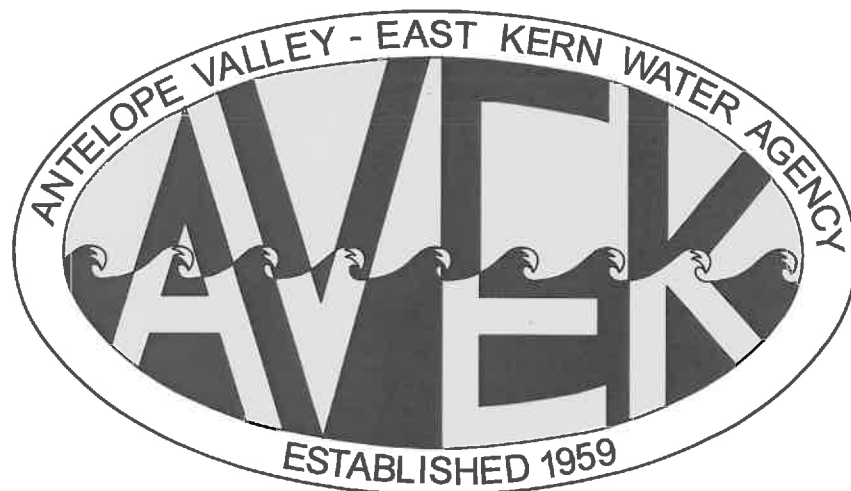


**AVEK'S 2005
URBAN WATER MANAGEMENT PLAN**

**Antelope Valley-East Kern Water Agency,
California
Urban Water Management Plan**

2005 URBAN WATER MANAGEMENT PLAN



A PUBLIC AGENCY

Table Of Contents

SECTION 1. INTRODUCTION	1
1.1 PURPOSE	1
SECTION 2. ADOPTION AND IMPLEMENTATION OF PLANS	2
2.1 PUBLIC PARTICIPATION.....	2
2.1.1 PLAN ADOPTION	2
2.2 AGENCY COORDINATION	3
2.2.1 INTERAGENCY COORDINATION	3
2.2.2 INTRA-AGENCY COORDINATION	5
2.3 SUPPLIER SERVICE AREA INFORMATION WITH 20 YEAR PROJECTIONS.....	1
2.3.1 DEMOGRAPHIC FACTORS	6
2.3.2 PAST DROUGHT, WATER DEMAND, AND CONSERVATION INFORMATION	7
2.3.3 CLIMATE.....	8
2.4 WATER SUPPLY SOURCES.....	9
2.4.1 IMPORTED WATER	9
2.4.2 GROUNDWATER.....	9
2.4.3 RECYCLED WATER	9
2.4.4 CURRENT AND PROJECTED WATER SUPPLIES.....	9
SECTION 3. RELIABILITY PLANNING	10
3.1 RELIABILITY	10
3.2 FREQUENCY AND MAGNITUDE OF SUPPLY DEFICIENCIES.....	10
3.3 RELIABILITY COMPARISON	11
3.4 FACTORS RESULTING IN INCONSISTENCY OF SUPPLY.....	11
3.5 TRANSFER OR EXCHANGE OPPORTUNITIES	12
3.5.1 WATER TRANSFERS.....	12
SECTION 4. WATER USE PROVISIONS	13
4.1 WATER USE BY CUSTOMER TYPE – PAST, CURRENT, AND FUTURE	14
4.1.1 AGRICULTURAL SECTOR.....	14
SECTION 5. DEMAND MANAGEMENT MEASURES	15
(A) DMM 1 – WATER SURVEY PROGRAMS FOR SINGLE-FAMILY AND MULTI-FAMILY RESIDENTIAL CUSTOMERS	15
(B) DMM 2 – RESIDENTIAL PLUMBING RETROFIT	15
(C) DMM 3 – SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR.....	15
(D) DMM 4 – METERING WITH COMMODITY RATES	16
(E) DMM 5 – LARGE LANDSCAPE CONSERVATION PROGRAMS AND INCENTIVES.....	16
(F) DMM 6 – HIGH-EFFICIENCY WASHING MACHINE REBATE PROGRAMS.....	16
(G) DMM 7 – PUBLIC INFORMATION PROGRAMS.....	16
(H) DMM 8 – SCHOOL EDUCATION PROGRAMS	16
(I) DMM 9 – CONSERVATION PROGRAMS FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL ACCOUNTS .	17
(J) DMM 10 – WHOLESALE AGENCY PROGRAMS.....	17
(K) DMM 11 – CONSERVATION PRICING.....	18
(L) DMM 12 – WATER CONSERVATION COORDINATOR	18
(M) DMM 13 – WATER WASTE PROHIBITION	19
(N) DMM 14 – RESIDENTIAL ULTRA-LOW FLUSH TOILET REPLACEMENT PROGRAMS	19
5.1 AGRICULTURAL WATER CONSERVATION PROGRAMS.....	19

SECTION 6. WATER SHORTAGE CONTINGENCY PLAN	20
6.1 STAGES OF ACTION.....	20
6.1.1 RATIONING STAGES AND REDUCTION GOALS	20
6.1.2 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS	21
6.2 PREPARATION FOR CATASTROPHIC WATER SUPPLY INTERRUPTION.....	22
6.2.1 WATER SHORTAGE EMERGENCY RESPONSE.....	22
6.2.2 SWP EMERGENCY OUTAGE SCENARIOS.....	22
6.3 PROHIBITIONS, CONSUMPTION REDUCTION METHODS AND PENALTIES	25
6.3.1 MANDATORY PROHIBITIONS ON WATER WASTING.....	25
6.3.2 EXCESSIVE USE PENALTIES	25
6.4 REVENUE AND EXPENDITURE IMPACTS AND MEASURES TO OVERCOME IMPACTS	26
6.5 SHORTAGE CONTINGENCY ORDINANCE/RESOLUTION.....	27
6.5.1 AVEK WATER SHORTAGE RESPONSE/PRIORITY BY USE	27
6.5.2 HEALTH AND SAFETY REQUIREMENTS.....	27
6.5.3 WATER SHORTAGE AND TRIGGERING MECHANISMS.....	27
6.6 REDUCTION MEASURING MECHANISM	28
6.6.1 MECHANISM TO DETERMINE REDUCTIONS IN WATER USE.....	28
SECTION 7. RECYCLED WATER PLAN	29
7.1 WASTEWATER QUANTITY, QUALITY, AND CURRENT USES	29
7.1.1 AVEK'S RECYCLED WATER USE CAPABILITIES	29
7.2 POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES	30
7.2.1 AVEK'S RECYCLED WATER USE PHILOSOPHY	30
SECTION 8. WATER QUALITY IMPACTS ON RELIABILITY	31
SECTION 9. WATER SERVICE RELIABILITY	32
9.1 PROJECTED WATER SUPPLY AND DEMAND.....	32
9.2 PROJECTED SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON.....	33
9.3 PROJECTED MULTIPLE DRY YEAR SUPPLY AND DEMAND COMPARISON	35
9.3.1 THREE YEAR MINIMUM WATER SUPPLY ALERT.....	38
APPENDIX A	
APPENDIX B	
APPENDIX C	
APPENDIX D	
APPENDIX E	
APPENDIX F	
APPENDIX G	
APPENDIX H	
APPENDIX I	

List of Tables

TABLE 1 COORDINATION AND PUBLIC INVOLVEMENT	4
TABLE 2 POPULATION CURRENT AND PROJECTED (AVEK AREA).....	7
TABLE 3 CLIMATE	7
TABLE 4 CURRENT AND PLANNED WATER SUPPLIES (AF/Y).....	8
TABLE 5 SUPPLY RELIABILITY.....	10
TABLE 6 BASIS OF WATER YEAR DATA	10
TABLE 7 TOTAL WATER USE (M&I).....	12
TABLE 8 NUMBER OF CONNECTIONS (TURNOUTS) FOR AGRICULTURAL USE	12
TABLE 9 SUPPLY RELIABILITY (AC-FT).....	17
TABLE 10 PROJECTED PROBABLE 5-YEAR WATER SUPPLY AF/Y.....	28
TABLE 11 PROJECTED PROBABLE 5-YEAR WATER DEMAND AF/Y	29
TABLE 12 PROJECTED PROBABLE 5-YEAR SUPPLY AND DEMAND COMPARISON AF/Y	29
TABLE 13 PROJECTED SINGLE DRY WATER YEAR SUPPLY AF/Y	29
TABLE 14 PROJECTED SINGLE DRY YEAR SUPPLY AND DEMAND COMPARISON AF/Y	29
TABLE 15 PROJECTED SUPPLY DURING MULTIPLE DRY YEAR ENDING IN 2010 - AF/	31
TABLE 16 PROJECTED DEMAND DURING MULTIPLE DRY YEAR ENDING IN 2010 - AF/Y	31
TABLE 17 PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR ENDING IN 2010 - AF/Y	31
TABLE 18 PROJECTED SUPPLY DURING MULTIPLE DRY YEAR ENDING IN 2015 - AF/Y	32
TABLE 19 PROJECTED DEMAND DURING MULTIPLE DRY YEAR ENDING IN 2015 - AF/Y	32
TABLE 20 PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR ENDING IN 2015 - AF/Y	32
TABLE 21 PROJECTED SUPPLY DURING MULTIPLE DRY YEAR ENDING IN 2020 - AF/Y	33
TABLE 22 PROJECTED DEMAND DURING MULTIPLE DRY YEAR ENDING IN 2020 - AF/Y	33
TABLE 23 PROJECTED SUPPLY AND DEMAND COMPARISON DURING MULTIPLE DRY YEAR ENDING IN 2020 - AF/Y	33
TABLE 24 PROJECTED SUPPLY DURING MULTIPLE DRY YEAR ENDING IN 2025 - AF/Y	34
TABLE 25 PROJECTED DEMAND DURING MULTIPLE DRY YEAR ENDING IN 2025 - AF/Y	34
TABLE 26 PROJECTED SUPPLY AND DEMAND DURING MULTIPLE DRY YEAR ENDING IN 2025 - AF/Y	34

List of Figures

FIGURE 1 SWP DELIVERY RELIABILITY (STUDY 6)	5
---	---

List of Appendices

APPENDIX A LIST OF GROUPS WHO PARTICIPATED IN THE DEVELOPMENT OF THIS PLAN / NOTIFICATION LETTER / FAX/MAILING LIST
APPENDIX B RESOLUTION TO ADOPT THE URBAN WATER MANAGEMENT PLAN / RESOLUTION TO ADOPT WATER SHORTAGE CONTINGENCY PLAN
APPENDIX C RATE STABILIZATION FUND DISCUSSION
APPENDIX D WATER SUPPLY CAPACITY CHARGE IMPROVEMENTS
APPENDIX E LOCATION MAP
APPENDIX F MAP OF SWP / WATER DELIVERIES TO AVEK / TABLES B-8 AND B-9/SWP RELIABILITY DATA
APPENDIX G AVEK TREATED M&I CUSTOMER LIST / UWMP CONTACTED AGENCIES LIST
APPENDIX H ASSUMPTIONS FOR POPULATION GROWTH PROJECTIONS
APPENDIX I EXCERPT FROM LOS ANGELES COUNTY WATERWORKS DISTRICT RECYCLED WATER SUPPLY ASSESSMENT / SANITARY SURVEY UPDATE REPORT 2001 / WATER QUALITY WEBSITE INFORMATION

Antelope Valley-East Kern Water Agency

2005 Urban Water Management Plan

Contact Sheet

Date plan submitted to the Department of Water Resources: 12/29/2005

Name of person preparing this plan: **Russell Fuller, General Manager**

Phone: **(661) 943-3201**

Fax: **(661) 943-3204**

E-mail address: **avekwa@aol.com**

The Water supplier is a: **State Water Project Contractor**

The Water supplier is a: **Wholesaler to potable water purveyors & Retailer of untreated agricultural water**

Utility services provided by the water supplier include: **Water**

Is This Agency a Bureau of Reclamation Contractor? **No**

Section 1. Introduction

1.1 Purpose

The California Urban Water Planning Act requires urban water suppliers to describe and evaluate sources of water supply, efficient uses of water, demand management measures, implementation strategy and schedule, and other relevant information and programs. This information is used by the urban water supplier for development of an Urban Water Management Plan (UWMP) which is submitted to the California Department of Water Resources (DWR) every five years.

Section 2. Adoption and Implementation of Plans

Law

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published ... After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

2.1 Public Participation

The Antelope Valley-East Kern Water Agency (AVEK) has actively encouraged community participation in its urban water management planning efforts by encouraging attendance and participation in the Board of Directors (BOD) public meetings held twice each month. Public hearings were held on November 15, 2005 and December 20, 2005 for review of plan and to receive comments on the draft plan before the AVEK's BOD approval.

A special effort was made to include community and public interest organizations. Legal public notices for each meeting were published in the local newspapers and posted at Agency facilities. Copies of the draft plan were available at Agency office. See Appendix A for participation list.

2.1.1 Plan Adoption

AVEK prepared the initial draft of its Urban Water Management Plan during spring 2005. The final plan was adopted by the BOD on 12/20/2005 and submitted to the California Department of Water Resources within 30 days of BOD approval. Attached to the cover letter addressed to the Department of Water Resources and as Appendix B are copies of the signed Resolution of Plan Adoption. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning).

2.2 Agency Coordination

Law

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

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

10621 (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

10621 (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan.....

2.2.1 Interagency Coordination

AVEK views "interagency coordination" in at least 2 ways, one with respect to the development of UWMP and the second concerns the development of additional water sources such as imported water stored in the groundwater basin. AVEK's draft UWMP was posted on it's website www.avek.org for public access and review. AVEK's outreach efforts concerning this UWMP are outlined in Table 1.

Table 1. Coordination and Public Involvement					
Entities	Coordination and Public Involvement Actions by AVEK				
	Contacted for Assistance	Attended public meetings	Received a copy of the draft	Commented on the draft	Sent notice of intention to adopt (Hearing)
Boron CSD			✓		✓
City of California City		✓	✓	✓	✓
Mojave Public Utility District			✓		✓
Rosamond CSD	✓	✓	✓	✓	✓
California Water Service Co			✓		✓
Los Angeles County Waterworks Districts	✓	✓	✓	✓	✓
Palm Ranch Irrigation District					✓
Palmdale Water District					✓
Littlerock Creek Irrigation District					✓
Quartz Hill Water District			✓		✓
California Department of Water Resources	✓		✓	✓	
City of Palmdale			✓		✓
City of Lancaster			✓		✓
Los Angeles County Sanitation Districts	✓		✓		✓
County of Los Angeles			✓		✓
County of Ventura			✓		✓
County of Kern			✓		✓

With respect to the second issue, it should be recognized that AVEK is a supplier of imported water from the State Water Project (SWP) for the Antelope Valley region and that it is not a primary source but a secondary source. Since AVEK wholesales water to area retail purveyors, water sales volumes and predicted future treated and untreated water quantities are the only tools and products available for distribution. See Appendix C for Rate Stabilization fund discussion. The water provided by DWR through AVEK is used by area consumers in lieu of or in addition to pumped groundwater. The UWMP seeks to optimize water assets and plans for future water shortages. AVEK attempts to maximize use of its surface water product by encouraging retail purveyors to utilize surface water instead of pumped groundwater whenever possible and utilize groundwater recharge as a method for banking water during wet years. AVEK is reducing over drafting of the area aquifers by providing as much of its allocated DWR water to consumers as possible.

Currently, AVEK is actively involved with the planning stages and coordination of a fully regional water banking program. The proposed water banking program would function under a Joint Power Association format and treat all area-wide water interests equally by offering participation to all customers if desired. AVEK currently has a Water Supply Capacity Charge that funds system improvements that will be required for the anticipated growth of AVEK's customers over the next 20 years. See Appendix D for list of proposed facility expansions. An improvement identified as a proposed facility expansion includes California Aqueduct turnouts, raw water pipelines and basin inlets that could be used for groundwater recharge.

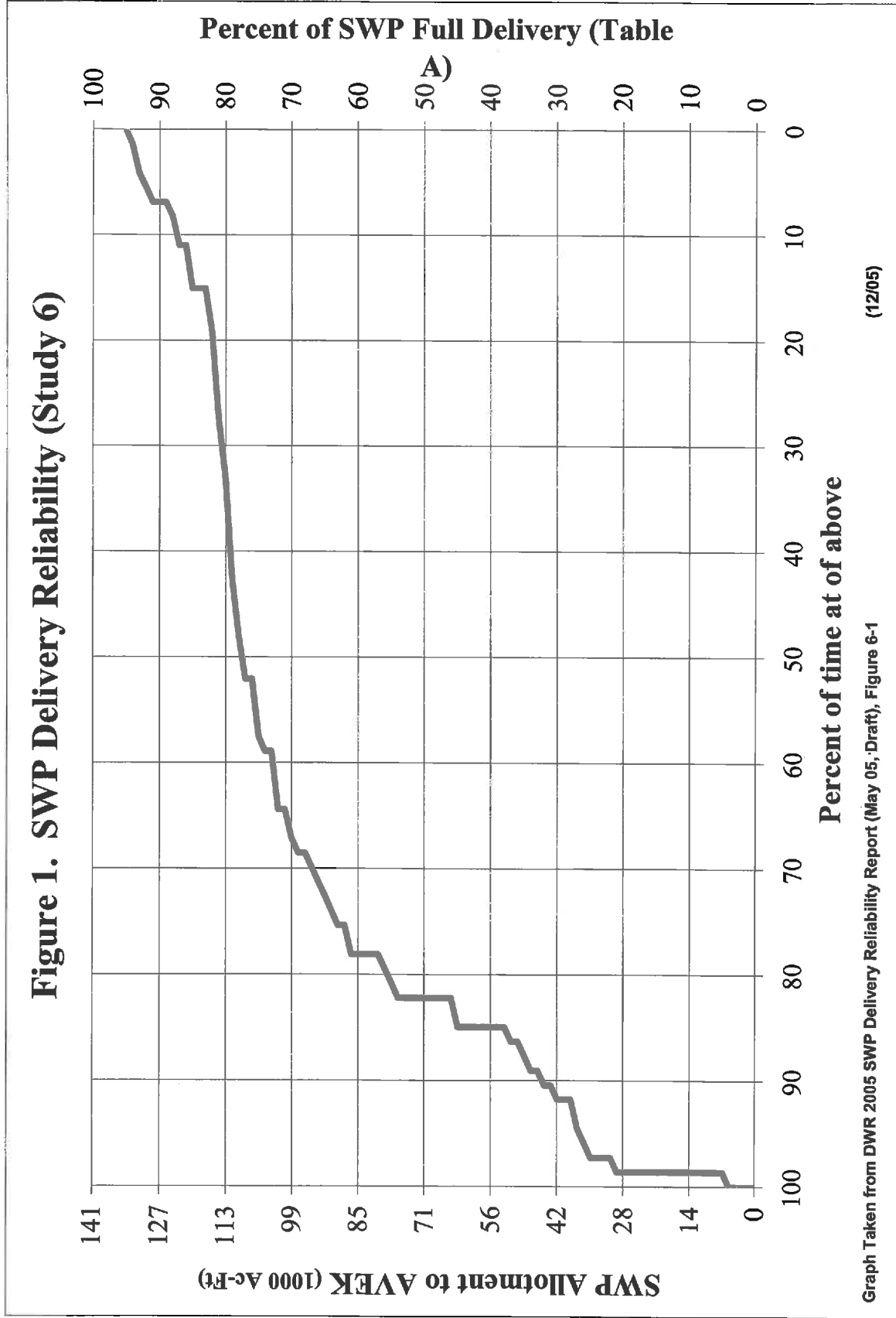
To develop a successful groundwater banking and storage program, AVEK believes a myriad of issues concerning such a program (eg, legal, technical, financial, policy, etc.) should be addressed at the earliest possible stage by creating a comprehensive institutional framework for the program. Formulating such a framework should create as many stakeholders as possible. AVEK will encourage that appropriate steps be taken to facilitate discussions about this matter among stakeholders.

Finally, AVEK's efforts to conserve and optimize its water resources have been the focus and will continue to be the focus on such programs as 1) provide treated and untreated surface water to area water retailers and farmers for a reasonable cost while maintaining their facilities and trained personnel; and 2) seek to institute programs and policies that deal with the water allocations during the inevitable dry years and spans of dry years. AVEK may assist, when possible, all area retailers in developing their own water conservation methods and policies as well as providing information about water conserving techniques.

2.2.2 Intra-Agency Coordination

Each year, the Agency considers the outlook on the water supplies for the Agency for the next 12 months. Figure 1, included in the UWMP, indicates AVEK's DWR water deliveries under different availability conditions. Figure 1 includes information provided by the 2005 DWR State Water Project Delivery Reliability Report (draft 5/05) and indicates the probability that a given SWP Table A amount will be delivered from the Delta for current condition Study 6. Each line is constructed by ranking 73 annual Table A delivery values of Study 6 from lowest to highest and calculating the percentage of values equal to or greater than the delivery value of interest.

Figure 1. SWP Delivery Reliability (Study 6)



2.3 Supplier Service Area Information with 20 Year Projections

Law

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

2.3.1 Demographic Factors

The Antelope Valley is located in the western part of the Mojave Desert, about 50 miles northeast of Los Angeles. The valley is triangular shaped, topographically closed basin covering about 2,200 square miles. Groundwater is an important component of water supply in the Antelope Valley (Leighton, USGS, 1999). Estimates of average natural annual groundwater recharge range from about 40,000 to 58,000 AFY (Snyder, 1955; Bloyd, 1967; Durbin, 1978). Pumping in the valley, primarily for agricultural purposes, peaked in the 1950's when production may have exceeded 400,000 AF annually (Snyder, 1955). Increased urban growth in the 1980's resulted in an increase in the demand for water and an increase in groundwater use. Long-term groundwater withdrawals have caused some land subsidence.

2.3.1.1 Service Area

AVEK has played a major role in the Valley's water system since it was granted a charter by the State legislature in 1959. It succeeded the AV-Feather River Association, which was formed in 1953 to encourage importation of water from the Feather River in northern California. See Appendix E for AVEK boundary map.

In 1962 the AVEK Board of Directors signed a water supply contract with the State Department of Water Resources (DWR) to assure delivery of imported water to supplement Antelope Valley groundwater supplies. AVEK has the third largest allotment of 29 State Water Project (SWP) water agencies in California, following the Metropolitan Water District and the Kern County Water Agency. See Appendix F for SWP map. SWP facilities are not fully constructed and until full built-out, SWP is capable of delivering annually about 72% of the project 4.1 million acre-feet.

Financed by a \$71 million bond issue, AVEK constructed the Domestic Agricultural Water Network (DAWN), which consists of four water treatment plants with clear water storage and more than 100 miles of pipelines. Four 8-million gallon water storage reservoirs near Mojave and one 3-million gallon reservoir at Vincent Hill Summit complete the DAWN network. The bulk of the imported water is treated and distributed to customers throughout its service area. See Appendix G for current list of water purveyors that AVEK serves. The network also provides delivery of untreated water from the Aqueduct to local farmers and ranchers.

The Quartz Hill water treatment plant is capable of producing 65 million gallons per day (mgd) of treated aqueduct water. The Eastside water treatment plant is capable of producing 10 mgd. The Rosamond water treatment plant can produce 14 mgd while the most recently added treatment plant in Acton can make 4 mgd of treated water. Additional surface water allotments from the SWP exist in the area for Palmdale Water District and Littlerock Creek Irrigation District.

2.3.1.2 Population Projections

Lancaster and Palmdale are the largest cities in the Antelope Valley with Mojave, Edwards Air Force Base, Boron, and Littlerock being the larger of the fewer than 10,000 population centers.

AVEK provides service to incorporated and unincorporated areas of Antelope Valley. The population projections include inhabitants from Lancaster, Palmdale, Acton, and Lake Los Angeles of Los Angeles County and California City, Rosamond, Edwards Air Force Base, Mojave, and Boron of Kern County. Since AVEK only serves a portion of Palmdale, the projected values for Palmdale have been adjusted and then included in Table 2.

Table 2 indicates population growth projections within the service areas of AVEK. The projections are based on data from California Department of Finance and the Southern California Association of Governments. See Appendix H for information from these sources on projected growth.

Table 2.					
Population – Current and Projected					
(AVEK Area) ¹					
Population	2006	2010	2015	2020	2025
Service Area Population	285,458	335,504	395,618	466,763	551,002

2.3.2 Past Drought, Water Demand, and Conservation Information

During drought periods, the Agency has met most of its customers' needs through special programs including turn back pool water, dry year water purchases, etc., and by utilizing larger reductions to agricultural users. AVEK has been unable to fulfill demands for SWP water only one time since its formation. See Appendix F for a list of the annual SWP water deliveries to AVEK.

Since 1995, the water demand for all water sources has increased by a growth rate of about 4% per year, due in part to a general acceleration in the region's economy. From 1990 to 2000, the population within AVEK's service area increased and new water demand has kept pace with the growth. The area continues to have a modest but growing industrial sector located principally in Palmdale and Lancaster. The commercial sector is increasing more rapidly due to increased numbers of consumers in the area and the general desire to shop closer to home. The agricultural economy is based on carrots, alfalfa, onions, peaches, pears, apple, vineyards and other stone type fruits becoming more common.

¹ Population growth projections include only a portion of the City of Palmdale.

2.3.3 Climate

The area encompassed by AVEK is primarily desert. Vegetation is typical of the western Mojave Desert that includes creosote and desert shrubs. Certain portions of the valley contain large stands of Joshua Trees. Summer temperatures can reach 112°F while winter temperatures have been known to drop about 10°F. Typical annual average rainfall is 7 to 8 inches. The perimeter of the Antelope Valley includes low brush covered hills transitioning into the Tehachapi Mountains and San Gabriel Mountains to the west and south. The surface water runoff drainage channels and courses are active only during times of runoff due to precipitation. The water tables are well below the levels, needed to sustain year round flowing streams. The area is known for its daily winds, usually from the west. Table 3 illustrates average rates of evapo-transpiration, temperature, and precipitation of the service area.

Table 3. Climate						
	Jan	Feb	Mar	Apr	May	June
Standard Monthly Average EvapoTranspiration (Eto)	1.86	2.80	4.65	6.00	8.06	9.00
Average Rainfall (inches)	1.49	1.82	1.35	0.36	0.12	0.05
Average Temperature (Fahrenheit)	44.3	47.5	52.7	58.3	66.7	75.2

Table 3. (continued) Climate							
	July	Aug	Sept	Oct	Nov	Dec	Annual
Standard Monthly Average (Eto)	9.92	8.68	6.60	4.34	2.70	1.86	66.5
Average Rainfall (inches)	0.10	0.14	0.19	0.35	0.48	1.05	7.51
Avg. Temperature (Fahrenheit)	81.1	79.7	73.3	62.6	50.4	43.2	61.3

Rainfall and temperature records based on data reported at the Lancaster station by NOAA. EvapoTranspiration data based on data reported from CIMIS station zone 17 – High Desert Valleys.

DWR's Draft Water Plan includes an assessment of the impacts of global warming on the State's water supply using a series of computer models and based on decades of scientific research. Model results indicate increased temperature, reduction in Sierra snow depth, early snow melt, and a raise in sea level. These changing hydrological conditions could affect future planning efforts which are typically based on historic conditions. Difficulties that may arise include:

- Hydrologic conditions, variability, and extremes that are different than current water systems were designed to manage
- Changes occurring too rapidly to allow sufficient time and information to permit managers to respond appropriately
- Requiring special efforts or plans to protect against surprises and uncertainties

As such, DWR will continue to provide updated results from these models as further research is conducted.

2.4 Water Supply Sources

Law

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data are available.]

2.4.1 Imported Water

AVEK sells imported water from the DWR California Aqueduct as part of the SWP. Currently, AVEK has an allocation for purchasing up to 141,400 acre-feet of water per year from the SWP.

2.4.2 Groundwater

AVEK does not have production groundwater wells and has no plans to include groundwater pumping as a water supply. In previous years, AVEK has made efforts to utilize groundwater to offset imported water deficiencies. These efforts were rejected by several of the larger AVEK purveyors and no further plans are in place for AVEK to use groundwater as a supply.

2.4.3 Recycled Water

AVEK does not provide recycled water. Reference is made to Section 7.1.1, AVEK's Recycled Water Use Capabilities.

2.4.4 Current and Projected Water Supplies

Water supplies will have different historical dry year sequences and different yields during multiple year drought conditions based on hydrology, average storage, contract entitlements, etc. AVEK's only source of water is SWP water.

Water Supply Sources	2006	2010	2015	2020	2025
SWP Allocation	141,400	141,400	141,400	141,400	141,400
Projected Delivery Percentages ²	69%	71%	73%	75%	77%
Projected Delivery by DWR ³	97,566	100,394	103,222	106,050	108,878
AVEK produced surface water	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0
Total	97,566	100,394	103,222	106,050	108,878

² Projected delivery percentages are based Study 6 & Study 7 of the DWR 2005 SWP Reliability Report (5/05 Draft). The average projected delivery percentage for year 2005 was taken from Table B-8 and for year 2025 the percentage was taken from Table B-9. Projected percentages for years 2010 – 2020 were derived by linearly escalating the percentage value of year 2005 to year 2025. See Appendix F.

³ Projected Delivery is the product of the SWP Allocation of 141,400 AF/Y and the Projected Delivery Percentages provided by the DWR models. For example, in year 2010 the projected delivery of 100,394 AF/Y is the product of 141,400 AF/Y multiplied by the projected delivery percentage of 71%.

Section 3. Reliability Planning

Law

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable and provide data for each of the following:

- (1) An probable water year;
- (2) A single dry water year; and,
- (3) Multiple dry water years.

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

3.1 Reliability

AVEK considers the usage of the word “reliability” in two connotations. First, the source reliability is only as reliable as the occurrences of the winter weather storms that deposit snow pack in the higher Sierra Nevada elevations that are part of the SWP watershed. Once the winter rain and snow season have been completed, the snow pack is measured and projected annual water volumes are given to SWP users. Prior to that, a specific volume of water is unpredictable. Based on previous experience, the predicted water values given by the State in the spring have been conservative.

The second step of “reliability” is what AVEK forecasts as the available water allocated for each of the water purveyors. AVEK also strives to be as informative as possible on the annual water allocations, and distributes information from the SWP projections to the water purveyors in a timely manner. The demand by water purveyors is greater in the summer months compared to the winter months. Utilizing water rates that are higher in peak months to offset water supply deficiencies is a demand management measure that is being used by AVEK.

Reliability planning requires information about: (1) the expected frequency and severity of shortages that occur because of reduction in SWP allocation and failure of transportation facilities; and (2) how available contingency measures can reduce the impact of shortages when they occur.

3.2 Frequency and Magnitude of Supply Deficiencies

The current and future supply projections through 2025 are shown in the above Table 4. The future supply projections assume normal inflows from the Sacramento Delta for the SWP. See Figure 1 for SWP delivery reliability.

According to SWP Delta Table A Delivery Reliability Probability for Year 2005, AVEK is projected to receive an average delivery of 69% of full Table A under current conditions. AVEK is projected to receive about 69% of full delivery at 69% of the time. The percentage of SWP Table A amounts projected to be available are referenced from Table B-8 of DWR’s “Excerpts from Working Draft of the 2005 State Water Project Delivery Reliability Report”, May 2005. AVEK has used the lowest allocation of 4% from Study 6, which includes revised current demands, for calculation of AVEK’s single dry year supplies. The multiple dry year demand was based on the 4-year drought values also presented in Table 6-5 title, “SWP Average and Dry Year Table A Delivery from Delta in Five-Year Intervals for Studies 6 and 7”. Based on the SWP

allotment for AVEK, a 69% of full delivery translates to about 97,566 acre-feet of water per year. For the remainder of this study, the value of 97,566 ac-ft will be defined as the baseline supply for a probable year.

3.3 Reliability Comparison

Table 5 details estimated water supply projections associated with several water supply reliability scenarios. The driest three-year historic sequence refers to the recorded three-year period with the lowest water deliveries that were available from DWR. For further information on the data, see Three-year Minimum Supply and Water Shortage Contingency Plan sections.

Unit of Measure: Acre-feet/Year		Multiple Dry Water Years		
Probable Water Year	Single Dry Water Year	Year 1	Year 2	Year 3
97,566	3,903	24,392	33,172	31,221
% of Probable	4%	25%	34%	32%

Water Year Type	Base Year(s)
Probable Water Year	(see footnote)
Single Dry Year	1977
Multiple-Dry Years	1931-1933

3.4 Factors Resulting in Inconsistency of Supply

The likeliest interruptions would be:

1. Reduction of annual SWP allocation due to low rainfall.
2. A result of loss of power or facility failure in the aqueduct.
3. Failure of Delta levee system.
4. Earthquake
5. Power loss

Response by the agency to any of the above factors will always include contact and coordination with AVEK's customers. Additionally, in the event of power loss AVEK has permanent emergency power generation that automatically starts to maintain water treatment operations. In the event of an earthquake, AVEK personnel will survey and assess damage and respond accordingly with shutdowns and repairs.

⁴ A probable water year scenario is defined as 69% of the full SWP allocation (141,400 ac-ft), or 97,566 ac-ft per historical reliability (Fig.1). This value coincides with the average percent of SWP allocation delivered as predicted in Table B-8 (Study 6) of the DWR 2005 SWP Delivery Reliability Report (5/05 Draft). The model assumes parties entitled to SWP water has adequate storage for capturing excess supplies during wet years. Actual volume of water available may be less if adequate storage is not available. Single and Multiple Dry Years data are cited from Table 6-5 (Study 6) of the DWR report.

3.5 Transfer or Exchange Opportunities

Law

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

3.5.1 Water Transfers

The Agency has in past explored and utilized dry year water transfer options to increase reliability. Additional water was acquired by AVEK in 2001; AVEK purchased 3,000 acre-feet of Table A water from Tulare Lake Irrigation District. It is estimated that additional water could be purchased by the Agency as emergency water supply if requested by water purveyors. Other sources of water available to AVEK include the turnback pool, Article 21, etc., that could be purchased if requested by customers or utilized for storage in the basin.

Section 4. Water Use Provisions

Law

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

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

(2) Agricultural.

(3) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

4.1 Water Use by Customer Type – Past, Current, and Future

Table 7 details water purveyors deliveries for M&I. The future water uses shown in the tables were based on the SWP Delivery Reliability (Figure 1) for 69% of the time.

Water Distributed	1999	2004	2010	2015	2020	2025
Billiton Exploration U.S.A.	22	14	26	27	28	28
Boron CSD	280	350	655	674	692	711
City of California City	163	801	1500	1542	1584	1626
Desert Lake CSD	63	161	301	310	318	327
Desert Sage Apartments	6	6	11	12	12	12
Edgemont Acres MWC	26	18	34	35	36	37
Edwards AFB	2140	1986	3718	3823	3927	4032
FPL Energy	1438	1251	2342	2408	2474	2540
Mojave Public Utility District	217	41	77	79	81	83
Rosamond CSD	1512	1111	2080	2138	2197	2256
US Borax	1625	1828	3422	3519	3615	3711
Antelope Valley Country Club	151	193	361	371	382	392
California Water Service Co	236	313	586	602	619	635
El Dorado MWC	387	60	112	115	119	122
Landale MWC	26	0.5	1	1	1	1
Los Angeles County Waterworks Districts	31794	38581	72227	74261	76296	78330
Palm Ranch Irrigation District	650	445	833	857	880	903
Quartz Hill Water District	3217	4099	7674	7890	8106	8322
Shadow Acres MWC	218	299	560	576	591	607
Sunnyside Farms MWC	290	293	549	564	579	595
Westside Park MWC	108	71	133	137	140	144
White Fence Farms MWC	731	755	1413	1453	1493	1533
Lake Elizabeth MWC	500	950	1778	1829	1879	1929
Sales to water purveyors (AF/Y)	45,800	53,627	100,394	103,222	106,050	108,878

Table 8 details the additional water uses and losses

	1999	2004	2010	2015	2020	2025
Raw Water	24,302	7,625	7,625	7,625	7,625	7,625
Unaccounted-for system losses	2,103	1,001	3,012	3,097	3,181	3,266
Total	26,405	8,626	10,637	10,722	10,806	10,891

In case of rationing, the Agency will be able to utilize its customer database for implementing any possible water reductions.

4.1.1 Agricultural Sector

Agricultural water demand from AVEK's system is projected to have minimal growth in the next ten to fifteen years with a possible decrease over the next twenty to thirty years. The water deliveries indicated in Table 8 show consistent amounts through 2025. Agricultural land use within the Agency's area is currently increasing in quantity. Even so, it is projected that in the long term, more agricultural land will eventually be converted to urban uses.

Section 5. Demand Management Measures

Law

10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: ...

AVEK is committed to implementing water conservation where applicable⁵. This Section discusses water conservation.

For responding to the Urban Water Management Planning Act, the Agency will address the 14 Demand Management Measures. Descriptions of the Agency's water conservation programs are below. The Agency has, in good faith, tried to address and comply with all of the BMP targets listed in the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding (MOU) where applicable, even though the Agency is not signatory to the MOU regarding Urban Water Conservation or a member of CUWCC.

(A) DMM 1 – Water Survey Programs for Single-Family and Multi-Family Residential Customers

IMPLEMENTATION DESCRIPTION: All services of this type are provided by the water purveyor customers of AVEK. AVEK will assist in information research and dissemination when appropriate.

(B) DMM 2 – Residential Plumbing Retrofit

IMPLEMENTATION DESCRIPTION: All services of this type are provided by the water purveyor customers of AVEK. AVEK will assist in information research and dissemination when appropriate.

(C) DMM 3 – System Water Audits, Leak Detection and Repair

IMPLEMENTATION DESCRIPTION: AVEK has no formal leak detection or pipeline survey program. AVEK does however audit system losses monthly as part of it's normal billing procedures. Pipelines are driven weekly as part of weekly water sample runs during which personnel will note leaks if observed. System losses of less than 3% of total deliveries are considered within the margin of error and normal. The agency repairs leaks promptly which averages about twice per year. Below is a table of results.

Results	2001	2002	2003	2004	2005 (est)
% of Unaccounted Water	2.1	1.3	1.2	1.9	1.6
Miles Surveyed	100	100	100	100	100
Miles Repaired	<1	<1	<1	<1	<1
Actual Expenditures - \$	10,000	10,000	10,000	10,000	10,000
Actual Water Saved - AF/Y	<1	<1	<1	<1	<1

⁵ It should be recognized that Section 10620(c) of the Urban Water Management Planning Act provides that a water wholesaler need not address or implement certain planning elements described in the UWMP Act that are more applicable to water retailers (eg, water demand management measures).

(D) DMM 4 – Metering with Commodity Rates

IMPLEMENTATION DESCRIPTION: The Agency charges all water purveyor customers based on metered readings and established rate schedules developed by the Agency. All current and new connections including temporary connections are required to be metered and billed per volume-of-use. AVEK has never operated unmetered connections. Additionally, existing meters are checked on a regular basis for leaks and accuracy.

(E) DMM 5 – Large Landscape Conservation Programs and Incentives

IMPLEMENTATION DESCRIPTION: Landscaping requirements and conservation incentives are provided by AVEK’s water purveyor customers and mandated by city and other governmental agencies.

(F) DMM 6 – High-efficiency washing machine rebate programs

IMPLEMENTATION DESCRIPTION: These programs are administered by water purveyor customers of AVEK. AVEK will disseminate information when appropriate.

(G) DMM 7 – Public Information Programs

IMPLEMENTATION DESCRIPTION: The Agency maintains an active public information program. The Agency promotes water conservation and other resource efficiencies in coordination with other utilities by distributing public information through brochures and through community speakers, paid advertising, and some special events every year. The Agency has been actively providing information to the public for over 20 years.

IMPLEMENTATION SCHEDULE: The Agency will continue to provide public information services and materials to remind the public about water and other resource issues.

METHODS TO EVALUATE EFFECTIVENESS: The Agency will solicit feedback from customer purveyors regarding the information provided.

CONSERVATION SAVINGS: AVEK has no method to quantify the savings of this DMM but believes that this program is in the public’s interest.

(H) DMM 8 – School Education Programs

IMPLEMENTATION DESCRIPTION: The Agency continues to work with school districts to promote water conservation and other resource efficiencies at school facilities and to educate students about these issues.

The Agency solicits advice from various local schools to help implement this program. AVEK provides educational materials to several grade levels, State and County water system maps, posters, workbooks, interactive computer software, videos, and tours (for example water treatment plants).

IMPLEMENTATION SCHEDULE: The Agency will continue to implement this DMM at the levels described.

METHODS TO EVALUATE EFFECTIVENESS: The Agency will continue to survey the institutions and educators on the number of programs, materials and attendance at water conservation activities.

CONSERVATION SAVINGS: The Agency has no method to quantify the savings of this DMM but believes that this program benefits the general public in their awareness of water conservation.

(I) DMM 9 – Conservation Programs for Commercial, Industrial, and Institutional Accounts

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK's water purveyor customers, and AVEK will disseminate information when appropriate.

(J) DMM 10 – Wholesale Agency Programs

IMPLEMENTATION DESCRIPTION: AVEK is a wholesale agency for water and the DMM's are identified and discussed in this section.

Existing Programs	Number of agencies assisted/Estimated AF per Year Savings				
	2001	2002	2003	2004	2005
Program Activities					
Water Surveys					
Residential Retrofit					
System Audits	1/1000	1/1000	1/1000	1/1000	1/1000
Metering-Commodity Rates	55/55	55/55	55/55	55/55	55/55
Landscape Programs					
Washing Machines					
Public Information	1/10	1/10	1/10	1/10	1/10
School Education					
Water Waste					
CII WC / ULF					
Pricing					
WC Coordinator					
Water Waste					
ULFT Replacement					
Actual Expenditures - \$	\$13,000	\$13,000	\$13,000	\$13,000	\$13,000

Planned Programs	No. of agencies to be assisted/ Est AF per Year Savings				
	2006	2007	2008	2009	2010
Program Activities	2006	2007	2008	2009	2010
Water Surveys	0/0	0/0	0/0	0/0	0/0
Residential Retrofit	0/0	0/0	0/0	0/0	0/0
System Audits	N/A	N/A	N/A	N/A	N/A
Metering-Commodity Rates	0/0	0/0	0/0	0/0	0/0
Landscape Programs	0/0	0/0	0/0	0/0	0/0
Washing Machines	0/0	0/0	0/0	0/0	0/0
Public Information	1/10	1/10	1/10	1/10	1/10
School Education	0/0	0/0	0/0	0/0	0/0
Water Waste	0/0	0/0	0/0	0/0	0/0
CII WC / ULF	0/0	0/0	0/0	0/0	0/0
Pricing	N/A	N/A	N/A	N/A	N/A
WC Coordinator	20/20	20/20	20/20	20/20	20/20
Water Waste	0/0	0/0	0/0	0/0	0/0
ULFT Replacement	0/0	0/0	0/0	0/0	0/0
Actual Expenditures - \$	\$7,000	\$7,000	\$7,000	\$7,000	\$7,000

(K) DMM 11 – Conservation Pricing

IMPLEMENTATION DESCRIPTION: AVEK does not have a conservation pricing structure. AVEK maintains a standard pricing structure to all water purveyor customers regardless of water usage but does have water pricing structures that include variations in pricing based on time of year (winter versus summer). The winter versus summer pricing is to encourage use of AVEK imported water during the off peak time of year instead of purveyors using groundwater. AVEK does not provide sewer service.

Table K2 - WHOLESALERS	
Water Rate Structure	None
Year rate effective	N/A

(L) DMM 12 – Water Conservation Coordinator

IMPLEMENTATION DESCRIPTION: AVEK does not have a designated water conservation coordinator but plans to assign the duties to a new position. The position has been approved that will include the duties of Water Conservation Coordinator and will be filled in December 2005.

Table L2 - Planned					
Table L2 - Planned	2006	2007	2008	2009	2010
# of full-time positions					
# of part-time staff	1	1	1	1	1
Pos.supplied by other agency					
Projected Expenditures - \$	\$7,000	\$7000	\$7000	\$7000	\$7000

(M) DMM 13 – Water Waste Prohibition

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK’s water purveyor customers, the retail water purveyors.

(N) DMM 14 – Residential Ultra-low Flush Toilet Replacement Programs

IMPLEMENTATION DESCRIPTION: These services are provided by AVEK’s water purveyor customers, the retail water purveyors. AVEK will disseminate information when appropriate.

5.1 Agricultural Water Conservation Programs

AVEK does not implement any agricultural water conservation programs, but encourages their agricultural customers to participate in water conservation.

5.2 Planned Future Supply Projects

AVEK does not currently have any planned future projects to increase water supply.

Non-implemented & Not scheduled DMM / Planned Water Supply Project Name	Per-AF Cost (\$)
N/A	

5.3 Development of Desalinated Water

Due to the agency’s distance from coastal areas, AVEK does not have the oppourtunity to implement a desalination program.

Section 6. Water Shortage Contingency Plan

Law

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

10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

6.1 Stages of Action

6.1.1 Rationing Stages and Reduction Goals

The Agency has developed delivery reduction goals to curb demand during water shortages. In the event of water supply shortages the Agency will make water delivery reductions per the Agency law for allocations. Reference is made to Appendix B, which includes the Resolution to Adopt a Water Shortage Contingency Plan.

Stage No.	Water Supply Conditions	% Shortage
1	Reduction in SWP Allocation Below Current Demand	1 %
2	Reduction in SWP Allocation Below Current Demand	50%

6.1.2 Estimate of Minimum Supply for Next Three years

Law

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

10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

Table 9. Supply Reliability (Ac-Ft) ¹				
Source	Year 1	Year 2	Year 3	Normal
State Water Project	24,392	33,172	31,221	97,566

¹ Based on the years 1931, 1932, and 1933 as reported in Table 6-5 of the DWR 2005 SWP Delivery Reliability Report (Draft 5/05).

6.2 Preparation for Catastrophic Water Supply Interruption

Law

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

10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

6.2.1 Water Shortage Emergency Response

Since the Agency began selling water to retailers, AVEK has maintained emergency contingency plans for activities required in the event there is an interruption in the DWR water supply or there is a major mechanical or electrical failure in one of the water treatment plants. The emergency activities that are undertaken by AVEK depend upon the severity of the problem and how quickly the problem can be remedied.

6.2.2 SWP Emergency Outage Scenarios

The Department of Water Resources has faced several potential outages along various parts of the SWP, mainly the California Aqueduct, since construction of the SWP in the early 1970s. Notable examples include slippage of side panels into the Aqueduct near Patterson in the mid-1990s, the Arroyo Pasajero flood event in 1995 (which also destroyed part of Interstate 5 near Los Banos), and various subsidence repairs needed along the East Branch of the Aqueduct since the 1980s.

All of these outages were short-term in nature (on the order of weeks or months), and DWR's Operations and Maintenance Division worked diligently to devise methods to keep the Aqueduct in operation while repairs were made. Thus, the SWP contractors experienced no interruption in deliveries.

One of the great design engineering features of the State Water Project is the ability to isolate parts of the system. If one reservoir or portion of the Aqueduct (the Aqueduct is divided into "pools") is damaged in some way, other portions of the system can still remain in operation. Since September 11, 2001, DWR has made significant investments in the security measures protecting all SWP facilities. Security is now coordinated with the California Highway Patrol.

Events could transpire that could result in significant outages and potential interruption of service. Examples of possible nature-caused events include a levee breach in the Sacramento San Joaquin Delta near the Harvey O. Banks Pumping Plant, a flood or earthquake event that severely damaged the Aqueduct along its San Joaquin alley traverse, or an earthquake event along either the West or East Branches. Such events could impact all the SWP Contractors south of the Delta.

AVEK and other SWP Contractors response to such events would be highly dependent on where along the SWP an event occurred. Three scenarios are described herein that could impact AVEK's SWP deliveries. For these scenarios it is assumed that a 100 percent reduction for six months would result from these catastrophic events.

Scenario 1: Levee Breach near Banks Pumping Plant

As demonstrated by the June 2004 Jones Tract levee breach, the Delta's levee system is extremely fragile. The SWP's main pumping facilities are located in the southern Delta. Should a major levee in the Delta near these facilities fail catastrophically, salt water from the eastern portions of San Francisco Bay would rush into the Delta, displacing the fresh water runoff that supplies the SWP. All pumping would be disrupted until water quality conditions stabilized and returned to pre-breach conditions. The re-freshening of Delta water quality would require large amounts of additional Delta inflows, which might not be immediately available depending on the timing of the levee breach. The Jones Tract repairs took several weeks to accomplish and months to complete; a more severe breach could take much longer, during which time pumping might not be available on a regular basis.

Annual SWP operations consist of filling San Luis Reservoir, the major SWP storage facility south of the Delta, during the winter and spring months. South of Delta Contractors then take deliveries through San Luis Reservoir for the remainder of the year. Supplies are also stored in Pyramid and Castaic Lakes along the West Branch, as well as in a variety of groundwater banking programs in the southern San Joaquin Valley. Assuming that Banks Pumping Plant would be out of service for six months and that all southern Contractors had to take their supplies from the three reservoirs and from banking programs, coordination between DWR and Contractors would be required.

Scenario 2: Complete Disruption of the Aqueduct in the San Joaquin Valley

The 1995 flood event at Arroyo Pasajero demonstrated vulnerabilities of the Edmund G. "Pat" Brown portion of the California Aqueduct (that portion that traverses the San Joaquin Valley from San Luis Reservoir to Edmonston Pumping Plant). Should a similar flood event or an earthquake damage this portion of the aqueduct, deliveries from San Luis Reservoir could be interrupted for a period of time. DWR has informed the contractors that a four-month outage could be expected in such an event. AVEK's assumption is a six-month outage.

Scenario 3: Complete Disruption of the Aqueduct East Branch

The East Branch of the California Aqueduct begins at a bifurcation of the Aqueduct in the Tehachapi Mountains south of Edmonston Pumping Plant. From the point of bifurcation, it is an open canal.

If a major earthquake (an event similar to or greater than the 1994 Northridge earthquake) were to damage a portion of the East Branch, deliveries could be interrupted. The exact location of such damage along the East Branch would be key to determining emergency operations by DWR and the southern California contractors. For this scenario, it is assumed that the East Branch suffered a single-location break and would not be available for deliveries.

If the shortage problem can be resolved within the available water storage time frame, only a few of the larger consumers need to be notified of the temporary decrease in water supply. If there will be a stoppage in the raw water deliveries to the various treatment plants, all customers (M&I and agriculture) will be notified of the stoppage and how soon water deliveries may be resumed.

If raw water deliveries to water treatment plants are temporarily stopped, treated water from other plants may be rerouted to the affected areas in some instances via interconnecting pipeline systems. Damages to the aqueduct will be repaired by DWR. Damaged Agency treatment plant components, whether mechanical or electrical, can usually be circumvented due to the duplicity of pumping and operations systems or the availability of manual over-ride controls. The magnitude of reduced water deliveries and length of time before resumption of full water availability will determine the extent of customer (M&I and agriculture) notification and activities required by the AVEK staff.

Possible Catastrophe:

- Power Outage
- Aqueduct Failure due to Earthquake or other circumstances
- Agency Treatment Plant Shutdown due to vital component failure
- Delta Levee Failure
- Local Earthquake

The following summarizes the actions the water agency will take during a water supply catastrophe.

Response by the agency to a catastrophic event will always include contact and coordination with AVEK's customers. Additionally, in the event of power loss AVEK has permanent emergency power generation that automatically starts to maintain water treatment operations. In the event of an earthquake, AVEK personnel will survey and assess damage and respond accordingly with shutdowns and repairs.

Preparation Actions for a Catastrophe

Possible Catastrophe	Summary of Actions
Regional power outage	Automatic switch to emergency power; contact customers, assess and respond
Earthquake	Automatic switch to emergency power (if needed); contact customers, assess and respond
Other (name event)	
Other (name event)	

6.3 Prohibitions, Consumption Reduction Methods and Penalties

Law

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

10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632 (f) Penalties or charges for excessive use, where applicable.

6.3.1 Mandatory Prohibitions on Water Wasting

AVEK believes that their customers are in the best position to implement no-waste policies. AVEK can and will make recommendations to assist its customers in monitoring water wasting, if AVEK's assistance is requested.

6.3.2 Excessive Use Penalties

Penalties for excessive use are imposed by water purveyor customers of AVEK. It is anticipated agricultural users will economize their water usage as required. AVEK has in place provisions for pre-paid ordering as a method of penalizing users who do not take the delivery requested. AVEK does not have powers to implement penalties for excessive use by a retailer's customer but encourages all retailers to have such penalties in place.

6.3.3 Implementation

AVEK relies on its water retailers to implement water consumption reduction methods to their customers in order to cope water supply shortages.

6.4 Revenue and Expenditure Impacts and Measures to Overcome Impacts

Law

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

10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments

Revenues collected by the Agency are currently used to fund operation and maintenance of the existing facilities and fund new capital improvements. The Agency will estimate projected ranges of water sales versus shortage stage to best understand the impact each level of shortage will have on projected revenues and expenditures.

Revenue reduction and an increase in expenditure may occur due to reduced sales from implementing the abovementioned programs. The magnitude of the revenue reduction and expenditure increase will be dependent on the severity of the water shortage, with larger and longer water shortages having greater impact on revenues. For minor events, the Agency may be able to absorb the revenue shortfall/increase in expenditures by reallocating existing funds, such as delaying some capital projects. For large events, the Agency may enact a rate adjustment to its customers.

6.5 Shortage Contingency Ordinance/Resolution

Law

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

10632 (h) A draft water shortage contingency resolution

6.5.1 AVEK Water Shortage Response/Priority by Use

AVEK has a plan of action in its existing rules and regulations in the event it is necessary to declare a water shortage emergency. AVEK reserves the right at any time if the quantity of water available to the Agency pursuant to the Water Supply Contract between the DWR and AVEK is less than the aggregate of all consumer requests to allocate the quantity of water available to AVEK to the extent permitted by law. See Appendix B for Resolution to Adopt a Water Shortage Contingency Plan.

6.5.2 Health and Safety Requirements

These requirements will be left to the retailing water purveyor agencies. AVEK has no direct control of the final water user actions and activities.

6.5.3 Water Shortage and Triggering Mechanisms

AVEK will attempt to provide the minimum health and safety water needs of the service area. It must be recognized that AVEK's water supply is not considered a primary source of water and it is a secondary source of water. The water shortage response plan was designed based on the assumption that during a long term drought DWR will have a reduction in water deliveries.

Rationing stages may be triggered by a shortage in the DWR water source. Although an actual shortage may occur at any time during the year, a shortage (if one occurs) is usually forecasted by the Water Department on or about April 1 each year. If it appears that it may be a dry year and the water supplies will be reduced, AVEK contacts its agricultural customers in March with confirmation follow up in April, so that the customers can minimize potential financial impacts.

The Agency's sole water source is imported surface water. Rationing stages may be triggered by a supply shortage or by contamination.

6.6 Reduction Measuring Mechanism

Law

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

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

6.6.1 Mechanism to Determine Reductions in Water Use

Under non-emergency water supply conditions, potable water production figures are recorded daily. Totals are reported daily to the Water Treatment Facility Supervisor. Totals are reported monthly to the Board of Directors and incorporated into the water supply report.

During water shortage periods, the Agency will review daily the water demands versus the established reduction goals. Reference is made to Appendix B, Resolution to Adopt Water Storage Contingency Plan. The Agency will take appropriate steps to reduce their deliveries to meet the reduction goals.

Section 7. Recycled Water Plan

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area, including quantification of the amount of wastewater collected and treated methods of wastewater disposal.

10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

7.1 Wastewater Quantity, Quality, and Current Uses

7.1.1 AVEK's Recycled Water Use Capabilities

AVEK does not collect or treat wastewater and has no plan to use recycled water as part of their deliveries. The Agency provides service to retail and water purveyors and agricultural customers that may have the opportunity to utilize recycled water as part of deliveries. The Agency supports the use of customers' plans that would utilize recycled water within AVEK boundaries. The use of recycled water by AVEK customers is an important part of reducing the demand on AVEK's available water. Los Angeles County Water Works District has estimates for the future availability and location of recycled water and they are included in Appendix I.

7.2 Potential and Projected Use, Optimization Plan with Incentives

Law

10633 (d) A description and quantification of the potential uses of recycled water. ..., and a determination with regard to the technical and economic feasibility of serving those uses.

10633. (e) 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 pursuant to this subdivision.

10633 (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

10633 (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacle to achieving that increased use.

7.2.1 AVEK's Recycled Water Use Philosophy

AVEK does not collect or treat wastewater and has no plan to use recycled water as part of their deliveries. AVEK's customers should investigate, develop, and implement recycled water usage programs. The Agency encourages the use of recycled water. For example, AVEK is presently assisting the City of Lancaster with funding for a recycled water project by extending the timing for repayment of an existing loan.

Section 8. Water Quality Impacts on Reliability

Law

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

The agency water supply is solely provided by the State Water Project, and its water quality is maintained and governed by the standards established by the Department of Water Resources. As such, the Agency does not expect fluctuation in the water quality that will affect agency water management strategies. See Appendix I for the DWR Sanitary Survey Update Report 2001 information and DWR website for State Water Project water quality information.

Section 9. Water Service Reliability

Law

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

9.1 Projected Water Supply and Demand

The following compares current and projected water supply and demand. This information is based on continued commitment to conservation programs, conjunctive use programs and use of groundwater and recycled water, by the water purveyors. Probable supply totals for the year 2005 are based on the Agency receiving 69% of its delivery amount from the State Water Project, 69% of the time, which is about 97,566 acre-feet of water per year. The projection gradually increases to 77% or 108,878 acre-feet of water per year by 2025. These projections are shown in Table 10. The 2005 and 2025 projections are based on data provided in Table 6-7 listed as the 'average percent delivery from 1922-1994' under Study 6 (Revised Demand Today) and Study 7 (Revised Demand Future), respectively, of the DWR SWP Delivery Reliability Report (May 05, Draft). The projected probable 5-year water supply for the other years are derived from a linear escalation of the 2005 supply totals up to the 2025 supply totals.

Active water efficiency improvements and additional water supply will be necessary to meet the Agency's projected water demand. The Agency will continue to examine supply enhancement options, such as groundwater recharge for Antelope Valley and conjunctive water use as discussed in Section 2.2.1, Interagency Coordination.

Projected demand totals are calculated based on population growth projection shown in Table 2. It was assumed that a household of 3.5 people requires 1.2 acre-foot of water per year. The assumed water usage rates are based on demand history for single-family dwellings in the area. New housing construction and related landscaping in the area does not appear to be different from existing housing development. The following tables will show water demand projection based on population projections from Table 2.

	2006	2010	2015	2020	2025
Supply totals	97,566	100,394	103,222	106,050	108,878
% of SWP Full Allotment	69%	71%	73%	75%	77%

Demand	2006	2010	2015	2020	2025
Retail Purveyors	97,871	115,030	135,640	160,033	188,915
Agriculture ⁷	7,625	7,625	7,625	7,625	7,625
TOTAL	105,496	122,655	143,265	167,658	196,540

	2006	2010	2015	2020	2025
Supply totals	97,566	100,394	103,222	106,050	108,878
Demand totals	105,496	122,655	143,265	167,658	196,540
Difference (shortfall)	(7,930)	(22,261)	(40,043)	(61,608)	(87,662)
Difference as % Supply	8%	22%	39%	58%	81%
Difference as % Demand	8%	18%	28%	37%	45%

The comparison of the projected probable year supply and demand indicates a shortfall starting in the year 2006. This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

9.2 Projected Single Dry Year Supply and Demand Comparison

	2006	2010	2015	2020	2025
Supply totals	5,656	6,010	6,363	6,717	7,070
% of SWP Full Allotment	4%	4.25%	4.5%	4.75%	5%

The 2005 and 2025 projected single dry water year percentages were based on the minimum delivery by the delta as reported in Table B-8 (Study 6) and Table B-9 (Study 7) respectively of the DWR SWP Delivery Reliability Report (May 05, Draft). The projected single dry water year percentages for the other years are derived from a linear escalation of the 2005 supply totals up to the 2025 supply totals.

	2006	2010	2015	2020	2025
Supply totals	5,656	6,010	6,363	6,717	7,070
Demand totals	105,496	122,655	143,265	167,658	196,540
Difference (shortfall)	(99,840)	(116,646)	(136,902)	(160,942)	(189,470)
Difference as % Supply	1765%	1941%	2152%	2396%	2680%
Difference as % Demand	95%	95%	96%	96%	96%

⁶ Projected five-year water demand is for all water sources available in the area.

⁷ The projected probable demand by agriculture is only an estimate of their demand since a record of their groundwater usage is not available.

The comparison of the projected probable year supply and demand indicates a shortfall starting in the year 2006. This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

In any dry year, the Agency will notify its customers of the potential water shortage for the year.

It is up to the purveying customers of AVEK to direct rationing program and policies to consumers. Therefore, expected changes to demand due to dry years will be provided by the purveying customers.

9.3 Projected Multiple Dry Year Supply and Demand Comparison

The following tables identify the projected minimum water supply based on the four-year drought historic sequence for water supply as presented in Table 6-5 of the DWR 2005 SWP Delivery Reliability Report (Draft May 05).

Table 15. Projected Supply During Multiple Dry Year Ending in 2010 - AF/Y					
	2006	2007	2008	2009	2010
Supply	31,221	31,221	31,221	31,221	31,221
Projected Normal	97,566	97,566	97,566	97,566	97,566
% of Projected Normal	32%	32%	32%	32%	32%

Table 16. Projected Demand During Multiple Dry Year Ending in 2010 - AF/Y					
	2006	2007	2008	2009	2010
Demand	108,928	112,360	115,791	119,223	122,655
% of Projected Demand	100%	100%	100%	100%	100%

Table 17. Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2010 - AF/Y					
	2006	2007	2008	2009	2010
Supply totals	35,930	35,930	35,930	35,930	35,930
Demand totals	108,928	112,360	115,791	119,223	122,655
Difference (shortfall)	(72,998)	(76,430)	(79,862)	(83,293)	(86,725)
Difference as % Supply	203%	213%	222%	232%	241%
Difference as % Demand	67%	68%	69%	70%	71%

The comparison of the projected probable year supply and demand indicates a shortfall starting in the year 2006. This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

Table 18.					
Projected Supply During Multiple Dry Year Ending in 2015 - AF/Y					
	2011	2012	2013	2014	2015
Supply	32,126	32,126	32,126	32,126	32,126
Projected Normal	100,394	100,394	100,394	100,394	100,394
% of Projected Normal	32%	32%	32%	32%	32%

Table 19.					
Projected Demand During Multiple Dry Year Ending in 2015 - AF/Y					
	2011	2012	2013	2014	2015
Demand	126,777	130,899	135,021	139,143	143,265
% of Projected Demand	100%	100%	100%	100%	100%

Table 20.					
Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2015 - AF/Y					
	2011	2012	2013	2014	2015
Supply totals	35,930	35,930	35,930	35,930	35,930
Demand totals	126,777	130,899	135,021	139,143	143,265
Difference (shortfall)	(90,847)	(94,969)	(99,091)	(103,213)	(107,335)
Difference as % Supply	253%	264%	276%	287%	299%
Difference as % Demand	72%	73%	73%	74%	75%

This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

Table 21.					
Projected Supply During Multiple Dry Year Ending in 2020 - AF/Y					
	2016	2017	2018	2019	2020
Supply	34,997	34,997	34,997	34,997	34,997
Projected Normal	106,050	106,050	106,050	106,050	106,050
% of Projected Normal	33%	33%	33%	33%	33%

Table 22.					
Projected Demand During Multiple Dry Year Ending in 2020 - AF/Y					
	2016	2017	2018	2019	2020
Demand	148,144	153,022	157,901	162,779	167,658
% of Projected Demand	100%	100%	100%	100%	100%

Table 23.					
Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2020 - AF/Y					
	2016	2017	2018	2019	2020
Supply totals	35,930	35,930	35,930	35,930	35,930
Demand totals	148,144	153,022	157,901	162,779	167,658
Difference (shortfall)	(112,214)	(117,092)	(121,971)	(126,850)	(131,728)
Difference as % Supply	312%	326%	339%	353%	367%
Difference as % Demand	76%	77%	77%	78%	79%

This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

Table 24.					
Projected Supply During Multiple Dry Year Ending in 2025 - AF/Y					
	2021	2022	2023	2024	2025
Supply	35,930	35,930	35,930	35,930	35,930
Projected Normal	108,878	108,878	108,878	108,878	108,878
% of Projected Normal	33%	33%	33%	33%	33%

Table 25.					
Projected Demand During Multiple Dry Year Ending in 2025 - AF/Y					
	2021	2022	2023	2024	2025
Demand	173,434	179,211	184,987	190,764	196,540
% of Projected Demand	100%	100%	100%	100%	100%

Table 26.					
Projected Supply & Demand Comparison During Multiple Dry Year Ending in 2025 - AF/Y					
	2021	2022	2023	2024	2025
Supply totals	35,930	35,930	35,930	35,930	35,930
Demand totals	173,434	179,211	184,987	190,764	196,540
Difference (shortfall)	(137,505)	(143,281)	(149,057)	(154,834)	(160,610)
Difference as % Supply	383%	399%	415%	431%	447%
Difference as % Demand	79%	80%	81%	81%	82%

This comparison is based on current usage patterns by the retail purveyors and agriculture users. The short fall in supply does not take into account the reliability of other sources available to water purveyors, such as their use of groundwater, future groundwater banking programs, future conservation efforts, and use of recycled water.

It is up to the purveying customers of AVEK to direct rationing program and policies to their consumers. Therefore, expected changes to demand due to dry years will be provided by the purveying customers. The development and use of other water sources, such as groundwater, conjunctive uses, the use of recycled water, and the storage of Article 21 water when available, are essential measures necessary to meet long-term demands.

9.3.1 Three Year Minimum Water Supply Alert

Based on experiences during reductions of State Water Project water, AVEK recognizes that it is better to enter into a water shortage alert early, to establish necessary programs and policies, to gain public support and participation, and to reduce the likelihood of more severe shortage levels later. Improved water use efficiency does mean that water supply reserves must be larger since water use efficiency improvements will be minimal. Water shortage responses must be made early to prevent severe economic and environmental impacts.

In May of each year, the Agency forecasts the minimum water supply availability for its water, and projects its total water supply for the current and three subsequent years. Based on the water shortage, a water shortage condition may be declared. Because shortages can have serious economic and environmental impacts, the Agency will make every effort to provide accurate predictions of water shortages.

APPENDIX A

- LIST OF GROUPS WHO PARTICIPATED IN THE DEVELOPMENT OF THIS PLAN
- NOTIFICATION LETTER
- FAX/MAILING LIST

List of Groups Who Participated In The Development Of This Plan

AVEK board members and staff
Boyle Engineering Corporation
Retail water purveyor customers
Members of the public, advisory groups, etc

December 8, 2005

Re: **AVEK 2005 URBAN WATER MANAGEMENT PLAN PUBLIC REVIEW DRAFT**

The Antelope Valley-East Kern Water Agency 2005 Urban Water Management Plan will be ready for review on **December 10, 2005**. The plan will be posted on the Agency's website (www.avek.org). The AVEK Board of Directors will be conducting a public hearing on the plan on Tuesday, December 20, 2005, at 7:00 p.m. in the Agency's Board Room.

Please provide any written comments to the Agency by 5:00 p.m. December 20, 2005. Comments should be directed to:

Antelope Valley-East Kern Water Agency
Attn: Michael Flood
6500 West Avenue N
Palmdale, CA 93551

Please contact me at 661-943-3201, or by e-mail at mfavekwa@aol.com, if you have any questions or need additional information.

Sincerely,

Michael Flood
Engineer

UWMP Notification Fax/Mailing List:

City of California City
21000 Hacienda Blvd.
California City, CA 93505
fax: 760-373-7511

Edwards Air Force Base
Mike Keeling, Directorate of Contracting
fax: 275-9656

City of Lancaster
Randy Williams, Public Works
44933 Fern Avenue
Lancaster, CA 93534
fax: 723-6182

Los Angeles County
Department of Public Works
Attn: Dean Efstathiou
P. O. Box 7508
900 S. Fremont Avenue
Alhambra, CA 91802
fax:

City of Palmdale
Attn: Steve Williams
38250 N. Sierra Highway
Palmdale, CA 93550
fax: 661-267-5292

Building Industry Association
Attn: Gretchen
43423 Division Street, Suite 401
Lancaster, CA 93535
fax: 848-6090

Kern County Planning Department
Attn:
1115 Truxtun Avenue
Bakersfield, CA
fax: 868-3485

**2005 AVEK URBAN WATER MANAGEMENT PLAN
NOTIFICATION**

Antelope Valley Country Club
Contact: Martha Whitfield
Fax:(661) 947-5026

Association of Irrigation Water Users
Contact:Jim Payne
Fax:(661) 256-6543

Billiton Exploration U.S.A.
Contact: H. James Sewell
Fax:(281) 544-2238

Biscaichipy Ranch
Contact: Cathy Biscaichipy
Fax:(661) 256-1303

Darik Bolin
40151 Valley View Lane
Leona Valley, CA 93551
Phone:(661) 270-0200

Boron CSD
Contact: Janna Riddle
Fax:(760) 762-6508

Building Industry Association
Contact: Gretchen Gutierrez
Fax: 661-848-6090

David & Marian Caldwell
PO Box 324
Lake Hughes, CA 93532
Contact: David/Marian Caldwell
Phone:(661) 724-9020

California Water Service Co
Antelope Valley District
Contact: Kevin Payne
Fax:661) 722-5720

Daniel C. Castronova M.D.
Contact: Lorraine Ceresino
Fax:(818) 883-5791
City of California City
Contact: City Manager
Fax: 760-373-7511

Dick Clark
Contact: Elaine Clark
Fax:(702) 723-5018

Allan Copeland
Fax:(661) 224-1781

Frank Cosola
Fax:(661) 270-1038

Desert Owl Farm
Contacty: Bill & Sheree Tompkins
Fax: (661) 256-3925

Diamond Farming Company
Contact: Carl Voss
Fax:(661) 845-5248

Desert Lake CSD
Contact: Dollie Kostopoulos
Fax:(760) 762-3161

Desert Sage Apartments
Christopher & Illona Anderson
Fax:(714) 848-4664

Edgemont Acres MWC
Contact: Renee Richey
Fax:(760) 769-4764

Edwards AFB
Contact: Mike Keeling
Directorate of Contracting
Fax: 661-275-9656

Edwards AFB
Contact: Robert Wood
Remedial Project Manager
Fax: 760-241- 7308

El Dorado MWC
Contact: Jeanne Miller
Fax:(661) 947-9701

Earl Jacques
Fax:(661) 270-9225

KJC Operating Company
Contact: Robert Fimbres
Fax:(760) 762-5546

Patrick Kellerman
Fax:(661) 270-0558

Lester Keute

40780 Godde Hill Rd
Palmdale, CA 93551
Contact: Lester Keute
Phone:(661) 943-4293

Lake Elizabeth MWC
Contact: Gayle Roth
Fax:(661) 724-1281

City of Lancaster
Contact: Randy Williams
Fax: 661-723-6182

Landale MWC
(Operated by California Water
Service Co)
PO Box 5808
Lancaster, CA 93539
Contact:John Rogers
Phone: 661-949-0286

Frances Lane
Fax:(661) 270-1305

Frank Lane
Contact: George Lane
Fax:(661) 942-7485

Sidney Liang
See Yu Wu
22090 Wallace Dr
Cupertino, CA 95014
Contact: Sidney Liang/See Yu Wu
Phone: (650) 967-139

Los Angeles County Waterworks Districts
Contact: Dean Efstathiou/Adam Arika
Fax: (626) 300-3385

Los Angeles County Waterworks Districts
Contact: Craig David
Fax: 661-723-7027

Maritorea Farms
Contact: Jose/Marie/Jean Pierre Maritorea
Fax: (661) 833-0327

Terry Milford
PO Box 707
Leona Valley, CA 93551
Phone: (661) 270-0027
Fax:

Keith Miller
7331 West Avenue 0-8
Leona Valley, CA 93551
Phone: (661) 270-1142

Mojave Desert State Parks
Contact: Rhonda Munoz-Andrade
Fax: (661) 940-7327

Mojave Public Utility District
Contact: Bruce Gaines
Fax: (661) 824-2361

Palm Ranch Irrigation District
Contact: Phillip Shott
Fax: (661) 943-8184

City of Palmdale
Contact: Steve Williams
Fax: 661-267-5292

Peachland Farms
Contact: Bill Cole
Fax: (661) 724-1656

Peter Rabbit Farms
Contact: Steve Powell
85-810 Grapefruit Blvd
Coachella, CA 92236
Phone: (760) 578-0593

Quartz Hill Water District
Contact: David Meraz
Fax:(661) 943-0457

Rancho Colima MBA
6353 Elizabeth Lake Rd
Leona Valley, CA 93551
Contact: Windsor Taunton
Phone:(661) 270-1638

SD Management
8057 Elizabeth Lake Rd
Leona Valley, CA 93551
Contact: Doug Pulsipher
Phone:(661) 270-1630
Fax:

Scattaglia Farms LLC
Contact: Denise Scattaglia
Fax:(661) 944-5790

Shadow Acres MWC
Contact: Jeanne Miller
Fax:(661) 947-9701

SonRise Farms
Calandri/SonRise Farms, LP
Contact: John A. Calandri
Fax:(661) 945-2930

Gary Shafer
Fax:(661) 943-0053

Sunnyside Farms MWC
Contact: Jeanne Miller
Fax:(661) 947-9701

Tapia Brothers
6908 Decelis Place
Van Nuys, CA 91406
Contact: Felix Tapia
Phone:(818) 787-4358

Rancho Vista Development/Golf Course
Contact: Roy Migita
Fax:(661) 265-9896

Rosamond CSD
Contact: Sheri Delano
Fax:(661) 256-2557

Tejon Ranch
Contact: Dennis Atkinson
Fax:(661) 248-3400

US Borax

Contact: Mark Severson

Fax:(760) 762-7531

Van Dam Farms

Contact: Craig Van Dam

Fax:(661) 946-6933

Westside Park MWC

Contact: Phil Wood

Fax:(661) 266-7938

White Fence Farms MWC

Contact: Dotty Jernigan

Fax:(661) 943-3576

White Fence Farms MWC #3

Contact: Frank Anley

Fax:(661) 266-8850

APPENDIX B

- **RESOLUTION TO ADOPT THE URBAN WATER MANAGEMENT PLAN**
- **RESOLUTION TO ADOPT WATER SHORTAGE CONTINGENCY PLAN**

ANTELOPE VALLEY-EAST KERN WATER AGENCY
RESOLUTION NO. R-05-34
TO ADOPT THE URBAN WATER MANAGEMENT PLAN

The Board of Directors of the Antelope Valley-East Kern Water Agency (“AVEK”) do hereby resolve as follows:

I
RECITALS

WHEREAS, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK’s powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the “AVEK Enabling Act”); and

WHEREAS, AVEK’s jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Appendix E in the 2005 Urban Water Management Plan (“AVEK’s Jurisdictional Boundaries”); and

WHEREAS, AVEK was formed for the purpose of providing water received from the State Water Project (“SWP”) as a supplemental source of water to retail water purveyors and other water interests within AVEK’s Jurisdictional Boundaries on a wholesale basis; and

WHEREAS, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources (“DWR”), which operates the SWP, in order for AVEK to receive water from the SWP (“SWP Water”); and

WHEREAS, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK’s Jurisdictional Boundaries that govern AVEK’s delivery of SWP Water to those purveyors and other water interests (the “AVEK’s Water Supply Contracts”). Article 19 in those contracts provide that “substantial uniformity” in those contracts is “desirable” and that AVEK will “attempt to maintain such uniformity” between such contracts; and

WHEREAS, AVEK does not provide SWP Water directly to any person or entity for domestic or municipal purposes; and

WHEREAS, AVEK does not own or operate any facilities that can produce reclaimed water or native groundwater from any area in AVEK's Jurisdictional Boundaries, and neither does AVEK possess any contractual right or matured water right to produce such waters; and

WHEREAS, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.* ("UWMP Act"), mandates that every supplier providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre feet of water annually, prepare an Urban Water Management Plan; and

WHEREAS, the UWMP Act further provides that such plans shall be periodically reviewed and updated by the supplier once every five years no later than December 31st of each calendar year ending in zero and five; and

WHEREAS, AVEK has circulated drafts of its proposed 2005 Urban Water Management Plan ("2005 UWMP") to the public for review and comment; and

WHEREAS, AVEK's Board of Directors ("AVEK Board") held duly noticed public hearings on its proposed 2005 UWMP on November 15, 2005 and December 20, 2005; and

WHEREAS, the AVEK Board received and considered written and verbal testimony and evidence from the public and others concerning its proposed 2005 UWMP; and

WHEREAS, AVEK retained technical and legal consultants to provide expert assistance concerning its 2005 UWMP; and

WHEREAS, AVEK has adopted Resolution No. 05-_____ that adopts a water shortage contingency plan.

II. FINDINGS

THEREFORE, AVEK finds as follows:

1. AVEK's 2005 UWMP complies with all applicable laws and regulations, including but not limited to the UWMP Act, the AVEK Enabling Act, and the Guidebook To Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan issued by the DWR and dated as of January 18, 2005.

2. AVEK's 2005 UWMP is consistent with the intent and terms of the AVEK's Water Supply Agreements.

3. The AVEK Board's adoption of the 2005 UWMP is supported by substantial evidence, which evidence is contained in the administrative record received by the AVEK Board for this matter.

4. Each of the recitals contained in this Resolution is approved as a finding of fact.

**III.
ADOPTION OF 2005 UWMP**

THEREFORE, be it resolved and ordained by the AVEK Board as follows:

1. The 2005 UWMP is approved and adopted. The President of the AVEK Board authorized and directed to file the 2005 UWMP with the entities specified in the UWMP Act by the dates specified therein.

ADOPTED this 20 day of December, 2005, by the following vote:

AYES: 6 NOES: 0 ABSENT: 1 ABSTAIN: 0

ATTEST:



Agency Secretary

Approved as to Form and Legality:



AVEK Special Counsel

ANTELOPE VALLEY-EAST KERN WATER AGENCY
RESOLUTION NO. 05-33
TO ADOPT A WATER SHORTAGE CONTINGENCY PLAN

The Board of Directors of the Antelope Valley-East Kern Water Agency ("AVEK") do hereby resolve as follows:

I.
RECITALS

WHEREAS, the Antelope Valley-East Kern Water Agency was formed in 1959 by an act of the State Legislature. AVEK's powers, duties, authorities and other matters are set forth in its enabling act, which is codified at California Water Code, Uncodified Acts, Act 9095 (the "AVEK Enabling Act"); and

WHEREAS, AVEK's jurisdictional boundaries cover portions of three counties, Los Angeles, Ventura County and Kern County, and is more particularly described in Appendix E in the 2005 Urban Water Management Plan ("AVEK's Jurisdictional Boundaries"); and

WHEREAS, AVEK was formed for the purpose of providing water received from the State Water Project ("SWP") as a supplemental source of water to retail water purveyors and other water interests within AVEK's Jurisdictional Boundaries on a wholesale basis; and

WHEREAS, in order to effectuate the above-referenced purpose, AVEK, among other things, entered into a contract with the Department of Water Resources ("DWR"), which operates the SWP, in order for AVEK to receive water from the SWP ("SWP Water"); and

WHEREAS, AVEK has entered into contracts with various retail purveyors and other water interests in AVEK's Jurisdictional Boundaries that govern AVEK's delivery of SWP Water to those purveyors and other water interests (the "AVEK's Water Supply Contracts"). Article 19 in those contracts provide that "substantial uniformity" in those contracts is "desirable" and that AVEK will "attempt to maintain such uniformity" between such contracts; and

WHEREAS, AVEK does not provide SWP Water directly to any person or entity for domestic or municipal purposes; and

WHEREAS, AVEK does not own or operate any facilities that can produce reclaimed water or native groundwater from any area in AVEK's Jurisdictional Boundaries, and neither does AVEK possess any contractual right or matured water right to produce such waters; and

WHEREAS, the Urban Water Management Planning Act, California Water Code Section 10610 *et seq.* ("UWMP Act") provides that urban water management plans shall include a resolution or ordinance by the supplier that sets forth a water shortage contingency plan; and

WHEREAS, Section 61.1 of the AVEK Enabling Act sets forth guiding principles for AVEK's distribution of SWP Water, which principles can be drawn upon in allocating such water in times of shortage (the provisions of Section 61.1 of the AVEK Enabling Act are set forth in Exhibit A to this Resolution); and

WHEREAS, real property related taxes have been paid to AVEK since 1959 by entities in AVEK's Jurisdictional Boundaries.

WHEREAS, AVEK has circulated drafts of its proposed 2005 UWMP and the water shortage contingency plan set forth in this Resolution ("WSC Plan") to the public for review and comment; and

WHEREAS, AVEK's Board of Directors ("AVEK Board") held duly noticed public hearings on its proposed 2005 UWMP on November 15, 2005 and December 20, 2005 and a public meeting on the WSC Plan on December 20, 2005; and

WHEREAS, the AVEK Board received written and verbal testimony and evidence from the public and others concerning its proposed 2005 UWMP and WSC Plan.

**II.
FINDINGS**

THEREFORE, AVEK finds as follows:

1. AVEK finds that there is a need to adopt a water shortage contingency plan given, among other things, the requirements of the UWMP Act and the potential that the amount of SWP Water made available to AVEK by DWR may not satisfy the demands for SWP Water by AVEK's customers (even though such demand for SWP Water has only exceeded the available supply of SWP Water once since AVEK was formed).

2. The WSC Plan complies with all applicable laws and regulations, including but not limited to the UWMP Act, the AVEK Enabling Act, and the Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan issued by the DWR and dated as of January 18, 2005.

3. AVEK finds that the WSC Plan is fair and equitable.

4. The WSC Plan is consistent with the intent and terms of the AVEK's Water Supply Agreements and the AVEK Enabling Act.

5. Each of the recitals contained in this Resolution is approved as a finding of fact.

**III.
ADOPTION OF WATER SHORTAGE CONTINGENCY PLAN**

THEREFORE, be it resolved and ordained by the AVEK Board as follows:

1. AVEK adopts a WSC Plan that would be implemented when the aggregate amount of SWP Water reasonably ordered by AVEK's customers in any water year exceeds the amount of SWP Water that DWR makes available to AVEK on that same water year (a "SWP Water Shortage Year"). When that contingency occurs (which contingency will be deemed to occur under both stages listed in Appendix 1 hereto), AVEK plans to allocate that amount of available SWP Water as follows:

(a) The available SWP Water shall first be allocated per each county (the "County Allocation of SWP Water") in AVEK's Jurisdictional Boundaries based on a running historical average of the amount of taxes paid to AVEK by entities in each particular county since the formation of AVEK in 1959. (Attached as Exhibit B to this Resolution is the historical amount of such taxes paid by county through June 30, 2005.) AVEK shall annually update and publish that running historical average of taxes paid to AVEK by county.

(b) Each County's Allocation of SWP Water shall be further allocated to each AVEK customer within that particular county based on its average annual percentage of SWP Water received in the two water years prior to the SWP Water Shortage Year relative to the amount of SWP Water received by all other AVEK customers in that particular county in those two prior water years. (For illustrative purposes, attached as Exhibit C to this Resolution is a list of such relative percentages by AVEK customers by county for 2004.)

(c) In determining the amount of SWP Water that should be delivered by AVEK to any customer in any SWP Water Shortage Year, AVEK will fill orders for SWP Water that will be used by the AVEK customer(s) for consumptive or agricultural uses in that same water year prior to filling any order for SWP Water that would be used by an AVEK customer for banking or storage purposes.

(d) AVEK reserves the right to allocate SWP Water that it receives from DWR in a SWP Water Shortage Year in a manner that differs from the provisions of this WSC Plan based on a finding by the AVEK Board of unique or unusual circumstances or needs.

EXHIBIT A

§ 61.1 Distribution and apportionment of water purchased from State, etc.

The agency shall whenever practicable, distribute and apportion the water purchased from the State of California or water obtained from any other source as equitably as possible on the basis of total payment by a district or geographical area within the agency regardless of its present status, of taxes, in relation that such payment bears to the total taxes and assessments collected from all other areas.

It is the intent of this section to assure each area or district its fair share of water based upon the amounts paid into the agency, as they bear relation to the total amount collected by the agency.

EXHIBIT B

**AVEK Water Agency
Taxes Collected from Inception through 06/30/05****

Description	Los Angeles City	Kern City	Ventura County	TOTALS
	Taxes collected by Fiscal Year	Taxes collected by Fiscal Year	Taxes collected by Fiscal Year	
FYE 06/30/1961	58,306.62	20,846.13		79,152.82
FYE 06/30/1962	55,138.24	19,372.80		74,511.14
FYE 06/30/1963	156,220.27	53,906.15		210,126.42
FYE 06/30/1964	221,396.82	81,444.27		302,841.09
FYE 06/30/1965	174,560.83	69,836.70		244,396.63
FYE 06/30/1966	195,498.90	97,105.93		292,604.83
FYE 06/30/1967	417,054.54	234,820.40		651,876.69
FYE 06/30/1968	787,195.00	371,132.00	201.75	1,161,398.00
FYE 06/30/1969	969,673.00	398,253.00	3,319.00	1,369,246.00
FYE 06/30/1970	1,227,682.00	547,984.00	4,642.00	1,780,268.00
FYE 06/30/1971	1,233,111.00	600,115.00	3,555.00	1,836,781.00
FYE 06/30/1972	1,825,460.00	854,408.00	4,560.00	2,684,426.00
FYE 06/30/1973	1,948,501.00	862,026.00	2,512.00	2,813,039.00
FYE 06/30/1974	2,047,566.00	808,490.00	2,309.00	2,856,365.00
FYE 06/30/1975	2,586,924.00	890,533.00	9,396.00	3,486,853.00
FYE 06/30/1976	2,029,787.00	862,576.00	3,921.00	2,896,284.00
FYE 06/30/1977	1,720,809.00	721,466.00	3,770.00	2,446,045.00
FYE 06/30/1978	1,607,785.00	774,212.00	5,121.00	2,387,118.00
FYE 06/30/1979	1,784,843.00	997,363.00	3,663.00	2,785,669.00
FYE 06/30/1980	4,171,081.00	592,189.00	3,511.00	5,066,781.00
FYE 06/30/1981	4,995,491.00	1,351,056.00	4,634.00	6,351,381.00
FYE 06/30/1982	3,115,486.00	1,222,927.00	6,544.00	4,344,957.00
FYE 06/30/1983	4,311,370.00	1,722,635.00	8,196.00	6,042,201.00
FYE 06/30/1984	5,609,680.00	1,501,127.00	4,279.00	7,115,086.00
FYE 06/30/1985	9,709,574.00	3,575,437.00	18,208.00	13,303,219.00
FYE 06/30/1986	12,776,020.00	3,693,507.00	13,154.00	16,422,681.00
FYE 06/30/1987	12,730,936.00	3,073,226.00	10,787.00	15,814,931.00
FYE 06/30/1988	12,076,802.00	2,805,666.00	5,427.00	14,887,895.00
FYE 06/30/1989	13,700,834.00	2,826,709.00	48,066.00	16,677,409.00
FYE 06/30/1990	16,387,050.00	2,924,143.00	3,959.00	19,315,153.00
FYE 06/30/1991	14,757,446.00	3,235,690.00	0	17,994,136.00
FYE 06/30/1992	14,730,588.00	2,987,854.00	722.00	17,719,164.00
FYE 06/30/1993	14,795,789.00	2,895,327.00	722.00	17,691,838.00
FYE 06/30/1994	10,374,626.00	2,405,372.00	732.00	12,783,630.00
FYE 06/30/1995	11,757,693.00	2,215,878.00	747.00	13,974,218.00
FYE 06/30/1996	11,705,148.00	1,445,898.00	730.00	13,151,776.00
FYE 06/30/1997	9,076,884.00	1,843,601.00	721.00	10,923,206.00
FYE 06/30/1998	10,297,808.00	1,890,125.00	734.00	12,188,667.00
FYE 06/30/1999	8,893,825.00	2,623,064.00	674.00	11,517,563.00
FYE 06/30/2000	15,587,806.00	2,094,870.00	678.00	17,783,352.00
FYE 06/30/2001	10,233,359.00	2,184,558.00	685.00	12,418,602.00
FYE 06/30/2002	10,096,249.00	2,069,703.00	353.00	12,166,305.00
FYE 06/30/2003	10,853,001.00	3,394,512.00	269.00	14,247,782.00
FYE 06/30/2004	12,011,832.00	1,987,130.00	280.00	13,999,242.00
FYE 06/30/2005	12,275,847.00	2,290,256.00	0.00	14,566,102.00
	296,323,247.39	70,480,127.48	185,016.75	366,968,391.62

EXHIBIT C

Kern County	%
Billiton Exploration U.S.A.	0.24
Boron CSD	4.66
City of California City	9.88
Desert Lake CSD	1.47
Desert Sage Apartments	0.09
Edgemont Acres MWC	0.31
Edwards AFB	37.79
Mojave Public Utility District	1.01
Rosamond CSD	17.88
US Borax	26.67

Los Angeles County	%
Antelope Valley Country Club	0.35
California Water Service Co	0.58
Landale MWC	0.13
Los Angeles County Waterworks Districts	84.98
Palm Ranch Irrigation District	0.71
Quartz Hill Water District	8.42
Shadow Acres MWC	0.61
Sunnyside Farms MWC	0.59
White Fence Farms MWC	1.71
Lake Elizabeth MWC	1.91

Appendix 1 to the Water Shortage Contingency Plan

Water Supply Shortage Stages and Conditions

Stage No.	Water Supply Conditions	% Shortage
1	Reduction in SWP Allocation Below Current Demand	1 %
2	Reduction in SWP Allocation Below Current Demand	50%

APPENDIX C

RATE STABILIZATION FUND DISCUSSION

The Agency uses as its rate stabilization fund the Agency's reserve fund to stabilize rates during periods of water shortages or disasters affecting water supply.

Appendix D

WATER SUPPLY CAPACITY CHARGE IMPROVEMENTS

Proposed Expansions

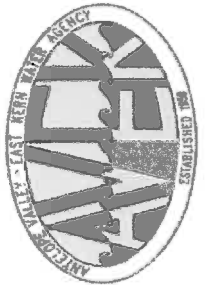
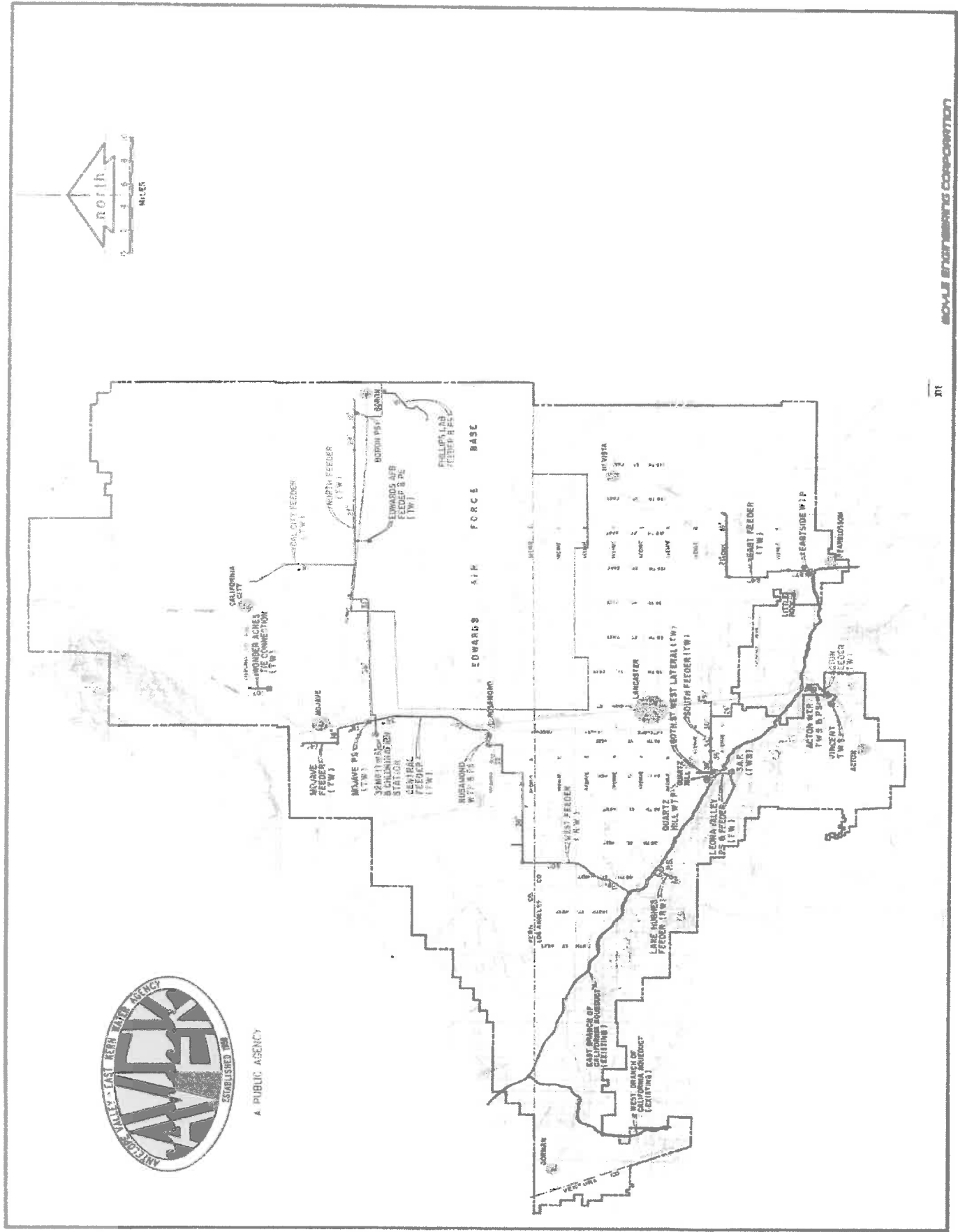
Eastside WTP (10 mgd to 25 mgd)
QHWTP (Phase I – 9 MG reservoirs)
QHWTP (Phase II – second 9 MG reservoirs)
Acton WTP (4 mgd to 8 mgd)
Rosamond WTP (4 mgd to 8 mgd)
Westside Water Treatment Plant #1 (15 mgd)
Westside Water Treatment Plant #2 (3 mgd)
East Feeder/South Feeder – Interconnect Pipeline
East Feeder/South Feeder – Interconnect Pump Station
Mojave Pump Station Addition
South Feeder Parallel Pipeline (Phase II)
QHWTP/Westside WTP #1 – Interconnect Pipeline
QHWTP/Westside WTP #2 – Interconnect Pump Station
Westside WTP I Feeder Pipeline
West WTP I Feeder Pump Station
East Feeder Parallel Pipeline
Lake Hughes Feeder Parallel Pipeline
Lake Hughes Feeder Pump Station
Leona Valley Feeder Parallel Pipeline
Leona Valley Feeder Pump Station
QHWTP/RWTP Intercon. Pipeline
QHWTP/RWTP Intercon. Pump Station
Area Raw Water Turnouts, Pipelines and Basin Inlets
North Feeder Pump Station
QHWTP (65 mgd to 90 mgd and ozone)

Abbreviation Legend"

QH = Quartz Hill, R = Rosamond, WTP = Water Treatment Plant

Appendix E

LOCATION MAP



A PUBLIC AGENCY

Appendix F

- **MAP OF SWP**
- **WATER DELIVERIES TO AVEK**
- **TABLES B-8 AND B-9 / SWP RELIABILITY DATA**

AVEK's Historical SWP Deliveries

Year	Ac-Ft
1962	0
1963	0
1964	0
1965	0
1966	0
1967	0
1968	0
1969	0
1970	0
1971	0
1972	53
1973	20
1974	1,259
1975	8,068
1976	27,782
1977	11,202
1978	33,137
1979	60,493
1980	72,407
1981	79,375
1982	50,291
1983	32,961
1984	32,662
1985	37,064
1986	32,449
1987	33,875
1988	34,079
1989	45,191
1990	47,206
1991	7,568
1992	28,041
1993	41,452
1994	47,663
1995	47,286
1996	56,356
1997	61,752
1998	52,926
1999	69,073
2000	84,016
2001	63,508
2002	59,888
2003	61,162
2004	61,252
2005	58,000*

*estimated

Internal Working Draft

Attachment 1

**Excerpts from Working Draft of
2005 State Water Project Delivery
Reliability Report**

May 2005

Table B-8 SWP Water Delivery from Deltas for Study 6 (maf)

Year	Model variable Table A demand	Model Table A delivery	Percent of full Table A - 4.112 maf	Model Article 21 supply
1922	3,750	3,743	91%	104
1923	3,261	3,251	79%	106
1924	3,489	1,244	30%	0
1925	3,353	1,670	48%	0
1926	3,393	2,981	72%	64
1927	3,660	3,646	93%	213
1928	3,458	3,384	82%	134
1929	2,907	1,108	27%	0
1930	3,326	2,855	89%	117
1931	2,833	1,018	28%	0
1932	3,139	1,406	34%	242
1933	3,427	1,330	32%	512
1934	3,470	1,541	37%	208
1935	3,798	3,799	92%	229
1936	3,596	3,573	87%	0
1937	3,482	3,362	82%	80
1938	3,344	3,344	81%	714
1939	3,262	3,262	79%	349
1940	3,239	3,219	78%	154
1941	2,526	2,527	81%	246
1942	3,167	3,167	77%	818
1943	3,104	3,104	75%	623
1944	3,080	3,081	75%	0
1945	3,112	3,101	75%	359
1946	3,215	3,215	78%	249
1947	3,422	3,292	80%	0
1948	3,395	2,942	72%	0
1949	3,313	2,284	65%	0
1950	3,465	3,199	78%	0
1951	3,497	3,487	85%	388
1952	2,685	2,688	63%	275
1953	3,323	3,323	81%	513
1954	3,294	3,294	80%	523
1955	3,226	2,207	64%	0
1956	3,691	3,686	87%	324
1957	3,235	3,235	79%	257
1958	2,980	2,980	72%	1,106
1959	3,547	3,480	85%	386
1960	3,555	1,665	45%	0
1961	3,580	2,669	65%	87
1962	3,660	3,262	78%	0
1963	3,823	3,818	93%	202
1964	3,492	3,323	81%	0
1965	3,059	3,059	74%	177
1966	3,282	3,282	80%	516
1967	2,950	2,946	72%	823
1968	3,324	3,329	81%	552
1969	2,636	2,632	64%	275
1970	3,257	3,257	79%	552
1971	3,341	3,341	81%	0
1972	3,457	3,342	81%	414
1973	3,097	3,092	75%	384
1974	3,184	3,184	77%	854
1975	3,229	3,229	79%	903
1976	3,471	3,285	79%	189
1977	3,421	199	4%	0
1978	3,823	3,803	88%	300
1979	3,512	3,501	89%	160
1980	2,715	2,709	88%	136
1981	3,358	3,358	82%	446
1982	2,890	2,890	70%	901
1983	2,487	2,488	61%	400
1984	3,227	2,766	67%	552
1985	3,214	3,214	78%	0
1986	2,321	2,297	56%	120
1987	2,896	2,896	70%	546
1988	2,967	856	21%	0
1989	3,551	3,174	77%	0
1990	3,628	1,099	27%	0
1991	3,425	1,052	26%	0
1992	3,366	1,426	38%	0
1993	3,862	3,848	94%	159
1994	3,689	3,306	80%	0
Average	3,290	2,818	80%	262
Maximum	3,862	3,848	94%	1,106
Minimum	2,321	199	4%	0

Table B-9 SWP Water Delivery from Delta for Study 7 (caf)

Year	Model variable Table A demand	Model Table A delivery	Percent of full Table A - 4,133 mwf	Model Article 21 supply
1922	4,133	4,133	100%	21
1923	4,133	4,133	100%	0
1924	4,133	982	9%	0
1925	4,133	1,491	36%	190
1926	4,133	2,721	66%	279
1927	4,133	4,133	100%	301
1928	4,133	3,379	82%	0
1929	4,133	1,118	27%	0
1930	4,133	2,738	66%	141
1931	4,133	1,072	26%	0
1932	4,133	1,572	38%	112
1933	4,133	1,337	32%	547
1934	4,133	1,471	36%	242
1935	4,133	4,081	99%	218
1936	4,133	3,729	90%	0
1937	4,133	3,389	82%	70
1938	4,133	4,133	100%	200
1939	4,133	3,450	83%	0
1940	4,133	4,116	100%	114
1941	3,898	3,908	95%	0
1942	4,133	4,133	100%	123
1943	4,133	3,787	92%	497
1944	4,133	3,542	86%	0
1945	4,133	3,899	94%	118
1946	4,133	3,828	93%	0
1947	4,133	2,771	67%	0
1948	4,133	2,940	71%	0
1949	4,133	2,025	49%	0
1950	4,133	3,400	82%	0
1951	4,133	4,133	100%	252
1952	3,898	3,912	95%	0
1953	4,133	4,133	100%	298
1954	4,133	4,133	100%	0
1955	4,133	1,505	36%	0
1956	4,133	4,133	100%	332
1957	4,133	3,585	87%	0
1958	4,133	4,133	100%	229
1959	4,133	3,787	92%	107
1960	4,133	1,607	39%	0
1961	4,133	2,712	66%	298
1962	4,133	3,311	80%	1
1963	4,133	4,133	100%	161
1964	4,133	2,889	70%	0
1965	4,133	3,485	84%	47
1966	4,133	4,133	100%	178
1967	4,133	4,133	100%	157
1968	4,133	3,797	92%	485
1969	3,898	3,910	95%	63
1970	4,133	4,122	100%	493
1971	4,133	4,133	100%	0
1972	4,133	2,721	66%	0
1973	4,133	4,032	98%	259
1974	4,133	4,133	100%	69
1975	4,133	4,133	100%	134
1976	4,133	3,137	76%	0
1977	4,133	187	5%	0
1978	3,898	3,902	94%	300
1979	4,133	3,773	91%	144
1980	3,898	3,513	85%	86
1981	4,133	3,797	92%	71
1982	4,133	4,133	100%	171
1983	3,898	3,909	95%	357
1984	4,133	4,133	100%	490
1985	4,133	3,413	83%	0
1986	3,898	2,857	74%	63
1987	4,133	3,307	80%	183
1988	4,133	423	10%	0
1989	4,133	3,513	85%	91
1990	4,133	955	23%	0
1991	4,133	850	21%	0
1992	4,133	1,481	36%	102
1993	4,133	4,133	100%	255
1994	4,133	3,153	76%	0
Average	4,110	3,178	77%	124
Maximum	4,133	4,133	100%	547
Minimum	3,898	187	5%	0

Appendix G

- **UWMP CONTACTED AGENCIES LIST**
- **AVEK TREATED M&I CUSTOMER LIST**

UWMP Contacted Agencies/AVEK M&I Customers:

City of California City
21000 Hacienda Blvd.
California City, CA 93505
fax: 760-373-7511

Edwards Air Force Base
Mike Keeling, Directorate of Contracting
fax: 275-9656

City of Lancaster
Randy Williams, Public Works
44933 Fern Avenue
Lancaster, CA 93534
fax: 723-6182

Los Angeles County
Department of Public Works
Attn: Dean Efstathiou
P. O. Box 7508
900 S. Fremont Avenue
Alhambra, CA 91802
fax:

City of Palmdale
Attn: Steve Williams
38250 N. Sierra Highway
Palmdale, CA 93550
fax: 661-267-5292

Building Industry Association
Attn: Gretchen
43423 Division Street, Suite 401
Lancaster, CA 93535
fax: 848-6090

Kern County Planning Department
Attn:
1115 Truxtun Avenue
Bakersfield, CA
fax: 868-3485

Billiton Exploration U.S.A.

PO Box 576
Room 4156
Houston, TX 77001-0576

Billing

Contact: H. James Sewell
Phone: (281) 544-2807
Fax: (281) 544-2238
E-mail: Jim.Sewell@shell.com

Emergency

Contact 1: H. James Sewell
Day Phone: (281) 544-2807
Night Phone: (281) 731-3287
Contact 2: Ken Tweedt
Day Phone: (661) 824-9404
Night Phone: (661) 824-9232

Boron CSD

(Treated/M&I)

PO Box 1060
Boron, CA 93596

Billing

Contact: Janna Riddle
Phone: (760) 762-6127
Cell: (760) 559-1224
Fax: (760) 762-6508
E-mail: bcsd@ccis.com

Emergency

Contact 1: Russell Terrill
Day Phone: (760) 250-3270
Night Phone: (760) 762-6795
Contact 2: Pete Lopez
Day Phone: (760) 250-3271
Night Phone: (760) 250-3271

Department of Health Services

System #: 1510002
Contact Person: James Stites
Phone: (661) 335-7315

City of California City
21000 Hacienda Blvd
California City, CA 93505
Billing

(Treated/M&I)

Contact:
Phone: (760) 373-8696
Fax:
E-mail:

Emergency

Contact 1:
Day Phone:
Night Phone:
Contact 2:
Day Phone:
Night Phone:

Department of Health Services

System #:
Contact Person:
Phone:

Desert Lake CSD
PO Box 567
Boron, CA 93596
Billing

(Treated/M&I)

Contact: Dollie Kostopoulos
Phone: (760) 762-5349
Fax: (760) 762-3161
E-mail: dimples@ccis.com

Emergency

Contact 1: Dollie Kostopoulos
Day Phone: (760) 403-0012
Night Phone: (760) 762-5786
Contact 2: Deanna Lone
Day Phone: (760) 762-5349
Night Phone: (760) 762-5365

Department of Health Services

System #: 1510027
Contact Person: James Stites
Phone: (661) 335-7315

Desert Sage Apartments

(Treated/M&I)

Rick Nishimura
1101 Salisbury
La Canada, Ca. 91011

Billing

Contact: Rick Nishimura
Phone: (818) 720-6042
Fax: (818) 790-9973
E-mail:

Emergency

Contact 1: Rick Nishimura
Day Phone: (818) 720-6042
Night Phone: (818) 720-6042
Contact 2:
Day Phone:
Night Phone:

Edgemont Acres MWC

(Treated/M&I)

PO Box 966
North Edwards, CA 93523-0966

Billing

Contact: Renee Richey
Phone: (760) 769-4764
Fax: (760) 769-4764
E-mail: eamwc@ccis.com

Emergency

Contact 1: Ray Young
Day Phone: (760) 769-4166
Night Phone:
E-mail: ryoung@ccis.com
Contact 2: Bruce White
Day Phone: (760) 769-4754
Night Phone:

Department of Health Services

System #: 1500290
Contact Person:
Phone:

Edwards AFB (Main Base)

(Treated/M&I)

95 CEG/CERF – Main Base Water Delivery

225 N. Rosamond Blvd

Building 3500

Edwards AFB, CA 93524-8540

Billing

Contact:

Phone: (661) 277-4927

Fax:

E-mail:

Emergency

Contact 1:

Day Phone:

Night Phone:

E-mail:

Contact 2:

Day Phone:

Night Phone:

Department of Health Services

System #:

Contact Person:

Phone:

Edwards AFB (Phillips Lab)

(Treated/M&I)

95 CEG/CERF – Propulsion Lab Water

225 N. Rosamond Blvd

Building 3500

Edwards AFB, CA 93524-8540

Billing

Contact:

Phone: (661) 277-4927

Fax:

E-mail:

Emergency

Contact 1:

Day Phone:

Night Phone:

E-mail:

Contact 2:

Day Phone:

Night Phone:

Department of Health Services

System #:

Contact Person:

Phone:

FPL Energy
41100 Highway 395
Boron, CA 93516
Billing

(Treated/M&I)

Contact: Janis Hill
Phone: (760) 762-5562 x300
Fax: (760) 762-5546
E-mail: rfimbres@kjcsolar.com

Emergency

Contact 1: Robert Fimbres
Day Phone: (760) 762-5562 x300
Night Phone: (760) 964-9854
Contact 2: Mike Roberson
Day Phone: (760) 762-5562 x375
Night Phone: (760) 964-4334

Mojave Public Utility District
15844 K Street
Mojave, CA 93501
Billing

(Treated/M&I)

Contact: Carol Pridgen
Phone: (661) 824-4161
Fax: (661) 824-2361
E-mail:

Emergency

Contact 1: Bruce Gaines
Day Phone: (661) 824-4161
Night Phone: (661) 824-0529
Contact 2: Bee Coy
Day Phone: (661) 824-4262
Night Phone: (661) 824-2435

Department of Health Services

System #: 1510014
Contact Person: James Stites
Phone: (661) 335-7315

Rosamond CSD

(Treated/M&I)

2700 20th Street West
Rosamond, CA 93560**Billing**Contact: Toni Welsh
Phone: (661) 256-3411
Fax: (661) 256-2557
E-mail: twelsh@qnet.com**Emergency**Contact 1: Juan DeLaRosa
Day Phone: (661) 256-3411
Night Phone:
Contact 2: Sherry DeLano
Day Phone: (661) 256-3411
Night Phone:**Department of Health Services**System #: 1510018
Contact Person: Jesse DHaLiwal
Phone: (661) 335-7318**US Borax**

(Treated/M&I)

14486 Borax Rd
Boron, CA 93516**Billing**Contact: Mark Severson
Phone: (760) 762-7462
Fax: (760) 762-7531
E-mail: mark.severson@borax.com**Emergency**Contact 1: Chuck Amento
Day Phone: (760) 762-7353
Night Phone: (760) 559-4327
Contact 2: Suresh Rajapakse
Day Phone: (760) 762-7053
Night Phone: (760) 447-9766

SOUTH FEEDER

Antelope Valley Country Club

(Treated/M&I)

39800 Country Club Dr

Palmdale, CA 93551

Billing

Contact: Martha Whitfield
Phone: (661) 947-3142 x13
Fax: (661) 947-5026
E-mail:

Emergency

Contact 1: Buzz Barker
Day Phone: (661) 810-0313
Night Phone: (760) 373-8234
Contact 2: Steve Applegate
Day Phone: (661) 947-3142 x15
Night Phone: (661) 949-0657

California Water Service Co

(Treated/M&I)

Antelope Valley District

5015 West Avenue L-14

Quartz Hill, CA 93536

Billing

Contact:
Phone: (661) 943-9001
Fax: (661) 722-5720
E-mail:

Emergency

Contact 1: Kevin Payne
Day Phone: (661) 943-9001
Night Phone: (661) 400-9403
Contact 2: Jose Ojeda
Day Phone: (661) 943-9001
Night Phone: (661) 400-9404

Department of Health Services

System #: 1910243
Contact Person: Steve Sung
Phone: (213) 580-5723

El Dorado MWC
PO Box 900519
Palmdale, CA 93590
Billing

(Treated/M&I)

Contact: Jeanne Miller
Phone: (661) 947-3255
Fax: (661) 947-9701
E-mail: sprung@antele.net

Emergency

Contact 1: Steve Sprunger
Day Phone: (661) 266-6233
Night Phone: (661) 273-4059
Contact 2: Murry Sprunger
Day Phone: (661) 947-8189
Night Phone: (661) 947-8189

Department of Health Services

System #: 1900803
Contact Person: Teymoori
Phone: (213) 580-5746

Landale MWC (Operated by California Water Service Co) (Treated/M&I)
PO Box 5808
Lancaster, CA 93539

Billing

Contact: John Rogers (Landale MWC)
Phone:
Fax:
E-mail:

Emergency

Contact 1: Kevin Payne (California Water Service Co)
Day Phone: (661) 943-9001
Night Phone: (661) 400-9403
Contact 2: Jose Ojeda (California Water Service Co)
Day Phone: (661) 943-9001
Night Phone: (661) 400-9404

Department of Health Services

System #:
Contact Person:
Phone:

Los Angeles County Waterworks Districts (Treated/M&I)

PO Box 7508

Alhambra, CA 91802-7508

Billing

Contact: Rami Gindi
Phone: (626) 300-3357
Fax: (626) 300-3385
E-mail: rgindi@ladpw.org

Emergency

Contact 1: Craig David
Day Phone: (661) 886-1673
Night Phone:
Contact 2: Ken Rosander
Day Phone: (661) 400-3835
Night Phone: (661) 722-4099
Contact 3: Adam Arriki
Day Phone:
Night Phone:

Department of Health Services

System #: 1910070 (4-50,4-53,4-56,4-59,4-66,4-70,4-71,34-7, 34-9)
Contact Person: James Ko
Phone: (213) 977-6808

Palm Ranch Irrigation District

(Treated/M&I)

42116 50th Street West, Suite D

Quartz Hill, CA 93536

Billing

Contact: Phillip Shott
Phone: (661) 943-2469
Fax: (661) 943-8184
E-mail: pranch7314@aol.com

Emergency

Contact 1: Phillip Shott
Day Phone: (661) 943-2469
Night Phone: (661) 266-9894
Cell Phone: (661) 810-6488
Contact 2: Pete Tuculet
Day Phone: (661) 943-2469
Night Phone: (661) 723-7894
Cell Phone: (661) 810-5712

Department of Health Services

System #: 1910103
Contact Person: Grazyna Newton
Phone: (213) 580-5714 / (818) 349-7960

Quartz Hill Water District

(Treated/M&I)

PO Box 3218
Quartz Hill, CA 93586
Billing

Contact: Susan Greenhouse
Phone: (661) 943-3170
Fax: (661) 943-0457
E-mail: sgreenhouse@qhwd.com

Emergency

Contact 1: Dave Meraz
Day Phone: (661) 943-3170
Night Phone: (661) 810-2217
Contact 2: Mike McCracken
Day Phone: (661) 943-3170
Night Phone: (661) 810-2223

Department of Health Services

System #: 1910130
Contact Person: Grazyna Newton
Phone: (213) 580-5734

Shadow Acres MWC

(Treated/M&I)

PO Box 900669
Palmdale, CA 93590
Billing

Contact: Jeanne Miller
Phone: (661) 947-0200
Fax: (661) 947-9701
E-mail:

Emergency

Contact 1: Jon Saitta
Day Phone: (661) 435-5192
Night Phone: (661) 435-5192
Contact 2: Jim Wisneski
Day Phone: (661) 947-0200
Night Phone: (661) 224-1526

Department of Health Services

System #: 1900301
Contact Person: Steve Layne
Phone: (661) 723-4549

Sunnyside Farms MWC**(Treated/M&I)**PO Box 901025
Palmdale, CA 93590**Billing**Contact: Jeanne Miller
Phone: (661) 947-3437
Fax: (661) 947-9701
E-mail:**Emergency**Contact 1: Chuck Laird
Day Phone: (661) 406-6486
Night Phone: (661) 406-6486
Contact 2: Linda Enger
Day Phone: (661) 947-2244
Night Phone: (661) 947-2244**Department of Health Services**System #: 1900146
Contact Person:
Phone: (661) 723-4549**Westside Park MWC****(Treated/M&I)**40317 11th Street West
Palmdale, CA 93551-3024**Billing**Contact: Phil Wood
Phone: (661) 273-2997
Fax: (661) 266-7938
E-mail: philw@rglobal.net**Emergency**Contact 1: Bill Raggio
Day Phone: (661) 272-4512
Night Phone: (661) 272-4512
Contact 2: Phil Wood
Day Phone: (661) 273-2997
Night Phone: (661) 273-2997**Department of Health Services**System #:
Contact Person:
Phone:

White Fence Farms MWC

(Treated/M&I)

41901 20th Street West
Palmdale, CA 93551

Billing

Contact: Dotty Jernigan
Phone: (661) 943-3316
Fax: (661) 943-3576
E-mail: wffwater@aol.com

Emergency

Contact 1: Mike McCracken
Day Phone: (661) 810-2223
Night Phone: (661) 810-2223
Contact 2:
Day Phone:
Night Phone:

Department of Health Services

System #: 1910249
Contact Person: Susanna Cohen
Phone: (213) 580-5723

White Fence Farms MWC #3

(Treated/M&I)

2606 West Avenue N-8
Palmdale, CA 93551

Billing

Contact: Frank Anley
Phone: (661) 266-8850
Fax: (661) 266-8850
E-mail: f.e.anley@att.net

Emergency

Contact 1: Frank Anley
Day Phone: (661) 266-8850
Night Phone: (661) 947-3240
Contact 2: Philip Anley
Day Phone: (661) 224-6087
Night Phone: (661) 943-5600

Department of Health Services

System #: 1900523
Contact Person: Grazyna Newton
Phone: (213) 580-5734

EAST FEEDER

Los Angeles County Waterworks Districts (Treated/M&I)

PO Box 7508

Alhambra, CA 91802-7508

Billing

Contact: Ramy Gindi
Phone: (626) 300-3357
Fax: (626) 300-3385
E-mail: rgindi@ladpw.org

Emergency

Contact 1: Craig David
Day Phone: (661) 886-1673
Night Phone:
Contact 2: Ken Rosander
Day Phone: (661) 400-3835
Night Phone: (661) 722-4099
Contact 3: Adam Arriki
Day Phone:
Night Phone

Department of Health Services

System #: 1910203 (24-4,33-3)
Contact Person: James Ko
Phone: (213) 977-6808
System #: 1910005 (38-4,38-5,38-6)
Contact Person: Steve Sung
Phone: (213) 580-5723

ACTON FEEDER

Los Angeles County Waterworks Districts (Treated/M&I)

PO Box 7508

Alhambra, CA 91802-7508

Billing

Contact: Ramy Gindi
Phone: (626) 300-3357
Fax: (626) 300-3385
E-mail: rgindi@ladpw.org

Emergency

Contact 1: Craig David
Day Phone: (661) 886-1673
Night Phone:
Contact 2: Ken Rosander
Day Phone: (661) 400-3835
Night Phone: (661) 722-4099
Contact 3: Adam Arriki
Day Phone:
Night Phone

Department of Health Services

System #: 1910248 (37-10)
Contact Person: Jeremy Chen
Phone: (213) 977-7372

Lake Hughes Feeder (Willow PS)

Lake Elizabeth MWC
14960 Elizabeth Lake Rd
Elizabeth Lake, CA 93532
Billing

(Untreated/M&I)

Contact: Gayle Roth
Phone: (661) 724-1806
Fax: (661) 724-1281
E-mail:

Emergency

Contact 1: Gayle Roth
Day Phone: (661) 724-1806
Night Phone: (661) 724-1850
Contact 2: Kenneth Gray
Day Phone: (661) 724-1806
Night Phone: (661) 724-9274

Appendix H

ASSUMPTIONS FOR POPULATION GROWTH PROJECTIONS

The population growth projections encompass water purveyors located in areas currently served by AVEK primarily around the Antelope Valley and portions of eastern Kern County. This includes the City of Lancaster, portions of the City of Palmdale, various communities in Kern County, and two unincorporated areas in Los Angeles County. Communities in Kern County include the cities of Mojave, Boron, Edwards, and Rosamond, and the Edwards Air Force Base. Unincorporated communities in Los Angeles County include Acton and Lake LA area.

The base population shown in this report is taken from years 1990 and 2000 census data provided by California Department of Finance (DoF). Documentation can be retrieved at the following web link - <http://www.dof.ca.gov/HTML/DEMOGRAP/CALHIST2a.XLS>.

Lancaster:

Population growth projections were based on the average growth rate of Palmdale from 2000 to 2020 as reported by Southern California Association of Government (SCAG) Documentation can be retrieved at their website - <http://www.scag.ca.gov/forecast/downloads/2004GF.xls>.

Palmdale:

Population growth projection provided by SCAG. Documentation can be retrieved at their website - <http://www.scag.ca.gov/forecast/downloads/2004GF.xls>. Since AVEK boundaries encompasses approximately 50% of the City of Palmdale, only 50% of the projected population have been included in the tables and figures of this report.

Kern County:

Data for population growth projections are also provided by the DoF. Documentation for the projections can be retrieved at their website at - www.dof.ca.gov/HTML/DEMOGRAP/DRU_Publications/Projections/P3/KERN.XLS. The DoF projections did not separate the cities mentioned above with the remaining cities in Kern County. Therefore, population growth data was extrapolated using year 2000 census data of the areas served by AVEK and the projected kern county growth rates from this DoF document. The population from this area accounts for approximately 11%-15% of the total population served by AVEK.

Los Angeles County:

Data for population growth projections are provided by SCAG. Documentation for the projections can be retrieved at their website at - <http://www.scag.ca.gov/forecast/downloads/2004GF.xls>. The SCAG projections did not separate the areas served by AVEK with the remaining unincorporated cities in Los Angeles County. Therefore, population growth data was extrapolated using year 2000 census data and the projected growth rate of 'Unincorporated LA County' as provided in the SCAG growth projection document. The population from this area accounts for approximately 6%-7% of the total population base served by AVEK.

Appendix I

- **EXCERPT FROM LOS ANGELES COUNTY WATERWORKS DISTRICT RECYCLED WATER SUPPLY ASSESSMENT**
- **SANITARY SURVEY UPDATE REPORT 2001**
- **WATER QUALITY WEBSITE INFORMATION**

2.3 Recycled Water Supplies

Another source of water that is available to the Antelope Valley but is not yet being utilized by the Study Area is recycled water. District No. 40 is currently leading an effort to develop a Recycled Water Facilities Plan for the Antelope Valley. This Facilities Plan recommends a backbone recycled water system to serve the Study Area.

2.3.1 Source Characteristics

Lancaster Water Reclamation Plant (LWRP), Palmdale Water Reclamation Plant (PWRP) and Rosamond Wastewater Treatment Plant (RWWTP) are three wastewater treatment plants in the Study Area. These three plants primarily provide secondary treated effluent. Currently, the only recycled water in the Study Area that is treated to a tertiary level is a small percentage of the wastewater at the LWRP through additional onsite facilities known as the Antelope Valley Tertiary Treatment Plant (AVTTP). Effluent management is challenging in Antelope Valley because the area is a closed basin with no river or other outlet to the Pacific Ocean. Effluent management options are restricted to methods such as reuse, evaporation, and percolation. LWRP, PWRP and RWWTP will all provide tertiary treated effluent with future upgrades. A description of each of the three treatment plants that may provide recycled water to the Study Area is provided below.

2.3.1.1 Lancaster Water Reclamation Plant (LWRP)

The LWRP, built in 1959 and located north of the City of Lancaster, is owned, operated, and maintained by the Los Angeles County Sanitation District No. 14 (District No. 14). LWRP, which has a permitted capacity of 16.0 mgd, treated an average flow of 13.3 mgd in 2004 to secondary

standards for use agricultural irrigation, wildlife habitat, and recreation. Additionally, 0.6 mgd is currently treated to tertiary standards and used for landscape irrigation at the Apollo Lakes Regional County Park.

District No. 14 plans to upgrade the existing LWRP for a total capacity of 21 mgd by 2008 with a proposed future upgrade to 26 mgd by 2014. Tertiary treated effluent from the upgraded LWRP will be available for municipal reuse in addition to the existing uses.

2.3.1.2 Palmdale Water Reclamation Plant (PWRP)

PWRP, built in 1953 and located on two sites adjacent to the City of Palmdale, is owned, operated, and maintained by the Los Angeles County Sanitation District No. 20 (District No. 20). PWRP, which has a permitted capacity of 15.0 mgd, treated an average flow of 9.4 mgd in 2004 to secondary standards for land application or agricultural irrigation.

A recent revision to the Waste Discharge Requirements due to concerns of nitrate in the groundwater, requires District No. 20 to eliminate their existing practice of land application and agricultural irrigation above agronomic rates of treated effluent by October 15, 2008. By November 15, 2009, District No. 20 is required to prevent the discharge of nitrogenous compounds to the groundwater at levels that create a condition of pollution or violate the water quality objectives identified in the 1994 Water Quality Control Plan for the Lahontan Region (1994 Basin Plan). In response, the treatment capacity of the PWRP will be increased to 22.4 mgd and tertiary treatment added. Tertiary treated water is anticipated to be fully used for municipal purposes.

**TABLE 2-7
RECYCLED WATER AVAILABILITY TO STUDY AREA 2005 – 2030**

	2005	2010	2015	2020	2025	2030
LWRP ^(a) (mgd)	12	14.8	19	23	27.1	31.2
PWRP ^(b) (mgd)	10.0	13.2	16.4	19.5	22.4	25.5
RWWTP ^(c) (mgd)	0	0.5	1.0	1.0	1.0	1.0
Study Area (mgd)	22.0	28.5	36.4	43.5	50.5	57.7
Study Area (AFY)	24,700	32,000	40,800	48,800	56,700	64,800

Notes:

- (a) Obtained from the *Lancaster Water Reclamation Plant 2020 Facilities Plan*, prepared by the Sanitation Districts of Los Angeles County, May 2004, less the 3.03 mgd already committed to contract.
- (b) Obtained from the *Draft Palmdale Water Reclamation Plant 2025 Facilities Plan and Environmental Impact Report*, prepared by the Sanitation Districts of Los Angeles County, April 2005.
- (c) Obtained from documentation and phone calls provided by RCSD in May 2005 and a RCSD fax received in August 2005.

Although Table 2-7 provides the volumes of recycled water available, actual use of recycled water is limited to demand. Table 2-8 provides the projections of recycled water demand for the Study Area assuming 100 percent delivery of Table A and existing groundwater pumping rates. The projections are based on a recycled water market assessment and are generally for agricultural irrigation, landscape irrigation, and wildlife habitat. Due to delays in funding, RCSD has yet to determine their recycled water demand or identify any recycled water users. Thus, for purposes of this report, a conservative estimate of zero demand was assumed. District No. 40 recycled water demands were determined from the addition of the City of Lancaster and City of Palmdale demands from the Facilities Plan. Use of recycled water would be encouraged through the use of financial incentives (i.e., recycled water would be available at a lower cost than the existing potable water supply).

**TABLE 2-8
PROJECTED FUTURE USE OF RECYCLED WATER IN THE STUDY AREA (AFY)**

	2010	2015	2020	2025	2030
District No. 40	2,720	5,440	8,160	10,880	13,600
Percent of Total Supply	2	4	6	8	10
Rosamond CSD	0	0	0	0	0
Percent of Total Supply	0	0	0	0	0
Quartz Hill WD	0	0	0	0	0
Percent of Total Supply	0	0	0	0	0
Study Area	2,720	5,440	8,160	10,880	13,600
Percent of Total Supply	2	4	5	7	8

2.3.3 Water Quality

The current and projected water quality of the treated wastewater at LWRP, PWRP and RWWTP that will be used for recycled water purposes is expected to meet tertiary treated standards as defined in California Water Code Title 22 regulations. Furthermore, the use of recycled water would allow for more potable water to be available with the same water quality as

CALIFORNIA STATE WATER PROJECT WATERSHED

Sanitary Survey
Update Report 2001

PREPARED BY:

California Department of Water Resources
Division of Planning and Local Assistance
Municipal Water Quality Investigations Program

UNDER THE DIRECTION OF:

The State Water Contractors

December 2001

Gray Davis
Governor
State of California

Mary D. Nichols
Secretary for Resources
The Resources Agency

Thomas M. Hammigan
Director
Department of Water Resources

Contents

More detailed Contents information along with lists of Figures and Tables are provided at the beginning of each chapter. At the beginning of chapters 3 through 10, which address the State Water Project watersheds and water supply systems, the reader will find significance matrices ranking potential contaminant sources.

Chapter 1 Introduction and Background	1-1
1.1 Purpose of the Watershed Sanitary Survey Update.....	1-1
1.2 History of the SWP Sanitary Survey Update 2001	1-1
1.3 Coordination with Stakeholders.....	1-1
1.4 2001 Sanitary Survey Assessment Approach.....	1-2
1.5 Scope of Work for Each SWP Watershed.....	1-2
1.6 Selection and Evaluation of Potential Contaminant Sources.....	1-3
1.7 Report Organization.....	1-3
1.8 Relationship with DHS' s Drinking Water Source Assessment and Protection (DWSAP) Program.....	1-7
Chapter 2 Regulatory Overview	2-1
2.1 Drinking Water Regulations.....	2-1
2.2 Recent and Proposed Rules.....	2-15
2.3 Drinking Water Quality Parameters of Concern.....	2-23
References.....	2-26

WATERSHEDS (CHAPTERS 3 THROUGH 7)

Chapter 3 Barber Slough/North Bay Aqueduct	3-1
3.1 Watershed Description.....	3-1
3.2 Water Supply System.....	3-10
3.3 Potential Contaminant Sources (PCSs).....	3-12
3.4 Water Quality Summary.....	3-19
3.5 Significance of Potential Contaminant Sources.....	3-46
3.6 Watershed Management Practices.....	3-47
References.....	3-49
Chapter 4 The Delta	4-1
4.1 Environmental Setting.....	4-1
4.2 Potential Contaminant Sources.....	4-21
4.3 Water Quality Summary.....	4-91
4.4 Significance of Potential Contaminant Sources.....	4-185
4.5 Watershed Management Practices.....	4-186
References.....	4-188

2001 SANITARY SURVEY UPDATE

Chapter 5 South Bay Aqueduct and Lake Del Valle	5-1
5.1 Watershed Description.....	5-1
5.2 Water Supply System.....	5-5
5.3 Potential Contaminant Sources.....	5-9
5.4 Water Quality Summary.....	5-18
5.5 Significance of Potential Contaminant Sources.....	5-41
5.6 Watershed Management Practices.....	5-43
References.....	5-44
Chapter 6 San Luis Reservoir	6-1
6.1 Watershed Description.....	6-1
6.2 Water Supply System.....	6-5
6.3 Potential Contaminant Sources.....	6-6
6.4 Water Quality Summary.....	6-9
6.5 Significance of Potential Contaminant Sources.....	6-21
6.6 Watershed Management Practices.....	6-23
References.....	6-23
Chapter 7 Southern California Reservoirs	7-1
7.1 Pyramid Lake.....	7-1
7.2 Castair Lake.....	7-17
7.3 Silverwood Lake.....	7-46
7.4 Lake Perris.....	7-69
References.....	7-87
WATER SUPPLY SYSTEMS (CHAPTERS 8 THROUGH 10)	
Chapter 8 California Aqueduct	8-1
8.1 Clifton Court Forebay to O'Neill Forebay.....	8-1
8.2 The O'Neill Forebay.....	8-7
8.3 Outlet of O'Neill Forebay to Check 21 (Kettleman City): San Luis Canal.....	8-20
8.4 Kettleman City to Kern River Intertie.....	8-57
8.5 Kern River Intertie to East/West Branch Bifurcation.....	8-61
References.....	8-71
Chapter 9 Coastal Branch Aqueduct	9-1
9.1 Introduction.....	9-1
9.2 Water Supply System.....	9-1
9.3 Potential Contaminant Sources.....	9-3
9.4 Water Quality Summary.....	9-4
9.5 Significance of Potential Contaminant Sources.....	9-8
9.6 Watershed Management Practices and Recommendations.....	9-8
References.....	9-9
Chapter 10 East and West Branches of the California Aqueduct	10-1
10.1 West Branch.....	10-1
10.2 East Branch.....	10-4
References.....	10-13

2001 SANITARY SURVEY UPDATE

Chapter 11 State Water Project Emergency Action Plan	11-1
11.1 Introduction.....	11-1
11.2 Regulatory Overview and Authority.....	11-1
11.3 Description of the Emergency Management System Structure.....	11-2
11.4 DWR EAP Responsibility and Procedures.....	11-4
11.5 Related Emergency Planning Documents.....	11-4
11.6 Description of a Typical DWR Field Division EAP.....	11-5
11.7 Emergency Action Plan Maintenance Procedure.....	11-5
11.8 Emergency Action Plan Maintenance Responsibility.....	11-5
11.9 Emergency Management and Duties.....	11-6
11.10 Emergency Duties of Field Division Personnel.....	11-6
11.11 Area Control Center and Project Operations Center Notification Responsibilities.....	11-7
11.12 Coordination with the Office of Emergency Services.....	11-7
11.13 Public Information And News Media Assistance.....	11-8
References.....	11-8
Chapter 12 Pathogens	12-1
12.2 Bacteria Summary.....	12-2
12.3 <i>Giardia</i>	12-12
12.4 <i>Cryptosporidium</i>	12-23
12.5 Long Term 2 Enhanced Surface Water Treatment Rule Microbial Index.....	12-25
12.6 Studies of Health Risks Resulting from Body-Contact Recreation in Southern California SWP Reservoirs.....	12-28
12.7 Protozoan Sampling Method Concerns.....	12-31
References.....	12-35
Chapter 13 Conclusions and Recommendations	13-1
Chapter 3 Barber Slough/North Bay Aqueduct.....	13-1
Chapter 4 The Delta.....	13-3
Chapter 5 South Bay Aqueduct and Lake Del Valle.....	13-10
Chapter 6 San Luis Reservoir.....	13-14
Chapter 7 Southern California Reservoirs.....	13-15
Chapter 8 California Aqueduct.....	13-22
Chapter 9 Coastal Branch Aqueduct.....	13-26
Chapter 10 East and West Branches of the California Aqueduct.....	13-27
Chapter 12 Pathogens.....	13-28
Appendix A Anderson Report to State Water Contractors	Back
Appendix B Summary of Pathogen Occurrence in the SWP and QA/QC Work Using the EPA's Information Collection Rule-Immunofluorescent Assay (ICR-IFA)	Back
Appendix C Summary of Method 1623 Recovery Analysis	Back
Glossary and Metric Conversion Chart	Back

2001 SANITARY SURVEY UPDATE

**State of California
Gray Davis, Governor**

**The Resources Agency
Mary D. Nichols, Secretary for Resources**

**Department of Water Resources
Thomas M. Hannigan, Director**

**L. Lucinda Chipponeri
Deputy Director
for Legislation**

**Peggy Bernardy
Chief Counsel**

**Steve Macaulay
Chief Deputy Director**

**Jonas Minton
Deputy Director**

**Raymond Hart
Deputy Director**

**Division of Planning and Local Assistance
Naser J. Bateni, Chief**

**Water Quality Assessment Branch
Phil Wendt, Chief**

**Technical Services Section
Dan Otis, Chief**

**Prepared under the supervision of
Richard S. Breuer, Chief
Municipal Water Quality Investigations Unit**

**Prepared by
Michael Zanoli, Project Leader**

**Carol L. DiGiorgio
William McCune**

**Fengmao Guo
Steven Murphy**

**Marvin Jung
Murage Ngatia**

James O. Siskman

DWR Division of Operations and Maintenance, Staff of the Environmental Assessment Branch

**Editorial review, graphics, and report production
Brenda Main, Supervisor of Technical Publications**

**Martee Talley, Lead Editor
Chris Derr**

**Nikki Blomquist
Gretchen Goetti
Joanne Pierce**

**Mike Durant
Alice Dyer**

Research and editorial assistance

Kurtis Banchemo

**Nicholas George
Kathryn Stacconi**

Joseph Hemmer

Acknowledgments

The Sanitary Survey Action Committee (SSAC) provided project oversight, logistical support, and manuscript review for the 2001 *Sanitary Survey Update*. A work team consisting of members of the SSAC and California Department of Health Services worked with Department of Water Resources staff to refine the original work plan for the update, and to address issues that arose during its writing and production. While the majority of the draft report was reviewed by the SSAC, this report is a DWR product and does not necessarily reflect the viewpoint of individual committee members or the member's organization.

The Department of Water Resources appreciates the SSAC's input and support in the development of the 2001 *Sanitary Survey Update*:

Elaine Archibald	Archibald and Wallberg Consultants
William Brunnen	Central Coast Water Authority
Richard Brown	DWR Division of Planning and Local Assistance
Jerry Burns	Central Valley RWQCB
Chris Chaloupka	State Water Resources Control Board
Douglas G. Chm	Alameda County Water District
John Coburn	State Water Contractors
Rick DeLeon	Metropolitan Water District of Southern California
Russell E. Fuller	Antelope Valley East Kern Water Agency
David Gonzalez	DWR Division of Local Assistance – WQA – Field Support Unit
Richard Haberman	Department of Health Services – Drinking Water Field Operations Branch
Judy Heath	CALFED
Robert Holtquist	Department of Health Services
Larry Joyce	DWR Division of Operations and Maintenance
Marvin Jung	Marvin Jung and Associates
Carl Lischka	California Department of Health Services – Division of Drinking Water and Environmental Management
Rich Losen	Metropolitan Water District Water District of Southern California
Bruce Marler PhD	U.S. Environmental Protection Agency
David Matthews	Santa Clara Valley Water District
Steve McLane	Castaic Lake Water Agency
David Olita	Solano County Water Agency
Dan Otis	DWR Division of Planning and Local Assistance
Dan Peterson	DWR Operations and Maintenance
Turan Rasmussen	City of Napa
Walt Shannon	State Water Resources Control Board
K.T. Shum PhD	Contra Costa Water District
John Stewart	Napa County FC & WCD
Mick Stewart	Metropolitan Water District of Southern California
Marcia Terobin	Metropolitan Water District of Southern California
Leah Walker	Department of Health Services
Phil Wendt	DWR Division of Planning and Local Assistance
Richard Woodward	Water Quality Consultant – State Water Contractors
BEI Wulff	Kern County Water Agency
Michael Zinati	DWR Division of Planning and Local Assistance

2001 SANITARY SURVEY UPDATE

DWR gratefully acknowledges the following individuals for their contribution in providing data, analysis, review, and insight:

Michael Anderson
Elaine Archibald
Dennis Barchfeld
Benjamin Bass
Dana Barthowick
Elissa Callman
Central Valley Regional Water
Quality Control Board-
Fresno office
Christine Erickson
Doug Chou
Laura deAlbidras
Gurpal Dool
Kevin Dumbuff
Rob Fagnano
Gary Faulconer
Seany Feng
Dick Gage
Ken Gaines
Greg Gartenberg
Roberto Gomez
Johnny Gonzalez

Mark Gowdy
Ios Hardcastle
Laura Hidas
John E. Iacon
Jeff Jamik
Larry Joyce
John Kemp
Mary Ann Mann
John Menke
Dwain Mills
Barry Montoya
Frank Morris
Angela O'Brien
Dan Paterson
Misty Pope
Louis Pratt
Turan Ramadan
Doug Kirchhater
Leo Samisimo
Vicki Shidell
Mark Vale
Tara Wegener

2001 SANITARY SURVEY UPDATE

STATE WATER PROJECT CONTRACTORS

Alameda County Flood Control and Water Conservation District Zone 7
Alameda County Water District
Antelope Valley-East Kern Water Agency
Caritas Municipal Water District
Castaic Lake Water Agency
Central Coast Water Authority
City of Yuba City
Coachella Valley Water District
County of Butte
County of Kings
Crestline-Lake Arrowhead Water Agency
Desert Water Agency
Dudley Ridge Water District
Empire-West Side Irrigation District
Kern County Water Agency
Littlerock Creek Irrigation District
Metropolitan Water District of Southern California
Mojave Water Agency
Napa County Flood Control and Water Conservation District
Oak Flat Water District
Palmdale Water District
Plumas County Flood Control and Water Conservation District
San Bernardino Valley Municipal Water District
San Gabriel Valley Municipal Water District
San Geronimo Pass Water Agency
San Luis Obispo County Flood Control and Water Conservation District
Santa Clara Valley Water District
Solano County Water Agency
Tulare Lake Basin Water Storage District

Contents

Introduction and Background	1-1
1.1 Purpose of the Watershed Sanitary Survey Update	1-1
1.2 History of the SWP Sanitary Survey Update 2001	1-1
1.3 Coordination with Stakeholders	1-1
1.4 2001 Sanitary Survey Assessment Approach	1-2
1.5 Scope of Work for Each SWP Watershed	1-2
1.6 Selection and Evaluation of Potential Contaminant Sources	1-2
1.7 Report Organization	1-3
1.7.1 Chapter Presentation	1-3
1.7.2 Significance Matrices	1-7
1.7.3 Development of Conclusions and Recommendations	1-7
1.8 Relationship with DHS's Drinking Water Source Assessment and Protection (DWSAP) Program	1-7
Reference	1-8
Personal Communication	1-8

Figure

Figure 1-1 Sanitary Survey Chapters and Corresponding Watersheds	1-5
---	-----

1

Introduction and Background

1.1 PURPOSE OF THE WATERSHED SANITARY SURVEY UPDATE

The California Department of Health Services (DHS), under California Surface Water Treatment regulations, requires that all water purveyors perform a sanitary survey of their water source watersheds and update it every 5 years. These regulations implement the federal Surface Water Treatment Rule (SWTR), which became effective on 31 December 1990.

The purpose of a watershed sanitary survey is to:

- Describe control and management practices,
- Describe potential contaminant sources or activities (PCSs) and their effect on drinking water source quality,
- Determine if appropriate treatment is provided, and
- Identify actions and recommendations to improve or control contaminant sources.

1.2 HISTORY OF THE SWP SANITARY SURVEY UPDATE 2001

After completion of the initial State Water Project (SWP) Sanitary Survey in 1990, a SWP Sanitary Survey Action Committee (SSAC) was formed. It consisted of staff from the California Department of Water Resources (DWR) and DHS's Drinking Water Program, representatives of the State Water Contractors, and consultants. The SSAC's role was to follow up on this report's recommendations. The SSAC's work resulted in the State Water Project Action Plan. This action committee has continued to meet over the years, and although individual membership has changed, the SSAC makeup has remained the same.

The SSAC has taken on the task of providing guidance for the 5-year updates of the Sanitary Survey. The *Sanitary Survey Update Report 1996* focused on changes in SWP watersheds and water quality since 1990. The update also provided information from site visits to watersheds—Del Valle, San Luis, Pyramid, Cactair, Silverwood, Ferris, Barker Slough/North Bay Aqueduct watershed, and the open channel section of Coastal Aqueduct. An emphasis was placed on the occurrence of coliforms and the pathogens *Giardia* and *cryptosporidium*. The *Update 1996*, completed in May 1996, included the results of an extensive

database search on toxic sites within SWP watersheds.

1.3 COORDINATION WITH STAKEHOLDERS

Preparation for the *Sanitary Survey Update Report 2001* began July 1999 with SSAC meetings to discuss and develop a work plan and scope of work. The SSAC approved a draft work plan and schedule in September 1999 and adopted the final work plan in December 1999.

In May 2000, SSAC members with specific expertise and/or access volunteered to work as a subgroup to expedite the information retrieval, evaluation, and feedback process for the 2001 update. These seven members represented DHS, SWP contractors, Metropolitan Water District of Southern California (MWDSC), Santa Clara Valley Water District (SCVWD), DWR's Operations and Maintenance Division (O&M), and the California Urban Water Agencies (CUWA).

Following work plan development, DWR's Municipal Water Quality Investigations (MWQI) management and staff, DHS staff, and the SSAC established agreements to help secure adequate progress, the obtainment of necessary information, and feedback on document content quality.

In conjunction with the agreements, this group—SSAC subgroup, MWQI and DHS staff—held frequent and focused meetings and conference calls

to track progress, discuss schedule and resource issues, and prioritize tasks.

DHS granted a schedule extension, which was requested because of staffing resource issues and difficulty in obtaining available information. The original delivery date of January 2001 for the final review draft was eventually changed to 4 May 2001. Because of time constraints, not all chapters were reviewed by the SSAC prior to the release of the final review draft. The SSAC, DHS, and DWR staff conducted a thorough review of the final review draft chapters and after a review of the comments, the document was edited to achieve technical accuracy and consistent formatting.

1.4 2001 SANITARY SURVEY ASSESSMENT APPROACH

Sanitary Survey Update Report 2001 offers detailed evaluations of study areas and issues that were selected based on actions and recommendations from previous reports and concerns stemming from new data and information. Findings and recommendations in *Update 1996* led to extensive studies of the Barber Slough watershed and pathogens in source water. Each of these follow-up activities is covered in detail in its own chapter.

The SSAC work plan specified that *Sanitary Survey Update 2001* would rely on existing data and information from DWR, MWDSC, and other agencies and would require extensive coordination and cooperation to obtain relevant information from several federal, State, and local sources.

During work plan development, it was agreed to provide information in *Sanitary Survey Update 2001* to make it useful for SWP utilities in complying with the California Drinking Water Source Assessment and Protection (DWSAP) Program. The relationship of the *Sanitary Survey Update 2001* to the DWSAP Program is discussed in section 1.8. *Sanitary Survey Update 2001* is not required by the DWSAP Program but much of its PCS information is readily available for incorporation into a source water assessment as required by the DWSAP Program.

A key task in the work plan was the preparation of a sanitary survey questionnaire and its distribution to SWP contractors. This approach was also used for the *Sanitary Survey Update 1996*. The questionnaire was used to obtain information in the most efficient and direct way possible on contaminant sources, available data, and major water quality issues. Of the 29 contractors, 12 responded to the questionnaire (several contractors were not using SWP water at the time).

1.5 SCOPE OF WORK FOR EACH SWP WATERSHED

During the development process for *Sanitary Survey Update 2001*, DWR stated that new field reconnaissance surveys and additional monitoring studies would not be performed specifically for the update. The exception was a 4-year study of the Barber Slough watershed because *Sanitary Survey Update 1996* recommended an investigation.

The major *Sanitary Survey Update 2001* tasks performed for each watershed study include:

- Review and evaluation of the results from the questionnaire sent to SWP contractors,
- Personal communication with staff of various agencies and review of pertinent reports and data about major water quality issues,
- Delineation and mapping of each source watershed area,
- Evaluation of areas and contaminants of known or suspected concern, as directed by DHS and the SSAC,
 - Development of inventories of PCSs and activities in each area,
 - Determination of the susceptibility of the water supplies of such area to those contaminant sources and activities.
- Reports and summaries of the results; identification and rating of significant PCSs and development of recommended actions to reduce the susceptibility of water supplies to existing and future water quality problems.

1.6 SELECTION AND EVALUATION OF POTENTIAL CONTAMINANT SOURCES

The general types of PCSs used in the *Sanitary Survey Update 2001* were developed with SSAC input and the *American Water Works Association Guidance Manual*. They are presented below.

- Recreation
- Wastewater treatment facilities (includes treatment plant effluent discharges, storage, transport, treatment, disposal to land, and septic systems)
- Urban runoff
- Animal populations (includes grazing, dairies, and wild animal populations)
- Algal blooms
- Agricultural activities (includes agricultural cropland use, pesticide/herbicide use, and agricultural drainages)
- Mining
- Solid or hazardous waste disposal facilities
- Logging

- Unsanctioned activity (includes illegal dumping, leaking underground tank)
- Traffic accidents/spills
- Groundwater discharges
- Sewerwater intrusion
- Geologic hazards (landslides, earthquakes, floods)
- Fires
- Land use changes

Different PCSs can require different approaches and types of data for evaluation. In general, susceptibility to PCSs in a given watershed was determined through the questionnaire and information and data obtained in response to the following criteria:

- Frequency of drinking water regulations (maximum contaminant levels) being actually or nearly exceeded at the water treatment plant intakes, reservoirs, and in the treated water, including complaints about taste and odor.
- Contaminants of concern (COC) causing additional water treatment costs or affecting treatment operations (for example, TOC removal requirements).
- Possibility of PCS to source water (for example, reservoirs, streams) and/or treatment plant intakes.
- Beach closures due to high bacteria counts or wastes or spills associated with certain PCSs (for example, water recreation, sewage spills, septic tank leaks).
- Available water quality data on receiving water downstream of PCS areas and upstream of the nearest water supply diversions. Comparison between these locations, including at the water supply intake.
 - The lack of data or the need to do a more thorough assessment of the susceptibility of the watershed to 1 or more PCSs.

1.7 REPORT ORGANIZATION

1.7.1 CHAPTER PRESENTATION

The *Sanitary Survey Update 2001* watershed chapters are organized by geographical areas, such as the 4 Southern California reservoirs, or by spatial connection, such as the 5 sections of the California Aqueduct. Figure 1-1 shows the approximate geographical location of the watersheds covered in the chapters and their corresponding sections of the SWP. The following SWP structures and their corresponding watersheds are covered in *Sanitary Survey Update 2001*:

- SWP reservoirs
 - Pyramid Lake
 - Castaic Lake
 - Silverwood Lake
 - Lake Perris
 - San Luis Reservoir
 - Lake Del Valle
- SWP aqueducts
 - North Bay Aqueduct (Barker Slough watershed)
 - South Bay Aqueduct
 - California Aqueduct sections:
 - H. O. Banks Pumping Plant to O'Neill Forebay/ Check 13
 - O'Neill Forebay
 - O'Neill Forebay to Arroyo
 - Arroyo to Kern River Intertie (Check 28)
 - Kern River Intertie to East/West Bifurcation (Check 41)
 - Coastal Branch
 - East Branch and West Branch
- Harvey O. Banks Delta Pumping Plant
 - The Sacramento San Joaquin Delta and watersheds of the Sacramento and San Joaquin rivers

At the beginning of each watershed section, a summary matrix shows the assessed threat a PCS poses for that particular watershed and water supply system. The matrix also shows the chapter section where the PCS is presented in detail. The chapter then presents the following information:

- Descriptions of land use, geology and soils, vegetation, and hydrology of each watershed area or descriptions of the SWP aqueduct branches for the water supply system site.
- Identification of PCSs for each area.
- Summary of water quality data.
- Discussion of the significance of the PCS(s) to each area.
- Watershed management practices.

Including this introductory chapter, 5 chapters do not focus on a particular watershed. Chapter 2 summarizes current laws and regulations for drinking water. Chapter 11 describes the SWP Emergency Action Plan and related information. Chapter 12 presents and discusses pathogen data, which DHS and the SSAC considered necessary to include in this report. Chapter 13 contains conclusions and recommendations for the PCSs and water quality issues presented in chapters 3 through 10.

1.7.2 SIGNIFICANCE MATRICES

Significance matrices provide a new approach for the SWP Sanitary Survey to give the reader a visual summary of the relative importance of PCSs in a watershed. Each watershed chapter begins with a matrix, which operates as a "road map" by providing a quick assessment of the most important PCSs and directing the reader to corresponding chapter sections. The matrices are not absolute ratings of importance. A chapter should be read completely to gain a full understanding of the potential threats to drinking water quality. Each PCS that threatens drinking water contamination of a water supply system was rated as follows:

- PCS is a highly significant threat to drinking water quality
- PCS is a medium threat to drinking water quality
- PCS is a potential threat, but available information is inadequate to rate the threat.
- PCS is a minor threat to drinking water quality

In each matrix, symbols represent ratings, and numbers stand for the chapter section in which the PCS is discussed. The ratings were based on data and information collected during research for *Sanitary Survey Update 2001*. Some data provided a clear connection between the PCS and its potential to contaminate drinking water. Some information was anecdotal and based on the collective knowledge and experience of the author investigating a source, as well as other SS Update authors and staff of the DWR Water Quality Assessment Branch. In some cases, where a PCS was a clear source of the contaminant but the linkage as a threat was unclear, the PCS was given a medium rating. Sometimes a PCS was a clear source of the contaminant, but evidence and data indicated the source was not a threat to drinking water. In these cases, the PCS received a minor threat rating, for example, pesticides in the Delta watershed.

Chapter headings for PCSs initially were drawn from a master list approved by the SSAC work team in fall 1999. The list had to be varied and expanded because of the extreme variation in geographical areas and settings for each chapter.

1.7.8 DEVELOPMENT OF CONCLUSIONS AND RECOMMENDATIONS

Conclusions and recommendations in chapter 13 were developed at 5 workshops where SSAC and other staff reviewed and discussed authors' drafts and provided substantive input and revision. Detail of the process and content is provided in the introduction to chapter 13. It must be emphasized that chapter 13 is not a "stand-alone" chapter and that each chapter must be reviewed to obtain a complete picture of the status of a particular watershed. Only significant PCSs were included in chapter 13's conclusions and recommendations.

1.8 RELATIONSHIP WITH DHS'S DRINKING WATER SOURCE ASSESSMENT AND PROTECTION (DWSAP) PROGRAM

Under the 1996 reauthorization of the Safe Drinking Water Act (SDWA), all states must complete a source water assessment (SWA) for public water systems by 2003. A SWA document is prepared to determine the existence of PCSs, to determine the appropriate monitoring needed, to inform the public, and to assist in the development of watershed protection programs. The DWSAP Program presents a set of standardized procedures for conducting a SWA. The DHS allows watershed sanitary surveys, like the *Sanitary Survey Update Report 2001*, as alternative methods of determining a water source's vulnerability.

While its requirements are similar, *Sanitary Survey Update Report 2001* contains more information than a SWA. Because of the vast size of the SWP, many subwatersheds interconnect with it. The major tasks of developing this sanitary survey consisted of separate assessments for each of the subwatersheds selected for inclusion. The DWSAP Program assessment and vulnerability summary of sources that are part of the SWP may be based on the information contained in this *Sanitary Survey Update*.

DHS will use the *Sanitary Survey Update Report 2001* as the basis of the DWSAP Program's source water assessment for SWP facilities and for the preparation of vulnerability summaries for those facilities. DHS will work with contractors and water utilities to complete the SWAs. Water utilities that will be required to include information about the assessments and vulnerability summary language in their Consumer Confidence Reports (Water for consumers).

There are 6 information requirements that SWP contractors will be required to supply for their DWSAP Program assessment. Contractors will prepare their own DWSAP Program assessments for DHS, based on *Sanitary Survey Update 2001* information, to include the following:

- 1) Location of Supply Source.
- 2) Definition of Source Areas and/or Protection Zones—Watershed will be designated as the source area/protection zone. This sanitary survey will provide the detailed information on the watershed, so each contractor's SWA can refer to the *2001 Sanitary Survey Update Report*.
- 3) Evaluation of Physical Barrier Effectiveness—DHS will provide standard language on this.
- 4) Inventory of Possible Contaminating Activities—This is identified in the *2001 Sanitary Survey Update Report*. Water contractors can refer to the update and provide limited description in DWSAP Program document.
- 5) Vulnerability Ranking—After review of raw water quality data provided by DWR and the water contractors, a consistent approach for each contractor to use in assessing vulnerability will be developed.
- 6) Assessment Map—*2001 Sanitary Survey Update Report* contains maps of watershed showing major land use pipelines, any intakes, etc.

Reference

PERSONAL COMMUNICATION

Walker, Leah, Senior Engineer, Department of Health Services, Drinking Water Program. 1599. E-mail to Mike Zenell, DWR. Nov 23.

**DWR Home****News and Information****State Water Project****Environment****Water Conditions****Water Use and Planning****Public Safety****Local Assistance****Department of Water Resources****Contact Us**

- [En Español](#)
- [Executive Management](#)
- [About DWR](#)
- [Other Agencies](#)

Mission:

To manage the water resources of California in cooperation with other agencies, to benefit the State's people, and to protect, restore, and enhance the natural and human environments.

1416 9th Street,
Sacramento, CA 95814

Mailing Address:
P. O. Box 942836,
Sacramento, CA 94236

**Water Quality**

- [Water Quality](#)

- [State Water Project Water Quality - Division of Operations and Maintenance](#)

The State Water Project water quality program collects detailed information on concentrations and distribution of chemical, physical, and biological parameters at more than thirty sites in the California Aqueduct and associated reservoirs.

- [Municipal Water Quality - Division of Environmental Services](#)

Site includes publications, program resources, projects and data related to drinking water quality.

- [Office of Water Quality - Division of Environmental Services](#)

Meet the overall water quality needs of DWR and to provide a central focal point for the collection and dissemination of water quality information.

- [Bay-Delta Hearing and Program Development - State Water Project Analysis Office](#)

Includes water rights hearings information, workshops, and Environmental Impact Reports.

- [South Delta Improvement Project \(SDIP\) - Bay-Delta Office](#)

The SDIP works to incrementally maximize diversion capability into Clifton Court Forebay, while providing an adequate water supply for diverters within the SDWA, and reducing the effects of State Water Project exports on both aquatic resources and direct fish losses in the South Delta.

- [North Delta Improvement Project \(NDIP\) - Bay-Delta Office](#)

The NDIP works to implement flood control improvements in a manner that benefits aquatic and terrestrial habitats, to the extent practicable.

- [Northern District Water Quality - Division of Planning and Local Assistance](#)

Water bodies are assessed for water quality characteristics, risks to beneficial uses, and effects of watershed management.

- [Central District Water Quality - Division of Planning and Local Assistance](#)

Assists local agencies and watershed groups with the collection, analysis, and storage of water quality data from rivers, streams, lakes, and reservoirs throughout its district boundaries.

- [San Joaquin District Water Quality - Division of Planning and Local Assistance](#)

Provide assistance and technical advice to local water agencies and to the general public on water quality conditions and on water well standards.

- [Southern District Water Quality - Division of Planning and Local Assistance](#)

Technical assessments are conducted that provide unique and consistent information on the status, trends, and causes of groundwater and surface water quality conditions.

- [Southern Field Division Water Quality Programs - Division of Operations and Maintenance](#)

DWR

Featured Links

- [S. Delta Imp](#)
- [Flood Mana Paper .pdf](#)
- [Saffon Sea I](#)
- [Perris Dam](#)
- [Water Plan](#)
- [Hetch Hetch](#)
- [Oroville Rel](#)
- [SWP Deltve](#)
- [Grants and](#)

Quick Hits

- [DWR Web S](#)
- [News Archi](#)
- [SWP Overvi](#)
- [Recreation](#)
- [Legislation](#)
- [Publication](#)
- [Employment](#)
- [Doing Busin](#)
- [Water Data](#)
- [Contact Us](#)

Monitors the water quality of its four Southern California reservoirs to provide its State Water Project contractors with the most current reservoir conditions.

- Water Data Library - *Division of Planning and Local Assistance*
Grab sample water quality data collected by DWR.
- California Data Exchange Center (CDEC) - *Division of Flood Management*
Real-time decision support system to DWR Flood Management and other flood emergency response organizations, providing operational and historical hydrologic and meteorologic data, forecasts, and reports.
- San Joaquin River Real-time Program - *Division of Planning and Local Assistance*
The Real-time Water Quality Management Program uses telemetered stream stage, salinity data and computer models to simulate and forecast water quality conditions along the lower San Joaquin River.
- Land & Water Use
- Ecosystem/Watershed Restoration
- Sacramento-San Joaquin Delta
- Drainage
- Environmental Analysis & Review
- Ecological Studies
- Environmental Compliance & Evaluation
- Environmental Documentation
- Invasive Species

[Back to Top of Page](#)

[Conditions of Use](#) | [Privacy Policy](#) | [Comments or Suggestions](#)
© 2005 State of California.