role in the management of those resources
- establish specific time schedules prior to program development and implementation in order to carry out the objectives of the MOU

### **MWA and Mojave Desert Resource Conservation District MOU**

The MWA and the Mojave Desert Resource Conservation District have entered into an MOU to heighten the public's awareness of ways to conserve water and convert high water use landscaping to low-maintenance trees and scrubs. This will be accomplished through at least the following:

- conducting a desert adaptive plant sale
- publishing educational materials
- developing demonstration projects

### **MWA and Mojave Weed Management Area MOU**

The MWA, the Mojave Desert Resource Conservation District, and seventeen other entities have entered into an MOU to work to prevent and control weeds throughout the Mojave Desert in California. Invasive weed species can crowd out native species and increase evapotranspiration of water supplies. Weed control and prevention will be accomplished in many ways, but specifically the MWA has agreed to:

- participate in seeking grants to fund weed management efforts in cooperation with the Mojave Weed Management Area partners and other organizations attempting to manage weeds
- promote the control and treatment of weeds on MWA property
- support efforts to educate the public about weeds, their identification, prevention, and methods of control

MWA has provided funding to MDRCD for removal of invasive plants from the Mojave River riparian habitat.

## **MWA and Copper Mountain College MOU**

The MWA and the Copper Mountain College have entered into an MOU to increase awareness about the need to manage and conserve the water resources of the Morongo Basin and to provide practical solutions to conserve water. The partners will work to achieve these goals through at least the following efforts:

- developing a college curriculum that will provide educational opportunities in the area of natural plant vegetation and conservation programs
- developing demonstration gardens

## **MWA and Barstow Community College MOU**

Similar to the Copper Mountain College MOU, MWA and the Barstow Community College have entered into an MOU to increase awareness about the need to manage and conserve High Desert water resources and to provide practical solutions regarding water-wise habits. The partners will work to achieve these goals through at least the following efforts:

- developing a college curriculum and present workshops that advance public education related to water availability, quality, use, conservation-based best management practices, and the management practices that directly encourage High Desert water consumers to support a sustainable approach to water resource management
- developing a plan to expand the current demonstration garden

## **MWA and Victor Valley College MOU**

Similar to the Copper Mountain College and Barstow Community College MOUs, MWA and the Victor Valley College have entered into a MOU to create a greater awareness about the need to manage and conserve High Desert water resources and to provide practical solutions that will promote efficient use of water. The partners will work to achieve these goals through at least the following efforts:

- developing a water conservation curriculum that will culminate in students receiving a Water Conservation Technician certificate
- developing a Conservation Outreach Day for the public with workshops on drip irrigation design and the use of adaptive plants
- expanding the GIS curriculum to facilitate water conservation mapping and other natural resource management projects

## **MWA Mojave Desert Resource Conservation District Demonstration Project**

MWA, the Mojave Desert Resource Conservation District, and the Apple Valley Country Club are working cooperatively on a demonstration project to evaluate and reduce turf water use at a golf course. The project will replace two acres of turf with native and other drought-tolerant



plants and monitor plant growth and water use over a one-year period. The project is intended to provide a tool to document, display and promote effective methods to save water, reduce costs and develop attractive desert adaptive landscapes.

## Urban Water Management Plans

*"The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level." California Water Code*

In 1983, the California Urban Water Management Planning Act was added to the California Water Code (Division 6 Part 2.6) with the signing of Assembly Bill 797. The Act has been amended several times. The Act requires water suppliers with over 3,000 customers or that supply over 3,000 acre-feet of water annually to prepare Urban

Water Management Plans (UWMP) and submit the plans to the California Department of Water Resources (DWR). The plans must be updated at least every five years in years that end in 0 or 5.

Changes made in late 2001 (Senate Bill 610) now require Urban Water Management Plans to include additional information. If updated plans were not submitted by December 31, 2001 or if plans submitted after January 1, 2002 do not contain the required additional information, the urban water supplier will be prohibited from receiving specified bond funds administered by DWR.

Cities and water agencies within the MWA boundaries have developed and adopted Urban Water Management Plans to comply with the Urban Water Management Planning Act in the California Water Code. Entities with adopted UWMPs are listed below:

- Adelanto Water Authority (serving Adelanto)
- Apple Valley Ranchos Water Company (serving Apple Valley)
- Hesperia Water District (serving Hesperia)
- Hi-Desert Water District (serving Yucca Valley)
- Joshua Basin Water District (serving Joshua Tree)
- Southern California Water Company (serving Barstow and parts of Apple Valley and Lucerne Valley)
- Victor Valley Water District (serving Victorville)

To meet the requirements of the Urban Water Management Planning Act, plans must address a number of topics including current and future water supply availability, projected demands for the next 20 years, reliability of supplies, supply and demand comparisons, the potential for recycling, penalties for wasting water, analysis of impacts on revenues from reductions in water

deliveries, measures to overcome revenue impacts, Demand Management (water conservation) Measures and water shortage contingency plans. The following section describes the Demand Management Measures described in the Act.

## Demand Management Measures

*The Mojave Water Agency Act authorized MWA "to pursue all necessary water conservation measures," and "reduce the waste of water."*

Fourteen Demand Management Measures (DMMs) are identified in Table 7 - 1. These measures represent the Best Management Practices that the California Department of Water Resources requires to be addressed in Urban Water Management Plans. The DMMs are intended to reduce current and future water demands through more efficient water use. Additional programs may be necessary during periodic water supply shortages. The DMM descriptions, methods to evaluate effectiveness and estimated water savings associated with the DMMs are taken from the "Memorandum of Understanding Regarding Urban Water Conservation in California" produced by the California Urban Water Conservation Council (CUWCC, 2002). Two agencies in the basin are members of the Council: the Hi-Desert Water District and the Southern California Water Company (which supplies water to the City of Barstow and parts of Apple Valley and Lucerne Valley). MWA adopted the DMMs in 1997.<sup>37</sup>

Table 7-1: Demand Management Measures

DMM	DMM Description
1	Water survey programs for single-family and multi-family customers
2	Residential plumbing retrofit
3	System water audits, leak detection, and repair
4	Metering and commodity rates for new connections and retrofit of existing connections
5	Large landscape conservation programs and incentives
6	High-efficiency washing machine rebate programs
7	Public information programs
8	School education programs
9	Conservation programs
10	Wholesale agency programs
11	Conservation pricing
12	Water conservation
13	Water waste prohibition
14	Residential ultra-low-flush toilet replacement programs

<sup>37</sup> Resolution 630-97, January 28, 1997

MWA is not a direct purveyor of drinking water and therefore is not required to implement the DMMs. In addition, MWA does not have the authority to implement programs in cities where water users are supplied water by their city or water agency. MWA is implementing some of the DMMs and is working with water agencies and cities both individually and collectively through the AWAC to promote the efficient use of water. Table 7-2 shows the implementation status of the DMMs for some of the drinking water purveyors in the basin.

Table 7-2: Implementation Status for DMMs

Demand Management Measures	Entity													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Water survey programs for single-family and multi-family customers	-	*	Y	Y	*	N	*	*	N	N/A	Y	*	Y	N
Residential plumbing retrofit	Y	Y	Y	Y	Y	N	Y	Y	Y	N/A	Y	Y	Y	N
System water audits, leak detection, and repair	Y	Y	Y	Y	N	N	Y	Y	N	N/A	Y	Y	Y	N
Metering and commodity rates for new connections and retrofit of existing connections	Y	Y	Y	Y	Y	N	Y	Y	N	N/A	Y	Y	Y	Y
Large landscape conservation programs and incentives	+	Y	Y	Y	N	N	Y	N	N	N/A	Y	Y	Y	N
High-efficiency washing machine rebate programs	NA	N/A	N/A	N/A	N/A	N/A	Y	Y	N/A	Y	N/A	Y	N/A	N/A
Public information programs	+	N	Y	Y	+	N	Y	Y	+	N/A	Y	Y	Y	+
School education programs	--	N	Y	Y	N	N	Y	Y	N	N/A	Y	Y	N	Y
Conservation programs for commercial, industrial, and institutional accounts														
Wholesale agency programs														
Conservation pricing														
Water conservation coordinator														
Water waste prohibition														
Residential ultra-low-flush toilet replacement programs														

\* Recommended in 1997 UWMP  
 + Recommended in 2000 UWMP  
 N/A - Not applicable

Additional information from the Urban Water Management Plans is included in Table 7-3. Adelanto Water District, Joshua Basin Water District and the Southern California Water Company included schedules for implementation of additional DMMs.

Table 7-3: Summary of Conservation Planning

Entity	City Served	Document	Date	Number of DMMs Implemented	Number of DMMs Planned
Adelanto WA	Adelanto	UWMP	1997	4	5
Apple Valley WC	Apple Valley	UWMP	2000	10	
Hesperia WD	Hesperia	UWMP	2000	9	
Hi Desert WD	Yucca Valley	UWMP	2000	11	
Joshua Basin WD	Joshua Tree	UWMP	2000	7	1
MWA	N/A	RWMP	2004	4	
Southern CA WC	Barstow	UWMP	2000	7	4
VVWD	Victorville	UWMP	2000	7	

Listed below are descriptions of the 14 DMMs, implementation status, and an estimate of water savings.

**DMM 1. Water Survey Programs for Single-Family and Multi-Family Customers**

Residential surveys, carried out by agency staff or contractors, can identify some of the more common residential water wasting practices. A typical survey includes checking for leaking faucets and toilets, identifying older fixtures that do not meet current water conserving plumbing standards, checking irrigation systems for leaks and proper coverage, reviewing or developing irrigation schedules and setting irrigation controllers accordingly, and checking the water meter.

*Implementation Status*

This DMM is being implemented to some degree in 5 of the 7 water service areas.

*Conservation Savings*

A potential for water savings exists if the surveys identify water-wasting practices that can be changed. Water savings vary depending on the water fixture and the type of repair or retrofit. Estimates of anticipated water savings are given in Table 7-4 (CUWCC, 2002).

Table 7-4: Conservation Savings for DMM 1

Device	Pre-1980 Construction	Post-1980 Construction
Low-flow showerhead retrofit	7.2 gcd*	2.9 gcd
Toilet retrofit (five year life)	1.3 gcd	0.0 gcd
Leak repair	0.5 gcd	0.0 gcd
Landscape survey	10%	10%

\*gcd = gallons per capita per day

## DMM 2. Residential Plumbing Retrofit

Retrofitting residences with water efficient plumbing fixtures can be cost effective and reduce per capita indoor water use, particularly in residences constructed prior to 1992. Typical retrofit programs involve replacing old fixtures with low-flow showerheads and faucet aerators and installing toilet displacement devices or retrofitting with water conserving toilets (as needed).

### *Implementation Status*

Plumbing fixture standards are being enforced throughout the basin. Retrofit programs are being implemented in 5 of the 7 water service areas.

### *Conservation Savings*

Water savings vary depending on the water fixture replaced. Estimates of anticipated water savings are given in Table 7-5 (CUWCC, 2002).

Table 7-5: Conservation Savings for DMM 2

Device	Pre-1980 Construction	Post-1980 Construction
Low-flow showerhead retrofit	7.2 gcd*	2.9 gcd
Toilet retrofit	1.3 gcd	0.0 gcd

\*gcd = gallons per capita per day

## DMM 3. System Water Audits, Leak Detection, and Repair

Full-scale water system audits estimate water lost due to leaks in the supply system. If the audit results indicate a significant quantity of water is not accounted for, a leak detection and repair effort may be warranted. Methodology is described in the American Water Works Association (AWWA) Water Audit and Leak Detection Guidebook (AWWA, 1992). Customers should be advised whenever it appears possible that leaks exist on the customer's side of the meter.

### *Implementation Status*

This DMM is being implemented in all 7 water service areas.

### *Conservation Savings*

Leak detection and repair may result in water and energy savings for cities and water agencies. Customers may benefit from an effective program or may face repair costs if leaks are detected on their side of the water meter.

#### DMM 4. Metering and Commodity Rates for New Connections and Retrofit of Existing Connections

The most equitable way to charge for water is through rates based on the quantity consumed. This requires metering service connections and billing customers by volume of use. According to current law, all new connections must be metered. Programs can be developed to retrofit existing unmetered connections.

##### *Implementation Status*

All of the water service areas are metered and require water meter installation on new construction. Metered connections are billed by volume of use.

##### *Conservation Savings*

Metered water service connections save up to 20% compared to unmetered connections (CUWCC, 2002).

#### DMM 5. Large Landscape Conservation Programs and Incentives

Large irrigated landscapes represent areas where significant water savings may be made. Efforts to improve water use efficiency of large landscapes include designing and using evapotranspiration-based water use budgets, providing notices each billing cycle showing the relationship between the budget and actual consumption, providing notices at the start and end of the irrigation season alerting customers to check their irrigation systems, marketing landscape surveys to existing accounts with large landscapes, and providing information on climate-appropriate landscape design, efficient irrigation equipment to new customers and change-of-service customer accounts.

Surveys of all landscapes at cities and water agencies could be conducted and appropriate adjustments made as indicated from results of the survey. Climate-appropriate water efficient landscaping could be installed at city and water agency facilities, and dual metering where appropriate.

##### *Implementation Status*

This DMM is being implemented in 4 of the 7 water service areas.

##### *Conservation Savings*

Landscapes and/or irrigation equipment that are modified as a result of water audits could reduce water use by 15% (CUWCC, 2002).

#### DMM 6. High-Efficiency Washing Machine Rebate Programs

High-efficiency washing machines save water and energy needed to heat water. Energy service providers often offer financial incentive for the purchase of high-efficiency washing machines. Cities and water agencies could also offer a cost-effective financial incentive based on the marginal benefits of the water savings.

##### *Implementation Status*

This DMM is not currently being implemented.

##### *Conservation Savings*

The estimate of reliable annual water savings per replacement of a low-efficiency washing machine with a high-efficiency washing machine is 5,100 gallons (CUWCC, 2002).

#### DMM 7. Public Information Programs

Public information programs to promote the wise use of water and the related benefits are in place throughout the MWA service area. Programs include providing speakers to employees, community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote wise water use practices; and coordinating with other government agencies, industry groups, public interest groups, and the media.

##### *Implementation Status*

MWA, the AWAC and all cities and water agencies have public information programs.

##### *Conservation Savings*

There is no method to quantify the savings of this DMM.

#### DMM 8. School Education Programs

School education programs promote wise water use and related benefits. Programs include working with school districts and private schools in the area to provide instructional assistance, educational materials, and classroom presentations that identify urban, agricultural, and environmental issues and conditions in the local watershed. Education materials should meet the state education framework requirements, and grade appropriate materials should be distributed to grade levels K-3, 4-6, 7-8, and high school.

### *Implementation Status*

This DMM is being implemented in 6 of the 7 water service areas.

### *Conservation Savings*

There is no method to quantify the savings of this DMM.

## DMM 9. Conservation Programs for Commercial, Industrial and Institutional Accounts

Water conservation efforts for commercial, industrial and institutional water users include replacement of existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets, water use surveys and customer incentives. Water use surveys include a site visit, an evaluation of all water-using apparatus and processes, and a customer report identifying recommended efficiency measures, their expected payback, and available agency incentives.

### *Implementation Status*

This DMM is being implemented in 2 of the 7 water service areas.

### *Conservation Savings*

Commercial water reduction from DMMs such as interior and landscape water surveys, plumbing codes, and other factors (includes savings accounted for in other DMMs) is estimated as 12% (CUWCC, 2002).

Industrial water reduction results from DMMs such as waste discharge fees, new technologies, water surveys, plumbing codes and other factors (including savings accounted for in other DMMs) is estimated at 15% (CUWCC, 2002). Institutional water reductions vary significantly.

## DMM 10. Wholesaler Agency Programs

### *Implementation Status*

MWA is assisting other agencies in the basin with water conservation through a number of cooperative efforts. These are discussed in the *Coordinated Water Conservation Efforts* section of this chapter.

Further water conservation could be achieved by the following means:

### Regional Conservation Partnerships

- Develop partnerships where financial incentives or equivalent resources, are made available to advance water conservation efforts and effectiveness



- Explore financial support for all DMMs implemented by cooperating retail water agencies which can be shown to be cost-effective in terms of avoided cost of water from the wholesaler's perspective

### Technical Facilitation

MWA can provide conservation-related technical support and information to all retail agencies through facilitation of groups such as the Alliance for Water Awareness and Conservation. Specific cooperative technical facilitation activities could include providing staff to work with retail agencies on DMM implementation, conducting or arranging workshops, and developing guidelines for:

- Calculating program savings, costs and cost-effectiveness
- DMM implementation measurement and reporting procedures
- Issues associated with water conservation activities for ULFT replacement, residential retrofits, surveys of commercial, industrial and institutional uses, residential and large turf irrigation, and conservation-related rates and pricing
- Encouraging and rewarding cost-effective investments in long-term conservation shown to advance regional water supply reliability and sufficiency.

### *Water Savings Assumptions*

There is no method to quantify savings from this DMM.

### DMM 11. Conservation Pricing

Conservation pricing provides incentives to customers to reduce average use, peak use, or both. Such pricing includes rates designed to recover the cost of providing service and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; or rates based on the long-term marginal cost or the cost of adding the next unit of capacity to the system.

### *Implementation Status*

All of the cities and water agencies currently bill for water based on conservation priced commodity rates.

### *Conservation Savings*

There is no method to quantify the savings of this DMM.

#### DMM 12. Water Conservation Coordinator

Water conservation coordinators and support staff (if necessary) perform a number of functions including coordination and oversight of conservation programs and DMM implementation, preparation of reports, promotion of water conservation issues to the city or water agency senior management, coordination of agency conservation programs with operations and planning staff, preparation of annual conservation budgets, and preparation of the conservation elements of the agency's Urban Water Management Plan.

##### *Implementation Status*

MWA and all of the cities and water agencies have staff that is dedicated to serving in this capacity.

##### *Conservation Savings*

There is no method to quantify the savings of this DMM.

#### DMM 13. Water Waste Prohibition

Water waste prohibitions involve enacted and enforced measures prohibiting gutter flooding, single pass cooling systems in new connections, nonrecirculating systems in all new conveyer car wash and commercial laundry systems, and nonrecycling decorative water fountains.

##### *Implementation Status*

Ordinances prohibiting water waste have been adopted in all of the water service areas.

##### *Conservation Savings*

There is no method to quantify the savings of this DMM.

#### DMM 14. Residential Ultra-Low-Flush Toilet Replacement Programs

Ultra-low-flush toilet replacement programs replace existing high-water-using toilets with ultra-low-flush (1.6 gallons or less) toilets in single-family and multi-family residences. Some programs involve requiring toilet replacement at time of resale.

##### *Implementation Status*

This DMM is currently being implemented in 3 of the water service areas.

##### *Conservation Savings*

Water savings depend on the type and number of toilets replaced.

# 8

## STAKEHOLDER ASSESSMENT AND PUBLIC OUTREACH

Significant public outreach efforts were made during development of this Regional Water Management Plan. These efforts involved meetings with individuals, groups, a Technical Advisory Committee and evaluation of questionnaires. Outreach efforts were directed at stakeholders from local water agencies, state and federal agencies, municipalities, San Bernardino County, and 13 local community groups. Lists of stakeholders are included in Chapter 2 of this Plan. The assessment of stakeholders' concerns is described in the following section.

### Assessment Approach

Stakeholders in the Mojave Water Agency (MWA) have a variety of issues related to potential water management activities. In an effort to identify those issues, several actions were taken as part of this planning process. Those actions included the following:

- review of existing data and reports provided by MWA and some stakeholders
- meetings with the MWA Technical Advisory Committee (TAC)
- individual and group meetings with stakeholders
- preparation and distribution of a written questionnaire; collection and review of responses

MWA arranged meetings with individual stakeholders or groups of related stakeholders. MWA selected those agencies thought to have critical issues that would benefit from individual discussions. The agencies that participated are as follows:

1. Victor Valley Wastewater Reclamation Authority
2. Baldy Mesa Water District
3. City of Barstow & Southern California Water Company
4. Joint Subarea Advisory Committee
5. City of Adelanto

6. City of Hesperia
7. Victor Valley Water District
8. Lahontan Regional Water Quality Control Board (Lahontan RWQCB)
9. Morongo Basin/Johnson Valley Area
  - a. Joshua Basin Water District
  - b. Hi-Desert Water District
  - c. Bighorn-Desert View Water Agency
  - d. San Bernardino County Special Districts
10. California Department of Fish and Game
11. San Bernardino County Special Districts

The written questionnaire was developed to provide an opportunity for all agencies and a greater number of individuals in MWA to provide input to the Regional Water Management Plan (RWMP) Update. The TAC provided review comments on the draft questionnaire and was instrumental in the development of the final version (Appendix D). The questionnaires were distributed in July 2001 in several ways: MWA mailed questionnaires directly to 26 entities, TAC members distributed copies to their constituent groups, and copies were distributed at other MWA meetings.

The following nineteen agencies and individuals submitted completed questionnaires:

### **Regional/Multiple Subareas**

1. California Department of Fish and Game
2. County of San Bernardino Special Districts
3. Lahontan Regional Water Quality Control Board (RWQCB)
4. Southern California Water Company
5. Unknown (respondent's name was not provided)

### **Morongo Basin/Johnson Valley Area**

1. Bighorn-Desert View Water Agency
2. Hi-Desert Water District
3. Joshua Basin Water District

### **Alto Subarea**

1. City of Adelanto
2. City of Hesperia
3. City of Victorville

4. Jess Ranch
5. Joe Monroe
6. Victor Valley Water District
7. Victor Valley Wastewater Reclamation Authority

### **Este Subarea**

1. Chuck Bell / Este Subcommittee
2. Norman Nichols

### **Oeste Subarea**

1. Paul Davis

### **Centro Subarea**

1. City of Barstow



### **Baja Subarea**

None submitted (several attempts were made to solicit a response)

The responses to the questionnaire varied, but they included several consistent themes. All of the responses to the questionnaire are summarized by subarea respondent in Appendix D.

## **Summary of Stakeholder Issues**

The following is a summary of the key stakeholder issues, as developed from the individual/group meetings and questionnaires.

### **Regional/Multiple Subareas**

1. California Department of Fish and Game (DFG)
  - a. Highest priority for the RWMP Update is increasing and maintaining the flows from Alto to Centro subareas. Replacement water needs to be delivered in the Narrows to benefit the riparian habitat.
  - b. RWMP Update should establish short-term actions in addition to long-term actions.
  - c. DFG would like Alto Subarea water level raised to create spillover to Lower Narrows.
  - d. RWMP Update should evaluate recharge at several locations: Rock Springs, upstream of Rock Springs, Transition Zone, and Silver Lakes area (south of Helendale Fault).
  - e. RWMP Update should address the need for additional water quality data.

- f. RWMP Update should address the needs of the existing riparian habitat. Minimum water levels for key habitats are included in Appendix H to the Judgment.
  - g. RWMP Update should address the viability of wastewater reclamation and its impact on riparian habitat.
  - h. RWMP Update should evaluate the viability of a diversion or dam at the lower end of the Mojave River upstream of Afton Canyon to retain storm water for use in the Baja Subarea.
  - i. RWMP Update should acknowledge the benefits of removing non-native vegetation in favor of native vegetation in the riparian habitat areas.
  - j. RWMP Update should evaluate the potential for MWA to assist with the funding of land purchases around sensitive riparian habitat.
  - k. Water quality concerns associated with the fish hatchery operations include: potential increases in levels of TDS and nutrients, and the potential for translocated pathogens from the State Water Project (SWP) water.
2. County of San Bernardino Special Districts  
(See Morongo Basin/Johnson Valley Area, Alto Subarea, and Oeste Subarea)
3. Lahontan RWQCB
- a. Highest priority for the RWMP Update is to address the long-term impacts of the increased salt levels associated with the delivery of SWP water.
  - b. Next year [2002], Lahontan RWQCB anticipates starting the process to revise the Basin Plan Objectives.
  - c. Would like a basin-wide water quality model to be used to evaluate alternative projects.
  - d. Would like the water quality model used to evaluate any proposed recycled water project.
  - e. Water conservation should be an integral part of the RWMP Update. MWA should take a leadership role in promoting water conservation.
4. Southern California Water Company
- a. Southern California Water Company (SCWC) operates systems in Alto Subarea (Apple Valley), Centro Subarea (Barstow), and Este Subarea (Lucerne Valley).
  - b. RWMP Update should include provisions to provide adequate supplies of water to each area of the region.
  - c. RWMP Update should evaluate all the competing interests for water and develop a plan for the greatest good of the group.

- d. Local soil conditions should be considered when selecting a recharge site to make sure recharge would not mobilize local contaminants that have been previously “locked” in the soil.
  - e. The quality of SWP water, as compared to existing and emerging contaminant standards, should be considered as part of the RWMP Update.
  - f. The storage capacity of a local basin should be utilized first for the benefit of local basin users. Once local needs are met, use of the storage capacity for others should be considered and this use should provide some benefit to the local users.
5. Unknown (respondent’s name was not provided)
- a. The overdraft must be stopped.
  - b. Projects and policies developed in the RWMP Update should be fair to all.

### Morongo Basin/Johnson Valley Area

- 1. Bighorn-Desert View Water Agency
  - a. District would like assistance with obtaining grant funding for system upgrades and replacements.
- 2. County of San Bernardino Special Districts
  - a. County operates 2 service areas in this subarea.
    - i. Zone 70 W-4 (Pioneertown)
    - ii. Zone 70 W-1 (Landers)
  - b. County would like assistance with obtaining grant funding for system upgrades and replacements.
  - c. High levels of uranium and arsenic (Zone 70 W-4) are concerns.
  - d. RWMP Update should address the issues of all regions within MWA.



- 3. Hi-Desert Water District
  - a. Highest priority for RWMP Update is the extension of the Morongo Basin Pipeline and the construction of an additional recharge facility.
  - b. Nitrate levels are a concern.
  - c. Would like an evaluation of the potential for a conjunctive use project in the Mesa area included in the RWMP Update.
  - d. RWMP Update should include a policy on how the SWP entitlement is to be allocated or shared.

- e. RWMP Update should include an evaluation of a treatment facility at the terminal reservoir for the Morongo Basin Pipeline.
4. Joshua Basin Water District
- a. Highest priority for RWMP Update is the extension of the Morongo Basin Pipeline to the District and the construction of a recharge facility.
  - b. District would like MWA assistance with obtaining grant funding for the pipeline extension and recharge facilities.
  - c. Fluoride and salt levels are a minor concern.
  - d. RWMP Update should address the need for additional SWP entitlement for the Morongo Basin/Johnson Valley Area.
  - e. RWMP Update should include an evaluation of a treatment facility at the terminal reservoir for the Morongo Basin Pipeline.

### Alto Subarea

1. Baldy Mesa Water District
- a. Significant urban growth and increased water demand are anticipated.
  - b. Water quality issues should be addressed. Arsenic levels are above 10 ppb.
  - c. How various stakeholders will gain access to MWA's SWP entitlement should be addressed.
  - d. How treatment of SWP water can fit into the regional plan and how reliable it will be should be addressed.
  - e. Would like MWA to jointly work with them to evaluate injection well feasibility and percolation basin feasibility. Oro Grande Wash and No Name Wash are identified recharge sites.
  - f. Would like the potential of moving their production to the Mojave River area East of Hesperia to be evaluated. A transmission system from the River to the District would be required.
2. City of Adelanto
- a. Significant urban growth and increased water demand are anticipated.
  - b. Highest priority for RWMP Update is to evaluate ways to recharge the Transition Zone to increase the reliability of the City's wells.
  - c. Water quality issues should be addressed. The City's wells on the Mesa have high TDS and fluoride levels.
  - d. How treatment of SWP water can fit into the regional plan and how reliable it will be should be addressed.
  - e. Would like the potential for injection in the Mesa area to be evaluated.



3. City of Hesperia
  - a. Significant urban growth and increased water demand are anticipated.
  - b. Water levels have dropped an average of 8 feet over the past 2 years due to 2 years of dry weather and minimal Mojave River flows.
  - c. Welcome the evaluation of a project to move Baldy Mesa Water District production to the Mojave River area East of the City. Feel such a project could be beneficial to the entire region.
  - d. City has no water quality concerns.
  - e. RWMP Update should be a regional plan, not a series of individual plans.
  - f. A treatment facility for SWP water should be evaluated as a regional project.
  - g. Direct use of SWP water for irrigation should be evaluated as an in-lieu project.
  - h. Existing and proposed local stormwater retention/detention basins should be evaluated for their potential dual use as recharge facilities.
  - i. Water conservation should be an integral part of the RWMP Update.
  - j. RWMP Update should mention the Army Corps of Engineers proposal to make the Mojave River Forks Dam a retention basin.
  
4. City of Victorville
  - a. RWMP Update needs to include alternatives for recharging the regional aquifer close to points of withdrawal.
  - b. The need for a water treatment facility for SWP water needs to be evaluated in the RWMP Update.
  - c. The RWMP Update process needs to be coupled with an aggressive public information program to educate the general public on the regional water supply issues.
  - d. Recycled water and water conservation should be an integral part of the RWMP Update.
  
5. County of San Bernardino Special Districts
  - a. County operates 5 service areas in this subarea.
    - i. Zone 42 (Oro Grande) in Transition Zone
    - ii. Zone 70 C (Silver Lakes) in Transition Zone
    - iii. Zone 64 (Spring Valley Lake)
    - iv. Zone 70 J (Oak Hills)
    - v. Zone 70 L (Pinion Hills – Phelan Area) most of production is in Oeste and most of consumption is in Alto

- b. Water quality issues: chromium VI (Zone 70 J), iron and magnesium (Zones 42 and 70 C), nitrate (Zone 64), arsenic (Zone 70 C), TDS (Zone 70 C), and fluoride (Zone 70 C).
- c. Zone 42 (Oro Grande) would benefit from recharge in the Transition Zone as proposed by City of Adelanto. Wells almost run dry seasonally.
- d. RWMP Update should address the issues of all regions within MWA.

6. Jess Ranch

- a. RWMP Update should include the concept of recharging large quantities of water in the Floodplain Aquifer via the Rock Springs facility and extracting that water for distribution to Alto, Este, and Morongo Basin/Johnson Valley users.
- b. RWMP Update should address consumptive use issues.
- c. Farmers need to be treated equitably.
- d. MWA should only be involved in the educational aspects of water conservation. MWA should focus on supplying supplemental water as a wholesaler.
- e. RWMP Update should address the potential of degrading local groundwater quality by recharging the aquifer with SWP water.
- f. RWMP Update should be an update to the existing plan and not a new plan. Any changes to the existing plan should be clearly identified.
- g. RWMP Update should focus on getting supplemental water flowing as soon as possible.

7. Joe Monroe

- a. The time should be taken to prepare an RWMP Update that provides for an adequate, equitable, and reliable water supply.

8. Victor Valley Water District



- a. Significant urban growth and increased water demand are anticipated.
- b. Water quality concerns include arsenic and temperature. 58% of well capacity is over 10 ppb level for arsenic. Are beginning to see some low levels of nitrate.
- c. RWMP Update focus should be on bringing in wet water.
- d. Would like to build treatment facility for SWP water for direct delivery and for injection.
- e. Percolation of SWP water is considered an option, but there is concern over where the water goes once it is recharged.

- f. Relying on projects that would pump additional water from around the Mojave River may be problematic for two reasons: water quality may not be adequate and increased pumping may have a detrimental affect on riparian habitat.
  - g. The use of recycled wastewater should be evaluated. The impact on the make-up obligations of Alto producers must be included in the evaluation.
  - h. RWMP Update should include a policy on how the SWP entitlement is to be allocated or shared.
  - i. Groundwater banking programs should be addressed in the RWMP Update. Principles must be developed that clearly state how the stakeholders establish benefits from these programs and how the benefits will be equitably shared.
  - j. RWMP Update should be plan that provides regional guidance while maintaining local control of facilities.
9. Victor Valley Wastewater Reclamation Authority
- a. Highest priority for RWMP Update is to determine and support the highest and best use of recycled wastewater.
  - b. Adjudication should recognize the benefits of wastewater reclamation.
  - c. Adjustments to the Physical Solution would be helpful.
  - d. Some of the Authority's main interceptors are reaching their capacity and/or design life.
  - e. Sub-regional wastewater reclamation facilities would eliminate or greatly reduce the need for major interceptor rehabilitation and/or replacement.
  - f. Recycled water from sub-regional facilities could be used for urban irrigation and groundwater recharge.
  - g. Regional facility would continue to treat solids and could continue to provide flow to the Mojave River.

## Este Subarea

- 1. Chuck Bell / Este Subarea Advisory Committee
  - a. A recharge facility for SWP water via the Morongo Basin Pipeline must be a part of the RWMP Update.
  - b. RWMP Update should include a wide range of options, recharge locations, financial incentive, etc.
  - c. Some concern regarding increasing TDS levels.
- 2. Norman Nichols
  - a. RWMP Update must treat farmers fairly and equitably.
  - b. Some concern regarding increasing TDS levels.
  - c. RWMP Update should include evaluation of groundwater storage programs in Este.

## Oeste Subarea

1. County of San Bernardino Special Districts
  - a. County operates 1 service area in this subarea
    - i. Zone 70 L (Pinion Hills – Phelan Area) most of production is in Oeste and most of consumption is in Alto
  - b. Water quality issues: MTBE
  - c. RWMP Update should evaluate the potential to recharge SWP water in Sheep Creek.
  - d. RWMP Update should address the issues of all regions within MWA.
2. Paul Davis
  - a. RWMP Update must fully address the needs of the outlying areas such as Este and Oeste.
  - b. Conservation needs to be a very important part of the RWMP Update.
  - c. Minimal users should pay their fair share of costs for regional programs and improvements.

## Centro Subarea

1. City of Barstow
  - a. Centro is close to being in balance, but there is a significant amount of FPA not currently being used.
  - b. TDS levels are a concern. Fourteen wells have TDS levels over 500 mg/l.
  - c. Want to make sure that Alto Subarea users are doing their part to get Alto in balance.
  - d. RWMP Update should focus on stopping the overdraft and reversing it if necessary.
  - e. RWMP Update should clearly state how MWA allocates SWP entitlement and how much it will cost so that developers will be able to evaluate the viability of new development.
  - f. RWMP Update should include Best Management Practices for each subarea.
  - g. Concerned that water introduced at the Transition Zone is not reaching Barstow.
  - h. RWMP Update should acknowledge the benefits of removing non-native vegetation in favor of native vegetation in the riparian habitat areas.
  - i. Want to have assurances that the requirement for 23,000 acre-feet per year to pass through the Narrows is being met.
  - j. SWP water delivered through the Mojave River Pipeline should be paid for on a postage stamp basis, not a railroad ticket basis.
  - k. Recognize that VVWRA discharge is currently the primary recharge mechanism for Barstow. Are willing to have alternatives that would make use of SWP water for

Transition Zone flow and allow some upstream wastewater reclamation. Centro and Barstow must not be negatively impacted.

### Baja Subarea

A formal response to the questionnaire was not received, but the following comments were among several received in discussions with TAC members.

1. RWMP Update needs to treat Baja interests fairly.
2. Concerned about the lack of water reaching Baja.
3. Concerned that increased development upstream will negatively impact local water supplies.
4. Concerned about a drop in local property values due to concerns about the water supply.
5. Would like to see support for obtaining grant funds to assist local farmers with water conserving improvements.
6. Would like to see MWA and USGS confirm that the aquifer in the Newberry Springs area is recharged from the Mojave River system.

### Issues Common to All Stakeholders

The assessment and evaluation of the meetings and questionnaires point to several issues that are common to virtually all stakeholders. These issues, as articulated below, helped to develop the suite of project alternatives evaluated in detail during Phase 2 of the RWMP Update.

1. Groundwater overdraft needs to be stopped and local water levels recovered if it is financially viable to do so.
2. Purchase of additional SWP entitlement should be pursued, if it makes financial sense to do so.
3. Groundwater banking with agencies outside and inside MWA should be considered as long as they provide benefit to the local basin.
4. The RWMP Update should strive to maximize the use of recycled water while meeting the obligations of the Adjudication.
5. Water conservation should be a key component in the long-term water supply.
6. The RWMP Update should treat all water users fairly and equitably.
7. Continued open dialog and stakeholder involvement is critical to the development of an effective RWMP Update.

## Key Water Management Issues

Identifying the key water management issues facing the Mojave Water Agency (MWA) service area is an important step in the Agency's planning process. Clearly articulating these issues helped define the water management actions and projects presented in the next chapter of this report.

The identification of the area's key water management issues stemmed from our evaluation of recent hydrogeologic data, our update of supply and demand estimates, and our stakeholder assessment process. The following six key water management issues emerged from this process:

### **1) Demand Exceeds Supply**

The projected year 2020 water balance shows a water deficit in the Mojave Basin area ranging from 57,200 acre-feet to 79,600 acre-feet. The projected 2020 deficit in the Morongo Basin/Johnson Valley Area is 1,900 acre-feet.

### **2) Water Quality**

Water quality problems affect drinking water supplies throughout the MWA service area. The key contaminants of concern include arsenic, nitrates, iron, manganese, chromium VI and TDS.

### **3) Overdraft of the Groundwater Basins**

Declining groundwater levels occur in all subareas of the Mojave Basin Area and in the Morongo Basin/Johnson Valley Area.

### **4) Riparian Ecosystem Maintenance**

All but two of the subareas (Oeste and Morongo Basin/Johnson Valley) have potential riparian maintenance issues to consider, such as invasive species and habitat preservation.

### **5) Wastewater Infrastructure**

Wastewater infrastructure issues affect the two subareas with the largest urban water demands within the Mojave Basin Area (Alto and Centro).

### **6) Subarea Interaction**

Many subareas within the MWA service area are impacted by activities in other subareas. These impacts include water supply and water quality issues.

Each subarea has a unique set of these key issues. To help identify the issues that are specific to each subarea, the following series of tables were developed. The tables also show the locations affected within the subarea and the aquifer(s) potentially impacted.

**Table 8-1: Baja Subarea Water Management Issues**

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 6,100 to 23,200 af/yr	Overall subarea	Floodplain & Regional
Water Quality	Arsenic > 10 ppb	<ul style="list-style-type: none"> <li>• Military Base</li> <li>• Individual Homeowner Wells</li> </ul>	Floodplain & Regional
	Local Organics	Same as above	Floodplain
	Boron	Same as above	Floodplain
	Chromium VI	Newberry Springs area	Floodplain
	Fluoride	Isolated areas	Floodplain & Regional
	High TDS	Isolated areas	Floodplain & Regional
Overdraft	<ul style="list-style-type: none"> <li>• Largest historical decline of Mojave R. Basin subareas</li> <li>• Causing wells to run dry</li> <li>• Potentially causing degradation in water quality</li> <li>• Potential ground subsidence NE of Newberry Springs</li> </ul>	Overall subarea	Floodplain & Regional
Riparian Ecosystem Maintenance	<ul style="list-style-type: none"> <li>• Declining water levels have caused harm to riparian growth and sustainability</li> <li>• Issue – Keeping groundwater levels in appropriate root zone</li> <li>• Listed species negatively effected</li> </ul>	Camp Cady	Floodplain
	Blowsand conditions and vegetation loss due to lowered water levels	Calico-Newberry Fault zone	Floodplain & Regional
Wastewater Infrastructure	Not an issue		
Subarea Interaction	Judgment requiring: <ul style="list-style-type: none"> <li>- Minimum subsurface flow from Centro</li> <li>- Minimum subsurface flow toward Afton</li> </ul>	Overall subarea	Floodplain



Table 8-2: Centro Subarea Water Management Issues

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 2,700 af/yr	Overall subarea	Floodplain & Regional
Water Quality	Arsenic > 10 ppb	Barstow and Harper Dry Lake areas	Floodplain & Regional
	TDS	Same as above. 14 wells have TDS levels over 500 mg/l.	Floodplain & Regional
	Fluoride	Barstow	Regional
	Nitrates	Barstow and isolated areas	Floodplain & Regional
Overdraft	<ul style="list-style-type: none"> <li>Causing wells to run dry</li> <li>Potentially causing degradation in water quality</li> <li>Potential ground subsidence near Harper Dry Lake</li> </ul>	Harper Lake area	Regional
Riparian Ecosystem Maintenance	<ul style="list-style-type: none"> <li>Habitat health based on groundwater level</li> <li>Per Judgment, gw levels for riparian have been set, but two of the monitoring wells have not been drilled.</li> <li>Invasive species – eradicate phreatophytes because of their consumption.</li> </ul>	Along Mojave River and Harper Lake Habitat Preserve	Floodplain & Regional
Wastewater Infrastructure	<ul style="list-style-type: none"> <li>~9,000 af/yr</li> <li>Alto discharges provide supply to Centro.</li> <li>Several entities protesting change of point of discharge. DFG wants 8,500 af/yr plus 37% of additional water treated to continue to be discharged at present location.</li> </ul>	Victorville area	Floodplain & Regional
Subarea Interaction	<ul style="list-style-type: none"> <li>Judgment requiring minimum subsurface flow from Alto and to Baja</li> <li>VVWRA wastewater point of discharge issue related to meeting downstream flow requirements.</li> </ul>	Overall subarea	Floodplain

**Table 8-3: Alto Subarea Water Management Issues**

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 46,000 to 48,500 af/yr	Overall subarea	Floodplain & Regional
Water Quality	Arsenic > 10 ppb	<ul style="list-style-type: none"> <li>• Various locations.</li> <li>• 58% of Victor Valley WD well capacity &gt; 10 ppb Arsenic.</li> </ul>	Mostly Regional, but also some in Floodplain
	High TDS	Adelanto	Regional
		Silver Lakes	Floodplain
	Fluoride	Adelanto, Silver Lakes, and isolated areas	Regional
	Nitrates (low priority, below MCLs)	Victorville	Floodplain & Regional
	Manganese, Iron	North of SCLA, Oro Grande, and isolated areas	Floodplain & Regional
	Chromium VI, Iron, Manganese, Arsenic, others	Upper Part of Mojave Watershed	Regional
	Organics	SCLA	Regional
High Temperature	Victorville	Regional	
Overdraft	Causing wells to run dry	Apple Valley	Regional
	Potentially causing degradation in water quality	Victorville	Floodplain & Regional
		Adelanto	Floodplain & Regional
		Baldy Mesa	Regional
	Hesperia	Floodplain & Regional	
Riparian Ecosystem Maintenance	<ul style="list-style-type: none"> <li>• Habitat health based on groundwater level and Mojave River flows</li> <li>• Water level needs to be raised to return to and maintain habitat</li> </ul>	Along Mojave River – 24-mile corridor from Spring Valley Lakes to the Helendale fault area	Floodplain
Wastewater Infrastructure	<ul style="list-style-type: none"> <li>• Return flow policy</li> <li>• Need for additional infrastructure</li> <li>• Satellite treatment and recycle</li> </ul>	Overall subarea	Floodplain & Regional
Subarea Interaction	<ul style="list-style-type: none"> <li>• Judgment requiring minimum subsurface flow from Este and Oeste and subsurface and surface flow to Centro</li> <li>• Tied to VVWRA wastewater point of discharge issue</li> </ul>	Overall subarea	Floodplain & Regional

**Table 8-4: Oeste Subarea Water Management Issues**

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 1,900 to 2,900 af/yr	Overall subarea	Regional
Water Quality	Arsenic > 10 ppb	Localized	Regional
	MTBE	Southern region	Regional
	Moderately high TDS Chromium VI	Near El Mirage Dry Lake	Regional
	Fluoride	Isolated areas	Regional
Overdraft	<ul style="list-style-type: none"> <li>Causing wells to run dry</li> <li>Potentially causing degradation in water quality</li> <li>Potential ground subsidence</li> </ul>	Depression beneath El Mirage Dry Lake	Regional
Riparian Ecosystem Maintenance	None identified		
Wastewater Infrastructure	Not an issue		
Subarea Interaction	Judgment requiring subsurface flow from Oeste to Alto	Overall subarea	Regional

**Table 8-5: Este Subarea Water Management Issues**

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 500 to 2,300 af/yr	Overall subarea	Regional & Lucerne
Water Quality	High TDS	Near Rabbit Dry Lake	Regional
		Near Lucerne Dry Lake	Lucerne
	Fluoride	Isolated areas	Lucerne
	Arsenic > 10 ppb	Isolated areas	Lucerne
	Nitrate concentrations near BBARWA discharge	Near Hwy 247 and Camp Rock Road	Lucerne
Overdraft	<ul style="list-style-type: none"> <li>Causing wells to run dry</li> <li>Potentially causing degradation in water quality</li> <li>Potential ground subsidence near Lucerne Dry Lake</li> </ul>	Overall Subarea	Lucerne
Riparian Ecosystem Maintenance	Springs along Helendale Fault support habitat (Rabbit Spring, Cushenberry Spring, & several unnamed springs)	Overall subarea	Regional & Lucerne
Wastewater Infrastructure	Not an issue		
Subarea Interaction	Judgment requiring subsurface flow from Este to Alto	Overall subarea	Regional

**Table 8-6: Morongo Basin/Johnson Valley Water Management Issues**

<b>Issue</b>	<b>Specification</b>	<b>Location</b>	<b>Aquifer(s)</b>
Demand Exceeds Supply	2020 deficit: 1,900 af/yr (Not including imported supply and Johnson Valley)	Overall subarea	Morongo Regional
Water Quality	Nitrates (septic contamination of recharged water)	Warren Valley Basin	Morongo Regional
	Arsenic > 10 ppb	Pioneertown	Morongo Regional
	Uranium	Pioneertown	Morongo Regional
	Iron & manganese	Pioneertown	Morongo Regional
	Fluoride	Isolated areas	Morongo Regional
	Moderate TDS	Warren Valley Basin	Morongo Regional
Overdraft		<ul style="list-style-type: none"> <li>Joshua Tree Subbasin – some decline</li> <li>Warren Basin is now stabilized with imported water</li> </ul>	Morongo Regional
Riparian Ecosystem Maintenance	None		
Wastewater Infrastructure	Treatment Plant being pursued for Warren Valley Basin	Warren Valley Basin	Morongo Regional
Subarea Interaction	Warren Valley Basin Judgment	Warren Valley Basin	Morongo Regional

A review of the tables above shows that the impacts caused by the six key issues are widespread in the MWA service area. This compilation of water management issues provides a tool for identifying linkages between specific issues and subareas. These linkages can be used to craft project alternatives and water management strategies that address the issues in an integrated manner.

## **Coordination of IWMP, GMP and UWMP with Other Agencies**

In the development of this Integrated Water Management Plan, input was sought from other agencies in the Mojave Basin through the Technical Advisory Committee. The committee discussed the content of the plan and provided input during its development. Agendas and minutes from TAC meetings are included in Appendix E.

## **Method for Public Participation**

MWA utilized numerous methods for informing the public about the development of its IWMP and describing means by which the public could have input into development of the plan. The methods are described below.

### Technical Advisory Committee

MWA formed a Technical Advisory Committee (TAC) comprised of local stakeholders with an interest in the areas groundwater. The TAC met regularly during development of the Regional Water Management Plan, reviewing and providing comments and suggestions on the Plan. The following entities comprise the Technical Advisory Committee:

Apple Valley Ranchos  
Baldy Mesa Water District  
Bar-H Mutual Water Company  
Bighorn Desert View Water Agency  
California Department of Fish & Game  
Citizens for a Better Community  
City of Barstow  
City of Hesperia  
City of Victorville  
County of San Bernardino Special Districts  
Department of Water Resources  
Hi-Desert Water District  
Jess Ranch  
Joshua Basin Water District  
Jubilee Mutual Water Company  
Lahontan Regional Water Quality Control Board  
Mariana Ranchos County Water District  
Mojave Basin Area Judgment Subarea Advisory Committees  
Newberry Springs-Harvard Property Owners Association  
Palisades Ranch  
Rancho Los Flores  
Silver Lakes Association  
Southern California Water Company  
Spring Valley Lakes Association  
Town of Apple Valley  
Victor Valley Wastewater Reclamation Authority  
Victor Valley Water District

In addition, approximately 20 individuals participated. Other stakeholders in the Regional Water Management Plan Update process are listed in Chapter 2.

### Newsletter

*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.

#### Website

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 and general information about MWA. MWA will continue to provide this service.

#### Annual Symposia

MWA organized and held water symposia in Victorville in Spring 2003 and in Joshua Tree in Fall 2003. Water leaders and regulators participated in discussion and information sessions. The Agency plans to make the symposia an annual event.

#### Alliance for Water Awareness and Conservation

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.

#### Speakers Bureau

MWA provides speakers to a variety of local and community groups on MWA's plans and projects.

#### MWA Community Liaison Officer

MWA will continue its outreach and education efforts through the position of the Community Liaison Officer.

#### Subarea Advisory Committees

The 1996 Mojave Basin Area Judgment stipulated formation of Subarea Advisory Committees for each of the five Subareas. The Committee for each area acts in an advisory capacity and studies, reviews and makes recommendations on all discretionary determinations made by the Watermaster which may affect that Subarea.

#### Written statement to the public

A copy of the statement (MWA Newsletter) on how interested agencies and other stakeholders could participate in the development of this Plan is included in Appendix F. Additional written statements include agendas for the TAC meetings that were mailed to the TAC members (Appendix E).

# 9

## BASIN MANAGEMENT OBJECTIVES AND ALTERNATIVES

### Mojave Water Agency

Basin Management Objectives (BMOs) and performance measures were developed as part of this Regional Water Management Plan (RWMP) Update using input from the Technical Advisory Committee (TAC) during two workshops in July and August 2002. Water supply projects and management actions were identified to provide a means to achieve these BMOs. Various combinations of these water supply projects and management actions were assembled into alternatives which were then evaluated for their ability to achieve the BMOs. This process is described in detail in this chapter.

During Phase 2 of the RWMP Update the TAC screened and selected the best combinations of projects and management actions that address key MWA water issues using a four-step systems approach. The first step was to clearly articulate what MWA wants to accomplish through the update of the RWMP.

The intended accomplishments are specified as Basin Management Objectives and performance measures. The BMOs spell out what MWA wants to accomplish, and the performance measures provide a tool to compare the relative success of alternative solutions in producing the desired results. Steps 2 through 4 are employed to generate alternative solutions, evaluate those alternatives, and ultimately select the best alternatives to implement.

The first step in this process was articulation of Basin Management Objectives and establishment of performance measures. The BMOs listed here were adopted by the TAC as a representative

#### Steps in Screening Process using Systems Approach

1. *Define Problem*
  - *Articulate Fundamental Objectives*
  - *Establish Performance Measures*
2. *Generate Alternatives*
3. *Evaluate Alternatives*
4. *Select Alternatives to Implement*

statement of what should be accomplished through the RWMP Update. The performance measures provide a set of indicators that can be used to help decide how effectively possible alternatives solutions provide the desired outcomes.

## Basin Management Objectives

The Fundamental Basin Management Objectives developed with the TAC are presented below. The objectives established for the Mojave Water Agency Regional Water Management Plan (MWA RWMP) through 2020 are to:

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 Exhibit H of the Mojave Basin Area Judgment and the Department of Fish & Game management plan required by Exhibit H
- limit the potential for well dewatering, land subsidence, and migration of poor quality water
- maintain a sustainable water supply through extended drought periods; and
- select projects with the highest likelihood of being implemented.

Maximize the overall beneficial use of water throughout MWA by:

- supplying water in quantity and of quality suitable to the various beneficial uses
- addressing at a minimum Table 7-1 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; and
- identifying sustainable funding sources including consideration of affordability.

Balancing future water demands with available supplies will increase water supply reliability by preventing continued overdraft of the groundwater. 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 and be kept above historic low. This will reduce the potential for land subsidence and associated aquifer compaction. By limiting migration of poor quality water, available supplies will be of sufficient quality to meet drinking water objectives, thereby increasing long-term water supply reliability.



## Performance Measures

For each part of the Basin Management Objectives, performance measures were proposed and discussed at the August TAC workshop. Input from this discussion is included below. The resulting performance measures can be grouped into six broad categories, as follows:

- Storage levels – relating to groundwater accessibility, environmental groundwater elevations, and subsidence potential
- Supply-demand balance – relating to water supply sustainability, mismatch between supply and demand, water supply operations and contingency plans
- Economics – relating to project costs, benefits related to water supply, mitigation requirements, and funding sources
- Water quality – relating to the suitability of water for a particular use, and expected changes in water quality
- Equity – relating to the fair and equitable distribution of benefits and costs
- Implementability – relating to the institutional complexity, potential redirected impacts, and environmental impact of proposed projects

A discussion of the Performance Measures proposed for use for the MWA Regional Water Management Plan Update is presented in Appendix B.

## Projects and Management Actions

Phase 1 of the Regional Water Management Plan Update (RWMP Update) provided an array of projects and management actions that can both mitigate groundwater overdraft and meet the water supply needs of the MWA service area for the next two decades. Proposed projects and management actions were tailored to address at least one key water management issue in the basin, as well as help satisfy the Basin Management Objectives.

The purpose of this evaluation is to reasonably estimate specific parameters for **Supply Enhancement Projects** and **Management Actions** identified for the RWMP Update. These parameters were used to develop and evaluate **Alternatives** designed to address the key water management issues summarized above.

The following terms defined below are used throughout this document:

**Supply Enhancement Project (Project)** - A project providing water supply enhancement through groundwater recharge or an increase in groundwater recharge efficiency.

**Management Action** - An action improving water quality or environmental habitat. Additionally, an action increasing net water supply by implementing conservation, storage agreements, or water transfers.

**Alternative** - A combination of projects and/or management actions focused on addressing water management issues.

## Methodology

To evaluate the relative impacts and benefits of an alternative, key parameters for the projects and management actions that compose an alternative are necessary. The following is a list of key parameters defined or estimated for each project and most management actions:

1. Project Location - by aquifer unit in the STELLA screening model presented below under the “MWA Screening Model” heading.
2. Recharge Capacity - acre-feet per year
3. Capital Cost - total cost in current (2003) dollars
4. Operation and Maintenance (O&M) Cost – dollars per year
5. Specific Issues - any known issues specific to that project
6. Facilities Required - new and existing facilities needed

The majority of the numbers presented in this document for cost and capacity are derived from a normalized unit cost analysis and should be considered rough estimates of actual design conditions. The costs reported in this document are for nominally-sized facilities and in many cases the projects were resized to match water supply needs in the screening model. The model evaluated multiple sizes and capacities of projects and management actions to spatially optimize recharge in the MWA service area for every alternative.

## Normalized Project Cost Methodology

A large number of projects and management actions included in this document have not been studied in detail. Consequently, comparable cost estimates were not available. While further refinement of each potential project and management action is needed, a detailed analysis was beyond the scope of this Plan. To provide a reasonable estimate of capital and operating cost for comparing all projects, a normalized cost table was developed and applied to projects and management actions lacking detailed information.

The normalized cost table was created to provide a unit cost for varying recharge capacities, pipeline diameters, recharge areas, pumping requirements, etc. Unit costs were developed from data provided by MWA composed of contract bids, previous engineering estimates, design documents, and previous reports. Table 9-1 shows an abbreviated version of the normalized cost table with major cost categories shown. These estimates are reflective of relative costs of the various projects based on known parameters. Actual costs may differ once site specific information is developed.

Capital costs were developed based on estimates of pipeline diameters, pipeline lengths, capacity, and various factors specific to a project. In discussions with MWA, the overall project cost is usually 30 percent greater than the construction cost. Therefore, 30 percent was added to the estimated construction cost. This expenditure is associated with project implementation cost and includes geotechnical analysis, right of way, permitting, environmental mitigation, consulting services, and other associated costs.

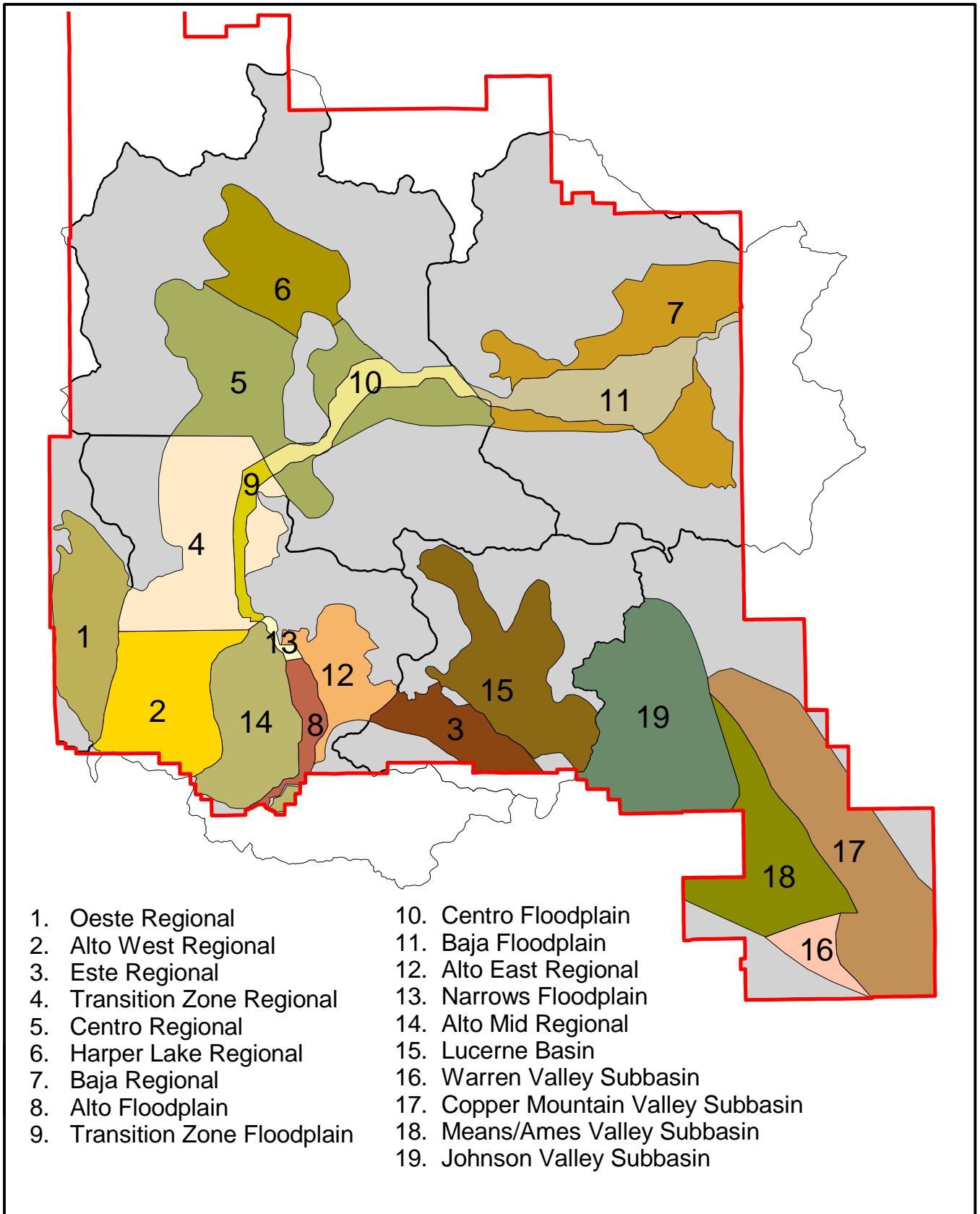
Operating and maintenance costs were developed from energy requirements, standard costs for maintenance of recharge areas and pipeline lengths, SWP water purchases, and various factors specific to a project.

## Supply Enhancement Projects and Management Action Groupings

Specific groups of projects and management actions have been developed to facilitate discussions of alternatives and to provide organization. Table 9-2 presents supply enhancement projects and Table 9-3 presents management actions. Both tables list the specific **aquifer unit** each project or management action overlays. To model the water system, the Mojave River Basin floodplain and regional aquifers have been subdivided into 19 distinct but inter-connected aquifer units, as illustrated in Figure 9-1.

Supply enhancement projects are divided between projects that recharge groundwater utilizing State Water Project (SWP) water and projects that utilize other sources of water (Non-SWP). The SWP section is further divided by projects that recharge the floodplain aquifer and those that recharge areas other than the floodplain aquifer. The Non-SWP section is further divided by projects that increase recharge efficiencies within the MWA service area and projects that change a source of groundwater supply.

Management actions are divided into three groups: actions that treat or blend water supplies, actions that improve riparian health, and actions focused on conservation and storage agreements.



**Table 9 - 1**  
**Abbreviated Normalized Cost Table**  
**(2003 dollars)**

Description	Design Capacity  (acre-feet/ year)	Peaking Factor	Operation Frequency	Recharge Pond Cost  (\$)	Pipeline Length  (ft)	Pipeline Cost  (\$)	Capital Cost Estimate  (\$)	Annual O&M Estimate  (\$)	SWP Water Purchase  (\$)	Cost Summary	
										Capital Cost with 30% Contingency  (\$)	Annual O&M and SWP Cost  (\$)
Kane Wash/ Newberry Springs Recharge Ponds	6,000	2.0	70%	\$660,000	53,400	\$3,500,000	\$4,200,000	\$50,000	\$1,200,000	\$5,500,000	\$1,300,000
El Mirage Dry Lake Recharge Ponds	2,500	2.0	70%	\$270,000	21,000	\$1,300,000	\$1,600,000	\$30,000	\$500,000	\$2,100,000	\$500,000
Sheep Creek Recharge Ponds	2,500	2.0	70%	\$270,000	10,000	\$600,000	\$1,000,000	\$140,000	\$500,000	\$1,300,000	\$700,000
Oro Grande Recharge Ponds	8,000	2.0	70%	\$880,000	0	\$0	\$1,600,000	\$60,000	\$1,600,000	\$2,100,000	\$1,700,000
Cedar Street Detention Basin	3,500	2.0	70%	\$1,000,000	0	\$0	\$1,500,000	\$70,000	\$700,000	\$2,000,000	\$800,000
Antelope Valley Wash Recharge Ponds	3,500	2.0	70%	\$780,000	0	\$0	\$1,300,000	\$60,000	\$700,000	\$1,700,000	\$800,000
Recharge Facilities South of Apple Valley	1,000	2.0	70%	\$110,000	10,000	\$600,000	\$700,000	\$130,000	\$200,000	\$900,000	\$300,000
Lucerne Valley Recharge Ponds	5,000	2.0	70%	\$550,000	5,000	\$300,000	\$900,000	\$530,000	\$1,000,000	\$1,200,000	\$1,600,000
Recharge Ponds West of Hellendale Fault	5,000	2.0	70%	\$550,000	5,000	\$300,000	\$900,000	\$530,000	\$1,000,000	\$1,200,000	\$1,600,000
Means/Ames Recharge Ponds	2,500	2.0	70%	\$270,000	10,000	\$600,000	\$900,000	\$30,000	\$500,000	\$1,200,000	\$500,000
Hi-Desert Water District Recharge Basin #3	6,400	2.0	70%	\$700,000	7,500	\$500,000	\$1,200,000	\$60,000	\$1,280,000	\$1,600,000	\$1,300,000
Joshua Basin District Recharge and Pipeline	1,000	2.0	70%	\$110,000	10,000	\$600,000	\$700,000	\$30,000	\$200,000	\$900,000	\$200,000
Minneola Recharge Ponds	3,600	2.0	70%	\$390,000	22,000	\$1,300,000	\$1,700,000	\$40,000	\$720,000	\$2,200,000	\$800,000
Daggett Recharge Ponds	16,800	2.0	70%	\$1,840,000	34,000	\$2,700,000	\$4,500,000	\$110,000	\$3,360,000	\$5,900,000	\$3,500,000
Recharge North of Helendale Fault	5,000	2.0	70%	\$550,000	7,500	\$500,000	\$1,100,000	\$50,000	\$1,000,000	\$1,400,000	\$1,100,000
In-Lieu Supply to Silver Lakes	5,000	2.0	70%	\$0	7,500	\$500,000	\$500,000	\$20,000	\$1,000,000	\$700,000	\$1,000,000
Mojave River Pipeline Extension - Transition Zone	2,500	2.0	70%	\$270,000	26,000	\$1,600,000	\$1,900,000	\$30,000	\$500,000	\$2,500,000	\$500,000
Hesperia Lakes Recharge	3,000	2.0	70%	\$330,000	16,000	\$1,000,000	\$1,300,000	\$40,000	\$600,000	\$1,700,000	\$600,000
Recharge Facilities South of Rock Springs Turnout	8,000	2.0	70%	\$880,000	21,000	\$1,700,000	\$2,600,000	\$60,000	\$1,600,000	\$3,400,000	\$1,700,000

Table 9-2: Supply Enhancement Project

<b>SWP</b>	
<i>Non-Floodplain Aquifer Recharge (14)</i>	<i>Aquifer Unit</i>
Kane Wash Recharge Ponds	Baja Regional
El Mirage Recharge Ponds	Oeste Regional
Sheep Creek Recharge Ponds	Oeste Regional
AVEK	Centro Regional
Oro Grande Wash Recharge Ponds	Alto West Regional
Cedar Street Detention Basin	Alto Mid Regional
Antelope Valley Wash Recharge Ponds	Alto Mid Regional
Recharge Facilities South of Apple Valley	Alto East Regional
Recharge Ponds West of Helendale Fault	Este Regional
Lucerne Valley Recharge Ponds	Lucerne Valley
Means/Ames Valley Recharge Ponds	Means/Ames Valley
Hi-Desert Water District: Warren Valley Recharge	Warren Valley
Hi-Desert Water District Recharge Basin #3	Warren Valley
Joshua Basin District Recharge & Pipeline	Copper Mountain Valley
<i>Floodplain Aquifer Recharge (12)</i>	<i>Aquifer Unit</i>
Newberry Springs Recharge Ponds	Baja Floodplain
Minneola Recharge Ponds	Baja Floodplain
Daggett Recharge Ponds	Baja Floodplain
Lenwood Recharge Ponds	Centro Floodplain
Hodge Recharge Ponds	Centro Floodplain
Recharge Ponds North of Helendale Fault	Centro Floodplain
In-Lieu Supply to Silver Lakes	Transition Zone Floodplain
Mojave River Pipeline Extension - Transition Zone	Transition Zone Floodplain
Rock Springs Release	Alto Floodplain
Hesperia Lakes Recharge	Alto Floodplain
Recharge Facilities South of Rock Springs Turnout	Alto Floodplain
Release SWP from Silverwood Lake	Alto Floodplain
<b>Non-SWP</b>	
<i>Increase Recharge Efficiency (5)</i>	<i>Aquifer Unit</i>
Baja Storm Flow Retention - 2 locations	Baja Floodplain
Gates for Mojave River Dam	Alto Floodplain
Cushenbury Flood Detention Basin	Lucerne Valley
Injection Wells in Mesa Area of Adelanto	Alto Mid Regional
Injection Wells in Victorville Area	Alto Mid Regional
<i>Change Source of Groundwater Supply (5)</i>	<i>Aquifer Unit</i>
SCWC Moving Wells to Serve Barstow	Centro Floodplain
Hinkley Water Supply Augmentation by SCWC	Centro Floodplain
JBWD Wells	Copper Mountain Valley
New Supply for Pioneertown	Means/Ames Valley
Old Woman Springs Ranch Supply	Lucerne Valley

**Table 9-3: Management Actions**

<i>Water Treatment and Blending (9)</i>	<i>Aquifer Unit</i>
Regional Surface Water Treatment Plant	Alto West Regional
Blending local water with treated SWP	Alto Mid Regional
Blending local water with Floodplain Aquifer	Alto Mid Regional
Local Wastewater Treatment Plants (Alto)	Alto Mid Regional
VVWRA Reclamation	Alto Regional
HDWD Nitrate Removal Plant	Warren Valley
Yucca Valley Wastewater Treatment	Warren Valley
Local Wastewater Treatment Plant (Lucerne)	Lucerne Valley
Individual Wellhead Treatment	Entire MWA
<i>Improve Riparian Health (2)</i>	<i>Aquifer Unit</i>
Land Purchase to Protect Riparian Habitat	Baja Floodplain
Eradication of Non-native Plant Species	MWA Floodplain
<i>Conservation and Storage Agreements (6)</i>	<i>Aquifer Unit</i>
Agricultural Conservation Programs	Entire MWA
Urban Conservation Programs	Entire MWA
Storage agreements with agencies within MWA	Entire MWA
Banking water agreements with outside agencies	Entire MWA
Pre-delivering SWP Water	Entire MWA
Water (entitlement) exchanges	Entire MWA

## Supply Enhancement Projects

This section provides a technical summary of specific parameters estimated for supply enhancement projects listed in Table 9 - 2. Supply enhancement projects have the potential to address the following key water management issues as discussed in Chapter 8.

- Demand exceeds supply
- Overdraft of the groundwater basins
- Localized water quality issues
- Subarea interactions

### SWP/Non-Floodplain Aquifer Recharge

**Kane Wash Recharge Ponds** represents a proposed terminal point in the Mojave River Pipeline where water would percolate into ponds adjacent to Kane Wash in the lower Baja Subarea. This recharge facility has been discussed as a possible alternative or addition to the Minneola or Newberry Springs recharge facilities. Currently, the pipeline is constructed to a location northeast of Barstow.

#### **Kane Wash/Newberry Springs Recharge Ponds**

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<i>Location of Project:</i>	Baja Regional Aquifer
<i>Recharge Capacity:</i>	6,000 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	\$5,400,000
<i>O&amp;M and SWP Cost:</i>	\$1,300,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Appropriate location; Recharge potential of site
<i>Facilities Required:</i>	Mojave River Pipeline; New pipeline extension

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**El Mirage Dry Lake Recharge Ponds** could address the significant drop in groundwater levels in this area of the Oeste Subarea. Perched groundwater, return flow from local dairies, and other naturally-occurring contaminant are issues, and selecting an appropriate location that would accommodate recharge will require additional technical evaluation.

#### **El Mirage Dry Lake Recharge Ponds**

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<i>Location of Project:</i>	Oeste Regional Aquifer
<i>Recharge Capacity:</i>	2,500 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 18" pipe with a design flow rate of 5 cfs and peaking of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$2,000,000
<i>O&amp;M and SWP Cost:</i>	\$500,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Appropriate Location; Perched groundwater conditions
<i>Facilities Required:</i>	California Aqueduct Turnout #1; El Mirage Pipeline

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**Sheep Creek Recharge Ponds** is the preferred project for recharging the regional aquifer in the Oeste Subarea. The 1994 RWMP identified three potential sites for recharge along Sheep Creek. Two of the sites are located south of the California Aqueduct and one is to the north. The site farthest south (upstream) is anticipated to have the greatest beneficial impact to the Phelan area (San Bernardino County Service Area 70L). Due to the relatively low permeability of soils in the region, distributing the recharge over a large area would be beneficial (Stamos et al. 2001).

**Sheep Creek Recharge Ponds**

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<i>Location of Project:</i>	Oeste Regional Aquifer
<i>Recharge Capacity:</i>	2,500 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 18" pipe with a design flow rate of 5 cfs and peaking factor of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$1,300,000
<i>O&amp;M and SWP Cost:</i>	\$700,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Appropriate Location; Water quality (MTBE)
<i>Facilities Required:</i>	California Aqueduct Turnout #1; El Mirage Pipeline; Pump station

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**Antelope Valley-East Kern Water Agency (AVEK)** has taken an average of 1,372 acre-feet of water from 1991 to the present to supply a powerplant located in the Centro Subarea. It is assumed that this use remains constant through 2020.

**Antelope Valley-East Kern Water Agency (AVEK)**

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<i>Location of Project:</i>	Centro Regional Aquifer
<i>Recharge Capacity:</i>	1,372 acre-feet/year
<i>Recharge Assumptions:</i>	Average water use from 1991 to the present; Table 4-5 RWMP Update
<i>Capital Cost:</i>	Not applicable
<i>O&amp;M and SWP Cost:</i>	\$270,000 per year
<i>Cost Assumptions:</i>	\$200 acre-foot SWP water cost
<i>Specific Issues:</i>	Not applicable
<i>Facilities Required:</i>	Supply to existing powerplant

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**Oro Grande Wash Recharge Ponds** are advantageous because the site is located upgradient from Baldy Mesa Water District (BMWD) and Victor Valley Water District (VVWD). MWA and USGS, working with VVWD and BMWD, initiated two pilot recharge projects along the Oro Grande Wash. The *Victorville Master Plan of Drainage* identifies the reach of the Wash just upstream of the California Aqueduct as a potential storm water detention basin. The Wash may be able to serve the dual purpose of a storm water detention basin and a recharge facility. VVWD has also recently selected a site further downstream on the Oro Grande Wash near the Green Tree Golf Course as a potential recharge location.

### **Oro Grande Wash Recharge Ponds**

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<i>Location of Project:</i>	Alto Regional Aquifer – West
<i>Recharge Capacity:</i>	8,000 acre-feet/year
<i>Recharge Assumptions:</i>	USGS is currently conducting a pilot project to determine the recharge capacity of the wash; 8,000 acre-feet/year is assumed from USGS Model Run Dated 6/19/2002. MWA has conducted a separate demonstration recharge project approximately two miles upstream of the USGS site. VVWD has also recently selected a site further downstream on the Oro Grande Wash near the Green Tree Golf Course as a potential recharge location.
<i>Capital Cost:</i>	\$2,100,000
<i>O&amp;M and SWP Cost:</i>	\$1,700,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Location relative to California Aqueduct
<i>Facilities Required:</i>	California Aqueduct (new turnout)

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**Cedar Street Detention Basin** may provide the opportunity for recharge upgradient from City of Hesperia wells. The Hesperia Master Plan of Drainage identifies a potential site for a storm water detention basin at the east end of Cedar Street and southwesterly of the California Aqueduct. In addition to storm water detention, the 120-acre site might be able to accommodate groundwater recharge. The California Aqueduct would be the source of recharge water.

### **Cedar Street Detention Basin**

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<i>Location of Project:</i>	Alto Mid Regional
<i>Recharge Capacity:</i>	3,500 acre-feet/year
<i>Recharge Assumptions:</i>	Assumed recharge capacity
<i>Capital Cost:</i>	\$2,000,000
<i>O&amp;M and SWP Cost:</i>	\$800,000
<i>Cost Assumptions:</i>	Cost Normalization Table
<i>Facilities Required:</i>	California Aqueduct (new turnout)

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**Antelope Valley Wash Recharge Ponds** could provide groundwater recharge upgradient from City of Hesperia wells. The Hesperia Master Plan of Drainage identifies a 65-acre site for a storm water detention basin in the Antelope Valley Wash south of Rancho Road. In addition to storm water detention, the site might be able to accommodate groundwater recharge. The Morongo Basin Pipeline passes by this area and would be the source of recharge water.

### **Antelope Valley Wash Recharge Ponds**

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<i>Location of Project:</i>	Alto Mid Regional
<i>Recharge Capacity:</i>	3,500 acre-feet/year
<i>Recharge Assumptions:</i>	Assumed recharge capacity
<i>Capital Cost:</i>	\$1,700,000
<i>O&amp;M and SWP Cost:</i>	\$800,000
<i>Cost Assumptions:</i>	Cost Normalization Table
<i>Facilities Required:</i>	California Aqueduct (new turnout)

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**Recharge Facilities South of Apple Valley** may provide opportunities for limited recharge utilizing the stream channels located south of Apple Valley that are crossed by the Morongo Basin Pipeline. If technically possible, these sites might provide some needed recharge to the Apple Valley area.

**Recharge Facilities South of Apple Valley**

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<i>Location of Project:</i>	Alto Regional Aquifer – East
<i>Recharge Capacity:</i>	1,000 acre-feet/year
<i>Recharge Assumptions:</i>	Assumed recharge capacity; RWMP Update states this site may have the potential for limited recharge
<i>Capital Cost:</i>	\$900,000
<i>O&amp;M and SWP Cost:</i>	\$300,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Recharge potential of site
<i>Facilities Required:</i>	Morongo Basin Pipeline

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**Lucerne Valley Recharge Ponds (East of Helendale Fault)** provides an opportunity for recharge in the Este Subarea. Recharge sites have been contemplated both east and west of the Helendale Fault. The 1994 RWMP recommended constructing a facility east of the fault because the majority of groundwater pumping occurs east of the fault. MWA has purchased the land for a recharge facility, prepared preliminary construction plans, and performed the necessary environmental reviews.

**Lucerne Valley Recharge Ponds (East of Helendale Fault)**

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<i>Location of Project:</i>	Lucerne Valley Subbasin
<i>Recharge Capacity:</i>	5,000 acre-feet/year
<i>Recharge Assumptions:</i>	From RWMP Update – MWA estimate
<i>Capital Cost:</i>	\$1,200,000
<i>O&amp;M and SWP Cost:</i>	\$1,600,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table; includes annual O&M cost of \$500,000 for using the Morongo Basin Pipeline under a joint-use agreement with MBP participants (estimate RWMP 1994); MWA has purchased land
<i>Facilities Required:</i>	Morongo Basin Pipeline; Potential recharge site purchased

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**Recharge Ponds West of Helendale Fault** were evaluated to compare the relative effects of recharging in Este on each side of Helendale Fault.

**Recharge Ponds West of Helendale Fault**

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<i>Location of Project:</i>	Este Regional Aquifer
<i>Recharge Capacity:</i>	5,000 acre-feet/year
<i>Recharge Assumptions:</i>	From RWMP Update – MWA estimate
<i>Capital Cost:</i>	\$1,200,000
<i>O&amp;M and SWP Cost:</i>	\$1,600,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table; includes annual O&M cost of \$500,000 for using the Morongo Basin Pipeline under a joint-use agreement with MBP participants (estimate RWMP 1994)
<i>Facilities Required:</i>	Morongo Basin Pipeline

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**Means/Ames Valley Recharge Ponds** would serve Bighorn-Desert View, Hi-Desert, County Service Area 70 W-1, with potential benefit to Pioneertown.<sup>38</sup> Further study will determine benefits to the Joshua Basin Water District. The project consists of a feasibility study, extension of the Morongo Basin Pipeline between one and one and a half miles, recharge to the Pipes Wash, installation of monitoring wells, and installation of production wells.

**Means/Ames Valley Recharge Ponds**

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<i>Location of Project:</i>	Means/Ames Valley Subbasin
<i>Recharge Capacity:</i>	2,500 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 18" pipe with a design flow rate of 5 cfs and a peaking factor of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$1,100,000
<i>O&amp;M and SWP Cost:</i>	\$500,000 per year plus possible supplemental pumping cost
<i>Cost Assumptions:</i>	\$200 acre-foot SWP cost
<i>Facilities Required:</i>	Morongo Basin Pipeline

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**Hi-Desert Water District: Warren Valley Recharge** has been occurring since 1995. The average amount of SWP water Hi-Desert has utilized from 1995 to 2001 is 3,475 acre-feet/year.

**Hi-Desert Water District: Warren Valley Recharge**

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<i>Location of Project:</i>	Warren Valley Subbasin
<i>Historic Recharge:</i>	3,475 acre-feet/year
<i>Recharge Assumptions:</i>	Average water use from 1995 to the present; Table 4-5 RWMP Update
<i>Capital Cost:</i>	Completed
<i>O&amp;M and SWP Cost:</i>	\$720,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Nitrate Leaching
<i>Facilities Required:</i>	Morongo Basin Pipeline

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**Hi-Desert Water District (HDWD) Recharge Basin #3** would extend the existing Morongo Basin Pipeline 7500 feet and provide recharge capability in Hydrogeologic Unit 1 of the HDWD. The project would provide the HDWD the ability to slightly lower the water levels in Hydrogeologic Unit 2 to reduce the impacts of contaminants (nitrate) that leach into the water from the upper zones of the aquifer.

**Hi-Desert Water District (HDWD) Recharge Basin #3**

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<i>Location of Project:</i>	Warren Valley Subbasin
<i>Recharge Capacity:</i>	6,400 acre-feet/year
<i>Recharge Assumptions:</i>	RWMP Update
<i>Capital Cost:</i>	\$1,600,000
<i>O&amp;M and SWP Cost:</i>	\$1,300,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Nitrate Leaching
<i>Facilities Required:</i>	Morongo Basin Pipeline; Pipeline extension

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<sup>38</sup> E-mail correspondence with Hi-Desert Water District 1-3-03

**Joshua Basin District Recharge & Pipeline** would create a mechanism for the Joshua Basin Water District (JBWD) to make use of SWP water via the Morongo Basin Pipeline. The JBWD is a part of Improvement District M and therefore is paying a share of the debt associated with the construction of the Morongo Pipeline facilities. The project would provide needed recharge into the Copper Mountain Valley Subbasin.

**Joshua Basin District Recharge & Pipeline**

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<i>Location of Project:</i>	Copper Mountain Valley Subbasin
<i>Recharge Capacity:</i>	1,000 acre-feet/year
<i>Recharge Assumptions:</i>	Assumed recharge capacity
<i>Capital Cost:</i>	\$900,000
<i>O&amp;M and SWP Cost:</i>	\$200,000 per year plus possible supplemental pumping cost
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Facilities Required:</i>	Morongo Basin Pipeline; Pipeline extension

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**SWP/Floodplain Aquifer Recharge**

**Newberry Springs Recharge Ponds** represents a proposed terminal point in the Mojave River Pipeline where water would percolate into ponds central to the lower Baja Subarea. This recharge facility has been discussed as a possible alternative or addition to the Minneola or Kane Wash recharge facilities. Currently, the pipeline is constructed to a location northeast of Barstow.

**Newberry Springs Recharge Ponds**

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<i>Location of Project:</i>	Baja Regional Aquifer
<i>Recharge Capacity:</i>	6,000 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	\$5,400,000
<i>O&amp;M and SWP Cost:</i>	\$1,300,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Appropriate location; Recharge potential of site
<i>Facilities Required:</i>	Mojave River Pipeline; New pipeline extension

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**Minneola Recharge Ponds** represents a potential terminal point in the Mojave River Pipeline supplying recharge to the Baja Floodplain Aquifer. The project would require construction of the Mojave River Pipeline from Daggett to this location.

**Minneola Recharge Ponds**

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<i>Location of Project:</i>	Baja Floodplain Aquifer
<i>Recharge Capacity:</i>	3,600 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	\$2,200,000
<i>O&amp;M and SWP Cost:</i>	\$800,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Recharge potential of site
<i>Facilities Required:</i>	Mojave River Pipeline; Pipeline extension

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**Daggett Recharge Ponds** are a current recharge option. The Mojave River Pipeline is currently being constructed beyond this location in the Baja Floodplain Aquifer.

**Daggett Recharge Ponds**

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<i>Location of Project:</i>	Baja Floodplain Aquifer
<i>Recharge Capacity:</i>	16,800 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	\$227,400
<i>O&amp;M and SWP Cost:</i>	\$3,500,000 per year
<i>Cost Assumptions:</i>	Actual construction cost for completed facility
<i>Specific Issues:</i>	Facility completed
<i>Facilities Required:</i>	Mojave River Pipeline

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**Lenwood Recharge Ponds** have been used for the delivery of Replacement Water, and for Makeup Water from the Alto Subarea, in compliance with the Judgment.

**Lenwood Recharge Ponds**

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<i>Location of Project:</i>	Centro Floodplain Aquifer
<i>Recharge Capacity:</i>	9,000 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	Completed
<i>O&amp;M and SWP Cost:</i>	\$1,900,000 per year
<i>Cost Assumptions:</i>	\$200 acre-foot SWP water
<i>Facilities Required:</i>	Mojave River Pipeline

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**Hodge Recharge Ponds** have been used for the delivery of Replacement Water, and for Makeup Water from the Alto Subarea, in compliance with the Judgment.

**Hodge Recharge Ponds**

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<i>Location of Project:</i>	Centro Floodplain Aquifer
<i>Recharge Capacity:</i>	9,000 acre-feet/year
<i>Recharge Assumptions:</i>	Technical Document No. 2 MWA Steady State Hydraulic Analysis of Mojave River Pipeline, July 1999
<i>Capital Cost:</i>	Completed
<i>O&amp;M and SWP Cost:</i>	\$1,900,000 per year
<i>Cost Assumptions:</i>	\$200 acre-foot SWP water
<i>Specific Issues:</i>	
<i>Facilities Required:</i>	Mojave River Pipeline

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**Recharge North of Helendale Fault** was suggested as a potential project. To date, this project has not been modeled because the Centro Floodplain Aquifer is relatively balanced and existing recharge facilities (Hodge and Lenwood) are already operating.

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**Recharge North of Helendale Fault**

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<i>Location of Project:</i>	Centro Floodplain Aquifer
<i>Recharge Capacity:</i>	5,000 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 24" pipe with a design flow rate of 10 cfs and a peaking factor of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$1,400,000
<i>O&amp;M and SWP Cost:</i>	\$1,100,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Facilities Required:</i>	Mojave River Pipeline

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**In-Lieu Supply to Silver Lakes** would augment current groundwater pumping with SWP supply to fill recreational lakes to be used in-lieu of the production of some or all of Silver Lakes' Base Annual Production (BAP), thereby leaving that amount of groundwater in storage. The proposal would swap up to 4,987 acre-feet of BAP for SWP supply. BAP currently allows extraction of 0.70 acre-feet for each acre-foot of BAP. Additional SWP supply would be stored in the existing Silver Lakes until released to percolate in the natural channel of Fremont Wash in the Transition Zone Floodplain Aquifer. This project would exist almost entirely on the private property of a willing participant, which may expedite implementation and minimize constraints and costs. Project would provide water in a location suitable for maintaining the TZ "water bridge", and could be compatible with plans for the reuse of treated water from County Service Area 70B.

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**In-Lieu Supply to Silver Lakes**

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<i>Location of Project:</i>	Transition Zone Floodplain Aquifer
<i>Recharge Capacity:</i>	5,000 acre-feet/year
<i>Recharge Assumptions:</i>	Correspondence with Silver Lakes Association
<i>Capital Cost:</i>	\$700,000
<i>O&amp;M and SWP Cost:</i>	\$1,100,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Facilities Required:</i>	Mojave River Pipeline

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**Mojave River Pipeline Extension - Transition Zone Recharge** has the potential to benefit the riparian habitat in the Transition Zone as well as enhance the groundwater production reliability. Water for this recharge operation would be conveyed to the recharge site(s) in a new pipeline that would be an extension of the existing Mojave River Pipeline.

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**Mojave River Pipeline Extension - Transition Zone Recharge**

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<i>Location of Project:</i>	Transition Zone Floodplain Aquifer
<i>Recharge Capacity:</i>	2,500 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 18" pipe with a design flow rate of 5 cfs and a peaking factor of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$2,500,000
<i>O&amp;M and SWP Cost:</i>	\$500,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Facilities Required:</i>	Mojave River Pipeline

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**Rock Springs Release** can discharge large volumes of SWP water from the Rock Springs Outlet to percolate into the Floodplain Aquifer. The construction of extraction wells and transmission pipelines would allow this stored water to be used where needed throughout MWA.

Transmission facilities could be constructed to deliver the water to the City of Hesperia, Baldy Mesa WD, Victor Valley WD, and the Centro and Baja subbasins via the Mojave River Pipeline. The water could be used directly, blended with local waters to meet quality objectives, or recharged into local groundwater basins for future use.

**Rock Springs Release**

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<i>Location of Project:</i>	Alto Floodplain Aquifer
<i>Recharge Capacity:</i>	40,000 acre-feet/year
<i>Recharge Assumptions:</i>	MWA – capacity of Rock Springs Outlet
<i>Capital Cost:</i>	None assumed
<i>O&amp;M and SWP Cost:</i>	\$8,100,000
<i>Cost Assumptions:</i>	Cost Normalization Table; Current modeling effort does not include a distribution system downstream of the Rocks Spring Outlet (no capital cost)
<i>Specific Issues:</i>	Affecting ability to recharge with flood flows
<i>Facilities Required:</i>	Rock Springs Outlet

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**Hesperia Lakes Recharge** would provide recharge south of the MWA’s Rock Springs Turnout. The City of Hesperia operates fishing lakes at its park complex adjacent to Lake Arrowhead Road. Recharge of SWP water in the Mojave River channel near the site has been suggested as a possible project.

**Hesperia Lakes Recharge**

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<i>Location of Project:</i>	Alto Floodplain Aquifer
<i>Recharge Capacity:</i>	3,000 acre-feet/year
<i>Recharge Assumptions:</i>	USGS Model Run Dated 6/19/2002
<i>Capital Cost:</i>	\$1,700,000
<i>O&amp;M and SWP Cost:</i>	\$600,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Moronggo Basin Pipeline; Pipeline extension
<i>Facilities Required:</i>	Rock Springs Outlet; Wellfield; Distribution System

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**Recharge Facilities South of Rock Springs Turnout** is similar in concept and location to the Hesperia Lakes Recharge. In order to maximize the use of the available storage in the Floodplain Aquifer, a pipeline would be constructed from the Moronggo Basin Pipeline to a turnout located as far south (upstream) in the river channel as possible. The hydraulic pressure head available in the Moronggo Basin Pipeline, approximately 400 feet, would limit the length of the pipeline to about four miles.



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### Recharge Facilities South of Rock Springs Turnout

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<i>Location of Project:</i>	Alto Floodplain Aquifer
<i>Recharge Capacity:</i>	8,000 acre-feet/year
<i>Recharge Assumptions:</i>	Based on capacity for 30" pipe with a design flow rate of 15 cfs and peaking factor of 2; 70% of design flow assumed on annual basis
<i>Capital Cost:</i>	\$3,400,000
<i>O&amp;M and SWP Cost:</i>	\$1,700,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Facilities Required:</i>	Morongo Basin Pipeline; Pipeline extension; temporary levees in Mojave River Channel

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**Release SWP water from Silverwood Lake** can introduce SWP water to areas upstream of the Rock Springs Outlet through Cedar Springs Dam. This alternative would require evaluation of the potential for impacts to/from land uses at the Los Flores ranch and the institutional arrangements necessary with the Department of Water Resources under their contract with the MWA. Large flows to the Mojave River can be accomplished through Cedar Springs Dam, which has a maximum discharge of 5,000 cfs.<sup>39</sup>

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### Release SWP water from Silverwood Lake

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<i>Location of Project:</i>	Alto Floodplain Aquifer
<i>Recharge Capacity:</i>	25,000 acre-feet/year
<i>Recharge Assumptions:</i>	Max annual release (1983) from Table 4-5 of RWMP Update
<i>Capital Cost:</i>	None assumed
<i>O&amp;M and SWP Cost:</i>	\$5,200,000 per year
<i>Cost Assumptions:</i>	RWMP 1994 states there is a \$9.25 per acre-foot SWP cost of using the California Aqueduct from MWA Turnout #3 to Silverwood Lake
<i>Specific Issues:</i>	Land use impacts (Los Flores Ranch); DWR operations; Affecting ability to recharge with flood flows; Federally-designated endangered Arroyo Toad
<i>Facilities Required:</i>	Cedar Springs Dam; temporary levees in Mojave River Channel

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### Baja Storm Flow Non-SWP\Increase Recharge Efficiency

Retention would construct seasonal (temporary) sand dams, dikes, or other facilities in the Mojave River channel that could enhance the natural recharge of the Floodplain Aquifer. Stakeholders have suggested that there are two or more locations in the vicinity of Daggett and Minneola that should be evaluated.

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<sup>39</sup> Water Resources Analysis of the Upper Mojave River Basin - Alto Subarea, Todd 1993

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**Baja Storm Flow Retention**

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<i>Location of Project:</i>	Baja Floodplain Aquifer
<i>Recharge Capacity:</i>	2,000 acre-feet/year
<i>Recharge Assumptions:</i>	Assuming capture of 25% of average annual flow at Afton; average flow is heavily weighted by very large infrequent flow, which may quickly erode earthen detention barriers
<i>Capital Cost:</i>	None assumed
<i>O&amp;M Cost:</i>	\$130,000 per year
<i>Cost Assumptions:</i>	RWMP 1994
<i>Specific Issues:</i>	Environmental review; Streambed alteration agreement and 401/404 permits; Mojave Basin Area Judgment
<i>Facilities Required:</i>	None assumed

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**Gates for Mojave River Dam** was studied in 1986 by the U.S. Army Corps of Engineers (USACE) to evaluate the feasibility of installing gates at the Mojave River (Forks) Dam to store up to approximately 62,700 acre-feet of storm water behind the dam for controlled release. USACE found that the modifications were technically and economically feasible at the time. However, they also noted that there was potential for adverse impacts to Federal listed endangered species downstream, and that significant opposition was expressed by several environmental organizations. Due to these concerns and because the County of San Bernardino and the Mojave Water Agency did not support the plan due to the cost of the project, USACE recommended that no action be taken to modify the Dam. The project is also inconsistent with current prohibitions in the Mojave Basin Area Judgment against interference with stormflows.

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**Gates for Mojave River Dam**

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<i>Location of Project:</i>	Alto Floodplain Aquifer
<i>Recharge Capacity:</i>	3,760 acre-feet/year
<i>Recharge Assumptions:</i>	USACE 1986
<i>Capital Cost:</i>	\$9,000,000 – \$30,000,000
<i>O&amp;M Cost:</i>	\$500,000 per year
<i>Cost Assumptions:</i>	USACE 1986
<i>Specific Issues:</i>	Environmental opposition; Endangered species; High cost; Adjudication restrictions
<i>Facilities Required:</i>	Mojave River Dam

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**Cushenbury Flood Detention Basin** is proposed to capture runoff from the San Bernardino Mountains in the Lucerne Valley Subbasin. Currently, large storm flows drain to dry lake beds in the area that have low percolation rates. Consequently, the majority of water that drains to the lake beds is lost to evaporation and never enters the basin. The project would divert storm flows to detention basins with high rates of percolation to decrease losses from evaporation.

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**Cushenbury Flood Detention Basin**

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<i>Location of Project:</i>	Lucerne Valley Subbasin
<i>Recharge Capacity:</i>	400 acre-feet/year
<i>Recharge Assumptions:</i>	Assumed capacity from discussion with MWA staff
<i>Capital Cost:</i>	\$200,000
<i>O&amp;M Cost:</i>	\$80,000 per year
<i>Cost Assumptions:</i>	Normalized Cost Table
<i>Specific Issues:</i>	Environmental review; potential dust from dry lakes; potential Adjudication restrictions
<i>Facilities Required:</i>	Stormflow Diversion and Detention Basin

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**Injection Wells in the Mesa Area of Adelanto** are proposed because the geology in the Mesa area is not conducive to surface recharge facilities. The technical and financial feasibility of using injection wells to recharge the aquifer in this location needs to be investigated.

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**Injection Wells in the Mesa Area of Adelanto**

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<i>Location of Project:</i>	Alto Regional Aquifer – West
<i>Recharge Capacity:</i>	1,000 acre-feet/year
<i>Recharge Assumptions:</i>	USGS Model Run Dated 6/19/2002
<i>Capital Cost:</i>	\$500,000
<i>O&amp;M and SWP Cost:</i>	\$350,000 per year
<i>Cost Assumptions:</i>	Initial assumption of one injection well; technical feasibility of project needs better quantification to determine financial aspects of operation
<i>Specific Issues:</i>	New wells
<i>Facilities Required:</i>	Injection Well, Distribution System

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**Injection Wells in the Victorville Area** is under consideration by Victor Valley WD to inject treated SWP water in their wells to recharge the aquifer. This blending of SWP water with native groundwater is intended to lower some native constituent levels such as arsenic.

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**Injection Wells in the Victorville Area**

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<i>Location of Project:</i>	Alto Regional Aquifer – West
<i>Recharge Capacity:</i>	1,000 acre-feet/year
<i>Recharge Assumptions:</i>	USGS Model Run Dated 6/19/2002
<i>Capital Cost:</i>	\$500,000
<i>O&amp;M Cost:</i>	\$350,000 per year
<i>Cost Assumptions:</i>	Initial assumption of one injection well; technical feasibility of project needs better quantification to determine financial aspects of operation
<i>Specific Issues:</i>	New wells
<i>Facilities Required:</i>	Injection Well, Distribution System

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## Non-SWP\Change Source of Groundwater Supply

Southern California Water Company Moving Wells to Serve Barstow will improve the quality of the water it delivers to the City of Barstow. More such alternative supplies are planned. The new wells will be located up-river from the city and down-river from the Lenwood Recharge Facility.

### **Southern California Water Company Moving Wells to Serve Barstow**

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<i>Location of Project:</i>	Centro Floodplain Aquifer
<i>Capacity:</i>	Not applicable
<i>Assumptions:</i>	SCWC Project
<i>Capital Cost:</i>	Not applicable
<i>O&amp;M Cost:</i>	Not applicable
<i>Cost Assumptions:</i>	SCWC Project
<i>Facilities Required:</i>	SCWC Wells

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**Hinkley Water Supply Augmentation by Southern California Water Company:** Hinkley is overdrafted locally, and the school well has recently gone dry. SCWC already serves most of Barstow, Lenwood, and much of the surrounding area in Centro. MWA has been studying the area, and has budgeted funds for further analysis.

### **Hinkley Water Supply Augmentation by Southern California Water Company**

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<i>Location of Project:</i>	Centro Floodplain Aquifer to Regional Aquifer
<i>Capacity:</i>	To be determined
<i>Assumptions:</i>	To be determined
<i>Capital Cost:</i>	To be determined
<i>O&amp;M Cost:</i>	To be determined
<i>Cost Assumptions:</i>	To be determined
<i>Specific Issues:</i>	To be determined
<i>Facilities Required:</i>	New wells; Distribution System

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**Joshua Basin Water District Wells** will move some of the JBWD groundwater production to the Copper Mountain Valley Subbasin. Pumping from new wells in the underutilized Copper Mountain Valley Subbasin will allow the District to reduce pumping in the Joshua Tree Subbasin to the recognized safe yield.

### **Joshua Basin Water District Wells**

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<i>Location of Project:</i>	Copper Mountain Valley Subbasin
<i>Capacity:</i>	Not applicable
<i>Assumptions:</i>	JBWD Project
<i>Capital Cost:</i>	Not applicable
<i>O&amp;M Cost:</i>	Not applicable
<i>Cost Assumptions:</i>	JBWD Project
<i>Facilities Required:</i>	<i>New wells; Distribution system</i>

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New Supply for Pioneertown to replace the San Bernardino County Service Area W-4's water supply that does not meet health standards for several constituents including arsenic, uranium,

iron, and manganese. One possible way for the community to receive water of acceptable quality would be for CSA W-4 to obtain its water from either HDWD or BDVWA.

**New Supply for Pioneertown**

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<i>Location of Project:</i>	Means/Ames Valley Subbasin
<i>Capacity:</i>	To be determined
<i>Assumptions:</i>	To be determined
<i>Capital Cost:</i>	To be determined
<i>O&amp;M Cost:</i>	To be determined
<i>Cost Assumptions:</i>	Unknown
<i>Specific Issues:</i>	Source of supply; identification of servicing entity
<i>Facilities Required:</i>	Distribution System

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**Old Woman Springs Ranch Supply** is being evaluated by MWA as a potential source of water. MWA is discussing the purchase of Old Woman Springs Ranch in Johnson Valley for rights to its water basin for future groundwater production.

**Old Woman Springs Ranch Supply**

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<i>Location of Project:</i>	Johnson Valley
<i>Recharge Capacity:</i>	To be determined
<i>Recharge Assumptions:</i>	To be determined
<i>Capital Cost:</i>	To be determined
<i>O&amp;M Cost:</i>	To be determined
<i>Cost Assumptions:</i>	To be determined
<i>Specific Issues:</i>	To be determined
<i>Facilities Required:</i>	New wells; distribution System; possible wellhead treatment

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**Management Actions**

This section provides a technical summary of specific parameters estimated for management actions listed in Table 9-3. Management actions have the potential to address the following key water management issues:

- demand exceeds supply
- riparian ecosystem maintenance issues
- localized water quality issues
- overdraft of the groundwater basins
- wastewater infrastructure issues

**Water Treatment and Blending**

Regional Surface Water Treatment Plant options were studied by Parsons, 2001. The proposed project would treat SWP water from the California Aqueduct for delivery to four agencies in Alto, which include Baldy Mesa Water District, Victor Valley Water District, Adelanto Water Authority and San Bernardino County Special Districts. The delivery would be considered an in-lieu groundwater recharge project by curtailing groundwater production in the Alto Basin.

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**Regional Surface Water Treatment Plant**

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<i>Location of Project:</i>	Alto Regional Aquifer - West
<i>Treatment Capacity:</i>	up to 56,000 acre-feet/year
<i>Treatment Assumptions:</i>	Assumes recommended alternative (50 MGD Treatment Plant) constructed as stated in Alternatives for Water Supply from the California Aqueduct (Parsons 2001)
<i>Capital Cost:</i>	\$107,000,000 (proportional cost assumed for smaller plants)
<i>O&amp;M Cost:</i>	\$3,300,000 per year
<i>Cost Assumptions:</i>	Data from recommended alternative (Parsons 2001), does not include injection or Silverwood options
<i>Specific Issues:</i>	High cost; would require internal SWP allocation
<i>Facilities Required:</i>	California Aqueduct (new turnout); Treatment plant

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**Blending Local Water with Treated SWP Water** may be able to address some of the water quality concerns of Baldy Mesa WD, Victor Valley WD, and others.

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**Blending Local Water with Treated SWP Water**

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<i>Location of Project:</i>	Alto Regional Aquifer - West
<i>Capacity:</i>	To be determined
<i>Assumptions:</i>	To be determined
<i>Capital Cost:</i>	To be determined
<i>O&amp;M Cost:</i>	To be determined
<i>Cost Assumptions:</i>	To be determined
<i>Specific Issues:</i>	To be determined
<i>Facilities Required:</i>	Surface water treatment plant; Pipeline infrastructure

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**Blending Local Water with Floodplain Aquifer Water** may be able to address some of the water quality and quantity concerns of Baldy Mesa WD, Victor Valley WD, and others.

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**Blending Local Water with Floodplain Aquifer Water**

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<i>Location of Project:</i>	Alto Regional Aquifer - West
<i>Capacity:</i>	To be determined
<i>Assumptions:</i>	To be determined
<i>Capital Cost:</i>	To be determined
<i>O&amp;M Cost:</i>	To be determined
<i>Cost Assumptions:</i>	To be determined
<i>Specific Issues:</i>	To be determined
<i>Facilities Required:</i>	Pipeline infrastructure

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**Local Wastewater Treatment Plant (Alto)** is being considered for several communities in the Alto Subarea. This sub-regional treatment plant concept is an alternative to the large-scale expansion of the VVWRA treatment plant. VVWRA is encouraging this concept for several reasons: (1) several large diameter pipelines are reaching their expected service lives and will need to be replaced soon, (2) flow volumes will soon exceed the capacity of several existing pipelines, and (3) local treatment of the liquid portion of the wastewater flow would be cost-effective as long as VVWRA is allowed to sell the recycled water to the local purveyors.

### **Local Wastewater Treatment Plant (Alto)**

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<i>Location of Project:</i>	Alto Regional Aquifer
<i>Treatment Capacity:</i>	1,100 acre-feet/year (up to 11,000 acre-feet per year may be required)
<i>Treatment Assumptions:</i>	Based on plant capacity of 1.0 MGD (up to 10 MGD may be required)
<i>Capital Cost:</i>	\$13,000,000
<i>O&amp;M Cost:</i>	\$1,000,000 per year
<i>Cost Assumptions:</i>	VVWRA Sewerage Facilities Update Year 2000 Amendment
<i>Specific Issues:</i>	Several locations proposed
<i>Facilities Required:</i>	Current sewer infrastructure; New treatment plants; Distribution system

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**VVWRA Reclamation** will likely remain in the Alto Subarea as a supply to urban, recreational, and agricultural interests. Approximately 9.8 MGD is treated at the VVWRA regional treatment facility, which has a capacity of 11.0 MGD. The reclaimed water is then discharged directly into the Mojave River channel or percolated into the Mojave River Floodplain Aquifer. VVWRA and the Department of Fish and Game entered into a Memorandum of Understanding to provide discharge of approximately 9,000 acre-feet per year (24.7 acre-feet per day) to the Mojave River Channel to support riparian vegetation and habitat. VVWRA estimates that its capacity to collect and treat wastewater with the existing facilities will be surpassed by wastewater production in approximately 2006.<sup>40</sup> VVWRA estimates that the wastewater flow by 2020 will be approximately 18.62 MGD. This expansion of the current treatment plant is an alternative to the current plan for dealing with wastewater treatment requirements by constructing two sub-regional recycled water facilities by the year 2005, and another two by 2010. These facilities will provide additional wastewater treatment and at the same time, produce recycled water for the surrounding communities. Without the sub-regional treatment facilities, VVWRA will need to expand its collection system and treatment facilities to handle up to 20 MGD.

### **VVWRA Reclamation**

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<i>Location of Project:</i>	Alto/Transition Zone Regional Aquifer
<i>Treatment Capacity:</i>	10,000 acre-feet/year
<i>Treatment Assumptions:</i>	VVWRA Sewerage Facilities Update 2000 estimates an increase in wastewater flows of 10 MGD from 2000 to 2020
<i>Capital Cost:</i>	\$28,000,000
<i>O&amp;M Cost:</i>	\$4,000,000 per year
<i>Cost Assumptions:</i>	VVWRA Sewerage Facilities Update 2000 – 20 MGD expansion estimate without subregional facilities
<i>Specific Issues:</i>	Non-degradation of groundwater quality; increases consumptive use which affects rampdown under the Mojave Basin Area Judgment
<i>Facilities Required:</i>	VVWRA Expansion

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<sup>40</sup> Sewerage Facilities Plan Update, Year 2000 Amendment, Adopted by the VVWRA Board of Commissioners October 26, 2000.

**Hi-Desert Water District Nitrate Removal Plant** was recently constructed to improve the quality of the groundwater HDWD serves.

**Hi-Desert Water District Nitrate Removal Plant**

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<i>Location of Project:</i>	Means/Ames Valley Subbasin
<i>Treatment Capacity:</i>	1,000 acre-feet/year
<i>Treatment Assumptions:</i>	HDWD states the plant allows for two wells to be put back in service, assuming each well produces 300 gpm (rough district average) then the total is approximately 1,000 acre-feet/year
<i>Capital Cost:</i>	Completed
<i>O&amp;M Cost:</i>	
<i>Cost Assumptions:</i>	HDWD has recently constructed the plant
<i>Facilities Required:</i>	HDWD has recently constructed the plant

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**Local Wastewater Treatment Plant (Lucerne)** Wastewater treatment in the region is currently provided by individual septic tank systems. It is likely that at some point in the future, a municipal wastewater treatment facility will have to be built.

**Local Wastewater Treatment Plant (Lucerne)**

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<i>Location of Project:</i>	Lucerne Subbasin
<i>Treatment Capacity:</i>	1,100 acre-feet/year
<i>Treatment Assumptions:</i>	Based on plant capacity of 1.0 MGD
<i>Capital Cost:</i>	\$13,000,000
<i>O&amp;M Cost:</i>	\$1,000,000 per year
<i>Cost Assumptions:</i>	Cost factors from VVWRA Sewerage Facilities Update Year 2000 Amendment
<i>Facilities Required:</i>	Current sewer infrastructure; New treatment plants; Distribution system

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**Local Wastewater Treatment Plant (Yucca Valley)** Presently, Yucca Valley uses septic systems to process waste. The need for a local wastewater treatment facility is mainly due to the growing number of wells testing high in nitrate, which to some degree can be attributed to septic tanks. Hi-Desert Water District has been discussing the necessity of a wastewater treatment facility with a 20-year time frame for construction of a facility.<sup>41</sup>

**Local Wastewater Treatment Plant (Yucca Valley)**

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<i>Location of Project:</i>	Means/Ames Valley Subbasin
<i>Treatment Capacity:</i>	1,100 acre-feet/year
<i>Treatment Assumptions:</i>	Based on plant capacity of 1.0 MGD
<i>Capital Cost:</i>	\$13,000,000
<i>O&amp;M Cost:</i>	\$1,000,000 per year
<i>Cost Assumptions:</i>	Cost factors from VVWRA Sewerage Facilities Update Year 2000 Amendment
<i>Facilities Required:</i>	Current sewer infrastructure; New treatment plants; Distribution system

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<sup>41</sup> Hi-Desert Water District website, 2003



**Individual Wellhead Treatment** is an option to address localized water quality issues and has been considered to treat elevated levels of arsenic and nitrate.

**Individual Wellhead Treatment**

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<i>Location of Project:</i>	MWA
<i>Treatment Capacity:</i>	800 acre-feet/year
<i>Treatment Assumptions:</i>	Based on one well pumping continuously at 500 gallons per minute
<i>Capital Cost:</i>	\$600,000
<i>O&amp;M Cost:</i>	\$40,000 per year
<i>Cost Assumptions:</i>	Estimates based on installation and operation costs of a standard Granular Activated Carbon system
<i>Facilities Required:</i>	Individual treatment devices

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**Improve Riparian Health**

Land Purchase to Protect Riparian Habitat could possibly benefit the remaining riparian habitat in the Camp Cady area through a land purchase program. The general concept of the project is to reduce local pumping near the Mojave River in the Camp Cady area, allowing groundwater levels to increase due to the elimination of local cones of depression (drawdown) from local wells.

**Land Purchase to Protect Riparian Habitat**

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<i>Location of Project:</i>	Baja Floodplain Aquifer
<i>Conservation:</i>	1,200 acre-feet/year
<i>Conservation Assumptions:</i>	Estimate of production of wells in 1997 that are in the vicinity of land purchase
<i>Capital Cost:</i>	\$2,000,000
<i>O&amp;M Cost:</i>	None assumed
<i>Cost Assumptions:</i>	Assumes purchase of 400 acres of land at \$5,000/acre
<i>Specific Issues:</i>	Benefit from changing location of pumping needs further study
<i>Facilities Required:</i>	None assumed

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Eradication of Non-Native Riparian Species in the Mojave River channel has been identified as a way to enhance the health of riparian habitat. Many of the non-native plants consume significant amounts of water. MWA is currently funding part of a cooperative effort to eradicate non-native species spearheaded by the Mojave Desert Resource Conservation District.

**Eradication of Non-Native Riparian Species**

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<i>Location of Project:</i>	MWA Floodplain Aquifer
<i>Conservation:</i>	2,500 acre-feet/year
<i>Conservation Assumptions:</i>	Assumes all non-native species are eradicated and replaced with the same density of native species; consumption values and aerial densities from: Riparian Vegetation and its Water use During 1995 Along the Mojave River (USGS)
<i>Capital Cost:</i>	None Assumed
<i>O&amp;M Cost:</i>	\$730,000 per year
<i>Cost Assumptions:</i>	Based on the Pecos River Project in New Mexico; \$182 dollars per/acre to remove salt cedars; assumes 4,000 acres in MWA
<i>Specific Issues:</i>	Feasibility of successfully eradicating non-native species; UC Davis studies have shown salt cedar is extremely resilient
<i>Facilities Required:</i>	None Assumed

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## Conservation and Storage Agreements

**Agricultural Conservation Programs** including educational programs and monetary support to implement Agricultural Efficient Water Management Practices, as identified by the Agricultural Water Management Council.

**Urban Conservation Programs** including educational programs and monetary support to implement Best Management Practices, as identified by the California Urban Water Conservation Council.

**Storage Agreements with Agencies within MWA:** Parties to the Judgment (including the MWA) can enter into storage agreements with the Mojave Basin Area Watermaster. The rules under which these types of agreements are possible are contained in the Rules and Regulations of the Mojave Basin Area Watermaster. These types of agreements provide parties to the Judgment the opportunity to store water for their future use or to meet future obligations under the Judgment.

**Banking water agreements with outside agencies** can provide benefits by cooperatively using available storage space in aquifers within the MWA service area. Groundwater banking typically involves importing surface water provided by a project partner (or partners) and storing the surface water in the groundwater basins underlying MWA. Typically, the partner banks their water during times of surplus for a right to take a portion of their water during a time of need. The potential benefits to MWA and area stakeholders from groundwater banking could be significant, including financial assistance to construct capital facilities, reduced pumping lifts and water supply for mitigation of overdraft conditions.

Currently, MWA and Metropolitan Water District of Southern California (MWD) are participating in a pilot study to bank MWD entitlement water from the California Aqueduct in the Mojave Water Agency during wet years in exchange for MWA entitlement during dry years. If this proves successful, the MWD and MWA might enter into longer-term agreements to bank water. Many details would need to be worked out by both agencies including the method to return water to MWD, infrastructure, accounting, and mitigation or avoidance of any negative affects.

Pre-delivering SWP water could be accomplished if MWA banks SWP water in subareas for future purchase and use by local pumpers. This would in essence be pre-delivering water to local pumpers for their use when needed.

Water (entitlement) exchanges are currently in place with the Solano County Water Agency (SCWA), another SWP contractor. Similar agreements could be pursued. The SCWA agreement allows MWA to receive entitlement deliveries from SCWA during hydrologic periods

when SCWA has approved entitlement in excess of their needs. MWA will subsequently allow SCWA to utilize some of their approved entitlement during periods of drought, but not more than half of the quantity of SCWA entitlement that has previously been delivered to MWA.

### The MWA Screening Model

The projects and management actions were grouped into alternatives that were evaluated to determine how well they mitigated the key management issues identified above. This evaluation was performed using a simulation model developed for this Plan. Using the results of the evaluation, two recommended alternatives have been selected and the projects and management actions included in those alternatives that have the highest priority for implementation have been identified.

The MWA Screening Model simulates the changes to groundwater hydrology, Mojave River flows, and pumping and return flow patterns that would result from implementation of the projects and management actions identified in the Phase 1 Report. The model was developed using the Stella 7.0 software, a simulation modeling package that allows model parameters to be changed and new results obtained quickly and easily.

To model the water system, the Mojave River Basin floodplain and regional aquifers have been subdivided into 14 distinct but inter-connected aquifer units. The Lucerne Valley, Copper Mountain Valley, Means/Ames Valley, and Warren Valley aquifers are modeled independently. The modeled aquifer units are shown in Figure 9 - 1. The model simulates groundwater storage and levels within each aquifer unit, groundwater flow between aquifer units, and leakance from the Mojave River into the aquifer units for the hydrologic period 1931-2001 using equations derived from the output of the USGS Modflow model of the Mojave River Basin.<sup>42</sup>

For each alternative, pumping and return flow quantities are determined for each sector within each subarea based on the amount of State Water Project (SWP) import and the Mojave Basin Area Judgment rules. These quantities are disaggregated among the subarea's aquifer units based on current pumping patterns and year 2020 population projections. The computed consumptive use is subtracted from the storage within each aquifer. MWA's SWP supplies are distributed to the alternative's SWP projects according to an algorithm that takes into account each project's demand and capacity and the capacities of the Mojave River and Morongo Pipelines. The model imposes projected 2020 demands on the historical hydrologic sequence. The model thus assumes that historical hydrology is a reasonable estimate of future hydrologic conditions.

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<sup>42</sup> Stamos et al. 2001

The model is flexible enough to simulate a wide variety of proposed projects and management actions. For each new alternative, the input data can be modified and the model run in an hour or less, allowing for the easy evaluation of new alternatives.

## Alternatives Overview

A total of 18 alternatives were evaluated in the course of this study. These include eight initial alternatives presented at the Technical Advisory Committee (TAC) meeting on February 19, 2003, eight revised alternatives presented at the TAC meeting on March 19, 2003, and two final alternatives developed based on the recommendations made at the March 19 meeting. The initial alternatives are labeled 'A' and 'B', and the revised and final alternatives are labeled 'C' and 'D.' The alternatives are further described below.

The following assumptions were common to each of these alternatives:

- 2020 demand assumptions from the Phase 1 report
- Implementation of the Mojave Basin Area Judgment (1996)
- Delivery of SWP water to the Antelope Valley-East Kern Water Agency (AVEK), to the Warren Valley subbasin for use by the Hi-Desert Water District (HDWD), and to the Hodge and Lenwood recharge ponds to meet Alto makeup obligations to Centro under the Judgment

The following seven additional primary factors can be used to distinguish between the alternatives:

- Representation of the Transition Zone
- Level of Judgment Implementation
- Agricultural demand (Scenario 1 or Scenario 2 from the Phase 1 Report)
- Amount of municipal conservation
- Presence and size of a regional water treatment plant in Alto
- Amount of Victor Valley Water Reclamation Authority (VWRA) discharge that is used for reclamation
- Amount of SWP discharge into the Mojave River at Rock Springs

The 'A' and 'C' alternatives assume Agricultural Scenario 1 while the 'B' and 'D' Alternatives assume Agricultural Scenario 2. Alternatives A0, B0, C0, and D0 are year 2020 No Action alternatives, in which the only SWP imports are those that go to AVEK, HDWD, or to the Hodge and Lenwood recharge ponds for Alto Makeup to Centro.

## Initial Alternatives

The initial alternatives include A0, A1, A2, B0, B1, B2, B3, and B4. Table 9 - 4 shows the principal characteristics that define each alternative. All of these alternatives assume full implementation of the Judgment by 2020, with consumptive use set to equal natural supply plus imports.

Alternatives A0 and B0 are No Action alternatives, which do not utilize any projects or management actions other than those in current use. Alternatives A1 and B1 attempt to meet each subarea’s demands with SWP imports, including a large Rock Springs release. Alternatives A2 and B2 include a 56,000 AF/year capacity treatment plant in Alto. Alternatives B3 and B4 are similar to Alternative B1 except that they include 5% municipal conservation as well. All of the alternatives other than B4 assume that the first 9,700 acre-feet of VVWRA’s discharge is released to the Mojave River, with the remaining being allocated to reclamation to golf course and municipal users. In Alternative B4 it is assumed that all VVWRA discharge is released to the Mojave River.

Table 9 - 4 shows the demands met under each alternative. Alternative A0 meets only 45% and Alternative B0 meets only 51% of the total MWA demand. In each of these No Action Alternatives, the Alto Baja, and Oeste subareas have less than 40% of their demands met.

Table 9-4: Initial Alternative Assumptions and Results

Alternative:	A			B				
	A0	A1	A2	B0	B1	B2	B3	B4
Common	AVEK, Hodge, Lenwood, Warren Valley							
Judgement Implementation	Full			Full				
Ag demand scenario	Ag Scenario 1			Ag Scenario 2				
Municipal Conservation	0%					5%		
Regional WTP			56K			56K		
Alto Reclamation		5.7K	11.0K		9.3K	11.0K	9.3K	
Rock Springs release		40K			40K		40K	40K
<b>Demands Met (KAF/yr)</b>								
Total	113	207	209	110	206	202	205	204
Percent Total	45%	82%	83%	51%	95%	93%	96%	98%
Agricultural	33	52	38	20	20	20	20	20
Municipal	68	129	154	70	153	162	152	152

Because they are trying to meet full municipal and agricultural demands under Agricultural Scenario 1, Alternatives A1 and A2 show significant shortages. Alternative A1 meets only 82% of total MWA demand, while Alternative A2 meets only 83%. Thus, these results indicate that it is impossible to meet full 2020 demands under Agricultural Scenario 1 with no conservation even while importing MWA’s entire SWP supply. Conservation of almost 30 percent of municipal consumptive use would be required to avoid significant shortages under this scenario.

Alternatives B1, B2, B3, and B4 all meet at least 93% of total MWA demands. However, because SWP deliveries to the treatment plant in Alto are given priority, Alternative B2 has

significant shortages in Baja, Oeste, and Este. Alternatives B3 and B4 have fewer shortages because they assume 5% municipal conservation.

The initial alternatives are formulated to balance supply and demand at the subarea level, but no attempt was made to select recharge projects that would balance each individual aquifer unit. As a result, although each subarea is in balance as a whole, many aquifer units show significant declines. In addition, the Transition Zone floodplain region shows unreasonable increases in elevation because no cap was placed on its available storage in the initial alternatives. This limitation in aquifer unit elevation has been resolved in the revised and final alternatives.

## Revised and Final Alternatives

In response to the comments received at the February 19, 2003 TAC meeting, eight new alternatives were developed and presented at the March 19 TAC meeting: C0, C3, D0, D2, D3, D5, D6, and D7. Table 9 - 5 shows the principal characteristics that define these alternatives. All of these alternatives except for C3 assume full implementation of the Judgment by 2020, with consumptive use set to equal natural supply plus imports. Alternative C3 assumes that the rampdown of agricultural producers will remain at 80% in 2020. In Alternative C3, agricultural production is permitted to continue even if it results in drawdowns in the groundwater aquifers.

Table 9-5: Revised and Final Alternative Assumptions and Results

Alternative:	C		D							
	C0	C3	D0	D2	D3	D5	D5r	D6	D6r	D7
Common	AVEK, Hodge, Lenwood, Warren Valley									
Judgement Implementation	Full	80% Ag	Full							
Ag demand scenario	Ag Scenario 1		Ag Scenario 2							
Municipal Conservation	0%	0%	5%	20%*	10%*	20%*	10%*	20%*	10%*	20%*
Regional WTP			46K		26K	12K				
Alto Reclamation		6.3K	9.9K	8.7K	6.8K	8.7K	6.8K	8.7K	6.8K	8.7K
Rock Springs release		10K		10K	10K	10K	10K	10K	10K	40K

\*Municipal conservation in the Morongo Basin/Johnson Valley Area is 5% in these alternatives

Demands Met (KAF/yr)										
Total	102	216	101	198	200	182	199	185	198	185
Percent Total	40%	85%	47%	95%	96%	98%	99%	100%	98%	100%
Agricultural	30	56	20	20	20	20	20	20	20	20
Municipal	59	138	63	153	148	131	146	131	145	131

The revised alternatives build off of the initial 'A' and 'B' alternatives. In these alternatives, the problem of unreasonably high elevation increases in the Transition Zone has been resolved by limiting the amount of recharge into the aquifer from the Mojave River such that the aquifer elevation could not exceed 2,510 feet. In addition, an attempt has been made in each alternative to select a combination of recharge projects for SWP water that would result in reasonable balance in each of the aquifers units.

Alternative D2 is a revised version of B2, with a 46,000 acre-foot/year regional water treatment plant in Alto and with 5 percent municipal conservation. Alternative D3 also has 5% municipal conservation but does not include a regional treatment plant. Alternatives D5, D6, and D7 include 20% municipal conservation in the Mojave River Basin. Alternative D5 includes a smaller 26,000 acre-foot/year regional treatment plant. Alternative D7 is the only new alternative with a large Rock Springs release.

After presentation of the results of these alternatives at the TAC meeting, it was decided to create two final alternatives that would be revisions of the D5 and D6 alternatives. D5r is similar to D5 except that it includes only 10% municipal conservation in the Mojave River Basin and the size of the Regional Treatment Plant has been reduced to 12,000 acre-feet/year capacity. D6r is similar to D6 except that the amount of municipal conservation is reduced to 10 percent. Table 9 - 6 shows the projects and management actions that were modeled in each of the revised and final alternatives. The following sections briefly describe each alternative's performance under different performance measures.

## **Demands Met**

Table 9 - 6 shows the demands met under each revised and final alternative. Alternative C0 meets only 40% and Alternative D0 meets only 47% of the total MWA demand. In each of these No Action Alternatives, Alto, Baja, and Oeste have 50% or less of their demands met. The results of Alternative C3 demonstrate that it is not possible to meet 2020 demand levels while keeping agricultural free production allowance at 80% rampdown levels. In this alternative, only 85% of total MWA demands are met, and significant overdraft of the Baja Subarea occurs.

Alternatives D2, D3, D5, D5r, D6, D6r, and D7 all meet at least 95% of total MWA demand. However, Alternative D2 has significant shortages in Baja and Oeste due to the lack of flexibility offered by the inclusion of a large treatment plant in Alto. With 20% municipal conservation, Alternatives D5, D6, and D7 are able to meet very close to 100% of total MWA demand. At the intermediate level of 10% municipal conservation, Alternatives D5r and D6r are each able to meet at least 98% of total MWA demand, with no significant shortage in any subarea.

All action alternatives meet significantly more demand than do the No Action Alternatives. Alternative C3 supplies the most total demand because it is not constrained to achieve balance in the groundwater aquifers. Alternatives D2 and D3 meet more total demand than the other 'D' alternatives because they include less municipal conservation, while Alternatives D5, D6, and D7 meet the least demand of all the non-No Action Alternatives because they include the greatest municipal conservation.

Table 9-6: Representative Projects and Management Actions Included in each Revised and Final Alternatives

Project/Management Action	Subarea	Alternative									
		C0	D0	C3	D2	D3	D5	D5r	D6	D6r	D7
(volume is in average annual acre-feet)											
Additional Recharge Facilities South of Rock Springs Outlet	Alto				1,408	11,956	3,555		7,280		
Alto wellhead treatment	Alto			0*	0*	0*	0*	0*	0*	0*	0*
Antelope Valley Wash Recharge Ponds	Alto			7,702	1,665	5,231	5,688	5,640	6,471	7,157	3,458
Cedar Street Detention Basin Recharge	Alto			7,702	1,665	4,857		5,640	6,471	7,157	
Hesperia Lakes Recharge	Alto					2,242		6,345		7,885	
Mojave River Pipeline Extension - Transition Zone	Alto			5,602							2,527
Oro Grande Wash Recharge Ponds	Alto			11,203	3,805	11,956	5,688	8,601	12,133	12,015	6,762
Recharge Ponds South of Apple Valley	Alto			4,201		4,110	711	2,820	4,044	3,755	
Regional Surface Water Treatment Plant	Alto				40,670		24,559	11,963			
Silver Lakes In-Lieu Recharge	Alto								2,427	2,253	2,527
Rock Springs Release	Alto			7,348		7,444	7,256	7,155	8,164	7,591	31,762
Baja Stormflow Retention	Baja			2,000		2,000	2,000	2,000	2,000	2,000	2,000
Daggett Recharge Ponds	Baja			6,337							
Kane Wash/Newberry Springs Recharge Ponds	Baja				2,671	3,449	2,510	2,604	2,855	2,800	2,984
Alto Makeup (to Hodge and Lenwood)	Centro	1,984	1,984	890	1,369	915	909	909	909	908	
AVEK	Centro	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372	1,372
Hinkley water supply	Centro			0*	0*	0*	0*	0*	0*	0*	0*
Cushenbury Wash Stormflow retention	Este			400				400	400	400	400
Lucerne Valley Recharge Ponds	Este			1,190							
Recharge Ponds West of Helendale Fault	Este			342	450	708	496	343	241	369	252
Hi-Desert WD: Warren Valley	MBJV	1,557	1,557	1,557	1,450	1,450	1,450	1,450	1,450	1,450	1,450
Joshua Basin District Recharge and Pipeline	MBJV			445	393	393	393	393	393	393	393
Means/Ames Recharge Ponds	MBJV						1,000	1,000	1,000	1,000	1,000
Pioneertown water supply	MBJV			0*	0*	0*	0*	0*	0*	0*	0*
Sheep Creek Recharge Ponds	Oeste			2,485	1,459	2,293	1,881	2,109	2,140	2,260	2,236
<b>SUBTOTAL IMPORTS</b>		<b>4,913</b>	<b>4,913</b>	<b>60,777</b>	<b>58,377</b>	<b>60,374</b>	<b>59,467</b>	<b>60,744</b>	<b>59,750</b>	<b>60,762</b>	<b>59,122</b>
Urban Conservation		0	0	0	8,142	8,142	31,417	15,900	31,417	15,900	31,417
VVWRA Reclamation		0	0	6,335	9,925	8,841	6,826	8,656	6,826	8,437	6,826

\*This project does not represent a new water supply



## Groundwater Storage

Table 9 - 7 shows the average annual change in groundwater storage in each subarea under each alternative. The Centro Subarea shows a surplus in all alternatives. In Alternative C3 there is a significant reduction in groundwater storage in Baja because there is not enough supply available to meet the agricultural production at 80% of Base Annual Production. Alternative D7 includes a large Rock Springs release, which is not effective in overcoming deficits in the Alto Regional aquifer and causes greater surpluses in Centro and Baja due to increased Mojave River flow downstream.

Alternatives D5 and D6 perform the best under this measure, with total net increases of 15,800 and 13,500 acre-feet/year, respectively and no deficits in any subarea. This occurs because the high 20% municipal conservation reduces the need for SWP supply to meet demand and allows a certain amount of SWP water to be imported for the purpose of replenishing the groundwater basins.

Table 9-7: Average Annual Change in Groundwater Storage

	Morongo	Este	Oeste	Alto	Centro	Baja	Total	Rank
No-Action Alternative C0	0	0	0	0	7,200	0	7,200	7
No-Action Alternative D0	0	100	0	0	6,600	0	6,700	9
C3	0	0	400	2,500	5,800	(10,900)	(2,200)	10
D2	0	100	500	1,100	5,400	(300)	6,800	8
D3	0	0	500	1,500	5,400	100	7,500	6
D5	1,000	600	500	2,600	10,000	1,100	15,800	1
D5r	1,000	100	500	1,300	7,400	200	10,500	3
D6	1,000	200	600	2,400	8,600	700	13,500	2
D6r	1,000	0	500	500	6,700	100	8,800	5
D7	1,000	(200)	400	(10,900)	12,800	6,400	9,500	4

## Groundwater Levels

In all of the alternatives following the initial alternatives, an effort has been made to select recharge projects in locations that would achieve relative balance in all subareas in the aquifer. This has been achieved in all alternatives except for Alternatives C3, D2 and D7.

In Alternative C3, the floodplain and regional aquifers in Baja are significantly depleted because agricultural production is allowed to remain at levels that cannot be supported by the available supply. Figure 9 - 2 shows the groundwater levels in the Baja Regional aquifer under each

alternative. In Alternative C3, the groundwater elevations drop 24 feet in this alternative, compared to 8 feet or less in each of the other alternatives.

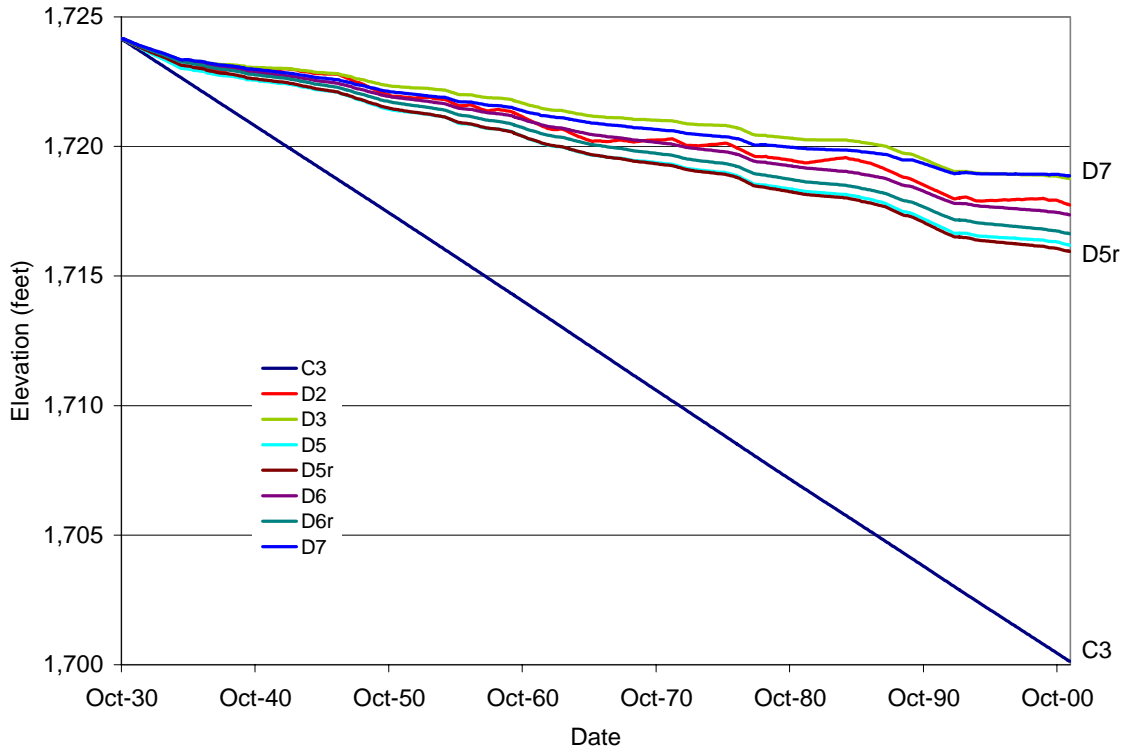


Figure 9-2: Time Series of Elevations in the Baja Regional Aquifer

In Alternative D2, there is not enough flexibility to balance all of the aquifers because such a large portion of the SWP supply is allocated to an Alto Treatment Plant. Figure 9 - 3 shows the groundwater levels in the Alto Floodplain Aquifer under each alternative. The groundwater levels in Alternative D2 drop 18 feet over the course of the model period compared to a decline of less than 8 feet for every alternative other than D7.

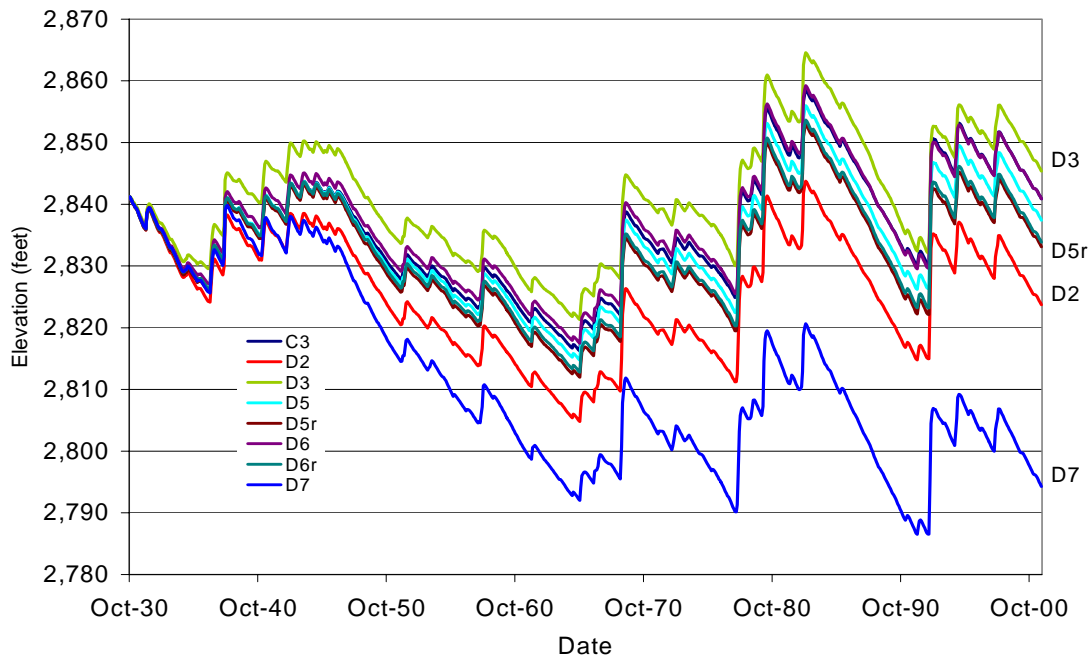


Figure 9-3: Time Series of Elevations in the Alto Floodplain Aquifer

In Alternative D7, the Alto West Regional, Mid-Regional, East Regional, and Floodplain aquifers are significantly depleted. This occurs because of the heavy reliance in this alternative on a Rock Springs release into the Mojave River to meet Alto's supply needs. In Alternative D7, the Alto Floodplain aquifer drops 47 feet in elevation over the course of the modeled period.

### Subarea Interaction

Subarea interaction is measured by the amount of Mojave River flow and groundwater flow that passes from one subarea to another. Figure 9 - 4 shows the average annual Mojave River flows in each alternative. Alternative D7 has significantly higher river flows in all river reaches compared to the other alternatives because a large Rock Springs release has been included in the alternative. Several thousand acre-feet of additional outflow from the basin through Afton Canyon would occur annually due to this operation. All of the other alternatives have similar magnitude Mojave River flows on average.

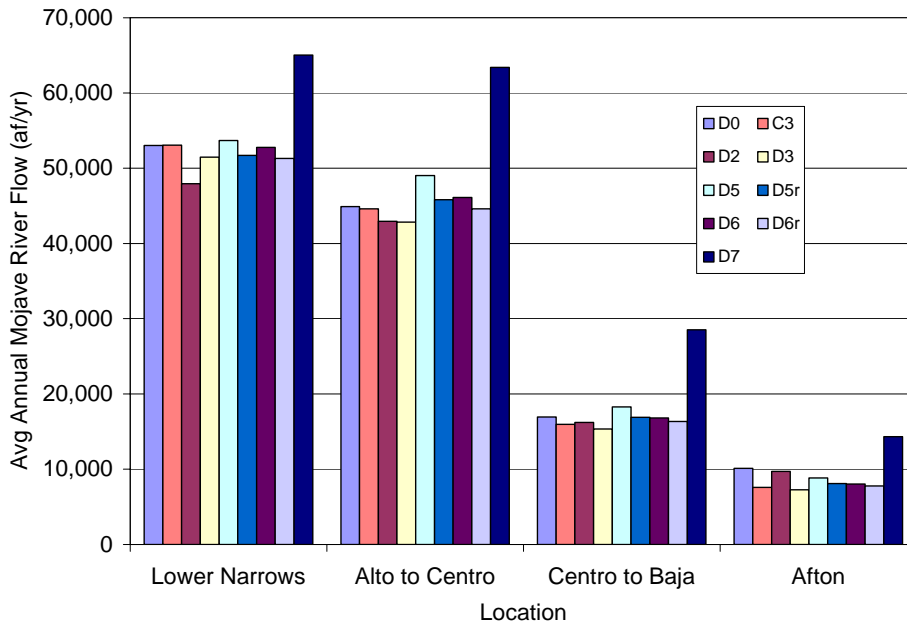


Figure 9-4: Average Annual Mojave River Flows

Figure 9 - 5 shows the average annual groundwater flows between subareas in each alternative. In Alternative D7 there is additional groundwater flow from Este and Oeste into Alto because the Alto regional aquifer has been depleted due to insufficient SWP recharge. Alternative C3 has the highest groundwater flows from Centro to Baja because Baja’s aquifers are depleted. The other alternatives have similar magnitude groundwater flows.

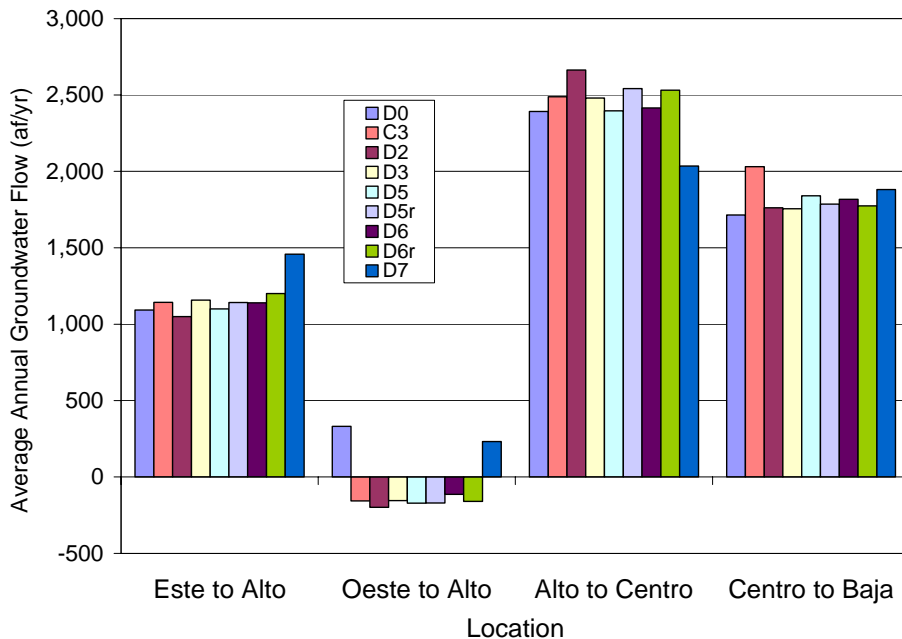


Figure 9-5: Average Annual Groundwater Flows

## Water Quality

All of the alternatives were evaluated to estimate the effects that the proposed imports of SWP water would have on the water quality of each subarea. For each constituent, the estimated quality of SWP water was compared to the quality of the existing water and to the constituent's drinking water standard to determine the degree of improvement or detriment caused by the introduction of SWP water. SWP water is of higher quality than drinking water standards for all constituents.

For most constituents and in most subareas, the quality of SWP water was superior to the existing water quality. However, constituent concentrations in the SWP water were slightly higher than the existing concentrations of boron, nitrates, and TDS in Alto and of boron and nitrates in Oeste.

## Alternative Cost

Table 9 - 8 shows the total estimated annualized capital and operating cost for each alternative. The alternatives that include an Alto Regional Treatment Plant (D2, D5, and D5r) have the highest costs.

**Table 9-8: Annualized Cost of Each Alternative**

Alternative	Annualized Cost (\$ millions/year)
C3	\$14.6
D2	\$22.9
D3	\$14.1
D5	\$21.3
D5r	\$20.8
D6	\$15.9
D6r	\$16.1
D7	\$14.6

## Recommended Alternatives

Alternatives D5r and D6r were identified as recommended alternatives to be carried forward for evaluation in greater detail in the programmatic environmental documentation. Each of these alternatives provide the following benefits:

- 99% of total MWA demand is met with no significant shortage in any subarea or demand sector
- include an attainable level of 10% municipal conservation
- provide water quality improvements over existing conditions
- all groundwater aquifer units are in balance
- each alternative provides benefits to all subareas without negatively impacting other areas

## Common Features

A complete list of projects and management actions included in Alternatives D5r and D6r was shown in Table 9 - 6. These alternatives have many common features, including:

- 10% Municipal conservation in the Mojave River Basin, 5% in the Morongo Basin/Johnson Valley area
- Agricultural Scenario 2
- Reclamation of VVWRA discharge above 9,700 acre-feet/year
- Recharge of SWP water into the Alto Mid-Regional, East Regional, and Floodplain aquifers, and into the Baja Regional, Este Regional, Oeste Regional, Warren Valley, Copper Mountain Valley, and Means/Ames Valley aquifers
- Baja and Cushenberry Canyon stormflow retention or equivalent pond recharge projects
- Water supply augmentation for Hinkley and Pioneertown
- Alto wellhead treatment

The primary difference between the two alternatives is that Alternative D5r includes a 12,000 acre-foot/year capacity regional treatment plant in Alto. Alternative D6r includes in-lieu supply of SWP water to Silver Lakes (or the equivalent pond recharge projects)<sup>43</sup> and larger sized recharge facilities in all Alto aquifers.

## Project and Management Action Priorities

An important goal of the RWMP Update was to identify those projects and management actions that would have the highest priority. For this purpose, each project and management action included in Alternatives D5r or D6r has been categorized as having High, Moderate, or Low Priority. The designation of priority for each project or management action was determined using the following criteria:

- whether it is an existing project or is already being pursued by MWA
- the level of current overdraft that the project attempts to mitigate
- expected growth in the subarea where the project will be applied

Table 9 - 9 shows the recommended priority of each project and management action. The projects that have the highest priority include implementing 10% municipal conservation, VVWRA wastewater reclamation, Alto wellhead treatment, a new water supply for Pioneertown, and the recharge of SWP water into the Warren Valley and into the Floodplain, West Regional, and Mid-Regional aquifers in Alto. Municipal conservation is considered to have the highest

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<sup>43</sup> Equivalent pond recharge projects would involve additional facilities and easements at higher cost.

priority because measures will need to be initiated immediately in order to achieve 10% 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. Many such projects have been proposed, including projects at Oro Grande Wash, Antelope Valley, and Cedar Street in the West and Mid-Regional aquifers, and an Upper Mojave Wellfield Distribution System utilizing Rock Springs or Hesperia Lakes or other additional recharge facilities South of Rock Springs in the Floodplain aquifer.

Table 9-9: Recommended Priority for each Project or Management Action

Project or Action	Aquifer	Existing or Being Pursued?	Amount of Current Overdraft in Aquifer?	Expected Subarea Growth?	New Projects (not in 1994 plan)	Designed or Complete EIR	Comments	Priority
10% Municipal Conservation	All	No	High	High			5% in Morongo/Johnson ;Needs to start immediately	High
Wastewater Reclamation	All of Alto	Yes	High	High	√		VVWRA is actively pursuing	High
Alto Regional Treatment Plant	All of Alto	No	High	High	√		High expected cost	Moderate
Alto Wellhead Treatment	All of Alto	Yes	N/A	N/A	√		Addresses localized water quality problems; arsenic standard implementation by 2006	High
Recharge	Alto Floodplain	Yes	High	High		√	Rock Springs existing; feasibility studies needed	High
Recharge	Alto Mid-Regional	Yes	High	High	√		Feasibility studies needed	High
Recharge	Alto West-Regional	Yes	High	High	√		Feasibility studies needed; Oro Grande tests proceeding	High
Recharge	Alto East Regional	No	Moderate	High	√		Feasibility studies needed	Moderate
Recharge/ In-lieu Recharge	Transition Zone Floodplain	No	Low	High	√		Recharge not needed; assumes continued VVWRA recharge; limited drought buffer	Moderate
Recharge or Stormflow Retention	Baja Floodplain	No	High	Low	√		Feasibility studies needed	Moderate
Recharge	Baja Regional	Yes	High	Low		√	Feasibility studies needed	Moderate
Hinkley Water Supply	Centro Regional	No	N/A	N/A	√		Addresses water quality and quantity problems	Moderate
Recharge or Stormflow Retention	Este Regional	No	Moderate	Moderate			Feasibility uncertain; Judgment limitations for stormflow retention; listed County flood control project	Moderate
Recharge	Lucerne Valley	No	Low	Moderate		√	Feasibility studies needed; no current demand	Low
Recharge	Oeste Regional	No	Moderate	Moderate			Feasibility studies needed	Moderate
Recharge	Copper Mtn Valley	Yes	Moderate	Moderate			Feasibility studies in progress	Moderate
Pioneertown Water Supply	Means/Ames Valley	No	High	N/A			Addresses water quality and quantity problems; no potable water currently available	High
Recharge	Means/Ames Valley	No	Moderate	Moderate			Feasibility studies needed	Moderate
Recharge	Warren Valley	Yes	Low	Moderate			Existing facility, new facilities being investigated	High



# 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.

The Riverside County Superior Court Judgment After Trial of January 10, 1996<sup>44</sup> (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.

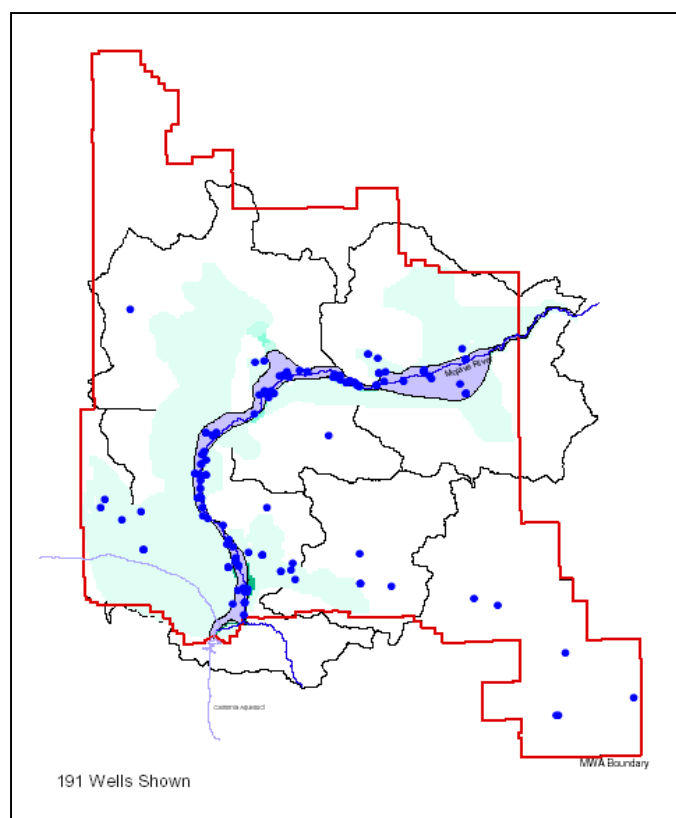


Figure 10-1: Well locations with known construction data

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:

<sup>44</sup> 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.<sup>45</sup> 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.

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<sup>45</sup> 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 of 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<sup>46</sup>:

- 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.

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<sup>46</sup> 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<sup>47</sup>
- 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.

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<sup>47</sup> 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.<sup>48</sup>

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<sup>48</sup> 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 construction 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 stream 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.

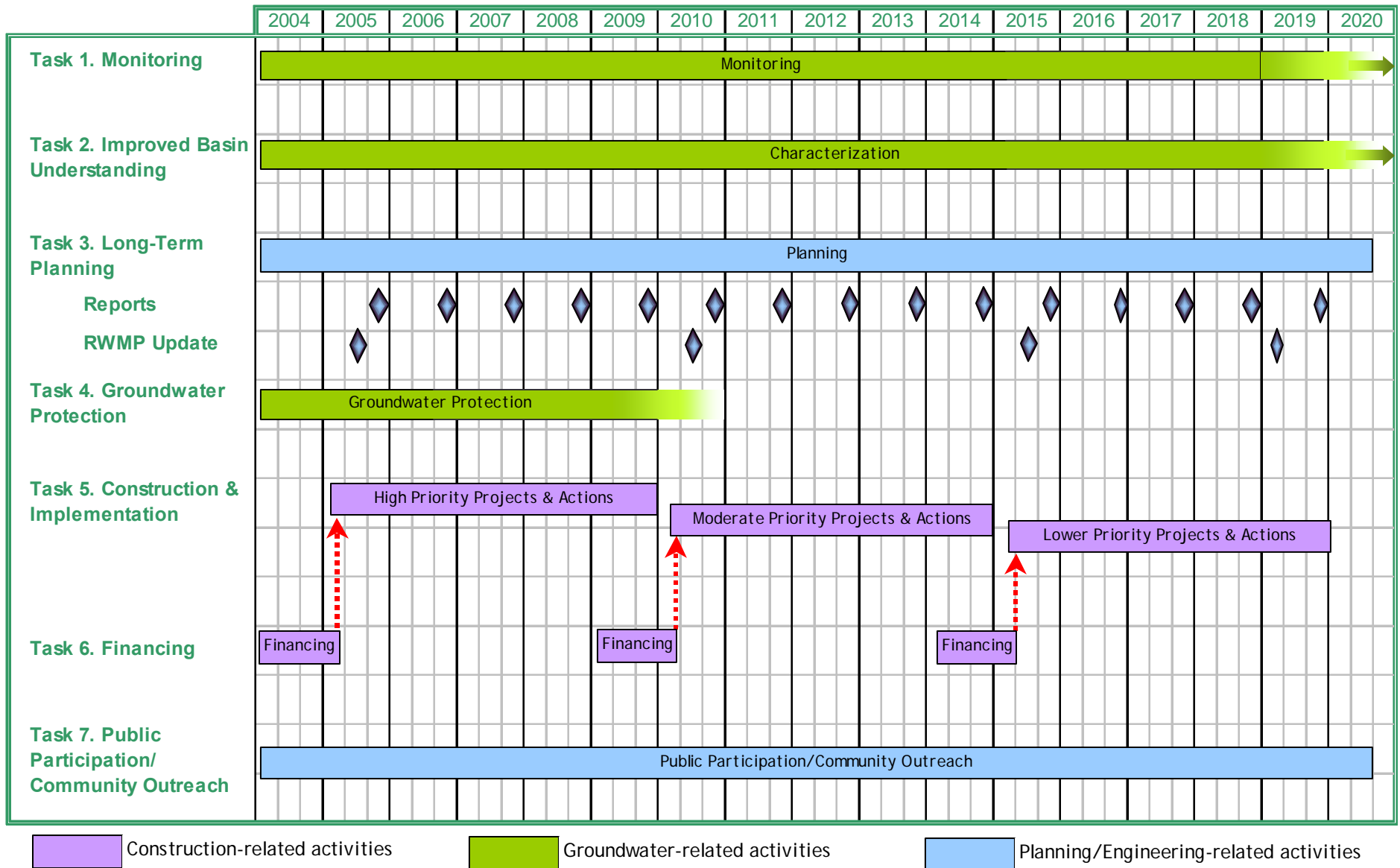
Action:MWA will maintain its Speakers Bureau to provide timely water related information to the public.

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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DRAFT  
Mojave Water Agency  
Groundwater Management Plan  
2014 Update

3 May 2014

Prepared for  
Mojave Water Agency  
22450 Headquarters Drive  
Apple Valley, CA 92345

K/J Project No. 1389002

# DRAFT

## Table of Contents

---

<i>List of Tables</i> .....	<i>iii</i>
<i>List of Figures</i> .....	<i>iii</i>
<i>List of Appendices</i> .....	<i>iii</i>
<i>List of Abbreviations</i> .....	<i>iv</i>
Section 1: Introduction .....	1-1
1.1 Plan Objectives .....	1-1
1.2 Plan Requirements and Organization .....	1-1
1.3 Plan Preparation and Adoption Process .....	1-3
1.4 Stakeholder Involvement.....	1-3
Section 2: GMP Management Area .....	2-1
2.1 MWA Service Area .....	2-1
2.2 Local Water Purveyors .....	2-2
2.3 Delineation of DWR Groundwater Basins and Subbasins .....	2-3
2.4 Geology .....	2-3
2.5 Hydrology .....	2-3
Section 3: Groundwater Management and Usage .....	3-1
3.1 Historical Groundwater .....	3-1
3.1.1 Groundwater Levels .....	3-1
3.2 Available Groundwater Supplies .....	3-3
3.3 MWA Water Supply Assessment .....	3-3
3.4 Groundwater Extractions.....	3-3
Section 4: Groundwater Conditions .....	4-1
4.1 Summary of Hydrologic Water Budget .....	4-1
4.2 Sustainability of Long-Term Water Supply .....	4-1
4.2.1 Groundwater Recharge and Storage Projects .....	4-1
4.2.2 Potential of Land Subsidence .....	4-2
Section 5: Groundwater Quality Conditions.....	5-1
5.1 Water Quality .....	5-1
5.2 Groundwater Quality Trends .....	5-1
5.3 Wastewater Management .....	5-2
5.4 DWR Definition of Recharge Areas.....	5-3
5.5 Water Quality Management Actions.....	5-3



## Table of Contents (cont'd)

---

5.5.1	Control of High-Salinity Waters .....	5-3
5.5.2	Regulation of the Migration of Contaminated Groundwater .....	5-4
5.5.3	Wellhead Protection Areas and Recharge Areas.....	5-4
5.5.4	Well Construction Policies.....	5-4
5.5.5	Well Abandonment and Destruction Program.....	5-5
Section 6:	Basin Management Objectives and Strategies .....	6-1
6.1	Basin Management Objectives (BMOs) .....	6-1
6.2	Implementation Plan.....	6-1
<i>References</i> .....		<i>i</i>

## Table of Contents (cont'd)

---

### List of Tables

---

- 1-1 Legislative Requirements Summary
- 3-1

### List of Figures

---

- 2-1 MWA Vicinity Map
- 2-2 MWA Adjudicated Boundary and Subareas
- 2-3 MWA Groundwater/Surface Water Monitoring Sites
- 2-4 MWA Groundwater Basins
- 2-5 Morongo Area Groundwater Basins
- 2-6 MWA Hydrogeologic Setting
- 4-1 Typical Geologic Cross-Section of Mojave River Groundwater Basin
- 4-2 Geology of Mojave River Groundwater Basin
- 4-3 Groundwater Elevations Map for MWA
- 4-4 Simulated Groundwater Elevations for MWA
- 5-1 Nitrates
- 5-2 Manganese
- 5-3 Fluoride
- 5-4 Iron
- 5-5 Arsenic
- 5-6 TDS
- 5-7 DWR Groundwater Recharge Areas

### List of Appendices

---

- A Resolution of GMP Adoption

## Table of Contents (cont'd)

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### List of Abbreviations

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AB 3030	Assembly Bill 3030
af	Acre-feet
afy	Acre-feet per year
As	Arsenic
asl	Above sea level
bgs	below ground surface
BMOs	Best Management Objectives
BMPs	Best Management Practices
CDPH	California Department of Public Health
CEC	Contaminant of emerging concern
County	San Bernardino County
CUWCC	California Urban Water Conservation Council
DWR	California Department of Water Resources
DWSAP	Drinking Water Source Assessment and Protection
ET	Evapotranspiration
ft/d	Feet per day
ft <sup>2</sup> /d	Square feet per day
GMP	Groundwater Management Plan
gpcd	Gallons per capita per day
gpm	Gallons per minute
GWPP	Groundwater Protection Plan
IRWM Plan	Integrated Regional Water Management Plan
K	Hydraulic Conductivity
MBAS	Methylene Blue Activated Substances
MCL	Maximum Contaminant Level
mgd	Million gallons per day
µg/L	Micrograms per liter
mg/L	Milligrams per liter
µmhos	micromhos
MSL	Mean Sea Level
MWA	Mojave Water Agency
OWTS	Onsite Wastewater Treatment System
PCAs	Potentially Contaminating Activities
PHG	Public Health Goal
RWQCB	Regional Water Quality Control Board
SB	State Bill
SMNP	Salt & Nutrient Management Plan
SOI	Sphere of Influence
Ss	Specific storage

## Table of Contents (cont'd)

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Sy	Specific yield
SWRCB	State Water Resources Control Board
T	Transmissivity
TDS	Total Dissolved Solids
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
WSA	Water Supply Assessment

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### Section 1: Introduction

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This updated Groundwater Management Plan (GMP) was prepared in accordance with Assembly Bill 3030 (AB 3030), also called the Groundwater Management Act (Section 10750 et. seq. of the California Water Code) for the Mojave Water Agency (MWA, Agency) to protect the quantity and quality of groundwater within its service area.

#### 1.1 Plan Objectives

The GMP serves as a planning tool to assist the Agency to maintain safe, sustainable, and high quality groundwater resources in the long-term. Groundwater management is planned and coordinated regionally to ensure a sustainable groundwater basin to meet future water supply needs. The GMP's Basin Management Objectives (BMOs) are discussed in Section 6 with the highest priority BMOs listed here:

1. Balance average annual future water demands with available future supplies to ensure sustainability throughout the Region between now and the 2035 planning horizon and beyond.
2. Maintain stability in previously overdrafted groundwater basins and reduce overdraft in groundwater basins experiencing ongoing water table declines.
3. Provide support and assistance to disadvantaged communities and help facilitate projects and programs that benefit those communities.

The GMP is considered as a "living document" that the MWA intends to update periodically to report on the progress made in managing groundwater resources and to reflect the amendments to the California Water Code. This Groundwater Management Plan Update was prepared to support MWA's role in the continuous management of the regional groundwater resources and water quality based on the substantial work that has been completed since MWA's 2004 Regional Water Management Plan (2004 RWMP). MWA is also completing an update to its Integrated Regional Water Management Plan (IRWM Plan), which will be adopted in 2014.

#### 1.2 Plan Requirements and Organization

AB 3030 was intended to provide public agencies increased management authority over groundwater resources. Any public agency which provides water service to all or a portion of its service area and whose service area includes all or a portion of a groundwater basin may adopt a GMP. AB 3030 was amended in 2002 with the passage of the Groundwater Management and Planning Act of 2002 (SB 1938).

The MWA GMP includes three types of components: SB 1938 mandatory components, AB 3030 and SB 1938 voluntary components, and California Department of Water Resources (DWR) Bulletin 118-suggested components (DWR 2003). These components are addressed in the

## DRAFT

GMP, and Table 1-1 identifies where in this GMP the information addressing each of these components can be found.

A GMP is a required “baseline” document for agencies seeking state grant funding opportunities. SB 1938 requires that for an agency to be eligible for state funding from the DWR, the GMP must incorporate the SB 1938 Mandatory Components listed in Table 1-1 (DWR, 2003).

**TABLE 1-1  
LEGISLATIVE REQUIREMENTS SUMMARY**

Components Section	Section
<b><i>SB 1938 Mandatory Components</i></b>	
1. Documentation of public involvement statement	Sec. 1.3, App. A
2. Basin Management Objectives (BMOs)	Sec. 6
3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality or are caused by pumping	Sec. 4.5.4 and 6.5, App. B
4. Plan to involve other agencies located in the groundwater basin	Sec. 6.6
5. Adoption of monitoring protocols	Sec. 6.5, App. B
6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with agency boundaries that are subject to GMP	Sec. 2.3
7. For agencies not overlying groundwater basins, prepare the GMP using appropriate geologic and hydrogeologic principles	Not Applicable
<b><i>AB 359 Mandatory Component</i></b>	
1. Map identifying the substantial recharge areas to be provided to local planning agencies (new as of January 1, 2013)	Sec. 5.5
<b><i>AB 3030 and SB 1938 Voluntary Components</i></b>	
1. Control of saline water intrusion	Sec. 5.6.1
2. Identify and manage well protection and recharge areas	Sec 5.6.3
3. Regulate the migration of contaminated groundwater	Sec 5.6.2
4. Administer well abandonment and destruction program	Sec. 5.6.5
5. Control and mitigate groundwater overdraft	Sec. 4.5.1
6. Replenish groundwater	Sec. 4.5.3 and 6.7
7. Monitor groundwater levels	Sec. 6.5, App. B
8. Develop and operate conjunctive use projects	Sec. 4.5.3 and 6.7
9. Identify well-construction policies	Sec. 5.6.4
10. Develop and operate groundwater contamination cleanup, recharge, storage,	Sec 4.5.3
11. Develop relationships with State and federal regulatory agencies	Sec. 6.6
12. Review land use plans and coordinate with land use planning agencies to assess activities that create reasonable risk of groundwater contamination	Sec. 6.6
<b><i>DWR Bulletin 118 Suggested Components</i></b>	
1. Manage with guidance of advisory committee	Sec. 6.6
2. Describe area to be managed under GMP	Sec. 2

## DRAFT

3. Create links between BMOs and goals and actions of GMP	Sec. 6
4. Describe GMP monitoring programs	Sec. 6.5, App. B
5. Describe integrated water management planning efforts	Sec. 6.6
6. Report of implementation of GMP	Sec. 6.5
7. Evaluate GMP periodically	Sec. 6.7

### 1.3 Plan Preparation and Adoption Process

The MWA Board of Directors invited public comment by holding a public hearing on February 13, 2014 to consider adopting the intent to prepare the GMP. The item was included on the Board agenda and was published in local media outlets in the area. After the public hearing, the Board passed Resolution 980-14 declaring the MWA's intention to update the existing MWA Groundwater Management Plan adopted in 2005. The February 13, 2014 Board agenda, staff report, and Resolution 980-14 are included in Appendix A. For the minutes of the meeting, the audio is available on MWA's website at [http://mojavewater.granicus.com/GeneratedAgendaViewer.php?view\\_id=2&clip\\_id=369](http://mojavewater.granicus.com/GeneratedAgendaViewer.php?view_id=2&clip_id=369).

The MWA Board of Directors held a second public hearing on \_\_\_\_\_, 2014 to consider adoption of the final GMP

The GMP was adopted by the MWA Board of Directors by passing Resolution 980-\_\_ on \_\_\_\_\_, 2014. Resolution 980-\_\_ is presented in Appendix A.

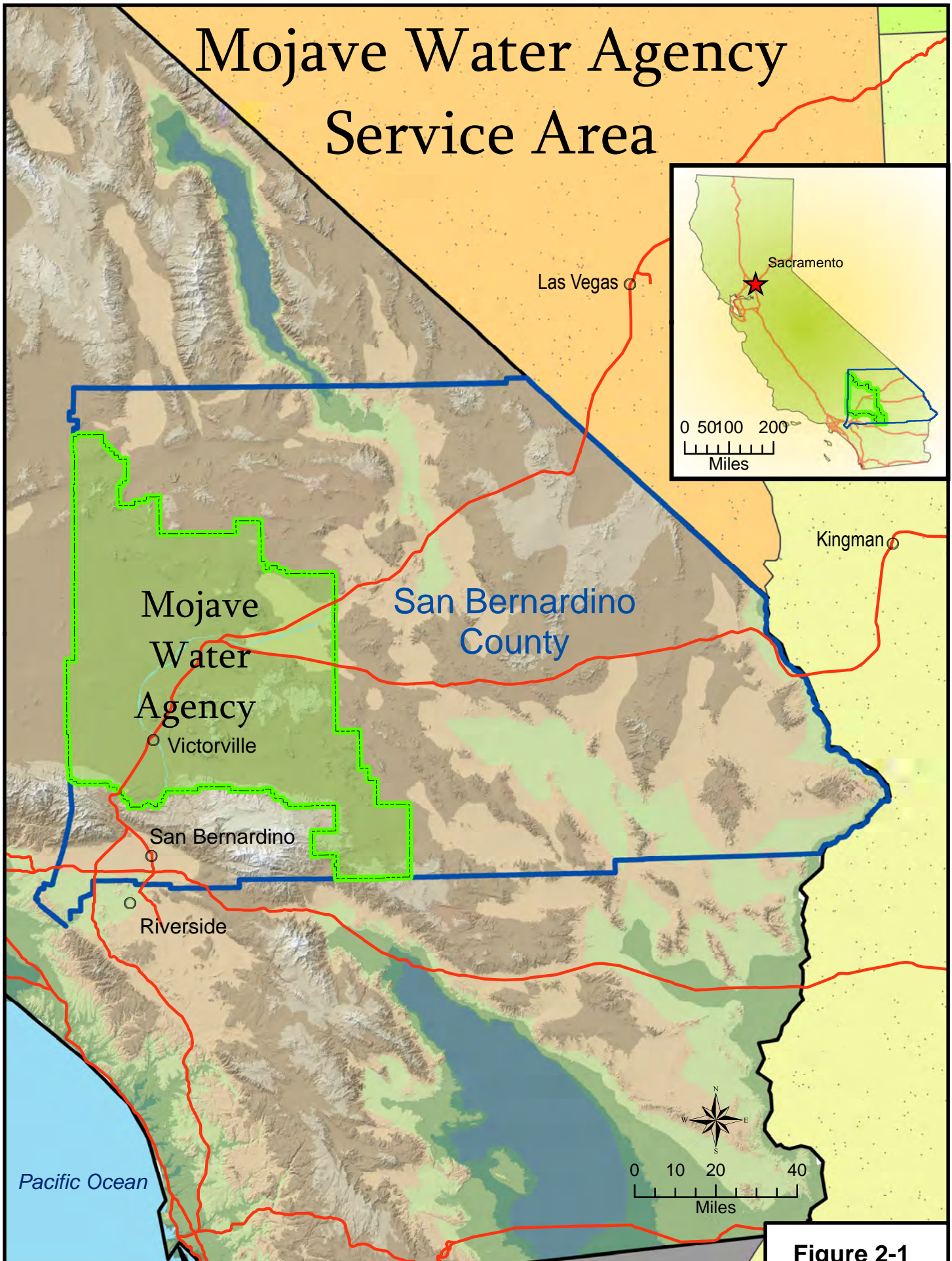
### 1.4 Stakeholder Involvement

MWA provided presentations and/or informational materials to stakeholders in the Region as part of their update to the Integrated Regional Water Management Plan (IRWM Plan) and the update to the GMP was included in these presentations and stakeholder meetings. For more information on Stakeholder involvement, see IRWM Plan Section 1.2.

The Stakeholder Group discussed the MWA's intent to update their GMP at the February 6, 2014 meeting with questions and comments taken from the group-at-large. The status of the update to the GMP was presented at the May 19, 2014 and the June 23, 2014 Stakeholder Meetings with feedback encouraged from the Group.

In support of these activities and in conjunction with the update to the IRWM Plan, MWA also maintained a website at [www.mywaterplan.com](http://www.mywaterplan.com).

# Mojave Water Agency Service Area



**Figure 2-1**



# Adjudicated Boundaries

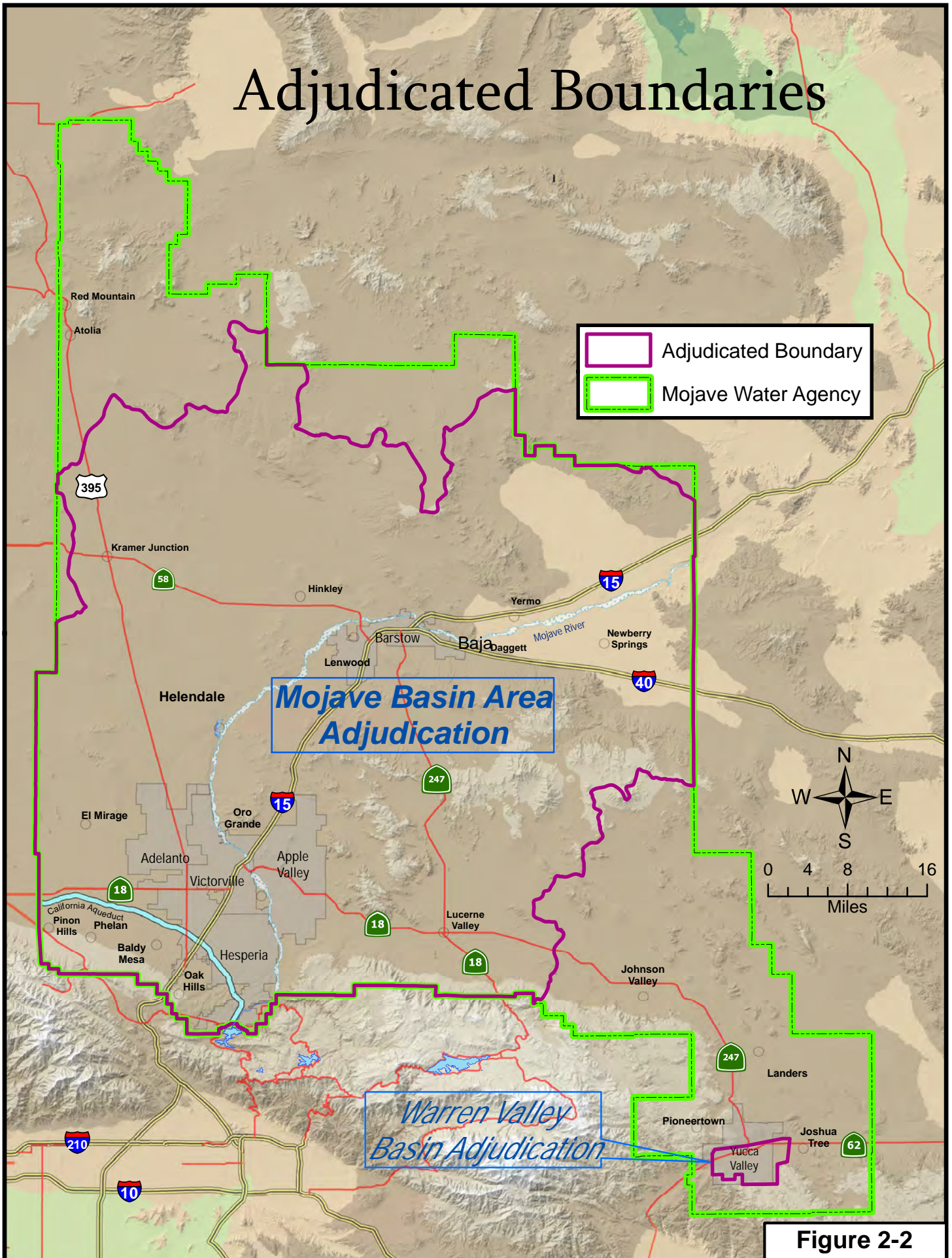


Figure 2-2

# Groundwater and Surface Water Monitoring Sites

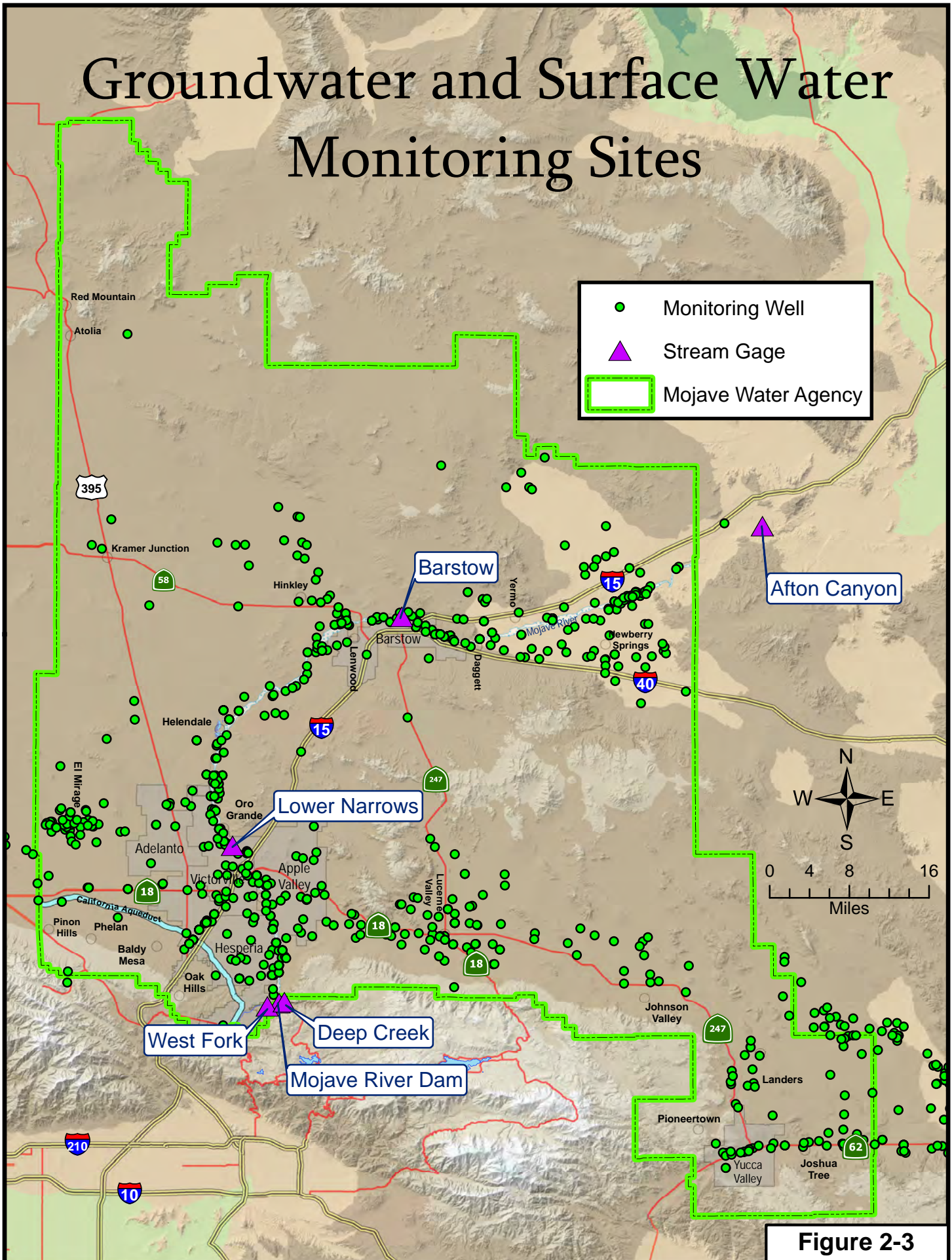


Figure 2-3

# Groundwater Recharge Areas

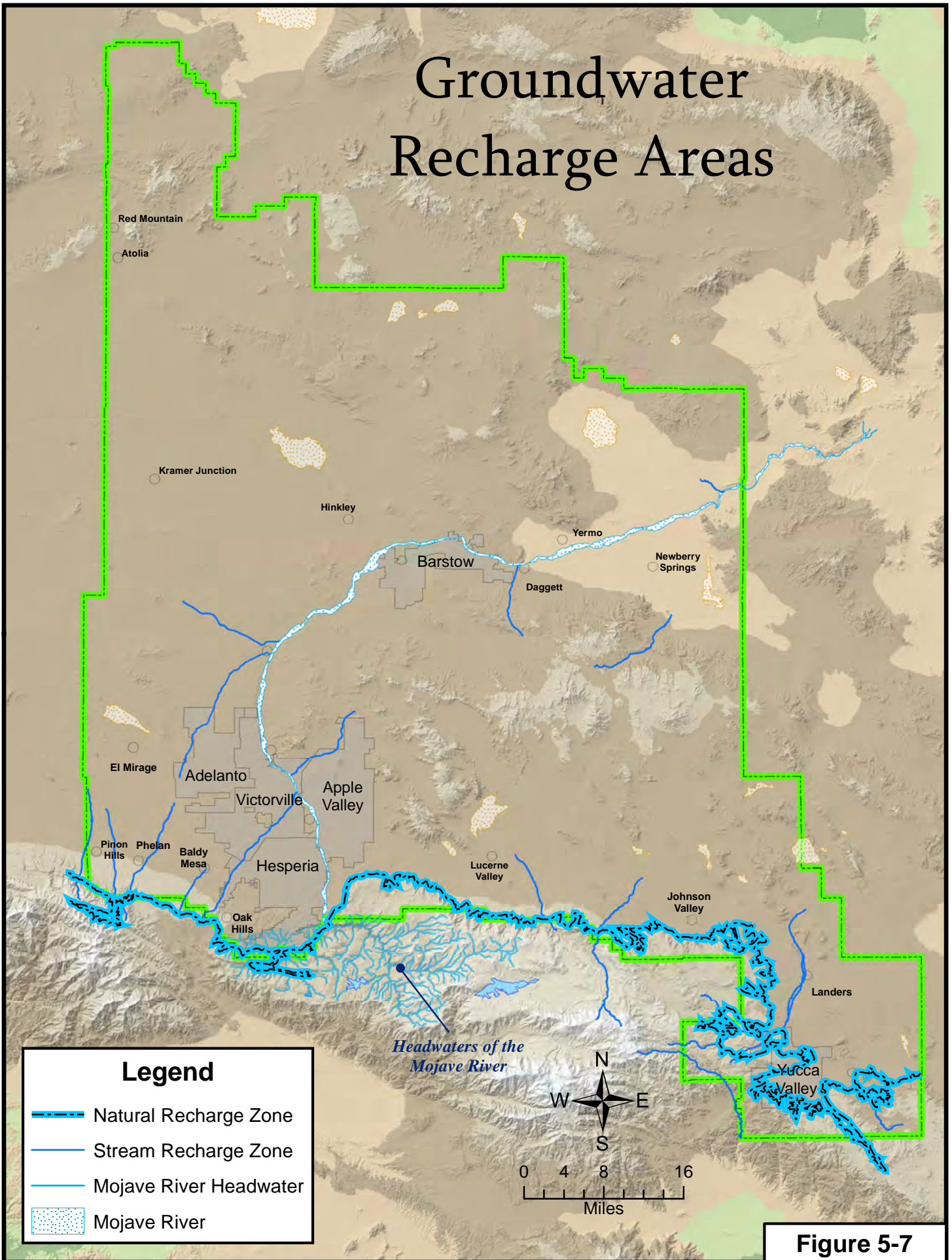


Figure 5-7