Appendix F

Demand Management Measures

- Assumptions Used in Calculation of DMM Cost Effectiveness Analyses for East Valley Water District, City of Loma Linda, City of San Bernardino, West Valley Water District, and Colton
- East Valley Water District Ordinance 375
- City of Redlands Water Waste Ordinance
- City of Loma Linda Municipal Code Title 13
- City of Loma Linda Ordinance 443
- West Valley Water District Ordinance 68 and Article 24
- Yucaipa Valley Water District Ordinance 48-1998 Section 5.15
- City of Colton FY 2010 Budget

Assumptions Used in Calculation of DMM Cost Effectiveness Analyses for East Valley Water District, City of Loma Linda, City of San Bernardino, West Valley Water District, and Colton

Appendix F1
Water Conservation Measures Analysis Assumptions

F.1 Base Assumptions (Common to All Programs)

Category	Variable	Value Used	Data Sources and Assumptions
Agency Benefits	Unit cost of avoided water supply	City of Colton – $331 City of Loma Linda - $153 City of San Bernardino - $188 EVWD - $274 WVWD - $126	Provided by Agencies
Discounting Information	Agency discount rate	2.9% per year	Real discount rate based on assumed nominal bond rate of 5% less 2.1% inflation (difference between nominal and real discount rates recommended by 2008 Office of Management and Budget Circular No. A-94, see http://www.whitehouse.gov/omb/circulars/a094/a94_appx-c.html).

F.2 BMP 1: Residential Assistance (Surveys)

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Survey cost	$313 per survey	Cost of survey targeted indoor/outdoor survey and indoor handouts including showerheads, aerators and toilet flappers was reported to be $200 and $16, respectively, in 1995 dollars (CUWCC 2005 BMP Costs and Savings Study, pgs 2-50 to 2-51). Cost projected to be approximately $313 per survey in 2010 dollars.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Reduction in average use	40 gpd	Savings for residential assistance program was reported to be 40 gpd for SFR (CUWCC Research and Evaluation Committee Report to Steering Committee, 8/13/2009).
	Savings decay	10% per year	While survey savings tend to decay over time by as much as 25% per year (CUWCC Research and Evaluation Committee Report to Steering Committee, 8/13/2009), high water users typically have leaks which contribute to excessive water use. Identifying and fixing these problems would result in greater sustained savings than surveys offered to typical customers without leaks.

F.3 BMP 2: Residential Plumbing Retrofit Kits

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Kit cost	$12 per kit (includes 2 aerators and 1 showerhead)	Estimated typical value based on Kennedy/Jenks experience.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Reduction in use (program savings, 1.5 gpm model)	7.7 gpd	CUWCC 2005 BMP Costs & Savings Study (pg 2-44) states 5.5 gpd for 2.5 gpm models. Assume 40% additional savings than 2.5 gpm models.
	Savings decay (1.5 gpm model)	30% per year	CUWCC 2005 BMP Costs & Savings Study (pg 2-44)

F.4 Residential High Efficiency Washing Machine Rebate Programs and Natural Replacement Savings

Category	Variable	Value Used	Data Sources and Assumptions
Annual Costs	HEWC rebate cost	$150	Typical value.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Average annual savings	10,220 gallons per year per machine	CUWCC Research and Evaluation Committee Report to Steering Committee, 8/13/2009
	Decay Factor	8%	Assume units replaced with equally efficient units.

F.5 BMP 14: Residential HET & ULFT Rebates

Category	Variable	Value Used	Data Sources and Assumptions
Annual Costs	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
	HET rebate cost	$100 per year	Typical value.
	Average savings per HET	21.1 gpd for SFR and 26.6 gpd for MFR	CUWCC Research and Evaluation Committee Report to Steering Committee, 8/13/2009
	Average savings per ULFT	16.9 gpd for SFR and 21.3 gpd for MFR	ULFT savings scaled from HET savings based on ratio of 1.3 gallons per flush (gpf) vs. 1.6 gpf for ULFTs.
	Decay factor	4%	AB 715 toilet standard requires 1/2 of all toilets sold to be HET in 2010 and all will be HET in 2014. Decayed units will be replaced with HET's.

F.6 BMP 5: Dedicated Irrigation Accounts Surveys

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Survey cost	$1,320 per survey	CUWCC 2005 BMP Cost and Savings Study cited cost of survey in 1999 at $500 to $1500. Use cost of $1,000 with 2.5% inflation. Includes cost for inventory of accounts, targeting, marketing, implementation, monitoring and tracking.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Reduction in average use	20%	CUWCC 2005 BMP Cost and Savings Study pg 2-103
	Savings decay	17% per year	CUWCC Research and Evaluation Committee Report to Steering Committee, 8/13/2009 suggests landscape surveys have life of 6 years.
Implement-ation Level	Number of surveys conducted per year	5%	Requirement is to reach all accounts that are 20% over their budgets within 6 years of implementing water budgets. Assume 5% of total dedicated irrigation accounts per year.

F.7 BMP 5: CII WBICs Direct Install

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Direct install cost	$1,000 per installation, 1.5 devices per site.	Average cost of installation in a previous project in Riverside County. Includes, product, installation, anc years signal fee costs, average of 1.5 devices per sit
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Reduction in avera	20% of outdoor use	Outdoor savings typically in the 20% range for high use customers. CUWCC 2005 Cost & Savings Study (pg 2-3).
	Savings decay	10% per year	Expected life 10-15 years. CUWCC 2005 Cost & Sa Study (pg 2-4)

F.8 BMP 5: CII WBICs Rebates

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Rebate cost	$200 per installation, 1.5 installations per site.	Typical value.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water	Reduction in	20% of outdoor	Outdoor savings typically in the 20% range for high

Category	Variable	Value Used	Data Sources and Assumptions
Savings	average use	use	use customers. CUWCC 2005 Cost & Savings Study (pg 2-3).
	Savings decay	10% per year	Expected life 10-15 years. CUWCC 2005 Cost & Savings Study (pg 2-4).

F.9 BMP 5: CII Precision Sprinkler Nozzles Distribution

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Nozzle cost	$4 per nozzle	Typical costs.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
	Nozzles distributed to each account	150 nozzles	Estimated value based on previous project in Riverside County.
Water Savings	Reduction in average use	0.002 AFY per nozzle	Estimated value based on previous project in Riverside County.
	Savings decay	20% per year	Estimated value based on previous project in Riverside County. Life of nozzles is 5 years.

F.10 BMP 9: CII High Efficiency Washing Machine Rebate Programs

Category	Variable	Value Used	Data Sources and Assumptions
Annual Costs	HEWC rebate cost	$150	Typical value.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Average annual savings	24,000 GPY	Based on previous Kennedy/Jenks project.
	Decay factor	0%	No decay was used. After 2010, all washing machines sold in CA will use no more than 6 gallons per CF washing capacity. http://energy.ca.gov/releases/2009_releases/2009-10-29_clotheswashers.html

F.11 BMP 9: CII Indoor Surveys

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Survey cost	$12,000 per survey	Kennedy/Jenks experience with prior CII indoor water survey project showed that consultant surveys for large CII water users can be between $12,000-$15,000 per survey
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water	Reduction in	12%	Based on 11% for consultant surveys (CUWCC

Category	Variable	Value Used	Data Sources and Assumptions
Savings	average use		2005 BMP Cost and Savings Study pg 2-66) and 12-15% (CUWCC MOU, 2007).
	Savings decay	10% per year	While survey savings tend to decay over time by as much as 25% per year, high water users typically have leaks or other system inefficiencies which contribute to excessive water use. Identifying and fixing these problems for high users would result in greater sustained savings than surveys offered to the average customers.

F.12 BMP 9: CII Performance Based Program Incentives

Category	Variable	Value Used	Data Sources and Assumptions
Agency Cost	Incentive cost	$975/AFY saved	MWD's former Save a Buck program offered $3 per 1000 gallons saved, equivalent to $975/AFY. Kennedy/Jenks previous experience with CII audits found that roughly ~$1000/AFY would be the minimum rebate required for large CII customers to be able to make capital improvements for water savings. However, the required amount can often be $2000/AFY or more.
	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
Water Savings	Reduction in average use	1 AFY for every $975 spent	Estimated typical value based on Kennedy/Jenks experience.
	Savings decay	10% per year	While survey savings tend to decay over time by as much as 25% per year, high water users typically have leaks or other system inefficiencies which contribute to excessive water use. Identifying and fixing these problems for high users would result in greater sustained savings than surveys offered to the average customers.

F.13 CII HET and Urinal Installs

Category	Variable	Value Used	Data Sources and Assumptions
Agency Costs	Admin cost	25%	Estimated typical value based on Kennedy/Jenks experience.
	HET Install cost	$162.5	Assume average cost of $162.5 per fixture. Average cost of $87.50 attributable to the fixture (at one-half) plus $75 for administrative and implementation costs, for a total cost of $162.50 per toilet fixture Source: CUWCC PBMP Report Year 2 - HEU's and HETs, pg 22.
	HE Urinal Install Cost	$450	Average cost for an HE urinal is approximately $375. Adding a $75 per unit cost for program

	ULF Urinal Install Cost	$450	administration and implementation brings the average total cost to $450.
	Zero Flow Urinal Install Cost	$450	Source: CUWCC PBMP Report Year 2 - HEU's and HETs, pg 23.
Water Savings	Average savings per HET	38 gpd	
	Average savings per HE urinal	62 gpd	
	Average savings per ULV urinal	72 gpd	
	Average savings per zero flow urinal	82 gpd	CUWCC MOU, 2008
	Decay factor	3 (flushometer)-4 (tank-type)%	AB 715 toilet standard requires 1/2 of all toilets sold to be HET in 2010 and all will be HET in 2014. Decayed units will be replaced with HET's. Assume same for urinals.

East Valley Water District Ordinance 375

ORDINANCE NO. 375

AN ORDINANCE OF THE EAST VALLEY WATER DISTRICT RESCINDING ORDINANCE NO. 358 ENTITLED "AN ORDINANCE ESTABLISHING RULES AND REGULATIONS FOR WATER SERVICE, ESTABLISHING A WATER DEPARTMENT, PROVIDING FOR INSTALLATION AND CONNECTION TO DISTRICT WATER MAINS, REGULATING CROSS CONNECTION CONTROL".

Be it ordained by the Board of Directors of the East Valley Water District, that Ordinance No. 358 is amended as follows:

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SECTION 2. GENERAL PROVISIONS

2.01 Short Title - This Ordinance may be cited as the "East Valley Water District Water Regulations and Service Ordinance".

2.02 Purpose - This Ordinance is intended to provide rules and regulations applicable to the administration and operational activities of the District. This Ordinance may be amended from time to time by action of the Board of Directors of the East Valley Water District.

2.03 Enabling Statutes - This Ordinance is adopted pursuant to the applicable provisions of Division 12 of the Water Code and Division 5, Chapter 7, Title 5, Division 2 of the Government Code, and further pursuant to the Constitution of the State of California. The District is further authorized by Water Code Section 31027 to prescribe and define by Ordinance those restrictions, prohibitions and exclusions it may determine to be necessary pursuant to the California Constitution Article X, Section 2 and Water Code Sections 31026 and 350 et seq. to restrict the use of District water during threatened or existing water shortages. It is therefore the intent of the Board of Directors to establish by this Ordinance those procedures and policies necessary to the orderly administration of a water conservation program to prohibit waste and to restrict the use of water during a water shortage or emergency.

2.04 Application - This Ordinance shall apply to all water facilities constructed, maintained, and operated by the District.

2.05 Enterprise - The District will furnish and/or make available, a system, plant, works, and undertaking used for and useful in the delivery of water for the District's service area, including all annexations thereto. lands, easements, rights in land, contract rights and franchises.

2.06 Separability - If any section, subsection sentence, clause, phrase, or portion of this Ordinance or the application thereof to any person or circumstances are for any reason held to be unconstitutional or invalid by any court of competent

14.18 **Water System Design Charge** - A non-refundable water system design charge shall be required for all main extensions, service connection and/or special facilities requiring the preparation of engineering plans and drawings.

14.19 **Engineering Services Charge** - The Engineering Services charge is a fee for the District's time and effort spent on assisting customers who have a requirement to construct water main extensions, or other water facilities, that must meet District needs and conform to District standards. This fee includes time and effort the District spends on plan checking, plan and easement development, and all other related work.

Prior to submission of any documents requiring work by the district, a non-refundable minimum charge in the amount of 7.5% of the engineer's estimated cost for the project shall be submitted to the district. The work will be accomplished on a time and effort basis. Should the District use more funds than the original charge, the additional billed costs must be paid prior to allowing water service to the project.

14.20 **Construction Water Charge** - The construction water charge is a temporary flat rate water charge. It is only available during the construction phase of a new building for services 1" in diameter or less. It is available for a period not exceeding six months.

14.21 **Fire Flow Test Charge** - The fire flow test charge is a flat rate to cover the District's time and effort for testing parts of the water system to obtain fire flow test data and calculate results as requested.

14.22 **Valve Deposit** - The valve deposit is a refundable charge that is used to insure all valve cans and caps are constructed to final grade before a water system construction project is complete. The District will accept a guarantee bond in lieu of a cash deposit. The fee will be returned or the bond released when valve cans and caps are constructed to final grade by the developer's contractor and verified by the District.

14.23 Service Initiation Charge - The service initiation charge is a non refundable charge which covers the reasonable District costs for initiating water service.

14.24 Returned Check Charge - A returned check charge is a charge which covers the reasonable administrative cost and banking charges for processing a returned check.

14.25 Temporary Service Charge - A temporary service is available through the use of a fire hydrant. A customer deposit for the temporary service will be required. All other applicable service charges shall apply.

SECTION 15 WATER CONSERVATION

15.01 Waste or Nuisance Water and Other Substances - It is unlawful for any person, firm or corporation to deposit, drain, wash, or allow to run or divert water, mud or sand into, or upon, any public road, highway, street, alley, drainage ditch, storm drain, flood control channel owned or controlled by any public agency within the District. When a written application is filed with the District, and approved by the General Manager, a permit may be granted with terms and conditions and applicable fees as it may deem appropriate to impose to such person . For purposes of enforcement of this section, the owner of the meter, or property, which is the source of the "waste or nuisance water and other substances" as defined herein will be considered the responsible party. Any violations cited hereunder, and defined as being detrimental to public health, safety or welfare, will be borne by the responsible party.

15.02 Conservation Measures - Stage No.1 Normal Conditions: Voluntary Conservation Measures - Normal conditions shall be in effect when the District is able to meet all the water demands of its customers in the immediate future. During normal conditions all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes

15.03 **Stage No. 2 - Threatened Water Supply Shortage** - In the event of a threatened water supply shortage which could affect the District's ability to provide water for ordinary domestic and commercial uses, the Board of Directors shall hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the District. The Board may then, by resolution, declare a water shortage condition to prevail, and the following conservation measures shall be in effect:

15.03.01 **Exterior Landscape Plans** - Exterior landscape plans for all new commercial and industrial development shall provide for timed irrigation and shall consider the use of drought resistance varieties of flora. Such plans shall be presented to and approved by the District prior to issuance of a water service letter.

15.03.02 **Excessive Irrigation and Related Waste** - No customer of the District or other person acting on behalf of or under the direction of a customer shall cause or permit the use of water for irrigation of landscaping or other outdoor vegetation, plantings, lawns or other growth, to exceed the amount required to provide reasonable irrigation of same, and shall not cause or permit any unreasonable or excessive waste of water from said irrigation activities or from watering devices or systems. The free flow of water away from an irrigated site shall be presumptively considered excessive irrigation and waste as defined in Section 3 herein.

15.03.03 **Agricultural Irrigation** - Persons receiving water from the District who are engaged in commercial agricultural practices, whether for the purpose of crop production or growing of ornamental plants shall provide, maintain and use irrigation equipment and practices which are the most efficient possible. Upon the request of the General Manager, these persons may be required to prepare a plan describing their irrigation practices and equipment, including but not limited to, an estimate of the efficiency of the use of water on their properties.

15.03.04 **Commercial Facilities** - Commercial and industrial facilities shall, upon request of the General Manager, provide the District with a plan to conserve water at their facilities. The District will provide these facilities with information regarding the average monthly water use by the facility for the last two year period. The facility will be expected to provide the District with a plan to conserve or reduce the amount of water used by that percentage deemed by the Board of Directors to be necessary under the circumstances. After review and approval by the General Manager, the water conservation plan shall be considered subject to inspection and enforcement by the District.

15.03.05 **Parks, Golf Courses, Swimming Pools and School Grounds** Public and private parks, golf courses, swimming pools and school grounds which use water provided by the District shall use water for irrigation and pool filling between the hours of 10:00 p.m. and 6:00 a.m.

15.03.06 **Domestic Irrigation** - Upon notice and public hearing, the District may determine that the irrigation of exterior vegetation shall be conducted only during specified hours and/or days, and may impose other restrictions on the use of water for such irrigation. The irrigation of exterior vegetation at other than these times shall be considered to be a waste of water.

15.03.07 **Swimming Pools** - All residential, public and recreational swimming pools, of all size, shall use evaporation resistant covers and shall re-circulate water. Any swimming pool which does not have a cover installed during periods of non-use shall be considered a waste of water.

15.03.08 **Run-off and Wash-down** - No water provided by the District shall be used for the purposes of wash-down of impervious areas, without specific written authorization of the General Manager. Any water used on a premises that is allowed to escape the premises and run off into gutters or storm drains shall be considered a waste of water.

15.03.09 **Vehicle Washing** - The washing of cars, trucks or other vehicles is not permitted, except with a hose equipped with an automatic shut-off device, or a commercial facility so designated on the District's billing records.

15.03.10 **Drinking Water Provided by Restaurants** - Restaurants are requested not to provide drinking water to patrons except by request.

15.04 **Stage No.3- Water Shortage Emergency:Mandatory Conservation Measures** - In the event of a water shortage emergency in which the District may be prevented from meeting the water demands of its customers, the Board of Directors shall, if possible, given the time and circumstances, immediately hold a public hearing at which customers of the District shall have the opportunity to protest and to present their respective needs to the Board. No public hearing shall be required in the event of a breakage or failure of a pump, pipeline, or conduit causing an immediate emergency. The General Manager is empowered to declare a water shortage emergency, subject to the ratification of the Board of Directors within 72 hours of such declaration, and the following rules and regulations shall be in effect immediately following such declarations:

15.04.01 **Prohibition** - Watering of parks, school grounds, golf courses, lawn water, landscape irrigation, washing down of driveways, parking lots or other impervious surfaces, washing of vehicles, except when done by commercial car wash establishments using only recycled or reclaimed water, filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes are prohibited.

15.04.02 **Restaurants** - Restaurants shall not serve drinking water to patrons except by request.

15.04.03 **Construction Meters** - No new construction meter permits shall be issued by the District. All existing construction meters shall be removed and/or locked.

15.04.04 **Commercial Nurseries and Livestock** - Commercial nurseries shall discontinue all watering and irrigation. Watering of livestock is permitted as necessary.

15.05 **Implementation and Termination of Mandatory Compliance Stages** The General Manager of the District shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the Water Conservation Plan Stages and shall notify the Board of Directors of the necessity for the implementation, or termination, of each stage. Each declaration of the Board of Directors implementing, or terminating, a water conservation stage shall be published at least once in a newspaper of general circulation, and shall be posted at the District offices. Each declaration shall remain in effect until the Board of Directors otherwise declares, as provided herein.

15.06 **Exceptions - Application for Exception Permits** - The General Manager may grant permits for uses of water otherwise prohibited under the provisions of this Ordinance if he finds and determines that restrictions herein would either:

15.06.01 **Hardship** - Cause an unnecessary and undue hardship to the water user or the public; or

15.06.02 **Emergency** - Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water use or of the public.

15.06.03 **Exemptions Granted** - Such exceptions may be granted only upon written application therefor. Upon granting such exception permit, the General Manager may impose any conditions he determines to be just and proper.

15.07 **Enforcement, Inspection** - Authorized employees of the District, after proper identification may, during reasonable hours, inspect any facility having a water conservation plan, and may enter onto private property for the purpose of observing the operation of any water conservation device, irrigation equipment or water facility.

Employees of the District may also observe the use of water or irrigation equipment within the District from public rights-of-way.

15.08 Criminal Penalties for Violation - Water Code Section 31029 makes any violation of this Ordinance a misdemeanor and upon conviction thereof, the violator shall be punished by imprisonment, fine or by both fine and imprisonment as may be allowed by law.

15.09 Civil Penalties for Violation - In addition to criminal penalties, violators of the mandatory provisions of this Ordinance shall be subject to civil action initiated by the District as follows:

15.09.01 First Violation: For a first violation, the District shall issue a written notice of violation to the water user violating the provisions of this Ordinance. The notice shall be given pursuant to the requirements of Section 15.10 below.

15.09.02 Second Violation: $100.00 Surcharge - For a second violation of this Ordinance within a 12 month period, or failure to comply with the notice of violation within the period stated, a surcharge of $100.00 is hereby imposed for the meter through which the wasted water was supplied.

15.09.03 Third Violation: $200.00 Surcharge and/or Installation of a Flow Restrictor - For a third violation of this ordinance within a 12 month period, or for continued failure to comply within 30 days after notice of an imposition of second violation sanctions, a one month penalty surcharge in the amount of $200.00 is hereby imposed for the meter through which the wasted water was supplied. In addition to the surcharge, the District may, at its discretion, install a flow-restricting device at such meter with a one-eighth inch (1/8") orifice for services up to one and one half (1-1/2") inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight (48) hours. The charge to the customer for installing a flow-restricting device shall be based upon the size of the meter and the actual cost of installation but shall not

be less than that provided in the District's Rules and Regulations. The charge for removal of the flow-restricting device and restoration of normal service shall be as provided in the District's Rules and Regulations.

15.09.04 Subsequent Violations: Discontinuance of Service - For any subsequent violation of this Ordinance within the twenty-four (24) calendar months after a first violation as provided in Section 15.09.2 hereof, the penalty surcharge provided in Section 15.09.3 hereof shall be imposed and the District may discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration of normal service shall be as provided in the Rules and Regulations of the District. Such restoration of service shall not be made until the General Manager of the District as determined that the water user has provided reasonable assurances that future violations of this Ordinance by such user will not occur.

15.10 Notice - First Violation - For a first violation, written notice shall be given to the customer and/or property owner personally or by regular mail.

15.10.01 Subsequent Violations - If the penalty assessed is a surcharge for a second or third violation, notice may be given by regular mail.

15.10.02 Violations Involving Installation of Flow-Restrictors or Discontinuance of Water Service - If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time, notice of the violation shall be given in the following manner:

a. Personal Service - By giving written notice thereof to the occupant and/or property owner personally; or if the occupant and/or property owner is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail addressed to the occupant and/or owner at his/her place of business or residence; or

b. **Posting** - If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be located, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person there residing, if such person can be found, and also sending a copy through the United States mail addressed to the occupant at the place where the property is situated and the owner if different.

15.10.03 Form of Notice - All notices provided for in this Section shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and a statement informing the occupant/owner of his/her right to hearing on the violation.

15.11 Hearing - Any customer or property owner against whom a penalty is levied pursuant to this ordinance shall have a right to a hearing, in the first instance by the General Manager, with the right of appeal to the Board of Directors, on the merits of the alleged violation upon the written request of that customer within fifteen (15) days of the date of alleged violation. At the next regularly scheduled meeting, the customer may then appear and present any evidence in support of his position and ask for a decision by the Board.

15.12 Delays on Action - The Board shall act promptly to resolve the dispute, but may delay a resolution of the dispute to the time of its next regular meeting in order to investigate the dispute or receive special reports related to the dispute.

15.13 Decision of the Board - The decision of the Board of Directors shall be final. Should the Board not render a decision within sixty (60) days of application to the Board, the failure to act shall be deemed a denial of the requested action, unless both parties have agreed to extend the resolution period.

SECTION 16. EFFECTIVE DATE

This Ordinance shall become effective upon adoption.

Approved and adopted this 15TH day of July 2010

ROLL CALL:
Ayes: **Directors**
Noes:
Absent:
Abstain:

_____

George E. Wilson, President

ATTEST:_____

Robert E. Martin, Secretary

City of Redlands Water Waste Ordinance

Chapter 13.06
WATER CONSERVATION PLAN

13.06.010: TITLE:

This chapter establishes the *CITY OF REDLANDS WATER CONSERVATION PLAN.* (Ord. 2151 § 1, 1991)

13.06.020: INTENT:

The city council of the city of Redlands declares that the public health, safety and general welfare requires that water resources available to the city be put to maximum beneficial use, that the waste or unreasonable use of water be prevented, and that the conservation of such water must occur to protect the people and property of the city of Redlands. (Ord. 2151 § 1, 1991)

13.06.030: PURPOSE AND SCOPE:

A. The purpose of this chapter is to reduce the nonessential use of water to conserve city water supplies, thereby minimizing the effect of a shortage of water supplies on city users. The water conservation plan here established is to:

1. Protect the health, safety, and welfare of the citizens and property owners of the city;

2. Assure the maximum beneficial use of city water supplies; and

3. Attempt to provide sufficient water supplies to meet the basic needs of human consumption, sanitation and fire protection.

B. This chapter shall remain in effect until the city council declares by ordinance that the provisions of this chapter are no longer applicable to existing water supply conditions and the supply of water available for distribution within the city's service area has been replenished or augmented. (Ord. 2151 § 1, 1991)

13.06.040: AUTHORIZATION:

A. The city is authorized to implement the provisions of this chapter following a public hearing as specified below upon the city council's determination by majority vote of the entire council that such implementation is necessary to protect the public health and safety.

B. A public hearing shall be held to determine whether to adopt a water conservation plan, and, if so, which measures provided herein should be implemented. A similar public hearing shall be held by the city council prior to the implementation or termination of each incremental water conservation stage pursuant to section 13.06.080 of this chapter. Notice of the time and place of these public hearings shall be published not less than ten (10) days before the hearing in a newspaper of general circulation.

C. Upon adoption by the city council, the provisions of this chapter shall become effective immediately. Notice of the implementation of successive stages of water conservation shall be given to water users immediately both by publication at least once in a newspaper of general circulation within ten (10) days after adoption, and by a notice enclosed with the next regular city invoice for water or utility service.

D. If the city council cannot meet in time to act to protect the public interest pursuant to this chapter, the city manager or his designee is hereby authorized and directed to implement such provisions of this chapter upon his or her written determination that the city cannot supply adequate water to meet the ordinary demands of water consumers, and that such implementation is necessary to protect the public health or safety. Such written determination shall be presented to the city council at its next meeting for review, revocation or ratification. Such meeting shall be held as soon as possible. (Ord. 2151 § 1, 1991)

13.06.050: APPLICATION:

The provisions of this chapter shall apply to all persons, customers, and property served water by the city wherever situated. (Ord. 2151 § 1, 1991)

13.06.060: GENERAL PROHIBITION:

No water user shall make, cause, use, or permit the use of water supplied by the city for residential, commercial, industrial, agricultural, governmental or any other use in a manner contrary to this chapter. Waste or the unreasonable or nonbeneficial use of water is prohibited in the city of Redlands. (Ord. 2151 § 1, 1991)

13.06.070: MANDATORY CONSERVATION; STAGE CRITERIA:

The director of the public works department shall recommend guidelines for adoption by the city council setting forth the criteria to determine when water supply conditions in the city require the implementation or termination of each water conservation stage. Such guidelines shall be updated when the director determines that water availability so requires. The director shall include in such guidelines a calendar symbol system designating allowed days for irrigation. (Ord. 2151 § 1, 1991)

13.06.080: MANDATORY CONSERVATION; PHASE IMPLEMENTATION:

The public works department shall monitor the projected supply and demand for water by its customers on a daily basis during the months of June, July, August, September, and October and shall recommend to the city manager the extent of conservation required through the implementation and/or termination of particular conservation stages to allow the department to prudently plan for and supply water to its customers. Thereafter, the city manager may recommend to the city council the implementation or termination of the appropriate stage of water conservation in accordance with the applicable provisions of this chapter. The city council may implement or terminate the appropriate stage pursuant to section 13.06.040 of this chapter. Notice of the implementation or termination of each stage shall be given pursuant to subsection 13.06.040C of this chapter.

A. Stage I, Voluntary Conservation Measures: Water users are requested to limit their water use from June 1 to October 1 of each year to an amount necessary for health, safety, economic necessity and irrigation. Water users should use water wisely and prevent its waste or unreasonable use.

   The following actions are recommended:

   1. Adjust sprinklers and irrigation systems to avoid overspray, runoff, and waste. Avoid watering on windy days;

   2. Install water saving devices, such as low flow showerheads and faucet aerators;

3. Select low water demand shrubs, ground covers and trees for new landscaping;

4. Restrict water service in restaurants.

B. Stage II, Mandatory Compliance; Water Alert: When implemented pursuant to subsection 13.06.040B of this chapter and noticed pursuant to subsection 13.06.040C of this chapter, the following restrictions shall apply to the use of water supplied by the city in addition to the recommendations of stage I:

1. Irrigation of lawns, gardens, landscaped areas, trees, shrubs, or other plants utilizing individual sprinklers or sprinkler systems is allowed only on an irrigation day designated by the city and is prohibited between the hours of twelve o'clock (12:00) noon and eight o'clock (8:00) P.M. However, irrigation is permitted at any time if:

   a. A handheld hose is used, or

   b. A handheld, faucet filled bucket containing five (5) gallons or less is used, or

   c. A drip irrigation system is used.

   Commercial nurseries, commercial farmers, and grove settings requiring twenty four (24) hour irrigation cycles, are exempt from stage II irrigation restrictions, but shall curtail all nonessential water use.

2. The washing of automobiles, trucks, trailers, boats, aircraft and other types of mobile equipment is allowed only on designated irrigation days and is prohibited between the hours of twelve o'clock (12:00) noon and eight o'clock (8:00) P.M. Mobile equipment washing shall be done only with a handheld bucket or a handheld hose equipped with a positive shutoff nozzle for quick rinses.

   Notwithstanding the above, washing of such equipment may be done at any time on the immediate premises of a commercial car wash or commercial service station with washwater recycling facilities. Garbage trucks and vehicles to transport food and perishables are exempt from these regulations if the public health or safety requires frequent vehicle cleaning.

3. The washing or sprinkling of foundations or structures shall be allowed only by city permit. Regulations for such permit shall be enacted by resolution.

4. The refilling or adding of water to uncovered swimming or wading pools or spas is allowed only on designated irrigation days and is prohibited between the hours of twelve o'clock (12:00) noon and eight o'clock (8:00) P.M.

5. The operation of any ornamental fountain or other structure making similar decorative use of water is prohibited, unless the fountain or structure has a recycling system.

6. The use of water for irrigation of golf greens and tees is allowed only on designated irrigation days and is prohibited between twelve o'clock (12:00) noon and eight o'clock (8:00) P.M. The irrigation of golf course fairways is absolutely prohibited. The irrigation of

golf courses utilizing treated wastewater or reused water is not subject to these prohibitions.

7. Restaurants shall not serve water to customers except upon specific customer request.

8. Failure to repair controllable leaks is prohibited.

9. Use of running water to wash driveways, sidewalks, parking areas, patios, tennis courts and other paved areas is prohibited.

10. Failure to prevent excessive runoff from irrigation activities is prohibited.

11. Use of water from fire hydrants is limited to firefighting and other activities necessary to maintain the health, safety, and welfare of the citizens of Redlands. The use of water piped from fire hydrants and sprinkled for construction purposes is prohibited.

C. Stage III, Mandatory Compliance; Water Warning: When implemented pursuant to subsection 13.06.040B of this chapter and noticed pursuant to subsection 13.06.040C of this chapter, the following restrictions, in addition to all elements of stages I and II, shall apply:

1. All outdoor irrigation of vegetation shall occur only on designated days using handheld hoses, drip irrigation, or handheld buckets and is prohibited between the hours of twelve o'clock (12:00) noon and eight o'clock (8:00) P.M.

   Exemption: Permanently installed automatic sprinkler systems may be used on designated irrigation days but are prohibited between the hours of twelve o'clock (12:00) noon and eight o'clock (8:00) P.M.

2. The watering of golf tee areas is prohibited except with treated wastewater or reused water.

D. Stage IV, Mandatory Compliance; Water Emergency: Pursuant to California Water Code section 350 et seq., the city council may declare a water shortage emergency upon its determination that the ordinary demands of city water users cannot be satisfied without depleting the city water supply to a point of insufficient water for human consumption, sanitation and fire protection. When implemented pursuant to subsection 13.06.040B of this chapter and noticed pursuant to subsection 13.06.040C of this chapter, the following restrictions, in addition to all elements of stages I, II and III, shall apply:

1. All outdoor irrigation of vegetation shall be allowed only between the hours of eight o'clock (8:00) P.M. and twelve o'clock (12:00) midnight on designated irrigation days.

2. The washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment not occurring upon the immediate premises of commercial car washes and commercial service stations and not in the immediate interest of the public health or safety is prohibited.

3. The washing of automobiles, trucks, trailers, boats, airplanes, or other types of mobile equipment upon the immediate premises of commercial car washes and commercial service stations shall occur only between the hours of twelve o'clock (12:00) noon and six o'clock (6:00) P.M.

4. Commercial nurseries and commercial farmers using city water shall water only on designated irrigation days between the hours of ten o'clock (10:00) A.M. and six o'clock (6:00) P.M. and shall use only handheld hoses, drip irrigation systems, or handheld buckets.

5. The filling, refilling, or adding of water to uncovered swimming or wading pools and spas is prohibited at any time of day or night.

6. The operation of any ornamental fountain or similar structure is prohibited.

7. The issuance of new service connections and meters is prohibited. (Ord. 2151 § 1, 1991)

13.06.090: RELIEF FROM COMPLIANCE:

A city water user may file a request for relief from any provision of this chapter. The city manager shall review all requests and hold a hearing with each applicant. The city manager may grant relief from the provisions of this chapter if he determines that special circumstances make compliance not reasonably possible, or that the restrictions herein would either:

A. Cause an unnecessary and undue hardship to the water user or the public; or

B. Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water user or of the public.

Such relief may be granted only upon written request to the city. Upon granting such relief, the city manager may impose any conditions he determines to be just and proper. The city manager shall make his determination within fourteen (14) days of receipt of the request for relief and shall inform the applicant of the decision in writing.

An applicant shall have the right to appeal the city manager's decision regarding his or her application to the city council or its designee. The appeal must be in writing and received by

the city within ten (10) days of the date of the city manager's written decision. The appeal shall be heard by the city council or its designee within a reasonable period of time from the date the appeal is filed. The city shall provide written notice to the applicant of the time and date of the hearing. The city council or its designee, at its discretion, may affirm, reverse or modify the city manager's decision and impose any conditions it deems proper. The decision of the city council shall be final. (Ord. 2151 § 1, 1991)

13.06.100: FAILURE TO COMPLY:

Violation by any customer of the water use prohibitions of this chapter shall be penalized as follows:

A. First Violation; Notice Of Noncompliance: The city manager is authorized and directed to issue a written notice of noncompliance to any water user who, in the reasonable judgment of the city manager, has failed or refused in a significant way to comply with those water use curtailment provisions of this chapter currently in effect. Any such notice of violation shall specify the time, place and manner of noncompliance, and shall specify a reasonable period to achieve compliance. Any notice of noncompliance shall be directed to the customer of record for the premises where the noncompliance was observed. Delivery may be through regular mail or by personal delivery with a declaration of delivery returned to the city manager.

B. Second Violation; Warning Of Penalties: For a second violation by any customer of the water use curtailment provisions of this chapter currently in effect, a written warning notice of the future imposition of penalties on the customer's water bill shall be issued. Any such warning notice shall specify the time, place and manner of noncompliance and shall require compliance within two (2) days. Any warning notice shall be directed to the customer of record for the premises where the violation has occurred. Delivery will be made by personal delivery with a declaration of delivery returned to the city manager.

C. Third Violation; Imposition Of Penalties:

1. For a third violation by any customer of this chapter, a citation shall be issued and a surcharge imposed on the customer's next regular water bill. The surcharge shall consist of a percentage of the customer's commodity charge as shown on the most recent water bill, based upon the water conservation stage then in effect at the time of the most recent

violation. The penalty surcharge for each stage is shown below:

Stage II	25 percent
Stage III	50 percent
Stage IV	75 percent

As an example, if a water user's most recent commodity charge is twenty five dollars ($25.00), a third violation while the city is in stage III would result in the imposition of a twelve dollar fifty cent ($12.50) surcharge.

2. If a water customer cited for a third violation fails or refuses to comply with the requirements of this chapter or to pay any outstanding water bills including surcharges, the city manager is hereby granted discretionary authority pursuant to California Water Code section 375 to cause a flow restricting device to be installed at the meter to reduce water availability to the customer's service address. Pursuant to California Water Code section 35423, if installation of a flow restrictor is infeasible, impractical or is unlikely to induce compliance with this chapter, the city manager may authorize a shutoff of service to the premises involved. (Ord. 2151 § 1, 1991)

13.06.110: HEARING REGARDING VIOLATIONS:

A. Any customer receiving notice of a second or subsequent violation pursuant to section 13.06.090 of this chapter shall have a right to a hearing by the city manager within fifteen (15) days of mailing or other delivery of the notice of violation.

B. The customer's written request for a hearing within the fifteen (15) day period shall automatically stay the imposition of monetary penalties on the customer's water bill until the city manager renders his decision.

C. The decision of the city manager may be appealed to the city council. (Ord. 2151 § 1, 1991)

13.06.120: CITY MANAGER DELEGATION:

The city manager may delegate all duties and responsibilities hereunder. (Ord. 2151 § 1, 1991)

13.06.130: SEVERABILITY:

If any provision, section, subsection, sentence, clause, or phrase of this chapter, or the application of same to any person or set of circumstances is held to be unconstitutional, void, or invalid, such decision shall not affect the remaining portions of this chapter which shall remain in full force and effect, and all provisions of this chapter are declared to be severable for that purpose. (Ord. 2151 § 1, 1991)

13.06.140: INCOMPATIBLE PROVISIONS:

To the extent any provision of this chapter is incompatible with or at variance with any prior adopted ordinance or resolution, the provisions of this chapter shall take precedence, and all prior ordinances and resolutions shall be interpreted to harmonize with and not change the provisions of this chapter. (Ord. 2151 § 1, 1991)

13.06.150: PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED:

Nothing in this chapter shall be construed to require the city to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health or public safety. (Ord. 2151 § 1, 1991)

13.06.160: EXEMPTION FROM CALIFORNIA ENVIRONMENTAL QUALITY ACT:

The city council determines that the adoption of this chapter and implementation of the measures set forth herein are exempt from review under the California environmental quality act[1] because it is an action taken to mitigate or prevent a water shortage emergency, and to protect natural resources. The city council directs the city manager or his designee to prepare and file a notice of exemption as soon as possible following adoption of the ordinance codified in this chapter. (Ord. 2151 § 1, 1991)

City of Loma Linda Municipal Code Title 13

Chapter 13.32 WATER-EFFICIENT LANDSCAPE

13.32.010 Purpose.

A. The State Legislature has found that:

1. The limited supply of state waters are subject to ever increasing demands;
2. California's economic prosperity depends on adequate supplies of water;
3. State Policy promotes conservation and efficient use of water;
4. Landscapes provide recreation areas, clean the air and water, prevent erosion, offer fire protection and replace ecosystems displaced by development; and
5. Landscape design, installation and maintenance can and should be water efficient.

B. Consistent with the legislative findings, the purpose of this chapter is to:

1. Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;
2. Establish a structure for designing, installing and maintaining water-efficient landscapes in new projects; and
3. Establish provisions for water management practices and water waste prevention for established landscapes. (Ord. 488 § 1 (part), 1992)

13.32.020 Definitions.

The words used in this chapter have the meaning set forth below:

"Anti-drain valve" or "check valve" means a value located under a sprinkler head to hold water in the system so it minimizes drainage from the lower elevation sprinkler heads.

"Application rate" means the depth of water applied to a given area, usually measured in inches per hour.

"Applied water" means the portion of water supplied by the irrigation system to the landscape.

"As-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

"Automatic controller" means a mechanical or solid state timer, capable of operating valve stations to set the days and length of time of a water application.

"Backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

"Conversion factor (0.62)" means a number that converts the maximum applied water allowance from acre-inches per acre per year to gallons per square foot per year. The conversion factor is calculated as follows:

(325,829 gallons/43,560 square feet)/12 inches = (0.62)

325,829 gallons = one acre foot

43,560 square feet = one acre

12 inches = one foot

To convert gallons per year to 100-cubic-feet per year, another common billing unit for water, divide gallons per year by 748. (748 gallons = 100 cubic feet.)

"Ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

"Effective precipitation" or "usable rainfall" means the portion of total precipitation that is used by the plants. Precipitation is not a reliable source of water, but can contribute to some degree toward the water needs of the landscape.

"Emitter" means drip irrigation fittings that deliver water slowly from the system to the soil.

"Established landscape" means the point at which plants in the landscape have developed roots into the soil adjacent to the root ball.

"Established period" means the first year after installing the plant in the landscape.

"Estimated applied water use" means the portion of the estimated total water use is derived from applied water. The estimated applied water use shall not exceed the maximum applied water allowance. The estimated applied water use may be the sum of the water recommended through the irrigation schedule.

"Estimated total water use" means the annual total amount of water estimated to be needed to keep the plants in the landscaped area healthy. It is based upon such factors as the local evapotranspiration rate, the size of the landscaped area, the types of plants and the efficiency of the irrigation system.

"ET adjustment factor" means a factor of 0.8, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.

A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. The irrigation efficiency for purposes of the ET adjustment factor is 0.625, therefore, the ET adjustment factor (0.8) = (0.5/0.625).

"Evapotranspiration" means the quantity of water evaporated from adjacent soil surfaces and transpired by plants during a specific time.

"Flow rate" means the rate at which water flows through pipes and valves (gallons per minute or cubic feet per second).

"Hydrozone" means a portion of the landscaped area having plants with similar water needs that are served by a valve or set or valves with the same schedule. A hydrozone may be irrigated or non-irrigated. For example, a naturalized area planted with native vegetation that will not need supplemental irrigation once established is a non-irrigated hydrozone.

"Infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).

"Irrigation efficiency" means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum irrigation efficiency for purposes of this chapter is 0.625. Greater irrigation efficiency can be expected from well designed and maintained systems.

"Landscape irrigation audit" means a process to perform site inspections, evaluate irrigation systems and develop efficient irrigation schedules.

"Landscaped area" means the entire parcel less the building footprint, driveways, non-irrigated portions of parking lots, hardscapes — such as decks and patios and other non-porous areas. Water features are included in the calculation of the landscaped area. Areas dedicated to edible plants, such as orchards or vegetable gardens are not included.

"Lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

"Main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

"Maximum applied water allowance" means, for design purposes, the upper limit of annual applied water for the established landscaped area. It is based upon the area's reference evapotranspiration, the ET adjustment factor, and the size of the landscaped area. The estimated applied water use shall not exceed the maximum applied water allowances.

"Mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

"Mulch" means any material such as leaves, bark, straw or other materials left loose and applied to the soil surface to reduce evaporation.

"Operating pressure" means the pressure at which a system of sprinklers is designed to operate, usually indicated at the base of a sprinkler.

"Overspray" means the water which is delivered beyond the landscaped area, wetting pavements, walks, structures or other non-landscaped areas.

"Plant factor" means a factor that when multiplied by reference evapotranspiration, estimates the amount of water used by plants. For purposes of this chapter, the average plant factor or low water using

plants ranges from 0 to 0.3, for average water using plants the range is 0.4 to 0.6, and for high water using plants the range is 0.7 to 1.0.

“Rain sensing device” means a system which automatically shuts off the irrigation system when it rains.

“Record drawing” or “as-builts” means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

“Recreational area” means areas of active play or recreation such as sports fields, school yards, picnic grounds or other areas with intense foot traffic.

“Recycled water,” “reclaimed water,” or “treated sewage effluent water” means treated or recycled waste water of a quality suitable for nonpotable uses such as landscape irrigation; not intended for human consumption.

“Reference evapotranspiration” or “ETo” means a standard measurement of environmental parameters which affect the water use of plants. ETo is given in inches per day, month, or year, and is an estimate of the evapotranspiration of a large field of four-inch to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the maximum applied water allowances so that regional differences in climate can be accommodated.

“Rehabilitated landscape” means any re-landscaping project that requires a permit.

“Run off” means water which is not absorbed by the soil or landscape to which it is applied and flows from the area. For example, run off may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a severe slope.

“Soil moisture sensing device” means a device that measures the amount of water in the soil.

“Soil texture” means the classification of soil based on the percentage of sand, silt, and clay in the soil.

“Sprinkler head” means a device which sprays water through a nozzle.

“Static water pressure” means the pipeline or municipal water supply pressure when water is not flowing.

“Station” means an area served by one valve or by a set of valves that operate simultaneously.

“Turf” means a surface layer of earth containing mowed grass with its roots. Annual bluegrass, Kentucky bluegrass, perennial ryegrass, red fescue, and tall fescue are cool-season grasses. Bermudagrass, kikuyugrass, seashore paspalum, St. Augustinegrass, zoysiagrass, and buffalo grass are warm-season grasses.

“Usable rainfall” means the portion of total precipitation that is used by the plants. Precipitation is not a reliable source of water, but can contribute to some degree toward the water needs of the landscape.

“Valve” means a device used to control the flow of water in the irrigation system.

“Water conservation concept statement” means a one-page checklist and a narrative summary of the project as shown in Exhibit “A” set out following this chapter. (Ord. 488 § 1 (part), 1992)

13.32.030 Provisions for new or rehabilitated landscapes.

A. APPLICABILITY.

1. Except as provided in Section 13.32.030(A)(3), this section shall apply to:

a. All new and rehabilitated landscaping for public agency projects and private development projects that requires a permit; and

b. Developer-installed landscaping in landscape maintenance district areas of single-family and multi-family projects.

2. Projects subject to this section shall conform to the provisions in this chapter.

3. This section shall not apply to:

a. Homeowner-provided landscaping at single-family and multi-family projects;

b. Cemeteries;

c. Registered historical sites;

d. Ecological restoration projects that do not require a permanent irrigation system; or

e. Mined-land reclamation projects that do not require a permanent irrigation system; or

f. Any project with a landscaped area less than twenty- five thousand square feet.

B. LANDSCAPE DOCUMENTATION PACKAGE.

1. A copy of the landscape documentation package conforming to this chapter shall be submitted to the city or county. No permit shall be issued until the city or county reviews and approves the landscape documentation package.

2. A copy of the approved landscape documentation package shall be provided to the property owner or site manager along with the record drawings and any other information normally forwarded to the property owner or site manager.

3. A copy of the water conservation concept statement and the certificate of substantial completion shall be sent by the project manager to the local retail water purveyor.

4. Each landscape documentation package shall include the following elements, which are described herein:

a. Water conservation concept statement;

b. Calculation of the maximum applied water allowance;

c. Calculation of the estimated applied water use;

d. Calculation of the estimated total water use;

e. Landscape design plan;

f. Irrigation design plan;

g. Irrigation schedule;

h. Maintenance schedule;

i. Landscape irrigation audit schedule;

j. Grading design plan;

k. Soil analysis;

l. Certificate of substantial completion (to be submitted after installation of the project.)

5. If effective precipitation is included in the calculation of the estimated total water use, then an effective precipitation disclosure statement from the landscape professional and the property owner shall be submitted with the landscape documentation package.

C. ELEMENTS OF LANDSCAPE DOCUMENTATION PACKAGE.

1. Water Conservation Concept Statement. Each landscape documentation package shall include a cover sheet, referred to as the water conservation concept statement similar to the following example. It serves as a check list to verify that the elements of the landscape documentation package have been completed and has a narrative summary of the project.

2. The Maximum Applied Water Allowance.

a. A project’s maximum applied water allowance shall be calculated using the following formula:

MAWA	= (ETo) (o.8) (LA) (o.62) where:
MAWA	= Max. applied water allowance (gallons per year)
ETo	= Reference evapotranspiration (inches per year)
0.8	= ET adjustment factor

LA	= Landscaped area (square feet)
0.62	= Conversion factor (to gallons per square foot)

b. Two example calculations of the maximum applied water allowance

i. Project Site One: Landscaped area of 50,000 sq. ft. in Fresno

MAWA	= (ETo) (.8) (LA) (.62)
	= (51 inches) (.8) (50,000 square feet) (.62)
	Maximum applied water allowance = 1,264,800 gallons per year (or 1,691 hundred-cubic-feet per year: 1,264,800/748 = 1,691)

ii. Project Site Two: Landscaped area of 50,000 sq. ft. in San Francisco

MAWA	= (ETo) (.8) (LA) (.62)
	= (35 inches) (.8) (50,000 square feet) (.62)
	Maximum Applied Water Allowance = 868,000 gallons per year (or 1,160 hundred-cubic-feet per year)

c. Portions of landscaped areas in public and private projects such as parks, playgrounds, sports fields, golf courses, or school yards where turf provides a playing surface or serves other recreational purposes may require water in addition to the maximum applied water allowance. A statement shall be included with the landscape design plan, designating areas to be used for such purposes and specifying any needed amount of additional water above the maximum applied water allowance.

3. Estimated Applied Water Use.

a. The estimated applied water use shall not exceed the maximum applied water allowance.

b. A calculation of the estimated applied water use shall be submitted with the landscape documentation package. It may be calculated by summing the amount of water recommended in the irrigation schedule.

4. Estimated Total Water Use.

a. A calculation of the estimated total water use shall be submitted with the landscape documentation package. The estimated total water use may be calculated by summing the amount of water recommended in the irrigation schedule and adding any amount of water expected from effective precipitation (not to exceed twenty-five percent of the local annual mean precipitation) or may be calculated from a formula such as the following:

The estimated total water use for the entire landscaped area equals the sum of the estimated water use of all hydrozones in that landscaped area:

$$\text{EWU (hydrozone)} = \frac{(\text{ETo})\ (\text{PF})\ (\text{HA})\ (.62)}{(\text{IE})}$$

EWU (hydrozone)	=	Estimated water use (gallons per year)
ETo	=	Reference evapotranspiration (inches per year)
PF	=	Plant factor
HA	=	Hydrozone area (square feet)
(.62)	=	Conversion factor
IE	=	Irrigation efficiency

b. If the estimated total water use is greater than the estimated applied water use due to precipitation being included as a source of water, an effective precipitation disclosure statement such as the one in the section entitled “Effective Precipitation” shall be included in the landscape documentation package.

5. Landscape Design Plan. A landscape design plan meeting the following requirements shall be submitted as part of the landscape documentation package:

a. Plant Selection and Grouping.

i. Any plants may be used in the landscape, providing the estimated applied water use recommended does not exceed the maximum applied water allowance and that the plants meet the specifications set forth in subsections (a)(ii), (a)(iii), and (a)(iv) immediately following.

ii. Plants having similar water use shall be grouped together in distinct hydrozones.

iii. Plans shall be selected appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the site. Protection and preservation of native species and natural areas is encouraged. The planting of trees is encouraged wherever it is consistent with the other provisions of this chapter.

iv. Fire prevention needs shall be addressed in areas that are fire prone. Information about fire prone areas and appropriate landscaping for fire safety is available from local fire departments or the California Department of Forestry.

b. Water Features.

i. Recirculating water shall be used for decorative water.

ii. Pool and spa covers are encouraged.

c. Landscape Design Plan Specifications. The landscape design plan shall be drawn on project base sheets at a scale that accurately and clearly identifies:

i. Designation of hydrozones;

ii. Landscape materials, trees, shrubs, groundcover, turf, and other vegetation. Planting symbols shall be clearly drawn and plants labeled by botanical name, common name, container size, spacing, and quantities of each group of plants indicated;

iii. Property lines and street names;

iv. Streets, driveways, walkways, and other paved areas;

v. Pools, ponds, water features, fences and retaining walls;

vi. Existing and proposed buildings and structures including elevation if applicable;

vii. Natural features including but not limited to rock outcroppings, existing trees, shrubs that will remain;

viii. Tree staking, plant installation, soil preparation details, and any other applicable planting and installation details;

ix. A calculation of the total landscaped area;

x. Designation of recreational areas.

6. Irrigation Design Plan. An irrigation design plan meeting the following conditions shall be submitted as part of the landscape documentation package:

a. Irrigation Design Criteria.

i. Runoff and Overspray. Soil types and infiltration rate shall be considered when designing irrigation systems. All irrigation systems shall be designed to avoid runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures. Proper irrigation equipment and schedules, including features such as repeat cycles, shall be used to closely match application rates to infiltration rates therefore minimizing runoff.

Special attention shall be given to avoid runoff on slopes and to avoid overspray in planting areas with a width less than ten feet, and in median strips. No overhead sprinkler irrigation systems shall be

installed in median strips less than ten feet wide.

ii. Irrigation Efficiency. For the purpose of determining the maximum water allowance, irrigation efficiency is assumed to be 0.625. Irrigation systems shall be designed, maintained, and managed to meet or exceed 0.625 efficiency.

iii. Equipment.

(A) Water Meters. Separate landscape water meters shall be installed for all projects except for single family homes or any projects except for single-family homes or any project with a landscaped area of less than five thousand square feet.

(B) Controllers. Automatic control systems shall be required for all irrigation systems and must be able to accommodate all aspects of the design.

(C) Valves. Plants which require different amounts of water shall be irrigated by separate valves. If one valve is used for a given area, only plants with similar water use shall be used in that area. Anti-drain (check) valves shall be installed in strategic points to minimize or prevent low-head drainage.

(D) Sprinkler Heads. Heads and emitters shall have consistent application rates within each control valve circuit. Sprinkler heads shall be selected for proper area coverage, application rate, operating pressure, adjustment capability, and ease of maintenance.

(E) Rain Sensing Override Devices. Rain sensing override devices shall be required on all irrigation systems.

(F) Soil Moisture Sensing Devices. It is recommended that soil moisture sensing devices be considered where appropriate.

b. Recycled Water.

i. The installation of recycled water irrigation systems (dual distribution systems) shall be required to allow for the current and future use of recycled water, unless a written exemption has been granted as described in the following subsection (b)(ii).

ii. Irrigation systems shall make use of recycled water unless a written exemption has been granted by the local water agency, stating that recycled water meeting all health standards is not available and will not be available in the foreseeable future.

iii. The recycled water irrigation systems shall be designed and operated in accordance with all local and state codes.

c. Irrigation Design Plan Specifications. Irrigation systems shall be designed to be consistent with hydrozones. The irrigation design plan shall be drawn on project base sheets. It should be separate from, but use the same format as, the landscape design plan. The scale shall be the same as that used for the landscape design plan.

The irrigation design plan shall accurately and clearly identify:

i. Location and size of separate water meters for the landscape;

ii. Location, type and size of all components of the irrigation system, including automatic controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, and backflow prevention devices;

iii. Static water pressure at the point of connection to the public water supply;

iv. Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (psi) for each station;

v. Recycled water irrigation systems as specified in this chapter.

7. Irrigation Schedules. Irrigation schedules satisfying the following conditions shall be submitted as part of the landscape documentation package:

a. An annual irrigation program with monthly irrigation schedules shall be required for the plant establishment period, for the established landscape, and for any temporarily irrigated areas.

b. The irrigation schedule shall:

i. Include run time (in minutes per cycle), suggested number of cycles per day, and frequency of irrigation for each station; and

ii. Provide the amount of applied water (in hundred cubic feet, gallons or whatever billing units the local water supplier uses) recommended on a monthly and annual basis.

c. The total amount of water for the project shall include water designated in the estimated total water use calculation plus water needed for any water features, which shall be considered as a high water using hydrozone.

d. Recreational areas designated in the landscape de-sign plan shall be highlighted and the irrigation schedule shall indicate if any additional water is needed above the maximum applied water allowance because of high plant factors (but not due to irrigation inefficiency).

e. Whenever possible, irrigation scheduling shall incorporate the use of evapotranspiration data such as those from the California Irrigation Management Information System (CIMIS) weather stations to apply the appropriate levels of water for different climates.

f. Whenever possible, landscape irrigation shall be between two a.m. and ten a.m. to avoid irrigating during times of high wind or high temperature.

8. Maintenance Schedules. A regular maintenance schedule satisfying the following conditions shall be submitted as part of the landscape documentation package:

a. Landscapes shall be maintained to ensure water efficiency. A regular maintenance schedule shall include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning, and weeding in all landscaped areas.

b. Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents.

9. Landscape Irrigation Audit Schedules. A schedule of landscape irrigation audits, for all but single-family residences, satisfying the following conditions shall be submitted to the city or county as part of the landscape documentation package:

a. At a minimum, audits shall be in accordance with the state of California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook, the entire document, which is incorporated by reference. (See Landscape Irrigation Auditor Handbook (June 1990) Version 5.5 [formerly Master Auditor Training].)

b. The schedule shall provide for landscape irrigation audits to be conducted by certified landscape irrigation auditors at least once every five years.

10. Grading Design Plan. Grading design plans satisfying the following conditions shall be submitted as part of the landscape documentation package:

a. A grading design plan shall be drawn on project base sheets. It should be separate from but use the same format as the landscape design plan.

b. The grading design plan shall indicate finished configurations and elevations of the landscaped area, including the height of graded slopes, drainage patterns, pad elevations, and finish grade.

11. Soils.

a. A soil analysis satisfying the following conditions shall be submitted as part of the landscape documentation package:

i. Determination of soil texture, indicating the percentage of organic matter;

ii. An approximate soil infiltration rate (either measured or derived form soil texture/infiltration rate tables). A range of infiltration rates should be noted where appropriate;

iii. Measure of pH, and total soluble salts.

b. A mulch of at least three inches shall be applied to all planting areas except turf.

12. Certification.

a. Upon completing the installation of the landscaping and the irrigation system, an irrigation audit shall be conducted by a certified landscape irrigation auditor prior to the final field observation. (See Landscape Irrigation Auditor Handbook as referenced in Section 13.32.040.)

b. A licensed landscape architect or contractor, certified irrigation designer, or other licensed professional in a related field shall conduct a final field observation and shall provide a certificate of substantial completion to the city or county. The certificate shall specifically indicate that plants were installed as specified, that the irrigation system was installed as designed, and that an irrigation audit has been performed, along with a list of any observed deficiencies.

c. Certification shall be accomplished by completing a certificate of substantial completion and delivering it to the city or county, to the retail water supplier, and to the owner of record. A sample of such a form, which shall be provided by the city or county is set out in Exhibit “B” following this chapter.

D. PUBLIC EDUCATION—PUBLICATIONS. Local agencies shall provide information to owners of all new, single-family residential homes regarding the design, installation, and maintenance of water efficient landscapes.

Information about the efficient use of landscape water shall be provided to water users throughout the community. (Ord. 488 § 1 (part), 1992)

13.32.040 Provisions for existing landscapes.

A. Water Management. All existing landscaped areas to which the city or county provides water that are one acre or more shall have a landscape irrigation audit at least every five years. At a minimum, the audit shall be in accordance with the California Landscape Water Management Program as described in the Landscape Irrigation Auditor Handbook, the entire document which is hereby incorporated by reference. (See Landscape Irrigation Auditor Handbook, Dept. of Water Resources, Water Conservation Office (June 1990) Version 5.5.)

1. If the project's water bills indicate that they are using less than or equal to the maximum applied water allowance for that project site, an audit shall not be required.

2. Recognition of projects that stay within the maximum applied water allowance is encouraged.

B. Water Waste Prevention. Cities and counties shall prevent water waste resulting from inefficient landscape irrigation by prohibiting runoff, low head drainage, overspray, or other similar conditions where water flows onto adjacent property, non-irrigated areas, walks, roadways or structures. Penalties for violation of these prohibitions shall be established locally. (Ord. 488 § 1 (part), 1992)

13.32.050 Effective precipitation.

SAMPLE CERTIFICATE OF SUBSTANTIAL COMPLETION

If effective precipitation is included in the calculation of the estimated total water use, an effective precipitation disclosure statement (similar to the sample Exhibit "C" set out following this chapter) shall be completed, signed, and submitted with the landscape documentation package. No more than twenty-five percent of the local annual mean precipitation shall be considered effective precipitation in the calculation of the estimated total water use. (Ord. 488 § 1 (part), 1992)

EXHIBIT "A" SAMPLE WATER CONSERVATION CONCEPT STATEMENT

Project Site: Project Number:
Project Location:
Landscape Architect/Irrigation Designer/Contractor:

Included in this project submittal package are:
(Check to indicate completion)

___ 1. Maximum Applied Water Allowance:
___ gallons or cubic feet/year

___ 2. Estimated Applied Water Use:
___ gallons or cubic feet/year

*___ 2.(a) Estimated Amount of Water Expected from Effective Precipitation:
___ gallons or cubic feet/year

___ 3. Estimated Total Water Use:
___ gallons or cubic feet/year

Note: * If the design assumes that a part of the Estimated Total Water Use will be provided by precipitation, the Effective Precipitation Disclosure Statement in Section 704 shall be completed and submitted. The Estimated Amount of Water Expected from Effective Precipitation shall not exceed 25 percent of the local annual mean precipitation (average rainfall).

___ 4. Landscape Design Plan
___ 5. Irrigation Design Plan
___ 6. Irrigation Schedule
___ 7. Maintenance Schedule
___ 8. Landscape Irrigation Audit Schedule
___ 9. Grading Design Plan
___ 10. Soil Analysis

Description of Project

(Briefly describe the planning and design actions that are intended to achieve conservation and efficiency in water use.)

Date:_____ Prepared By:_____

EXHIBIT "B" SAMPLE CERTIFICATE OF SUBSTANTIAL COMPLETION

Project Site/Number:_____
Project Location:_____

Preliminary Project Documentation Submitted (Check indicating submittal)

___ 1. Maximum Applied Water Allowance:
___ (gallons or cubic feet per year)
___ 2. Estimated Applied Water Use:
___ (gallons or cubic feet/year)
___ *2a. Estimated Amount of Water Expected from Effective Precipitation:
___ (gallons of cubic feet/year)
___ 3. Estimated Total Water Use:
___ (gallons of cubic feet/year)

NOTE: *If the design assumes that a part of the Estimated Total Water Use will be provided by precipitation, the Effective Precipitation Disclosure Statement shall be completed and submitted. The estimated Amount of Water Expected from Effective Precipitation shall not exceed 25 percent of the local annual mean precipitation (average rainfall).

___ 4. Landscape Design Plan
___ 5. Irrigation Design Plan
___ 6. Irrigation Schedules
___ 7. Maintenance Schedule
___ 8. Landscape Irrigation Audit Schedule
___ 9. Grading Design Plan
___ 10. Soil Analysis

Post-Installation Inspection: (Check indicating substantial completion)

___ A. Plants installed as specified
___ B. Irrigation system installed as designed
B. ___ dual distribution system for recycled water
B. ___ minimal run off or overspray
___ C. Landscape irrigation Audit performed

___ Project submittal package and a copy of this certification has been provided to owner/manager and local water agency.

Comments:

I/we certify that work has been installed in accordance with the contract documents.

_____
Contractor Signature

_____
Date License Number

I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the Water Efficient Landscape Ordinance and that the landscape planting and irrigation installation conform with the approved plans and specifications.

_____
Landscape Architect Signature
or Irrigation Designer/Consultant
or Licensed or Certified Professional in a Related Field

_____
Date State License Number

I/we certify that I/we have received all of the contract documents and that it is our responsibility to see that the project is maintained in accordance with the contract documents.

_____
Owner Signature

_____
Date

EXHIBIT "C" SAMPLE EFFECTIVE PRECIPITATION DISCLOSURE STATEMENT

I certify that I have informed the project owner and developer that this project depends on _____ (gallons or cubic feet) of effective precipitation per year. This represents _____ percent of the local mean precipitation of _____ inches per year.

I have based my assumptions about the amount of precipitation that is effective upon:

I certify that I have informed the project owner and developer that in times of drought, there may not be enough water available to keep the entire landscape alive.

_____
Licensed or Certified Landscape Professional

I certify that I have been informed by the licensed or certified landscape professional that this project depends upon _____ (gallons or cubic feet) of effective precipitation per year. This represents _____ percent of the local mean precipitation of _____ inches per year.

I certify that I have been informed that in times of drought, there may not be enough water available to keep the entire landscape alive.

_____ _____

Owner Developer

EXHIBIT "D" REFERENCE EVAPOTRANSPIRATION

(In inches—Historical Data, extrapolated from 12-month Normal Year ETo Maps and U.C. publication 21426)

SAN BERNARDINO COUNTY

City	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann ETo.
Baker	2.7	3.9	6.1	8.3	10.4	11.8	12.2	11.0	8.9	6.1	3.3	2.1	86.6
Barstow	2.6	3.6	5.7	7.9	10.1	11.6	12.0	10.4	8.6	5.7	3.3	2.1	83.6
Chino	2.1	2.9	3.9	4.5	5.7	6.5	7.3	7.1	5.9	4.2	2.6	2.0	54.6
Crestline	1.5	1.9	3.3	4.4	5.5	6.6	7.8	7.1	5.4	3.5	2.2	1.6	50.8
Needles	3.2	4.2	6.6	8.9	11.0	12.4	12.8	11.0	8.9	6.6	4.0	2.7	92.1
Lucerne Valley	2.2	2.9	5.1	6.5	9.2	11.0	11.4	9.9	7.4	5.0	3.0	1.8	75.3
San Bernardino	2.0	2.7	3.8	4.6	5.7	6.9	7.9	7.4	5.9	4.2	2.6	2.0	55.6
29 Palms	2.6	3.6	5.9	7.9	10.1	11.2	11.2	10.3	8.6	5.9	3.4	2.2	82.9
Victorville	2.3	3.1	4.9	6.7	9.3	10.0	11.2	9.8	7.4	5.1	2.8	1.8	74.6

City of Loma Linda Ordinance 443

Chapter 13.04 WATER DEPARTMENT

Note

* Prior ordinance history: Ords. 1, 294, 286 and 333.

13.04.010 Short title.

This chapter shall be known and may be cited as the “utility services division (water) of the community services department” of the city. (Ord. 443 § 1 (part), 1991)

13.04.020 Definitions.

As used in this chapter:

A. Words and Phrases. For the purpose of this chapter, all words used in the present tense shall include the future; all words in the plural number shall include the singular number; and all words in the singular number shall include the plural number.

B. “City council” means the city council of the city of Loma Linda, California. All decisions of the city manager and city staff may be appealed to the city council pursuant to Section 2.08.030.

C. “City staff” means the employees and contract representatives of the city who are appointed to administer and operate the water system of the city.

D. “Connection” means the pipe line and appurtenant facilities such as the curb stop, meter and meter box, all used to extend water service from the main to premises, the laying thereof and the tapping of the main. Where services are divided at the curb or property line to serve several customers, each such branch service shall be deemed a separate service.

E. “Cost” means the cost of labor, material, transportation, supervision, engineering, and all other necessary overhead expense.

F. “Cross-connection” means any physical connection between the piping system from the division’s service and that of any other water supply that is not, or cannot be, approved as safe and potable for human consumption, whereby water from the unapproved source may be forced or drawn into the utility services division (water) distribution mains.

G. “Main” means a water pipe line in a street, highway, alley, or easement used for public and private fire protection and for general distribution of water.

H. “Owner” means the person owning the fee, or the person in whose name the legal title to the property appears, by deed duly recorded in the county recorder’s office, or the person in possession of the property or buildings under claim of, or exercising acts of ownership over same for himself, or as executor, administrator, guardian or trustee of the owner.

I. “Person” means an individual or a company, association, copartnership or public or private corporation.

J. “Premises” means a lot or parcel of real property under one ownership, except where there are well-defined boundaries or partitions such as fences, hedges, or other restrictions preventing the common use of the property by the several tenants, in which case each portion shall be deemed separate premises. Apartment houses and office buildings may be classified as single premises.

K. “Private fire protection service” means water service and facilities for building sprinkler systems, hydrants, hose reels and other facilities installed on private property for fire protection and the water available therefor.

L. “Public fire protection service” means the service and facilities of the entire water supply, storage and

distribution system of the division, including the fire hydrants affixed thereto, and the water available for fire protection, excepting house service connections and appurtenances thereto.

M. “Regular water service” means water service and facilities rendered for normal domestic, commercial and industrial purposes on a permanent basis, and the water available therefor.

N. “Temporary water service” means water service and facilities rendered for construction work and other uses of limited duration, and the water available therefor.

O. “Utility services division (water)” means division operated under the jurisdiction of the city council represented by appropriate employees or agents. (Ord. 443 § 1 (part), 1991)

13.04.030 Notice—To customers.

Notices to customers by the division will normally be given in writing and either delivered or mailed to him at his last known address. Where conditions warrant, and in emergencies, the utility services division (water) may resort to notification either by telephone or messenger. (Ord. 443 § 1 (part), 1991)

13.04.040 Notice—From customers.

Notices from customers to the utility services division (water) may be given by the customer or his authorized representative in writing, in person or by mail at the division’s office. (Ord. 443 § 1 (part), 1991)

13.04.050 Authority of public services director.

The public services director shall have full charge and control of the maintenance, operation and construction of the water works and water distribution system of the district. The public services director shall regularly inspect all physical facilities related to the city water system, to see that they are in good repair and proper working order, and to note and report violations of any ordinances or water regulations. (Ord. 443 § 1 (part), 1991)

13.04.060 Supervisory employees designated.

The supervisory employees of the utility services division (water) shall consist of public services director and a utility services superintendent. (Ord. 443 § 1 (part), 1991)

13.04.070 Administrative powers and duties.

Regular inspection of all physical facilities belonging and related to the city water system to ensure they are in good repair and proper working order and to note violations of any water regulations. The public services director or his designee shall have charge of other employees working under his direct supervision, particularly relating to the repair and maintenance of the water system and the reading of customer meters. He shall report and be responsible to the city manager in all matters pertaining to the operation of the utility services division (water). In the event of an emergency requiring immediate action, he shall take whatever steps are necessary to maintain customer service pending further action by the city manager, if any. Supervision of all repair or construction work authorized by the city council and any other duties prescribed elsewhere in this chapter or which shall, after the effective date of the ordinance codified in this chapter, be prescribed by the rules and regulations of the city council are the responsibility of the public services director or his designee. (Ord. 443 § 1 (part), 1991)

13.04.080 Delegation of utility services.

In the absence of the public services director, the duties set forth may be performed by another employee who may be designated by the public services director to perform such duties. (Ord. 443 § 1 (part), 1991)

13.04.090 Department to furnish system.

The city will furnish a system, plant, and works used for and useful in obtaining, conserving and disposing of water for public and private uses, including all appurtenances to it, and lands, easements, rights in land, water rights, contract rights, franchises, and other water supply, storage and distribution facilities and equipment, including but not limited to private and public developed projects both on-site and off-site. (Ord. 443 § 1 (part), 1991)

13.04.100 Acceptance of conditions required.

All applicants for service connections or water service shall be required to accept such conditions of pressure and services as are provided by the distributing system at the location of the proposed service connection, and to hold the city harmless for any damages arising out of low pressure or high pressure conditions or interruptions in service. (Ord. 443 § 1 (part), 1991)

13.04.110 Department not responsible for pressure.

The city shall not accept any responsibility for the maintenance of pressure, and it reserves the right to discontinue service while making emergency repairs, etc. Consumers dependent upon a continuous supply of water should provide their own emergency storage. (Ord. 443 § 1 (part), 1991)

13.04.120 Valve operation restricted to department.

No one except an employee or representative of the utility services division (water) shall at any time in any manner operate the curb cocks or valves, except for repair on private property or to avoid property damage, main cocks, gates or valves of the city's water system or interfere with meters or their connections, street mains or other parts of the water system. (Ord. 443 § 1 (part), 1991)

13.04.130 Service discontinuance authorized for noncompliance.

For the failure of the customer or his agent to comply with all or any part of this chapter and any ordinance, resolution, or order fixing rates and charges of the city's utility service division (water), the customer's service shall be discontinued, and water shall not be supplied such customer until he shall have complied with the rule or regulation which he has violated or paid the rates or charges made against him for services rendered. This section shall be in addition to any other remedies authorized by law. (Ord. 443 § 1 (part), 1991)

13.04.140 Division right to determine connection size and location.

The utility services division (water) reserves the right to determine the size of service connections and their location with respect to the boundaries of the premises to be served. The laying of consumer's pipe line to the curb should not be done until the location of the service connection has been approved by the utility services division (water) superintendent. (Ord. 443 § 1 (part), 1991)

13.04.150 Curb cock or valve required.

Every service connection installed by the utility services division (water) shall be equipped with a curb cock or ball valve on the inlet side of the meter. Such valve or curb cock is intended for the exclusive use of the utility services division (water) in controlling the water supply through the service connection pipe. If the curb cock or valve is damaged by the consumer's use to an extent requiring replacement, such replacement shall be at the consumer's expense. (Ord. 443 § 1 (part), 1991)

13.04.160 Service connection regulations.

Domestic, commercial and industrial service connections shall conform with the following rules and any deviation therefrom shall be deemed unlawful:

A. Separate Building. Each house or building under separate ownership must be provided with a separate service connection. Two or more houses under one ownership and on the same lot or parcel of land may be supplied through the same service connection; provided, that for each house under a separate roof which shall face a street, an additional minimum water charge will be applied to the single meter serving the house or a separate service connection may be provided for each building. The city reserves the right to limit the number of houses or the area of land under one ownership to be supplied by one service connection.

B. Single Connection. Not more than one service connection for domestic or commercial water supply shall be installed for one building, except under special conditions approved by the public services director.

C. Different Owners. A service connection shall not be used to supply adjoining property of a different owner or to supply property of the same owner across a street or an alley.

D. Divided Property. When property provided with a service connection is divided, each service connection shall be considered as belonging to the lot or parcel of land which it directly enters.

E. Service Connections. The service connections extending from the water main to the property line and including the meter, meter box and curb cock or ball valve, shall be maintained by the utility services division (water). All pipes and fixtures extending or lying beyond the meter or seven feet from main whichever is closer shall be installed and maintained by the owner of the property. (Ord. 443 § 1 (part), 1991)

13.04.170 Main extension—Regulations.

The following rules are established for making main extensions:

A. Any owner of one or more lots or parcels, or a subdivider of a tract of land, desiring the extension of one or more water mains, to serve such property, shall make a written application therefor to the utility services division (water), such application to contain the legal description of the property to be served and tract number thereof, and any additional information which may be required by the city, and be accompanied by a map showing the location of the proposed connections.

B. Upon receipt of the application, the utility services division (water) shall make an investigation and survey of the proposed extension and shall report the findings to the city council, including the estimated cost of any extensions involving the utility services division (water).

C. The city council shall thereupon consider the application and report of the utility services division (water) and after such consideration reject or approve the same.

D. All extensions of mains, fire hydrants, laterals and connections provided for in accordance with this chapter and approved by the city council shall by agreement become and remain the property of the city. When a contractor or subdivider installs water mains, fire hydrants, laterals and connections in any subdivisions at his own expense, but under the supervision of the utility services division (water), such installations, upon completion and before water service is provided shall be transferred to the ownership of the city by appropriate grant deed and bill of sale.

E. No dead-end lines shall be permitted, except with the approval of the utility services superintendent, and in cases where circulation lines are necessary they shall be designed and approved by the utility services division (water) in advance of installation before becoming a part of the city system.

F. The city will provide all main pipe line extensions in existing streets to properties along dedicated roads and streets upon application for water service and if in their opinion such water service is economically feasible and to the advantage of the city system in serving the requirements of the area. The cost of such extension of water mains shall be at the expense of the applicant or group of applicants to be shared by them. If an applicant could be served adequately by

a certain size pipe line to provide for future expansion of water services in the area, the city may agree to share the cost of the pipe lines on terms agreeable to both parties concerned. In the event that a larger pipe line is installed at partial cost to the city, the city may require future water users in the area who apply for new connections to reimburse the utility services division (water) for such main line extension cost until the full amount of the cost has been recovered.

G. If the property owners or subdividers initiating the pipe line extension are required to defray the entire cost of any main line extension under these regulations, and they wish to put up the entire cost of the project, the city may agree to reimburse such property owners or subdividers over a period of years by requiring all new connections in that area to pay a proportionate amount of the cost to the city, which money shall then be paid to the original investors until the full amount has been paid. (Ord. 443 § 1 (part), 1991)

13.04.180 Independent pipe line systems required when.

The applicant may apply for as many services as may be reasonably required for his premises provided that the pipe line system for each service be independent of the others and that they not be interconnected. (Ord. 443 § 1 (part), 1991)

13.04.190 Wasting water prohibited—Service discontinuance authorized when.

No customer shall knowingly permit leaks or waste water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the utility services division (water) may discontinue the service if such conditions are not corrected within five days after giving the customer written notice. (Ord. 443 § 1 (part), 1991)

13.04.200 Facilities department property—Obstruction removal authorized.

All facilities installed by the city on private property for the purpose of rendering water service shall remain the property of the city and may be maintained, repaired or replaced by the utility services division (water) without the consent or interference of the owner or occupant of the property. The owner shall use reasonable care in the protection of the facilities. No payment shall be made for placing or maintaining the facilities on private property. Shrubbery or plants must not be planted adjacent to fire hydrants or water meters. If property owners do not cooperate in this, the city shall have the right to remove such obstructions at the expense of the property owner after giving notice of such intention. (Ord. 443 § 1 (part), 1991)

13.04.210 Customer liability for facilities damage.

The customer shall be liable for any damage to the service facilities when such damage is from causes originating on the premises by an act of the customer or his tenants, agents, employees, contractors, licensees, or permitees, including the breaking or destruction of locks by the customer or others on or near a meter, and any damage to a meter that may result from hot water or steam from a boiler or heater on the customer's premises. The city shall be reimbursed by the customer for any such damage promptly on presentation of a bill for same. (Ord. 443 § 1 (part), 1991)

13.04.220 Attaching ground wires prohibited.

All individuals or business organizations are forbidden to attach any ground wire or wires to any plumbing which is or may be connected to a service connection or main belonging to the city. The city shall hold the customer liable for any damage to its property occasioned by such ground wire attachments. (Ord. 443 § 1 (part), 1991)

13.04.230 Customer required to provide valve.

The customer shall provide a valve on his side of the service installation, as close to the meter location as practicable,

to control the flow of water to the pipe lines on his premises. The customer shall not use the service curb valve to turn meter on and off for his convenience. (Ord. 443 § 1 (part), 1991)

13.04.240 Department right-of-entry.

Representatives from the utility services division (water) shall have the right of ingress and egress to the customer's premises at reasonable hours for any purpose reasonably connected with the furnishing of water service. (Ord. 443 § 1 (part), 1991)

13.04.250 Unauthorized connection to avoid charges.

A customer, subdivider or their employees or agents shall not make illegal and unauthorized connections to the water system with or without a meter, thus avoiding the record of payment of water charges. (Ord. 443 § 1 (part), 1991)

13.04.260 Meters—Installation—Sealing.

Meters will be installed on or near property lines and shall be owned by the city and installed and removed at its expense. No rent or other remuneration will be paid by the city for a meter or other facilities including connections belonging to individuals. All meters will be sealed by the utility services division (water) at the time of installation, and no seal shall be altered or broken except by one of the utility services division (water) authorized employees or agents. (Ord. 443 § 1 (part), 1991)

13.04.270 Meters—Relocation charges.

Meters moved for the convenience of the customer will be relocated at the customer's expense. Meters moved to protect the city's property will be moved at its expense. If the lateral distance which the customer desires to have the meter moved exceeds eight feet, he will be required to pay for new service at the desired location. (Ord. 443 § 1 (part), 1991)

13.04.280 Service discontinuance authorized for cross-connection.

Water service may be refused or discontinued to any premises where there exists a cross-connection in violation of state or federal laws. (Ord. 443 § 1 (part), 1991)

13.04.290 Service discontinuance—Fraud or abuse.

Service may be discontinued if necessary to protect the city against fraud or abuse. (Ord. 443 § 1 (part), 1991)

13.04.300 Service discontinuance—Noncompliance.

Service may be discontinued for noncompliance with this chapter or any other ordinance or regulation relating to the water service. (Ord. 443 § 1 (part), 1991)

13.04.310 Water service application—Form.

A property owner or his agent may make application for regular water service on a form provided by the utility services division (water). Such application shall signify the customer's willingness and intention to comply with this chapter and other ordinances or regulation relating to the regular water service and to make payment for the water service received. (Ord. 443 § 1 (part), 1991)

13.04.320 Water service application—Payment of past service required.

An application for water service will not be honored unless payment in full has been made for water service previously rendered to the applicant within the boundaries of the division. (Ord. 443 § 1 (part), 1991)

13.04.330 Connection charges—Installation by authorized personnel.

A. Where a regular charge has been fixed for the type of service connection desired, such regular charges shall be paid in advance by the applicant. Where there is no regular fixed charge, the city reserves the right to require the applicant to deposit an amount equal to the estimated cost of such service connection. The current schedule of regular service connection charges is in resolution form.

B. Only duly authorized employees or agents of the utility services division (water) will be authorized to install service connections. (Ord. 443 § 1 (part), 1991)

13.04.340 Service installation—Main abutment required.

Regular water services will be installed at the location desired by the applicant, of the size determined by the utility services division (water). Service installation will be made only to property abutting on distribution mains as have been constructed in public streets, alleys or easements, or to extensions thereof as provided in this chapter. Service installed in new subdivisions prior to the construction of streets or in advance of street improvements must be accepted by the applicant in the installed location. (Ord. 443 § 1 (part), 1991)

13.04.350 Service requirements changes—Notice required.

Customers making any material change in the size, character or extent of the equipment or operations utilizing water services, or whose change in operations results in a large increase in the consumption of water, shall immediately give the utility services division (water) written notice of the nature of the change and, if necessary, amend or change their original application. (Ord. 443 § 1 (part), 1991)

13.04.360 Subdivision system application—Required.

A person or persons desiring to provide a water system within a tract of land which he proposes to subdivide, shall make written application therefor. (Ord. 443 § 1 (part), 1991)

13.04.370 Subdivision system application—Contents.

The application shall state the number of the tract, the name of the subdivision, and its location. It shall be accompanied by a copy of the final map and of the plans, profiles and specifications for the street work therein. (Ord. 443 § 1 (part), 1991)

13.04.380 Subdivision system—Compliance required.

If approved by the city council, it shall be required that the subdivider shall meet all specifications set forth by the American Water Works Association and city standards and specifications as to adequate size, type and quality of materials used and the location of main lines, valves, connections, fire hydrants, etc., and comply with all requirements of the State Health Department and the department of public safety (fire division). (Ord. 443 § 1 (part), 1991)

13.04.390 Subdivision system—Subdivider responsibility—Division inspection.

The utility services division (water) will not undertake on its own initiative to provide or construct any main extension pipe lines in a subdivision or for the extension of main lines from existing pipe lines to the subdivision area. Such subdivision main lines and service required, together with any extension of existing pipe lines to such area, shall be the responsibility of and at the expense of the subdivider. He shall provide and arrange for the construction of all main lines, valves, connections and hydrants with laterals to the inside of curb. Upon completion of the construction project, the system shall be inspected by utility services and if approved, the subdivider shall be required to obtain final approval of the city engineer. Upon such approval, the subdivider shall be required to transfer his ownership in the mains, valves, fire hydrants, laterals, connections, etc., to the city before any regular water service shall be supplied to the subdivided tract or area. (Ord. 443 § 1 (part), 1991)

13.04.400 Subdivision system—Division payment for larger main installation.

If the city council shall require a subdivider or other person to install a larger size main pipe line than that which would normally be required or necessary to serve the interests of the subdivider or others, by consent and written agreement between the subdivider or others and the city council, the utility services division (water) may agree to pay for the difference in cost between the small size main pipe line and the large one which is deemed necessary and desirable for future expansion of the system. All final agreements must be approved and ratified by the city council. (Ord. 443 § 1 (part), 1991)

13.04.410 Department right to set meter—Consumer liability for negligence.

The utility services division (water) reserves the right to set and maintain a meter on any service connection. The water consumer shall be held liable, however, for any damage to the meter due to customer’s negligence or carelessness and in particular, for damage caused by hot water or steam from the premises. (Ord. 443 § 1 (part), 1991)

13.04.420 Guarantee deposit required when.

All water customers who are renters, subdividers or builders subject to frequent change of customers shall be required to make a guarantee deposit set by resolution per connection returnable or applicable to the last or closing bill. (Ord. 443 § 1 (part), 1991)

13.04.430 Temporary service—Connection discontinuance.

Temporary service connections shall be discontinued and terminated within six months after installation unless an extension of time is granted in writing by the utility services division (water). (Ord. 443 § 1 (part), 1991)

13.04.440 Temporary service—Cost deposit required—Connection charges.

The applicant shall deposit, in advance, the estimated cost of installing and removing the facilities required to furnish the service exclusive of the cost of salvageable material. Upon discontinuance of service, the actual cost shall be determined and an adjustment made as an additional charge, refund or credit. If service is supplied through a fire hydrant, the applicant will be charged as per resolution. (Ord. 443 § 1 (part), 1991)

13.04.450 Temporary service—Facilities operation.

All facilities for temporary service to the customer connection shall be made by the utility services division (water) and shall be operated in accordance with its instructions. (Ord. 443 § 1 (part), 1991)

13.04.460 Temporary service—Meter responsibility.

The customer shall use all possible care to prevent damage to the meter or to any other loaned facilities of the utility services division (water) which are involved in furnishing the temporary service from the time they are installed until they are removed, or until forty-eight hours' notice in writing has been given to the utility services division (water) that the contractor or other person is through with the meter or meters and the installation. If the meter or other facilities are lost or damaged, the cost of the meter or cost of making repairs shall be paid by the customer. (Ord. 443 § 1 (part), 1991)

13.04.470 Temporary service—Hydrant use regulations.

An applicant for temporary use of water from a fire hydrant must secure a permit therefor from the utility services division (water) and pay the regular fee charged for the installation and removal of a meter to be installed on the hydrant, provide himself with a hydrant wrench necessary to operate such hydrant, and pay for the water used in accordance with the meter readings, at the rates prescribed by resolution. (Ord. 443 § 1 (part), 1991)

13.04.480 Tampering with hydrant prohibited.

Tampering with any fire hydrant for the unauthorized use of water therefrom, or for any other purpose, is punishable by law. (Ord. 443 § 1 (part), 1991)

13.04.490 Temporary service—Advance payment or credit references required.

The applicant shall pay the estimated cost of water service in advance or shall be otherwise required to establish acceptable credit references. (Ord. 443 § 1 (part), 1991)

13.04.500 Arrangements for large quantities of water required.

When an abnormally large quantity of water is desired for filling a swimming pool or for other purposes, arrangements must be made with the utility services division (water) prior to taking such water. Permission to take water in unusual quantities will be given only if it can be safely delivered through the city's facilities and if other consumers are not inconvenienced thereby. (Ord. 443 § 1 (part), 1991)

13.04.510 Equipment maintenance required.

The customer shall, at his own risk and expense, furnish, install and keep in good and safe condition all equipment that may be required for receiving, controlling, applying and utilizing water, and the city shall not be responsible for any loss or damage caused by the improper installation of such equipment, or the negligence or wrongful act of the customer or of any of his tenants, agents, employees, or contractors, licensees or permittees in installing, maintaining, operating or interfering with such equipment. The city shall not be responsible for and will not consider refunds or credits for the loss or wastage of water occasioned by the breakage, leakage or damage to pipe lines on customer's property which is beyond the customer's water meter. The city also shall not be responsible for damage to property caused by faucets, valves and other equipment that are open when water is turned on at the customer's meter, either originally or when turned on after a temporary shutoff. (Ord. 443 § 1 (part), 1991)

13.04.520 Collection by suit—Defendant payment of costs.

Defendant shall pay all costs of suit in any judgment rendered in favor of the city. (Ord. 443 § 1 (part), 1991)

13.04.530 Hydrants—Authorized use only permitted.

Fire hydrants are for use by the utility services division (water) or by the department of public safety (fire division). Other parties desiring to use fire hydrants for any purpose must first obtain written permission from the utility services

division (water) prior to use and shall operate the hydrant in accordance with instructions issued by the utility services division (water). Unauthorized use of hydrants will be prosecuted according to law. (Ord. 443 § 1 (part), 1991)

13.04.540 Hydrants—Maintenance charge.

A charge, to be determined by contract between the utility services division (water) and organized fire protection agencies will be imposed for hydrant maintenance and water used for public fire protection. (Ord. 443 § 1 (part), 1991)

13.04.550 Hydrants—Change in location.

When a fire hydrant has been installed in the location specified by proper authority, the city has fulfilled its obligation. If a property owner or other party desires a change in the size, type or location of the hydrant, he shall bear all costs of such changes without refund. Any change in the location of a fire hydrant must have the approval of the proper authority. (Ord. 443 § 1 (part), 1991)

13.04.560 Private fire protection—Applicant to pay installation cost.

The applicant for private fire protection service shall pay the total actual cost of installation of the service from the distribution main to the customer's premises, including the cost of an approved double detector check device as per City Standard W-11. Customer shall be responsible for maintenance and testing of such device and meter at cost. (Ord. 443 § 1 (part), 1991)

13.04.570 Private fire protection—Connection with other systems prohibited.

There shall be no connections between this fire protection system and any other water distribution system on the premises. (Ord. 443 § 1 (part), 1991)

13.04.580 Private fire protection—Fire extinguishing and testing purposes only authorized.

There shall be no water used through the fire protection service except to extinguish fires and for testing the firefighting equipment. (Ord. 443 § 1 (part), 1991)

13.04.590 Private fire protection—Charges double when—Exception.

Any consumption recorded on the meter will be charged for at double the regular service rates, except that no charge will be made for water used to extinguish fires where such fires have been reported to the department of public safety (fire division). (Ord. 443 § 1 (part), 1991)

13.04.600 Private fire protection—Rate determination.

The monthly rates for private fire protection shall be established by the utility services division (water) upon receipt of application. (Ord. 443 § 1 (part), 1991)

13.04.610 Private fire protection—Tank filling authorized when.

Occasionally water may be obtained from a private fire service for filling a tank connected with a fire service, but only if permission is secured from the utility services division (water) in advance and an approved means of measurement is available. The regular water rates will be applied. (Ord. 443 § 1 (part), 1991)

13.04.620 Private fire protection—Service discontinuance authorized when.

If water is used from a private service in violation of the agreement or of this chapter, the city may, at its option, discontinue and remove the service. (Ord. 443 § 1 (part), 1991)

13.04.630 Private fire protection—Department nonresponsibility for damage.

The city assumes no responsibility for loss or damage due to lack of water or pressure, either high or low, and merely agrees to furnish such quantities and pressures as are available in its general distribution system. The service is subject to shutdowns and variations required by the operation of the system. (Ord. 443 § 1 (part), 1991)

13.04.640 Private fire protection—Other service connections authorized.

The city shall have the right to take a domestic, commercial or industrial service connection from the fire service connection at the curb to supply the same premises as those to which the fire service connection belongs. The city shall also have the right to determine the proportion of the installation costs properly chargeable to each service connection, if such segregation of costs shall become necessary. (Ord. 443 § 1 (part), 1991)

13.04.650 Private fire protection—Check valve installation authorized.

The city reserves the right to install on all fire service connections a double detector check as per City Standard W-11, at the expense of the owner of the property. (Ord. 443 § 1 (part), 1991)

13.04.660 Backflow protective device—Installation required when.

The customer must comply with state and federal laws governing the separation of dual water systems or installations of backflow protective devices to protect the public water supply from the range of cross-connections. Backflow protective devices must be installed as per city standard and shall be open to test and inspection by the utility services division (water). Plans for the installation of backflow protection devices must be approved by the utility services division (water) prior to installation. (Ord. 443 § 1 (part), 1991)

13.04.670 Pressure relief valves required when.

As a protection to the customer’s plumbing system, a suitable pressure relief valve must be installed and maintained by him, at his expense, when check-valves or other protective devices are used. The relief valve shall be installed between the check-valve and the water heater. (Ord. 443 § 1 (part), 1991)

13.04.680 Backflow protective device—Required on supply lines when.

Whenever backflow protection has been found necessary on a water supply line entering a customer’s premises, then any and all water supply lines from the utility services division (water) mains entering such premises, buildings, or structures shall be protected by an approved backflow device, regardless of the use of the additional water supply lines. (Ord. 443 § 1 (part), 1991)

13.04.690 Backflow protective device—Inspection and testing.

The double check valve or other approved backflow protection devices shall be inspected and tested in accordance with the California Administrative Code Title 17 by the utility services division (water) or a certified tester. The devices shall be serviced, overhauled, or replaced whenever they are found defective, and all costs of repair and maintenance shall be borne by the customer. (Ord. 443 § 1 (part), 1991)

13.04.700 Service discontinuance authorized for check valve installation defected.

The service of water to any premises may be immediately discontinued by the utility services division (water) if any defect is found in the check valve installations or other protective devices, or if it is found that dangerous unprotected cross-connections exist. Service will not be restored until such defects are corrected. (Ord. 443 § 1 (part), 1991)

13.04.710 Department nonliability for service interruption damage.

The city shall not be liable for damage which may result from an interruption in service from a cause beyond the control of the utility services division (water). (Ord. 443 § 1 (part), 1991)

13.04.720 Billing—Period.

The regular billing period will be monthly or bimonthly at the option of the utility services division (water). (Ord. 443 § 1 (part), 1991)

13.04.730 Meters—Reading.

Meters will be read as nearly as possible on the same day of each month, as near the end of each month as practicable and reasonably possible. (Ord. 443 § 1 (part), 1991)

13.04.740 Opening and closing bill proration.

Opening and closing bills for less than the normal billing period shall be prorated both as to minimum charges and quantity by blocks of one hundred cubic feet. If the total period for which service is rendered is less than one month, the bill shall not be less than the monthly minimum charge applicable. Closing bills may be estimated by the utility services division (water) for the final period as an expediency to permit the customer to pay the closing bill at the time service is discontinued. (Ord. 443 § 1 (part), 1991)

13.04.750 Charges due when.

Water charges are due and payable within twenty days of billing date to the property owner or his tenant or agency as designated in the application, and delinquent twenty days after the date indicated on the bill. Service may be discontinued without further notice if payment is not made by the delinquent date. (Ord. 443 § 1 (part), 1991)

13.04.760 Billing—Payment due notice required.

Bills for metered water services shall be rendered at the end of each billing period. Flat rate service shall be billed in advance. Bills shall be payable on presentation. On each bill for water service rendered by the utility services division (water) shall be printed substantially as follows: “Payment is due within twenty (20) days of billing date. Service may be turned off if account is unpaid.” (Ord. 443 § 1 (part), 1991)

13.04.770 Billing—Separate bills required—Exception.

Separate bills will be rendered for each meter installation except where the utility services division (water) has, for its own convenience, installed two or more meters in place of one meter. Where such installations are made the meter readings will be combined for billing purposes. (Ord. 443 § 1 (part), 1991)

13.04.780 Payment guarantee required for turn on.

The water charge begins when a service connection is installed and the meter is set, unless the water is ordered to be left shut off when the service connection is ordered to be installed. Before water is turned on by the utility services division (water) for any purpose whatever, the property owner or tenant must sign a form in which he guarantees payment of future water bills for the service required. The person signing the guarantee form or meter set form will be held liable for water used until the utility services division (water) is notified in writing to discontinue service or to transfer the account to another owner or tenant. (Ord. 443 § 1 (part), 1991)

13.04.790 Unauthorized water use—Consumer liability.

A person taking possession of premises and using water from an active service connection without having made application to the utility services division (water) for meter service shall be held liable for the water delivered from the date of the recorded meter reading, and if the meter is found inoperative, the quantity consumed will be estimated. If proper allocation for water service is not made upon notification to do so by the utility services division (water), and if accumulated bills for service are not paid immediately, the service may be discontinued by the utility services division (water) without further notice. (Ord. 443 § 1 (part), 1991)

13.04.800 Department nonliability for wasted water.

When turning on the water supply as requested, and the house or property is vacant, the utility services division (water) will endeavor to ascertain if water is running on the inside of the building. If such is found to be the case, the water will be left shut off at the curb cock on the inlet side of the meter. The utility services division (water) jurisdiction and responsibility ends at the property line for all purposes, and the utility services division (water) will in no case be liable for loss of wasted water or for damages occasioned by water running from open or faulty fixtures, or from broken, leaking or damaged pipes inside of the property line of the customer. (Ord. 443 § 1 (part), 1991)

13.04.810 Desired discontinuance—Notification required.

Customers desiring to discontinue service should so notify the utility services division (water) two days prior to vacating the premises. Unless discontinuance of service is ordered, the customer shall be liable for regular charges whether or not any water is used. (Ord. 443 § 1 (part), 1991)

13.04.820 Collection by suit—Authorized when.

All unpaid rates and charges and penalties provided in this chapter may be collected by suit. (Ord. 443 § 1 (part), 1991)

13.04.830 Service rates.

Each and all premises which are served by a connection to the water system of the city shall be charged and the owner thereof shall pay a water service usage charge based upon a schedule for such charges fixed by resolution duly adopted by the city council. (Ord. 443 § 1 (part), 1991)

13.04.840 Administrative decision appeal—City council action final.

All ruling of the city council shall be final. All administrative decisions of the staff concerning city policies, rules or regulations shall be appealed, if at all, to the city council within ten days subsequent to written notice of such administrative decision; otherwise, the decision shall be deemed final. (Ord. 443 § 1 (part), 1991)

13.04.850 Meter testing—Required when—Procedure.

All meters will be tested prior to installation, and no meter will be installed which registers more than two percent fast. If a customer desires to have the meter serving his premises tested, he shall first deposit the fees required and may be present when the meter is tested in the meter shop of the utility services division (water). Should the meter register more than two percent fast, the deposit will be refunded, but should the meter register less than two percent fast, the deposit will be retained by the utility services division (water). (Ord. 443 § 1 (part), 1991)

13.04.860 Meter testing—Refund authorized when.

If a meter tested at the request of a customer is found to be more than two percent fast, the excess charges for the time service was rendered the customer requesting the test, or for a period of six months, whichever shall be the lesser, shall be refunded to the customer. (Ord. 443 § 1 (part), 1991)

13.04.870 Meter testing—Additional billing authorized when.

If a meter tested at the request of a customer is found to be more than five percent slow, the utility services division (water) may bill the customer for the amount of the undercharge based upon corrected meter readings for the period, not exceeding six months, that the meter was in use. (Ord. 443 § 1 (part), 1991)

13.04.880 Charge estimate when meter not registering.

If a meter is found to be not registering, the charges for service shall be at the minimum monthly rate or based on the estimated consumption, whichever is greater. Such estimates shall be made from previous consumption records for a comparable period or by such other method as is determined by the utility services division (water) and its decision shall be final. (Ord. 443 § 1 (part), 1991)

13.04.890 Service discontinuance authorized for nonpayment.

Service may be discontinued for nonpayment of bills on or before the twentieth day following the date of billing. (Ord. 443 § 1 (part), 1991)

13.04.900 Failure to receive bill no relief of liability.

Failure to receive a bill for service rendered does not relieve consumer of liability. Any amount due shall be deemed a debt to the city, and any person, firm or corporation failing, neglecting or refusing to pay such indebtedness shall be liable to an action in the name of the city in any court of competent jurisdiction for the amount thereof. (Ord. 443 § 1 (part), 1991)

13.04.910 Reconnection charge—Meter removal charge.

A reconnection charge, plus penalties as per resolution shall be made and collected prior to renewing service following a discontinuance of water service due to nonpayment of bill, and an additional charge shall be made whenever it is deemed necessary to remove the meter from the premises. (Ord. 443 § 1 (part), 1991)

13.04.920 Delinquent charge penalty.

Rates and charges which are not paid on or before the day of delinquency shall be subject to a penalty of ten percent and thereafter shall be subject to a further penalty of two percent per month on the first day of each month following. (Ord. 443 § 1 (part), 1991)

13.04.930 Security deposit charge.

The security deposit is the charge which insures payment of minimum utility service division (water) charges. Upon discontinuance of service the security deposit shall be applied to reduce any unpaid charges outstanding on the customer's account. The amount of deposit required shall be established by the city council in the resolution on fees. The security deposit shall be refunded to the customer as provided in this section. (Ord. 443 § 1 (part), 1991)

13.04.940 Waste or nuisance water and other substances.

It is unlawful for any person, firm or corporation to deposit, drain, wash, allow to run or divert into or upon any public road, highway, street or alley, drainage ditch, storm drain or flood control channel owned by or controlled by any public agency within the city, any water, mud, or sand; except that, upon written application of any person filed with the city and approved by the director of public services, the city may, upon such terms and conditions as it may deem advisable to impose, including the charging of a fee therefor, grant a permit to such person to do any of the acts prohibited by this section, provided the same shall not be detrimental to the public health, safety or welfare. For purposes of enforcement of this section, the owner of the meter or property which is the source of the waste or nuisance water or other substance as defined in this section is considered the party responsible for any violations cited under this section. (Ord. 443 § 1 (part), 1991)

13.04.950 Conservation measures—Stage No. 1 normal conditions—Voluntary conservation measures.

Normal conditions shall be in effect when the city is able to meet all the water demands of its customers in the immediate future. During normal conditions all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes. (Ord. 443 § 1 (part), 1991)

13.04.960 Stage No. 2—Threatened water supply shortage.

In the event of a threatened water supply shortage which could affect the city's ability to provide water for ordinary domestic and commercial uses, the city council shall hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the city. The city council may then, by resolution, declare a water shortage condition to prevail, and the following conservation measures shall be in effect.

A. Exterior Landscape Plans. Exterior landscape plans for all new commercial and industrial development shall provide for timed irrigation and shall consider the use of drought resistant varieties of flora. Such plans shall be presented and approved by the city prior to issuance of a water service letter.

B. Excessive Irrigation and Related Waste. No customer of the city or other person acting on behalf of or under the direction of a customer shall cause or permit the use of water for irrigation of landscaping or other outdoor vegetation, plantings, lawns or other growth, to exceed the amount required to provide reasonable or excessive waste of water from such irrigation activities or from watering devices or systems. The free flow of water away from an irrigated site shall be presumptively considered excessive irrigation and waste as defined.

C. Agricultural Irrigation. Persons receiving water from the city who are engaged in commercial agricultural practices, whether for the purpose of crop production or growing of ornamental plants shall provide, maintain and use irrigation equipment and practices which are the most efficient possible. Upon the request of the director of public services, these persons may be required to prepare a plan describing their irrigation practices and equipment, including but not limited to, an estimate of the efficiency of the use of water on their properties.

D. Commercial Facilities. Commercial and industrial facilities shall, upon request of the director of public services, provide the city with a plan to conserve water at their facilities. The city will provide these facilities with information regarding the average monthly water use by the facility for the last two-year period. The facility will be

expected to provide the city with a plan to conserve or reduce the amount of water used by that percentage deemed by the city council to be necessary under the circumstances. After review and approval by the director of public services, the water conservation plan shall be considered subject to inspection and enforcement by the city.

E. Parks, Golf Courses, Swimming Pools and School Grounds. Public and private parks, golf courses, swimming pools and school grounds which use water provided by the city shall use water for irrigation and pool filling between the hours of six p.m. and six a.m.

F. Domestic Irrigation. Upon notice and public hearing, the city may determine that the irrigation of exterior vegetation shall be conducted only during specified hours and/or days, and may impose other restrictions on the use of water for such irrigation. The irrigation of exterior vegetation at other than these times shall be considered to be a waste of water.

G. Swimming Pool. All residential, public and recreational swimming pools, of all sizes, shall use evaporation resistant covers and shall recirculate water. Any swimming pool which does not have a cover installed during periods of nonuse shall be considered a waste of water.

H. Runoff and Washdown. No water provided by the city shall be used for the purposes of washdown of impervious areas without specific written authorization of the director of public services. Any water used on a premises that is allowed to escape the premises and run off into gutters or storm drains shall be considered a waste of water.

I. Vehicle Washing. The washing of cars, trucks or other vehicles is not permitted, except with a hose equipped with an automatic shut-off device, or at a commercial facility designated and so designated on the city's billing records.

J. Drinking Water Provided by Restaurants. Restaurants are requested not to provide drinking water to patrons except by request. (Ord. 443 § 1 (part), 1991)

13.04.970 Stage No. 3—Water shortage emergency—Mandatory conservation measures.

In the event of a water shortage emergency in which the city may be prevented from meeting the water demands of its customers, the city council shall, if possible given the time and circumstances, immediately hold a public hearing at which customers of the city shall have the opportunity to protest and to present their respective needs to the city council. No public hearing shall be required in the event of a breakage or failure of a pump, pipeline, or conduit causing an immediate emergency. The director of public services is empowered to declare a water shortage emergency, subject to the ratification of the city council within seventy-two hours of such declaration, and the following rules and regulations shall be in effect immediately following such declarations:

A. Prohibition. Watering of parks, school grounds, golf courses, lawn watering, landscape irrigation, washdown of driveways, parking lots or other impervious surfaces, washing of vehicles, except when done by commercial car wash establishments using only recycled or reclaimed water, filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes are prohibited.

B. Restaurants. Restaurants shall not serve drinking water to patrons except by request.

C. Construction Meters. No new construction meter permits shall be issued by the city. All existing construction meters shall be removed and/or locked.

D. Commercial Nurseries and Livestock. Commercial nurseries shall discontinue all watering and irrigation. Watering of livestock is permitted as necessary. (Ord. 443 § 1 (part), 1991)

13.04.980 Mandatory compliance—Implementation and termination.

The director of public services of the city shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the water conservation plan stages and shall notify the city council of the necessity for the implementation or termination of each stage. Each declaration of the city council implementing or terminating a water conservation stage shall be published at least once in a newspaper of general circulation, and shall be posted at the city offices. Each declaration shall remain in effect until the city council

otherwise declares, as provided in this section. (Ord. 443 § 1 (part), 1991)

13.04.990 Mandatory compliance—Exception permits.

The director of public services may grant permits for uses of water otherwise prohibited under the provisions of this chapter if he finds and determines that restrictions herein would either:

A. Hardship. Cause an unnecessary and undue hardship to the water user or the public; or

B. Emergency. Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water use or of the public. (Ord. 443 § 1 (part), 1991)

13.04.1000 Exception granted.

Such exceptions may be granted only upon written application therefor. Upon granting such exception permit, the director of public services may impose any conditions he determines to be just and proper. (Ord. 443 § 1 (part), 1991)

13.04.1010 Enforcement, inspection.

Authorized employees of the city, after proper identification may, during reasonable hours, inspect any facility having a water conservation plan, and may enter onto private property for the purpose of observing the operation of any water conservation device, irrigation equipment or water facility. Employees of the city may also observe the use of water or irrigation equipment within the city from public rights-of-way and as alleged violations are reported to the city. (Ord. 443 § 1 (part), 1991)

13.04.1020 Civil penalties for violation.

Violators of the mandatory provisions of this chapter shall be subject to civil action initiated by the city as follows:

A. First Violation. For a first violation, the city shall issue a written notice of violation to the water user violating the provisions of this chapter. The notice shall be given pursuant to the requirements listed in Sections 13.04.970 and 13.04.980.

B. Second Violation. For a second violation of this chapter within a twelve-month period or for failure to comply with the notice of violation within the period stated, a surcharge of one hundred dollars is imposed for the meter through which the wasted water was supplied.

C. Third Violation. For a third violation of this chapter within a twelve-month period, or for continued failure to comply within thirty days after notice of an imposition of second violation sanctions, a one-month penalty surcharge in the amount of two hundred dollars is imposed for the meter through which the wasted water was supplied. In addition to the surcharge, the city may, at its discretion, install a flow-restricting device at such meter with a one-eighth inch orifice for services up to one and one-half inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight hours. The charge to the customer for installing a flow-restricting device shall be based upon the size of the meter and the actual cost of installation but shall not be less than that provided in the city’s rules and regulations. The charge for removal of the flow-restricting device and restoration of normal service shall be as provided in the city’s rules and regulations.

D. Subsequent Violations—Discontinuance of Service. For any subsequent violation of this chapter within the twenty-four calendar months after a first violation as provided in this section, the penalty surcharge shall be imposed and the city may discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration of normal service shall be as provided in the rules and regulations of the city. Such restoration of service shall not be made until the director of public services of the city has determined that the water user has provided reasonable assurances that future violations of this chapter by such user will not occur. (Ord. 443 § 1 (part), 1991)

13.04.1030 Notification of violation.

A. First Violation. For a first violation, written notice shall be given to the customer and/or property owner personally or by regular mail.

B. Subsequent Violation. If the penalty assessed is a surcharge for a second or third violation, notice may be given by regular mail.

C. Penalties Involving Installation of Flow-restrictors or Discontinuance of Water Service. If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time, notice of the violation shall be given in the following manner:

1. Personal Service. By giving written notice thereof to the occupant and/or property owner personally, or if the occupant and/or property owner is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail addressed to the occupant and/or owner of his/her place of business or residence; or

2. Posting. If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be located, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person there residing, if such person can be found, and also sending a copy through the United States mail addressed to the occupant at the place where the property is situated and to the owner if different. (Ord. 443 § 1 (part), 1991)

13.04.1040 Form of notice.

All notices provided for in Section 13.04.1030 shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and a statement informing the occupant/owner of his/her right to a hearing on the violation. (Ord. 443 § 1 (part), 1991)

13.04.1050 Hearing.

Any customer or property owner against whom a penalty is levied pursuant to this chapter shall have a right to a hearing, in the first instance by the director of public services, with the right of appeal to the city council, on the merits of the alleged violation upon the written request of that customer within fifteen days of the date of alleged violation. At the next regularly scheduled meeting, the customer may then appear and present any evidence in support of his position and ask for a decision by the city council. (Ord. 443 § 1 (part), 1991)

13.04.1060 Delays on action.

The city council shall act promptly to resolve the dispute, but may delay a resolution of the dispute to the time of its next regular meeting in order to investigate the dispute or receive special reports related to the dispute. (Ord. 443 § 1 (part), 1991)

13.04.1070 Decision of the city council.

The decision of the city council shall be final. Should the city council not render a decision within sixty days of application to the city council, this failure to act shall be deemed a denial of the requested action, unless both parties have agreed to extend the resolution period. (Ord. 443 § 1 (part), 1991)

West Valley Water District Ordinance 68 and Article 24

ARTICLE 24. WATER CONSERVATION

1. Purpose. The purpose of this Article is to provide water conservation measures in order to minimize the effect(s) of a water shortage on the citizens of, visitors to, and the economic well-being of the communities we serve and, by means of this Article, to adopt provisions that will significantly reduce the wasteful and inefficient consumption of water, thereby extending the available water resources required for the domestic, sanitation, and fire protection needs of the citizens of, and visitors to, the communities we serve while reducing the hardship on the District and the general public to the greatest extent possible.

2. Application. The provisions of this Article shall apply to all customers and property within the service area of the District and shall also apply to all property and facilities owned, maintained, operated, or otherwise under the jurisdiction of the West Valley Water District.

a) Exception. The prohibited uses of water provided for by this Ordinance are not applicable to that use of water necessary for public health and safety or for essential government services such as police, fire, and similar emergency services.

3. Policy. Due to the fact that we are located in a semi-arid region and our groundwater is of limited supply and in an overdraft condition and because of these conditions prevailing in the District and areas elsewhere from which the District obtains its water supplies, the general welfare requires that the water resources available to the District be put to the maximum beneficial use to the extent to which they are capable and that the wasteful, inefficient, or unreasonable use, or method of use of our previous, limited, and finite water resources be prevented.

As such, the conservation of such waters is to be exercised with a view to the reasonable and beneficial and efficient use thereof in the interests of the people of the District and for the public welfare.

Therefore, the West Valley Water District establishes the following goals, objectives, policies, and four-stage water conservation plan pertaining to the conservation and use of water:

2401. GOALS

< The conservation of water.

< The efficient use and distribution of available water supplies.

< Adequate and sufficient potable water supply and availability for the greatest public benefit, with particular regard to human consumption, sanitation, and fire protection.

ARTICLE 24. WATER CONSERVATION

< Maintain high quality customer service.

< Ensure fiscal soundness.

< Protect environmental quality.

< Meet growing water quality regulations.

2402. OBJECTIVES

< To conserve all available water supplies.

< To achieve an overall water use reduction.

< To reduce the volume of wastewater.

< To continuously increase consumer awareness about the need for and benefits of water conservation.

< To reduce or eliminate wasteful and inefficient uses of water.

< To assure an adequate supply of potable water sufficient to meet the essential private and public needs of the District's growing population and economy of those communities in which we serve.

< To assure that all new developments and existing dwellings which are remodeled or added to are equipped with water-conserving devices, fixtures, and appliances.

< To increase the use of native or water-conserving plant species for landscaping purposes.

2403. POLICIES

< As a condition of water service, all new structures shall be equipped with ultra low-flush toilets (1.6 gallons per flush max) as per Section 17921.3 of the California Health and Safety Code, and with low-flow showers and faucets as per Title 24, Part 6, Article 1, T20-1406F of the California Administrative Code, in addition to the insulating of all hot water lines according to California Energy Commission Rules.

ARTICLE 24. WATER CONSERVATION

< As a condition of continued water service, existing structures not so equipped, which require building permits to remodel or expand, shall be retrofitted with toilet tank dams resulting in 1.6 gallon flushes unless the toilets are to be replaced, in which case the new toilets shall be ultra low-flush (1.6 gpf), as stated above, and low-flow showers and faucets. Certification of compliance with this Ordinance shall be forwarded to the District.

< The use of lawns shall be minimized in new commercial, hotel, condominium, and high-density housing and shall be subject to District review and conditioning of projects. The use of native or water-conserving trees, shrubs, lawns, grass, ground cover, vines, and other plant species for landscape planting or replanting purposes is required and shall be approved by the District. (A list of such plants can be obtained at the District office.)

< Large water users, as determined by the District, shall submit a water conservation plan to the District and promote implementation of same as a condition to continued service.

< Water demand, use, and mitigation shall be address in every Environmental Impact Report.

< The District shall:

a) Cooperate with other local water purveyors, appropriate state and other responsible agencies in facilitating a continuous program to increase consumer awareness about the need for and benefits of water conservation.

b) Encourage large water users to implement water recycling and reuse processes.

c) Make water conservation as reliable a method of reducing water demands as water supply projects are in meeting such demands.

2404. STAGE I - NORMAL CONDITION

Normal supply and distribution capacity is available. All policies shown in Section 2403 and the following water conservation measures shall apply.

1. Recommendations for use of water.

(a) Watering with sprinklers should be done at night between 11:00 p.m. and 8:00 a.m. Hand watering should be done between 6:00 p.m. and 8:00 a.m. Drip irrigation and hand watering while gardening is exempt from this recommendation. Water being used during repair or maintenance of watering system is exempt from this section.

b) Water conservation should be practiced within the home or business.

c) All restaurants are requested not to serve water to their customers unless specifically requested by the customer.

2. The following uses of water are hereafter considered non-essential to the public health, safety and welfare and, if allowed, would constitute the wasting of water and is hereby prohibited, pursuant to Water Code Section 350 et seq., Water Code Section 71640 et. Seq., and the common law:

a) There shall be no hose washing of sidewalks, walkways, driveways, parking areas, patios, porches, verandas, tennis courts, or other paved, concrete, or other hard surface areas, unless done with hand-held hose equipped with a trigger nozzle, except that flammable or other similarly dangerous or unhealthy substances may be washed from said areas by direct hose flushing for the benefit of public health or safety.

b) No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.

c) No person shall permit water to leak from any facility or plumbing fixture on his/her premises; said leak shall be repaired in a timely manner.

d) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment are prohibited unless done with a hand-held bucket or hand-held hose equipped with an automatic positive shut off trigger nozzle for quick rinses. The nozzle shall be removed when the hose is not in use. This section does not apply to the washing of the above-listed vehicles or mobile equipment when conducted at a commercial car wash utilizing recycling systems.

1. Such washings are exempted from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

e) Use of water for any purpose, which results in flooding or run-off in gutters, driveways or streets, should be prevented and controlled.

f) The use of sprinklers for any type of irrigation during high winds is prohibited.

ARTICLE 24. WATER CONSERVATION

2405. STAGE II - WATER ALERT

The District may not be able to meet all water demands of all customers, unless the following water conservation measures are applied:

a) All policies and prohibitions listed in Sections 2403 and 2404.

b) All customers are asked for a voluntary minimum 10% reduction of their water consumption over their last year's consumption, unless otherwise stated.

(c) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment is prohibited unless done with a hand-held bucket or hand-held hose equipped with a positive shut off nozzle for quick rinses. This section does not apply to the washing of the above-listed vehicles or mobile equipment when conducted at a commercial car wash utilizing recycling systems.

1. Such washings are exempted from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

d) All restaurants are prohibited from serving water to their customers except when specifically requested by the customer.

e) District will screen all new applications for water service installations and will limit water use before occupancy to that essential use for construction and testing of landscape plumbing. Limited landscaping for new development shall be allowed as approved by the District.

f) Irrigators will be notified that water delivery will be limited to those crops, which are presently planted. Water will not be delivered to crops planted after date of notice.

g) Commercial nurseries shall curtail all non-essential water use and shall irrigate between the hours of 11:00 p.m. to 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using reclaimed water.

h) All publicly owned lawns, landscapes, parks, school grounds, and freeways shall be irrigated between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using reclaimed water.

ARTICLE 24. WATER CONSERVATION

i) All golf courses and other large landscaped areas shall be irrigated between the hours of 11:00 p.m. to 6:00 a.m. and consumption shall be reduced to 25% less than the customer's last year's comparable billing period unless they are using raw creek water or reclaimed water.

j) All other lawn watering and landscape irrigation shall be done between the hours of 8:00 p.m. and 6:00 a.m. Drip irrigation, hand-watering while gardening and water being used during repair and maintenance of watering system is exempt from this section.

k) Water use for compaction, dust control, and other types of construction shall be by permit only and will be limited to conditions of the permit or may be prohibited as determined by the General Manager or his designee.

2406. STAGE III - WATER WARNING

District is not able to meet all water demands of all customers; therefore, the following water conservation measures shall apply.

a) All policies and prohibitions listed in Sections 2403, 2404 and 2405.

b) All customers are asked for voluntary minimum of 15% reduction in their water consumption over their last year's consumption, unless otherwise stated.

c) Washing of automobiles, trucks, trailers, boats, airplanes, and other types of mobile equipment are prohibited. Washing of the above-listed vehicles or mobile equipment shall be allowed only at a commercial car wash where recycled water is being utilized.

   1. Such washings are exempt from these regulations when the health, safety, and welfare of the public is contingent upon frequent vehicle cleaning such as garbage trucks and vehicles used to transport food and perishables.

d) New water services shall be installed but water shall be used before occupancy for essential construction only and for testing of landscape irrigation systems. The installation of new landscaping for all new development/projects must be approved by the District.

e) Commercial nurseries shall use water only between the hours of 11:00 p.m. and 6:00 p.m., and only with hand-held devices or with drip irrigation, and consumption shall be reduced to 50% less than the customer's last year's comparable billing period unless they are using reclaimed water.

f) School grounds shall be watered only on odd numbered days except where they are equipped with electronic moisture sensor control systems and/or drip irrigation systems. All watering shall be done between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 40% less than the customer's last year's comparable billing period, unless they are using reclaimed water.

g) All other publicly owned lawns, landscape, parks, and freeways shall be watered on even numbered days unless equipped with electronic moisture sensor control systems and/or drip irrigation systems. All watering shall be done only between the hours of 11:00 p.m. and 6:00 a.m. and consumption shall be reduced to 50% less than the customer's last year's comparable billing period, unless they are using reclaimed water. Water being used during repair or maintenance of watering system is exempt from this section.

h) All other lawn and landscape irrigation shall be done as follows: users with house numbers ending in an even number shall water on even numbered days only and users with house numbers ending in an odd number shall water on odd numbered days only, except where equipped with electronic moisture sensor control system and/or drip irrigation systems. All watering shall be done between the hours of 8:00 p.m. and 6:00 a.m.

i) All agricultural water users shall irrigate only at times approved by the District.

j) Swimming pools, ornamental pools, fountains and artificial lakes shall not be filled or refilled after being drained.

k) Water used for compaction, dust control, and other types of construction shall be by permit only and will be limited to conditions of the permit or may be prohibited as determined by the General Manager, or his designee.

2407. STAGE IV - WATER EMERGENCY

District is experiencing a major failure of supply or distribution; therefore, the following water conservation measures shall apply:

a) All policies and prohibitions shown in Sections 2403, 2404, 2405 and 2406.

b) All customers are asked for voluntary minimum 20% reduction in their water consumption over their last year's consumption, unless otherwise stated.

c) No water shall be used for construction purposes. All construction meters shall be locked off or removed.

d) Commercial nurseries shall water only between the hours of 11:00 p.m. and 6:00 a.m. and only with hand-held devices or with drip irrigation systems.

e) There shall be no watering of any lawn or landscaped area.

f) The use of water shall be limited to essential household, commercial, manufacturing, or processing uses only, except where other uses may be allowed by permit.

g) All agricultural water users shall irrigate only at times approved by the District.

2408. DETERMINATION AND DECLARATION OF WATER CONDITIONS

The General Manager of the District, or his designee, shall access all available water supply data and shall make a report of his/her findings to the Board of Directors at the next Regular meeting or at a Special meeting called for that purpose. The Board of Directors may at that time determine and declare which of the four (4) previously discussed conditions the District's water supply is in and the extent of water conservation required to prudently plan for and supply water to the District's customers.

Thereafter, the Board of Directors may order that the appropriate stage of water conservation be implemented or terminated in accordance with the applicable provision of this Ordinance. The declaration of any stage shall be made by public announcement and notice shall be published once in a local newspaper of general circulation. The stage designated shall become effective immediately upon announcement.

2409. DURATION OF DECLARATION

The declaration of any stage of water supply conditions shall remain in effect until such time as another stage is declared.

2410. AUTHORITY - MISDEMEANOR

This Article is adopted pursuant to Sections 375 and 376 of the California Water Code. Any second or subsequent violation of this policy after notice as specified in Section 2411 1(a) is a misdemeanor. (California Water Code Section 377).

ARTICLE 24. WATER CONSERVATION

2411. ENFORCEMENT

1. **Violations**. In addition to the remedy of criminal prosecution available to the District as described above, violation of this Ordinance may result in the imposition of surcharges and restriction and/or termination of water service as set forth below:

a) First Violation - written warning accompanied by a copy of this Ordinance, delivered by U.S. Mail and/or hung on customer's door.

b) Second Violation (within one year) - a surcharge of $100.00 or 100% of the current water billing cycle, whichever is higher.

c) Third Violation (within one year of the first violation) – a surcharge of $300.00 or 200% of current water billing cycle, whichever is higher, and installation of flow restricting device in the meter for a minimum of ninety-six (96) hours. Said restricted flow shall meet minimum

County Health Department's standards, if any have been established. If said ninety-six (96) hour period ends on a weekend or holiday, full service will be restored during the next business day.

d) Fourth Violation (within one year of the first violation) – a surcharge of $500.00 or 300% of the current water billing cycle, whichever is higher, and termination of service for such period as the Board of Directors determines to be appropriate under the circumstances, following a hearing regarding said issue. Written notice of the hearing shall be mailed to the customer at lest ten days before the hearing.

2. **Surcharges, Additional Charges**. Any surcharge hereunder shall be in addition to the basic water rates and other charges of the District for the account and shall appear on and be payable with the billing statement for the period during which the violation occurred; non-payment shall be subject to the same remedies available to the District as for non-payment of basic water rates.

In addition to any surcharge, a customer violating this Ordinance shall be responsible for payment of the District's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the District's Schedule of Charges then in effect. Such charges shall be paid prior to the removal of the flow restrictor or reconnection of service, whichever the case may be.

3. **Nonliability for Damage**. The customer or resident who violates this Ordinance thereby assumes responsibility for injury to the customer and/or other residents/occupants receiving service, including emotional distress and/or damage to the customer's private water system and/or to other real or personal property owned by the customer or by a third party resulting from the installation and operation of a flow restricting device or from termination of service; said customer shall thereby

be deemed to have: (a) waived any claim for injury or for damage to the customer's property which the customer may otherwise have against the District; and (b) agreed to indemnify, defend, and hold the District harmless from claims by third parties for injury or property damage arising or claimed to arise out of the District's installation and/or operation of a flow restricting device or termination of water service.

4. **Exemptions**. No exemption shall be granted to any person for any reason in the absence of a showing by said person that he/she has achieved the maximum practical reduction in water consumption in his/her residential, commercial, industrial, or governmental water consumption as the case may be.

The General Manager, or his designee, may grant exemptions ("exceptions" to this Ordinance) for uses of water otherwise prohibited by the regulations. Water customers who feel that they need an adjustment in the prohibitions as they relate to him/her will fill out a simple application form for an exemption stating the justification and circumstances. If the exemption is not granted, customer may appeal in writing as stated in Section 2412.1.

a) Inconvenience or the potential for damage to landscaping shall not be considered for exemption from any section of this Ordinance.

2412. APPEALS

1. **Procedures.** The General Manager, or his designated Enforcement Officer, shall determine when violations have occurred and shall issue to the customer a Notice of Violation by mailing same and/or hanging same on the customer's door at least ten (10) days before taking enforcement action. Said notice shall describe the action to be taken (notice of first violation shall simply be accompanied by a copy of this Ordinance) and shall be mailed or delivered at least ten (10) days before the proposed action is scheduled to be taken.

A customer may appeal the Notice of Violation by filing a written notice of appeal with the District no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed shall be final. Upon receipt of a timely appeal, a hearing on the appeal by the Board of Directors shall be scheduled at the Board's next Regular meeting or at a Special meeting scheduled for that hearing; in either, the hearing shall be at least ten (10) days following receipt of the appeal, and the District shall mail written notice of the hearing to the customer at least ten (10) days before the date of said hearing.

ARTICLE 24. WATER CONSERVATION

2. **Interim Measures**. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the General Manager or the Enforcement Officer, if one has been designated, may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violation and the current declared water condition.

2413. CEQA EXEMPTION

The adoption of this Ordinance, and the actions taken hereunder, are exempt from the provisions of the California Environmental Quality Act of 1970 in that they constitute a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Section 15071 of the State EIR Guidelines.

2414. DURATION OF ORDINANCE

This Ordinance shall remain in effect until the Board of Directors finds that the threatened emergency and threatened water shortage no longer exists. The provisions of this Ordinance shall prevail and control in the event of any inconsistency with any other rules and regulations of the District.

2415. SEVERABILITY

If any section, subsection, sentence, clause, or phrase of this Ordinance is for any reason held to be unconstitutional or invalid, such decision shall not affect the validity of the remaining portions of this Ordinance. The Board of Directors hereby declares that it would have passed this Ordinance and each section, subsection, sentence, clause, or phrase thereof irrespective of the fact that any one or more sections, subsections, sentences, clauses or phrases may be unconstitutional or invalid.

2416. EFFECTIVE DATE, PUBLISHING, AND POSTING

This Ordinance shall be effective immediately upon adoption. Within ten (10) days of adoption, a copy of this Ordinance shall be published one time in a local newspaper and posted in the lobby of the District Office.

Yucaipa Valley Water District Ordinance 48-1998 Section 5.15

ORDINANCE NO. 48-1998

ORDINANCE OF THE BOARD OF DIRECTORS OF THE YUCAIPA VALLEY WATER DISTRICT, SAN BERNARDINO AND RIVERSIDE COUNTIES, CALIFORNIA, AMENDING ORDINANCE 42-1992 REGARDING RULES AND REGULATIONS FOR WATER SERVICE WITHIN THE YUCAIPA VALLEY WATER DISTRICT

BE IT ORDAINED by the Board of Directors of the Yucaipa Valley Water District that this Ordinance, amending Ordinance No. 42-1992, shall hereby read as follows:

SECTION 1. INDEX

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Section 1	Index	1
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supplied such customer until he shall have complied with the rules and regulations, rate or charge which he has violated.

5.13 Water System: The District will furnish a system, plant, works and undertakings used for and useful in obtaining, conserving and disposing of water for public and private uses, including all parts of the Enterprise, all appurtenances to it, and lands, easements, rights in land, water rights, contract rights, franchises, and other water supply, storage and distribution facilities and equipment.

5.14 Number of Services per Premises: The applicant may apply for as many services as may be reasonably required for his premises provided that the pipe line system for each service be independent of the others and that they not be interconnected.

5.15 Water Waste: No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises the District may discontinue the service if such conditions are not corrected within five days after giving the customer written notice.

5.16 Responsibility for Equipment on Customer Premises: All facilities installed by the District on private property for the purpose of rendering water service shall remain the property of the District and may be maintained, repaired or replaced by the Water Department without consent or interference of the owner or occupant of the property. The property owner shall use reasonable care in the protection of the facilities.

City of Colton FY 2010 Budget

CITY OF COLTON

STATEMENT OF REVENUES, EXPENSES
AND CHANGES IN FUND NET ASSETS
PROPRIETARY FUNDS
YEAR ENDED JUNE 30, 2010

	Business-Type Activities - Enterprise Funds				Governmental Activities- Internal Service Fund
	Electric Utility	Water Utility	Waste Water Utility	Totals	
Operating Revenues:					
Sales and service charges	$ 56,895,682	$ 7,425,807	$ 8,029,360	$ 72,350,849	$ 5,265,523
Miscellaneous	1,067,994	224,749	80,181	1,372,924	75,572
Connection Fees	1,040	274,446	192,518	468,004	-
Total Operating Revenues	**57,964,716**	**7,925,002**	**8,302,059**	**74,191,777**	**5,341,095**
Operating Expenses:					
Salaries and benefits	4,851,237	1,819,922	855,372	7,526,531	1,672,245
Maintenance and operations	4,459,032	4,771,838	3,117,930	12,348,800	1,260,267
Generation	3,632,466	-	-	3,632,466	-
Purchased power	27,170,629	-	-	27,170,629	-
Contractual services	-	-	-	-	162,146
Claims and benefits	-	-	-	-	1,749,949
Charges from other funds	2,310,719	739,338	1,364,533	4,414,590	-
Amortization	156,123	10,229	-	166,352	-
Depreciation expense	3,525,897	624,691	1,165,956	5,316,544	141,500
Total Operating Expenses	**46,106,103**	**7,966,018**	**6,503,791**	**60,575,912**	**4,986,107**
Operating Income (Loss)	11,858,613	(41,016)	1,798,268	13,615,865	354,988
Nonoperating Revenues (Expenses):					
Interest revenue	140,487	33,427	47,808	221,722	-
Interest expense	(2,654,938)	(431,348)	(428,414)	(3,514,700)	-
Gain (loss) on disposal of capital assets	(4,021)	-	-	(4,021)	-
Total Nonoperating Revenues (Expenses)	**(2,518,472)**	**(397,921)**	**(380,606)**	**(3,296,999)**	**-**
Income (Loss) Before Transfers	9,340,141	(438,937)	1,417,662	10,318,866	354,988
Transfers out	(5,538,225)	(76,294)	(47,407)	(5,661,926)	(82,785)
Changes in Net Assets	**3,801,916**	**(515,231)**	**1,370,255**	**4,656,940**	**272,203**
Net Assets:					
Beginning of fiscal year	21,211,676	9,707,932	33,849,631	64,769,239	(979,993)
End of Fiscal Year	**$ 25,013,592**	**$ 9,192,701**	**$ 35,219,886**	**$ 69,426,179**	**$ (707,790)**

Reconciliation of Changes in Net Assets to the Statement of Activities:

Changes in Net Assets, per the Statement of Revenues, Expenses and Changes in Fund Net Assets - Proprietary Funds	$ 4,656,940
Adjustment to reflect the consolidation of current fiscal year internal service funds activities related to enterprise funds	256,372
Changes in Net Assets of Business-Type Activities per Statement of Activities	$ 4,913,312

See Notes to Financial Statements

CITY OF COLTON

STATEMENT OF CASH FLOWS
PROPRIETARY FUNDS
YEAR ENDED JUNE 30, 2010

	Business-Type Activities - Enterprise Funds				Governmental Activities- Internal Service Fund
	Electric Utility	Water Utility	Waste Water Utility	Totals	
Cash Flows from Operating Activities:					
Cash received from customers and users	$58,649,706	$7,814,580	$ 8,649,842	$75,114,128	$ 5,341,428
Cash paid to supplies for goods and services	(36,345,214)	(5,405,419)	(4,053,439)	(45,804,072)	(3,562,592)
Cash paid to employees for services	(4,833,162)	(1,828,487)	(862,419)	(7,524,068)	(1,684,215)
Net Cash Provided (Used) by Operating Activities	**17,471,330**	**580,674**	**3,733,984**	**21,785,988**	**94,621**
Cash Flows from Non-Capital Financing Activities:					
Cash transfers out	(5,538,225)	(76,294)	(47,407)	(5,661,926)	(82,785)
Payment received from other funds	-	-	(389,940)	(389,940)	-
Payment made to other funds	(5,532,351)	389,940	-	(5,142,411)	-
Net Cash Provided (Used) by Non-Capital Financing Activities	**(11,070,576)**	**313,646**	**(437,347)**	**(11,194,277)**	**(82,785)**
Cash Flows from Capital and Related Financing Activities:					
Acquisition and construction of capital assets	(6,358,229)	(249,174)	(169,562)	(6,776,965)	(78,444)
Principal paid on capital debt	(2,185,000)	(260,000)	(1,302,884)	(3,747,884)	-
Interest paid on capital debt	(2,658,943)	(437,086)	(418,978)	(3,515,007)	-
Net Cash Provided (Used) by Capital and Related Financing Activities	**(11,202,172)**	**(946,260)**	**(1,891,424)**	**(14,039,856)**	**(78,444)**
Cash Flows from Investing Activities:					
Interest received	165,248	33,427	53,635	252,310	-
Net Cash Provided (Used) by Investing Activities	**165,248**	**33,427**	**53,635**	**252,310**	**-**
Net Increase (Decrease) in Cash and Cash Equivalents	**(4,636,170)**	**(18,513)**	**1,458,848**	**(3,195,835)**	**(66,608)**
Cash and Cash Equivalents at Beginning of Year	21,991,147	3,618,847	1,012,810	26,622,804	213,462
Cash and Cash Equivalents at End of Year	**$17,354,977**	**$3,600,334**	**$ 2,471,658**	**$23,426,969**	**$ 146,854**

See Notes to Financial Statements

CITY OF COLTON

STATEMENT OF CASH FLOWS
PROPRIETARY FUNDS
YEAR ENDED JUNE 30, 2010

	Business-Type Activities - Enterprise Funds				Governmental Activities- Internal Service Fund
	Electric Utility	Water Utility	Waste Water Utility	Totals	
Reconciliation of Operating Income to Net Cash Provided (Used) by Operating Activities:					
Operating income (loss)	$ 11,858,613	$ (41,016)	$ 1,798,268	$ 13,615,865	$ 354,988
Adjustments to reconcile operating income (loss) net cash provided (used) by operating activities:					
Depreciation	3,525,897	624,691	1,165,956	5,316,544	141,500
Amortization	156,123	10,229	-	166,352	-
(Increase) decrease in accounts receivable	679,240	(105,951)	57,926	631,215	333
(Increase) decrease in deposits receivable	(68,863)	-	-	(68,863)	-
(Increase) decrease in due from other governments	(1,988)	-	289,857	287,869	-
(Increase) decrease in inventories	45,568	(6,167)	-	39,401	-
Increase (decrease) in accounts payable	1,182,064	111,924	429,024	1,723,012	(178,043)
Increase (decrease) in deposits payable	76,601	(4,471)	-	72,130	-
Increase (decrease) in claims and judgments	-	-	-	-	(212,187)
Increase (decrease) in compensated absences	18,075	(8,565)	(7,047)	2,463	(11,970)
Total Adjustments	5,612,717	621,690	1,935,716	8,170,123	(260,367)
Net Cash Provided (Used) by Operating Activities	**$ 17,471,330**	**$ 580,674**	**$ 3,733,984**	**$ 21,785,988**	**$ 94,621**
Non-Cash Investing, Capital, and Financing Activities:					
Gain/(Loss) on disposition of fixed assets	$ (4,021)	$ -	$ -	$ (4,021)	$ -

See Notes to Financial Statements

Appendix G

Water Shortage Contingency Resolutions/Ordinances

- Upper Santa Ana Watershed Integrated Regional Water Management Plan, Vulnerability to Catastrophic Interruption of Water Supply
- San Bernardino Municipal Water Department Rule and Regulation 21
- Yucaipa Valley Water District 2000 Urban Water Management Plan and Water Shortage Contingency Plan
- City of Colton Draft No Waste Ordinance, Draft Resolution to Declare a Water Shortage Emergency, and Draft Moratorium on New Connections During a Water Shortage

The following resolutions and ordinances also relate to water shortage contingency planning and were provided as part of Appendix F.

- East Valley Water District Ordinance 375
- City of Loma Linda Municipal Code Title 13
- City of Loma Linda Ordinance 443
- City of Redlands Water Waste Ordinance
- West Valley Water District Ordinance 68 and Article 24

Upper Santa Ana Watershed Integrated Regional Water Management Plan, Vulnerability to Catastrophic Interruption of Water Supply

Upper Santa Ana River Watershed

Integrated Regional Water Management Plan

Appendix F

Vulnerability to Catastrophic Interruption of Water Supply

November 2007

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Attachment 1 – Earthquake Literature Search

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1 Background

This appendix addresses vulnerability of the region's water supply system to catastrophic events that may interrupt the water supply system in the Upper Santa Ana IRWM Plan Region (region). California Water Code Section 10632 (c) requires that Urban Water Management Plans address catastrophic supply interruptions. While not the only cause for catastrophic water supply interruption, the postulated Magnitude 8+ Earthquake certainly will be the predominant example in the region. Since a large magnitude earthquake is generally considered the most significant event for the region, we will concentrate on earthquake effects as our primary water supply interruption, knowing that other events would be treated similarly. Literature to be reviewed includes post-earthquake surveys of water system damage, earthquake planning reports, purveyor's Urban Water Management Plans and available reports prepared by the Department of Water Resources. We have concentrated the following discussions with a magnitude 8+ earthquake example in mind. Other catastrophic interruptions caused by regional power failure, terrorist attack, or other man-made or natural catastrophic event could cause similar conditions and issues to water supply systems in the region. For purposes of this report, a major earthquake is defined as an earthquake on the San Andreas Fault (SAF) on the order of 8.0.[1]

The work conducted for this appendix is intended to be the fist step and is at the conceptual level. Additional detailed work should be conducted in the future to further evaluate options to effectively address water supply system vulnerabilities. This appendix includes the discussion of the following:

- An earthquake literature search of major earthquake events and what has been learned from such events.
- Evaluation of Catastrophic interruption of the regional facilities
- Vulnerabilities of region's water supply system to SWP supply interruption.
- Vulnerably of local purveyors' system to an earthquake .
- Summary of Finding and Recommendations including Water Shortage Contingency Plan

[1] The California Division of Mines and Geology has prepared two "Planning Scenarios" for major earthquakes in southern California. The first was a Magnitude 8.3 Earthquake on the San Andreas Fault (California, 1982). The second was a magnitude 7 earthquake on the San Bernardino Valley segment of the San Jacinto Fault (California, 1993).

- Options to reduce the impacts in case of catastrophic water supply system failure.
- Water Shortage contingency planning.

The region is located in a seismically active area of Southern California. Four major fault zones are found in the region, including the San Jacinto Fault, the Chino-Corona segment of the Elsinore Fault, the Cucamonga Fault, and the San Andreas Fault (SAF). Numerous other minor faults associated with these larger fault structures may also present substantial hazards.

The SAF is a right-lateral strike-slip fault that runs approximately 800 miles through western and southern California. The fault marks a transform boundary between the Pacific Tectonic Plate and the North American Tectonic Plate.

In Southern California, the SAF runs along the southern base of the San Bernardino Mountains, crosses through Cajon Pass, and continues northwest along the northern base of the San Gabriel Mountains. Historical records indicate that massive earthquakes have occurred in the central section of the SAF in 1857 and in the northern section in 1906 (the San Francisco Earthquake). In 1857, an estimated magnitude 8+ earthquake occurred on the San Andreas Fault rupturing the ground for 200 to 275 miles, from near Cholame to Cajon Pass and possibly as far south as San Gorgonio Pass. The recurrence interval for a magnitude 8 earthquake along the total length of the fault is estimated to be between 50 and 200 years. It has been 147 years since the 1857 rupture. A study completed by Yuri Fialko (2005) suggests that the SAF in Southern California has been stressed to a level sufficient for an earthquake of magnitude 7.0 or greater.

A detailed earthquake-related literature search was conducted to prepare this report. The literature search included review of the following events and reports:

- Loma Prieta Earthquake of October 17, 1989
- Northridge Earthquake of January 17, 1994
- Santa Clara Valley Water District Water Infrastructure Reliability Project
- San Simeon Earthquake of December 22, 2003
- Denali Earthquake of November 3, 2002
- City of San Diego Water Supply Study
- City of Vancouver Regional Water Distribution System Study
- San Fernando Earthquake of 1971
- Kobe (Japan) Earthquake of January 17, 1995
- California Division of Mines and Geology Planning Scenarios

Attachment A summarized this literature search.

2 Evaluation of a Catastrophic Interruption to Regional Facilities

This section evaluates the impact of catastrophic interruption of region's water supply facilities and specific actions that may be taken to minimize the impact on water deliveries.

2.1 Facility Evaluation

The individual facilities that were examined in this analysis are as follows:

- Foothill Pipeline
- Santa Ana River Connector (SARC) Pipeline
- Greenspot Pump Station
- Morton Canyon Connector
- Greenspot Pipeline
- Tate Pump Station
- Crafton Hills Pump Station
- Crafton Hills Reservoir
- Crafton Hills Pipeline, portion of EBX
- Yucaipa Pipeline
- Bryant Street Pipeline
- Lytle Pipeline
- Baseline Feeder System

Given a loss of each of the above facilities, the examination will include:

- How the water supply needs of the affected service area could be met.
- To what degree local groundwater can replace the loss of surface water supply.
- What projects would be required to mitigate the loss of the facility.
- What projects could be implemented to mitigate the impact of catastrophic failures of these facilities.

Figure AF-1 shows the location of Valley District's major facilities relative to fault lines.

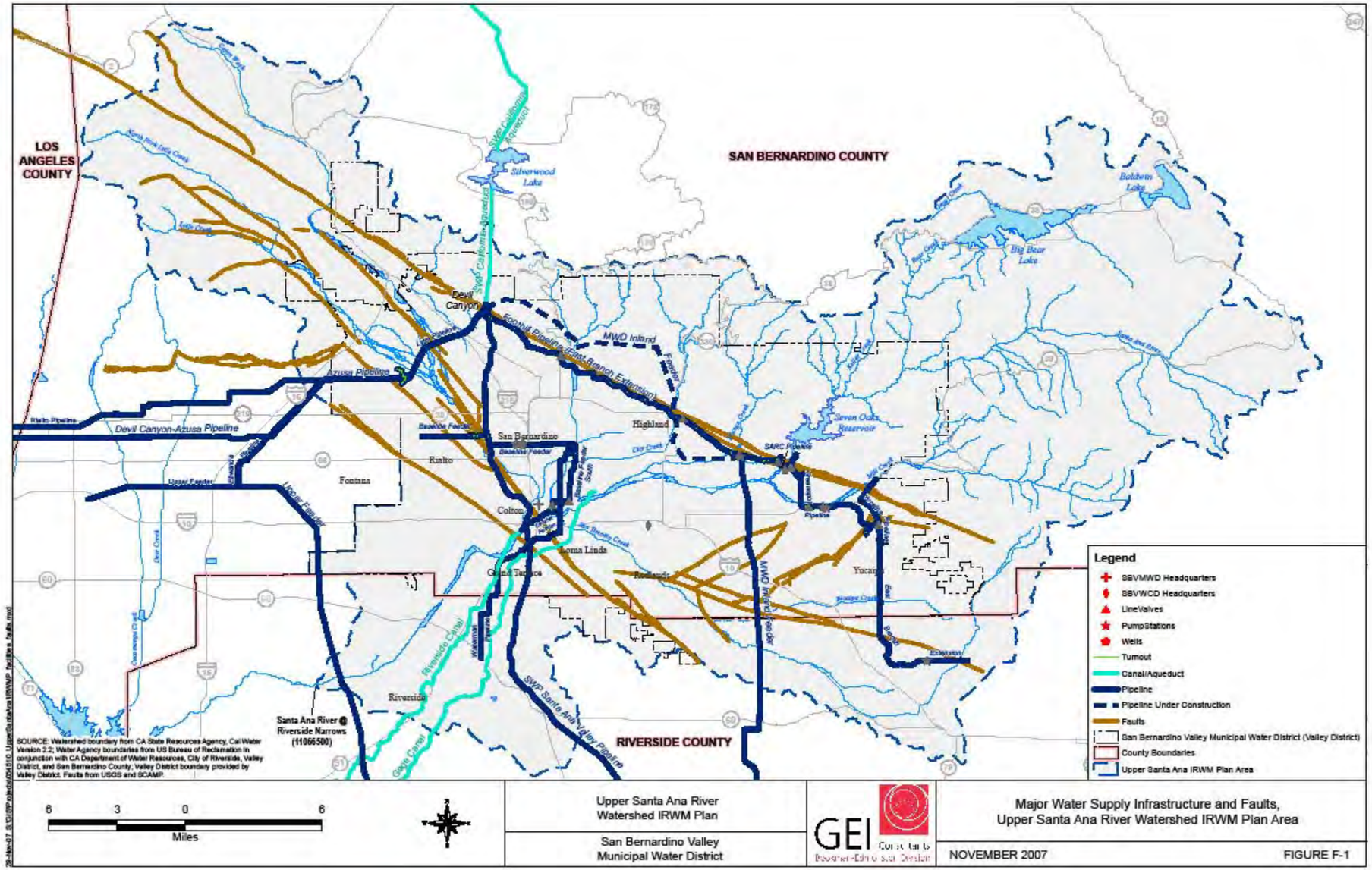
In general, Valley District direct deliveries are to surface water treatment plants that were built to treat local surface water. Local surface water, collected and conveyed by the purveyor's own system, is the least costly. Valley District deliveries supplement these supplies. Valley District facilities are used to deliver imported (State Water Project) water when local supplies are insufficient.

Valley District also makes direct deliveries for irrigation. These deliveries can be suspended during severe events and will not be investigated further.

Table AF-1 shows the Valley District conveyance facilities and the surface water treatment plants that receive deliveries of imported and surface water from those facilities. This table shows how interruption in each of the Valley District facilities may impact water deliveries for the local purveyors. Valley District's conveyance system is used to implement the Santa Ana-Mill Creek Cooperative Water Project and effect deliveries of local surface water and exchanges of local surface water and SWP water. Furthermore, these facilities can be used to convey from east to west and deliver surface water from streams in the Upper Santa Ana to the Devil Canyon Forebay and then west in the Lytle Creek Pipeline. In the past, Valley District has delivered local surface water to Devil Canyon where it was transferred to Metropolitan Water District of Southern California and conveyed to the Weymouth Water Filtration Plant.

It should also be mentioned that the California Division of Mine and Geology planning scenario for a major earthquake on the San Jacinto Fault concludes that the Santa Ana Valley (a SWP facility) Pipeline will also be damaged extensively as the fault and pipeline cross several times.

Figure F-1
Water Supply Infrastructure and Faults



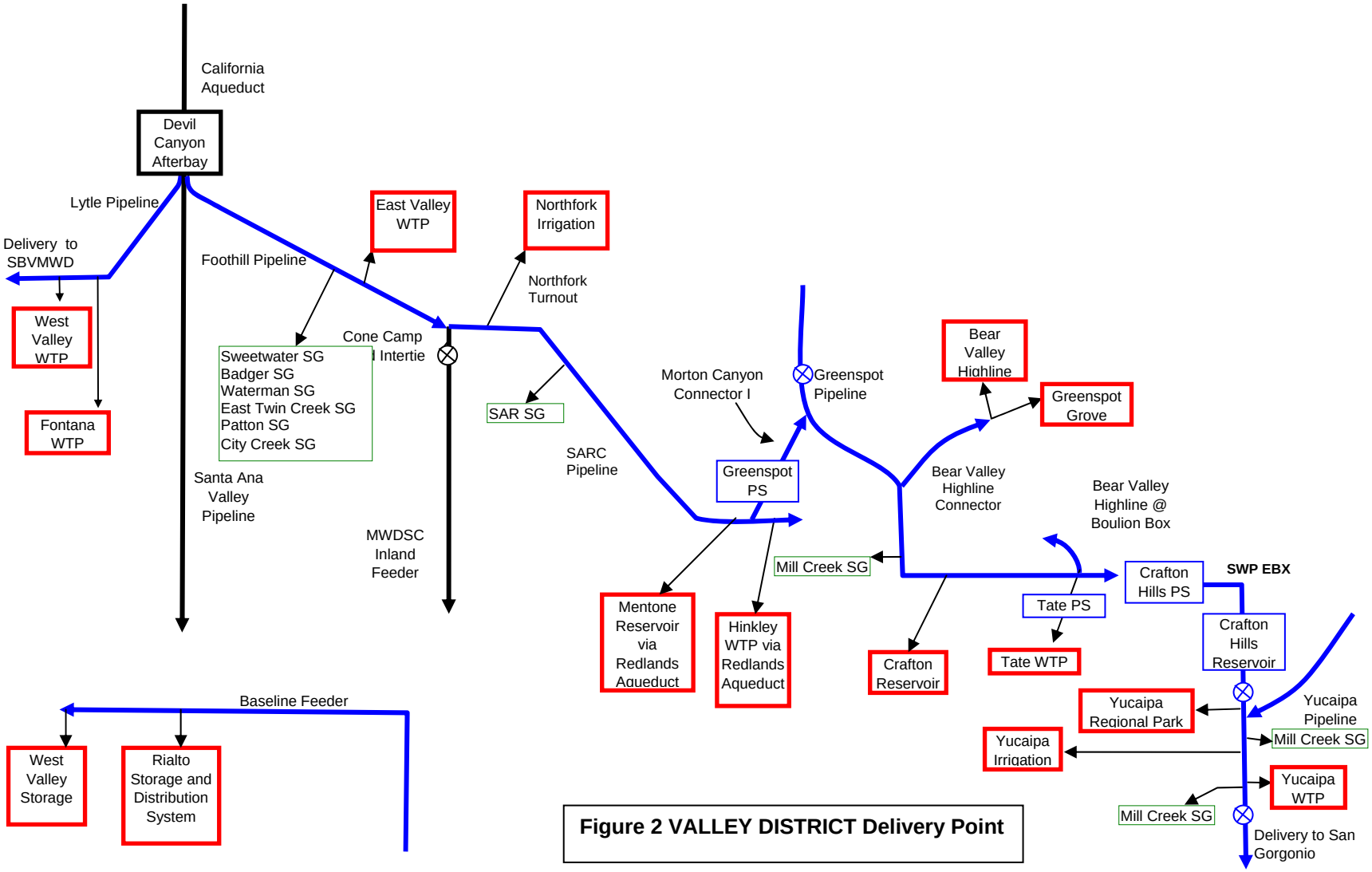


Figure 2 VALLEY DISTRICT Delivery Point

Table AF-1
Valley District Facilities Used to Deliver Water to Retail Agencies

Agency	Foothill Pipeline	SARC Pipeline	Morton Canyon Connector	Green-spot Pipeline	Green-spot Pump Station	Devil Canyon - Azusa	Tate Pump Station	Crafton Hills PS	Crafton Hills Reservoir	EBX[1] Reach 1 Pipeline	EBX Reach 2 Pipeline	Yucaipa Pipeline	Baseline Feeder
San Bernardino Municipal Water Department	✓	✓	✓	✓[2]	- -	- -	- -	- -	- -	- -	- -	- -	- -
East Valley Water District	✓	✓	✓	✓[2]	- -	- -	- -	- -	- -	- -	- -	- -	- -
City of Redlands – Hinckley	✓	✓	✓	✓	✓	- -	- -	- -	- -	- -	- -	- -	- -
City of Redlands – Tate	✓	✓	✓	✓	✓	- -	✓	- -	- -	- -	- -	- -	- -
Bear Valley MWC - In lieu obligation and irrigation	✓	✓	✓	✓	✓	- -	- -	- -	- -	- -	- -	- -	- -
Yucaipa Valley Water District	✓	✓	✓	✓	✓	- -	- -	✓	✓	✓	✓	✓	- -
Fontana Water Company	✓	✓	✓	✓[2]	- -	✓	- -	- -	- -	- -	- -	- -	- -
West Valley Water District	✓	✓	✓	✓[2]	- -	✓	- -	- -	- -	- -	- -	- -	✓
City of Rialto	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	✓

Notes:

[1]EBX: East Branch Extension of the California Aqueduct

[2] Required only if Mill Creek water is being delivered in a westerly direction.

Valley District's conveyance system is used to implement the Santa Ana-Mill Creek Cooperative Water Project and effect deliveries of local surface water and exchanges of local surface water and State Project water.

The Devil Canyon - Azusa Pipeline is owned by San Gabriel Valley Municipal Water District. Valley District has conveyance capacity of the pipeline from Devil Canyon to the Lytle Creek area and uses this capacity to convey water to West Valley, Rialto, and Fontana. It could be used to convey local surface water if the SWP were to fail and if the legal issues were resolved.

The Baseline Feeder is used to convey groundwater to Rialto and West Valley. The groundwater is produced by the City of San Bernardino on behalf of Valley District and by Rialto for Rialto.

Valley District deliveries to San Bernardino Municipal Water Department are for recharge. Changes in recharge impact well hydrographs in six to seven months.

2.2 Findings and Recommendations

Table AF-1 summarizes the degree to which purveyors depend on Valley District facilities for deliveries over a period of days to one year. This table presumes normal operations by the purveyor with the exception that non-potable deliveries (West Valley and Yucaipa) are suspended. Table AF-1 shows that all purveyors listed will be impacted by interruption in the Foothill Pipeline, SARC Pipeline, Morton Canyon Connector, and Greenspot Pipeline. Therefore, these four pipelines are the most vulnerable facilities in the case of a major earthquake along the San Andreas Fault. In addition, Foothill Pipeline is critical to conveying water to the MWDSC Inland Feeder, East Valley Water Treatment Plant, groundwater spreading grounds, and North Fork Irrigation. Specific recommendations to manage the catastrophic interruption are discussed below.

2.2.1 Alternative Local Supplies

2.2.1.1 Interties between Purveyors

Table AF-2 lists interconnections between purveyors. These interties could be used to balance supplies between purveyors. An interconnection between the City of San Bernardino and East Valley is currently being used to facilitate blending. This use is anticipated to end in the near future. Fontana Water Company has historically depended on supplies delivered through its interconnection with Cucamonga Valley to meet peak day demand.

Table AF-2 – System Interties between Purveyors

Transfer	Direction	Capacity (MGD)	Remarks/data source
City of San Bernardino/East Valley	Either	4	Three interties. One currently used to facilitate blending.
City of San Bernardino/Riverside	To San Bernardino	2	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/West Valley	Either	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Loma Linda	Either	5	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Colton	To Colton	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Rialto	Either	3.6	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/ Riverside Highland	To Riverside/ Highland	3	(San Bernardino UWMP, Pg 2-10)
Fontana/Cucamonga Valley	To Fontana	3.6	Fontana UWMP (2500 gpm)
West Valley/Fontana	Either		West Valley UWMP.
West Valley/Rialto	Either		West Valley UWMP.
West Valley/Colton			West Valley UWMP.
Redlands/Loma Linda	To Loma Linda		Greg Gage
Rialto[1]/Marygold	To Marygold		Rialto has historically conveyed 1,500 afy of groundwater to Marigold. The agreement under which this was accomplished is expiring.

Sources: San Bernardino Municipal Water Department 2005 UWMP; Jack Nelson, Yucaipa Valley; Ron Buchenwald, East Valley; Greg Gage, Valley District, West Valley 2005 UWMP.

[1] Rialto has several connections with other systems, including four connections with West Valley Water District, and connections with City of San Bernardino, Fontana Water Company, and Riverside Highland Water Company.

Based on the limited sources of data, this list may be incomplete.

2.2.1.2 Use of Big Bear Lake

Big Bear Lake has a capacity of over 70,000 acre-feet. The goal of Big Bear Lake Municipal Water District is stabilization of the level of Big Bear Lake by managing the amount of water released to the downstream water rights holder. That is, water is kept stored in the lake at all times for recreational use. A legal framework could be established to make this water available in case of a catastrophe that prevented Valley District from making deliveries to East Valley, Redlands, Yucaipa, and San Gorgonio Pass Water Agency.

Valley District's Foothill Pipeline System provides a means of conveying this water. Implementation of this project may require resolution of water quality issues at Seven Oaks Dam. More work is needed to evaluate the feasibility of this option.

2.2.2 Increased Groundwater Production Capacity and Reliability

In general, the groundwater basin is able to meet peak demands without Valley District facilities. If the catastrophe is an earthquake, the most likely impact on groundwater production capacity will be damage to the electrical system of the well or to the electricity supplier's system, and backup power supplies at key production wells will be necessary

Thus, depending on the system of each purveyor, increasing the purveyor's groundwater production capacity and the reliability of that capacity may improve the area's ability to operate after a catastrophic failure.

2.2.3 Alternative Conveyance of Surface Water

2.2.3.1 Alternatives to Foothill Pipeline System

As stated earlier, Foothill Pipeline together with Santa Ana River Connector Pipeline are the most vulnerable facilities if a major earthquake were to occur along the San Andreas Fault and the most critical during a catastrophic interruption. The following systems could provide some alternative conveyance of surface water should portions of the Foothill Pipeline System fail:

- Metropolitan's Inland Feeder can convey water stored in Diamond Valley north to the Valley District service area. The conveyance capacity of the Inland Feeder operating from Diamond Valley Lake to the north is reported to be 250 cfs.

- Once completed, the tunnel portion of the Inland Feeder, with proper interties, will be able to convey SWP water from Devil Canyon Afterbay towards the south end of Foothill Pipeline.

- The Central Feeder, portions of which are under construction, would increase the ability to convey groundwater to purveyors as a substitute for imported water. With an intertie to the Santa Ana Valley Pipeline, the Central Feeder could convey SWP water to the Crafton Hills Pump Station, bypassing the Foothill Pipeline, SARC Pipeline, Greenspot Pump Station, Morton Canyon Connector I, and Greenspot Pipeline.

2.2.4 Additional Surface Storage

If the ability to import SWP water is lost or the region is faced with major interruption of regional and local facilities due to a catastrophic event, it is important to have ample local surface storage to meet immediate water demands. While there may be significant water stored below ground, the ability to extract and deliver this water may also be disrupted by a catastrophic event. The following suggestions could further prepare the Region for such an emergency:

- Inventory surface water storage facilities throughout the region and determine the amount of existing storage capacity compared to need to satisfy emergency water demands. The Valley District should conduct an evaluation of feasible storage needs for the Region.
- Select appropriate delivery methods for the waters (i.e., trucking or alternative or backup pipelines).
- Rank agencies by their current amount of surface water storage and their operating storage amounts to determine which areas of the Region are in need of additional surface storage. (How far would people have to walk or drive to get to water? Which cities or communities are most at risk for water shortages?)
- Investigate adding additional local surface water storage facilities that could supply water to the entire Region in the event of an emergency. (North and South Lake projects and conservation pool behind Seven Oaks Dam.)

3 Vulnerability of Region's Water Supply System to SWP Supply Interruption

A large earthquake along the San Andreas Fault would likely sever the State Water Project (SWP) California Aqueduct just above Devil Canyon power plant. In addition to the threat of earthquake, a disruption on the SWP could be caused by levee failure in the Sacramento-San Joaquin Delta or by other disruptions in transmissions facilities. These two disasters would have an impact on the delivery of SWP water into the region. This chapter will investigate the effects of an interruption of the SWP system on the Valley District.

3.1 Valley District SWP Deliveries

Deliveries of SWP water to Valley District have averaged approximately 15,000 acre-feet per year (1999-2003 Western-San Bernardino watermaster records). San Gorgonian Pass Water Agency is also receiving SWP water that would be affected by interruption of SWP deliveries. These direct deliveries are projected to increase to 34,000 acre-feet per year by 2030 based on the UWMP projections within the Region. Historically, direct deliveries have peaked during summer months with the greatest deliveries in July, August, and September. In the event that State Water Project deliveries are severely reduced, more demand will be placed on local groundwater supplies. For example, in a one-month shutdown, additional demands on groundwater within the Valley District service area would be 3,000 to 6,000 acre-feet (current to future demands, shut down in the summer); in a six-month shutdown, additional groundwater demands would be 10,000 to 30,000 acre-feet (current to future demands, shut down in May to September); and in a 12-month shutdown, additional demands on groundwater would be 15,000 to 34,000 acre-feet (current to future demands).

3.2 Overview of Known Earthquake Vulnerabilities of State Water Project

Publications available from the Department of Water Resources address the institutional requirements of responding to an emergency.

3.2.1 California Division of Mines and Geology Planning Scenarios

The California Division of Mine and Geology planning scenario for a major earthquake on the San Jacinto Fault concludes that the Santa Ana Valley Pipeline of the SWP will be damaged extensively as the fault and pipeline cross several times.

The planning scenario for a magnitude 8.3 earthquake north of the San Bernardino area and on the San Andreas Fault concludes that though all of the SWP facilities of the California Aqueduct are designed to resist the effects of a great earthquake comparable to the scenario

event, widespread damage to the aqueduct will inevitably occur. For planning purposes, a minimum of three months will be required to accomplish those repairs necessary to restore water deliveries to southern California. Severe damage to the East Branch where it crosses the San Andres Fault at Barrel Springs is expected. No major damage to aqueduct facilities between Lake Silverwood and the Devil Canyon Power Plant is expected (this scenario assumes that surface fault rupture would terminate some 25 km northwest of Devil Canyon). The Santa Ana Valley Pipeline would be subjected to intense shaking and possible ground failure.

3.2.2 Seismic Risk Analysis for California State Water Project – Reach C

The objective of this study (Shah, 1976) was to develop a seismic hazard map for the east branch of the SWP. The study concluded that with respect to the pumping and power plants, the hazard or probability of exceeding the design load level employed for the substructures and superstructures during the next 50 years was very small (on the order of 5 percent). For the switchyards, however, the probability of exceeding their design load level during the next 50 years is large (on the order of 30 to 60 percent).

The following recommendations were made as a result of the above study.

- "The risk of damage or destruction to the pumping and power plant substructures and superstructures is minimal during the next 50 to 100 years, and therefore no action is required. However, for the mechanical and electrical equipment within these plants it is recommended that a thorough survey be made to evaluate their ability to resist seismic loads."

- "All switchgear equipment should be modified so as to resist a minimum peak ground acceleration of 0.3 g. This load level corresponds to a return period of approximately 200 years or more along [the East Branch]."

- "Since the ground shaking along the Santa Ana Valley pipeline is relatively high, in excess of 0.5 g for a 1000 year return period), an investigation should be made to determine the advisability of providing a cut-off facility for this portion of the [East Branch]."

- "Because of the large risk potential, a central operations and maintenance center with facilities and capabilities for dealing with earthquake induced damage should be set up for the region south of the Devil Canyon Power Plant."

3.3 Finding and Recommendations

Valley District currently requires the agencies it serves to have a back-up water supply in case the State Water Project (SWP) supply is not available. Assuming the back-up supply is groundwater produced from the San Bernardino Basin Area (SBBA), 15,000 additional acre-

feet per year of groundwater production would be needed if the earthquake happened in the near future, and potentially 34,000 acre-feet of additional groundwater production if the earthquake happened around 2030.

The average instantaneous pumping rate for the 199 wells (with data available) of the major water purveyors in the SBBA is approximately 1,438 gpm. Based on well production rates at 70 percent of their instantaneous pumping rate, annual production would be about 323,100 acre-feet. For the remaining wells without instantaneous pumping rate data, the total maximum annual production between 2001 and 2005 was about 60,800 acre-feet. This yields a total maximum annual groundwater production of 383,900 acre-feet. The projected groundwater pumping for the Baseline Run 1 ranged from 193,200 acre-feet in 2010 to 289,100 acre-feet in 2034, with an annual average of 248,900 acre-feet per year for the period 2006-2044. The additional groundwater supply with the current infrastructure is approximately 95,000 acre-feet (383,935 – 289,105). The 95,000 acre-feet represents approximately 9 percent of the 1,000,000 acre-feet of usable storage in the SBBA.

In the event of a SWP shutdown, there is sufficient groundwater storage and production facilities to continue water deliveries to customers in the Valley District service area. Impact on groundwater storage and groundwater levels in the basins can be mitigated through additional recharge when SWP and local supplies are available.

3.3.1 Pipeline Redundancy

Pipeline redundancy in the region is important if interruption occurs in the region along the Santa Ana Valley Pipeline. On a regional-scale, projects like the Baseline Feeder, Central Feeder, and the Riverside Corona Feeder will provide additional options of conveyance in an emergency situation.

Although SWP water is not critical to short-term water demands, it is critical to long-term management of the groundwater basin. Regardless, the following suggestions could help further prepare the Region for a shutdown of the State Water Project.

3.3.2 Recharge with SWP Water when it is Available

The SBBA is essentially an underground storage reservoir that contributes to the water reliability of the Region during periods of drought. By recharging water from the SWP when it is available, the Region can prepare in advance for drought or disruptions in the SWP system.

3.3.3 Surface Storage in the Region

Additional surface storage in the region can help provide water supplies during a catastrophic failure of the California Aqueduct.

3.3.4 Exchange and Banking Program Utilizing Santa Ana River Water

In years when water available from the Santa Ana River exceeds the capacity of local treatment plants and spreading grounds, the excess amount could physically be delivered to the Inland Feeder and into Metropolitan's water system in exchange for SWP water from Metropolitan. This banked water could be recovered and delivered to the region if a catastrophe occurs along the California Aqueduct.

4 Vulnerabilities of Local Purveyors Water Supply System to an Earthquake in the Region

A catastrophic 8.0 earthquake near San Bernardino could lead to pipeline rupture, loss of electricity, and well failure, substantially reducing water supplies available in the Region. The quality of both surface and groundwater supplies could also be affected by the failure of existing wastewater treatment facilities. Figure AF-1 shows the San Andreas Fault trace through the Valley District service area with a five mile fault buffer zone. In the case of a 7.8 earthquake, anything within five miles of the fault is likely to be damaged or destroyed (Caltech meeting, July 31, 2007). In addition, regional infrastructure within this zone includes the SWP CA Aqueduct coming from Lake Silverwood to Devil Canyon, regional water facilities owned by Valley District (Foothill Pipeline, Greenspot Pipeline, Lytle Canyon Pipeline, and the East Branch Extension), and Metropolitan's Inland Feeder will be impacted. Prudent preparation for a catastrophic earthquake would suggest planning for no water deliveries from the SWP.

4.1 Overview of Known Earthquake Vulnerabilities of Purveyor's Systems

This section has been prepared based on review of Urban Water Management Plans of agencies receiving direct deliveries from Valley District. California Water Code Section 10632 (c) requires that Urban Water Management Plans address catastrophic supply interruptions.

4.1.1 San Bernardino Municipal Water Department

San Bernardino Municipal Water Department's Supplemental Emergency Plan is designed for implementation during emergency water shortages that could occur as a result of earthquake, flood, fire, or other catastrophes. SBMWD maintains portable backup power supply and diesel- and/or natural gas-driven wells at critical locations within the distribution system to provide domestic water for emergency purposes during sustained power outages. Additionally, they have entered into a Mutual Aid Agreement with surrounding water agencies.

4.1.2 East Valley Water District

East Valley has in place back-up power supplies at critical locations within the distribution system. The District maintains portable pumps that can be used to transfer water between zones, but cannot be used for production. East Valley's storage capacity of 25.5 million gallons would provide a potable supply for customers' non-irrigation uses (assumes implementation of Water Shortage Contingency Plan) for an estimated two to three days. A

Mutual Aid Agreement with surrounding water agencies is also in place for the provision of water supply and/or manpower.

East Valley has an agreement with Arrowhead Drinking Water Company to deliver potable water tanks to selected sites within the District's service area. The trucks will be manned by District personnel to distribute water to customers for drinking purposes.

Were surface water deliveries to East Valley disrupted, East Valley has adequate groundwater production capacity to meet peak day. This presumes that East Valley's facilities remained intact.

4.1.3 West Valley Water District

Extended multi-week supply shortages due to natural disasters or accidents that damage all West Valley water sources are unlikely. The District's 23 storage reservoirs hold 65.6 million gallons, which is sufficient water to meet the health and safety requirements of 50 gallons per day per capita for the 60,121 customers for 21 days. This assumes zero non-residential use. Under emergency power outages or catastrophic earthquake conditions, the existing storage is expected to provide a minimum supply of 3.5 days of average day demand or 1.7 days under maximum summer demand.

The District is planning to construct an additional 12.5 million gallons of storage within the next few years for a total of 78.11 million gallons, which would give the District 4.2 days of average day demand. The District also has interconnections with three other agencies for emergency supplies.

The District has portable back-up generators that can be used in the event of an area-wide power outage. These generators can be located on both wells and booster stations to continue water production. These generators will be located in the northern part of the distribution system. Water can then be boosted to higher zones or gravity fed to the lower zones. In addition to the portable generators, the District is constructing back-up generators at the Zone 5 and 6 booster stations.

West Valley's groundwater production capacity is approximately 80 percent of peak day demand. It obtains water from two Valley District facilities, the Lytle Pipeline and the Baseline Feeder. These facilities are required to meet peak day demand.

4.1.4 Yucaipa Valley Water District

Yucaipa Valley's Major Disaster Plan and Alerting Procedures deal with non-drought-related water shortages, including those that might result from earthquakes. It outlines the responsibilities of the District's designated emergency response personnel, alerting procedures, alternate headquarters, communications, transportation, and relationships with regional and state emergency response officials.

To the extent well capacity exists, the Yucaipa basin can be temporarily exercised beyond its long-term safe yield in response to shortages.

It is East Valley's intent to maintain groundwater production facilities adequate to meet peak day demand without use of surface water.

4.1.5 City of Redlands

The Redlands UWMP notes that the Redlands Municipal Utilities Department has an emergency plan that supplements the Citywide Emergency Plan. It notes that in case of an earthquake, required actions are to "coordinate the resources necessary for repair of water infrastructure," and to "utilize vendor lists to identify available water haulers, temporary water lines, piping, heavy equipment, etc."

Redlands does not have adequate capacity to meet peak day demand without use of surface water. Redlands obtains surface water from Mill Creek and SWP wheeled by SBVWMD. During a typical summer, Mill Creek is the main source during early summer, but this supply is substantially reduced by late summer. SWP water is the dominate source in late summer. Depending on the supply of Mill Creek water, Redlands may not be able to meet peak day demands without SWP water.

4.1.6 Fontana Water Company

Fontana is dependent on imported surface water to meet demands. Presently, the water is all delivered via the Lytle Pipeline. It is possible that in the future, some of the imported water will be conveyed by Metropolitan's Foothill Feeder (also known as the Rialto Pipeline). These two lines are parallel, however, and it is reasonable to presume that the same event that damages one will damage the other.

4.1.7 City of Rialto

Rialto's UWMP notes that the city's storage reservoirs can meet the health and safety requirements of 50 gallons per day per capita for 11 days. This assumes no non-residential use. The City is retrofitting key well sites to enable the City to bring in portable generators for use during a power outage.

Rialto obtains water from two Valley District facilities, the Lytle Pipeline and the Baseline Feeder. It is believed that both these facilities are required to meet peak day demand.

4.2 Findings and Recommendations

- The purveyors in the region will primarily rely on groundwater during catastrophic events. Therefore, they must ensure they have reliable and adequate backup power supplies at critical locations within the distribution system as well as key production

wells. The backup power supplies should be tested periodically to ensure proper operations during emergencies.

- Local purveyors should examine their current storage and interties capacities and plan for additional storage and interties to ensure adequate water supply is available for health and safety during catastrophic events.

5 Summary of Findings and Recommendations

5.1 Findings

These findings have been developed from a search of literature reporting the impacts of major earthquakes and limited work by water purveyors. More detailed, site-specific analyses are needed to better quantify and identify impacts from major earthquakes or other catastrophic outages.

- **Reliability of Groundwater Wells.** Review of post-earthquake lifeline performance reports reveals little discussion of groundwater well failure. However, loss of commercial power, damage to electrical equipment and aboveground appurtenances, or damage to the distribution system may effectively put the well out of service. Liquefaction, especially in areas where there is high groundwater levels between depths of 5 to 50 feet, may cause ground settlement and interfere with continued well operation.

  No discussion of the performance of well head treatment systems during earthquakes was found. This may be due to the limited amount of well head treatment in place during prior earthquakes. As well head treatment typically includes purchased equipment installed in a field location, there is significant opportunity for lapses in the seismic design.

  The groundwater basin and the groundwater production wells are a reliable part of the water supply system for the San Bernardino area.

- **Reliability of Pipelines**. Pipelines are generally the most fragile part of a water system. Generally, damage is a function of displacement rather than shaking. Empirical algorithms have been developed to predict seismic reliability of pipelines.
- **Reliability of Pump Stations**. Past earthquakes indicate that the structural and mechanical elements of a pump station are highly resistant to earthquake damage. The most likely failures are to the electrical equipment and loss of commercial power.
- **Reliability of Surface Water Treatment Facilities**. The major elements of a surface water treatment system are typically concrete structures that are very resistant to damage. However, these facilities include a large variety of mechanical equipment, much of it long and light weight that is subject to damage not only from the direct force of an earthquake, but also to the wave action created by the earthquake. Similar to a pump station, power supply and electrical equipment are fragile.
- **Reliability of the State Water Project**. While little specific information was found on anticipated damage to the SWP, the high susceptibility of the Santa Ana Valley

Pipeline is recognized. A major vulnerability of the SWP is the Sacramento-San Joaquin Delta. The SWP does have a Business Resumption Plan and an Emergency Operations Plan.

- **Length of Outages.** The Loma Prieta earthquake affected a large number of separate systems. The San Jose Water Company serves most of San Jose and all of Los Gatos. Los Gatos was hard hit and half of the water customers lost water service. In San Francisco, the worst hit area was the Marina District. Fires and liquefaction both affected the district. East Bay Municipal Water District serves 1.1 million customers and suffered $3.7 million in damage. Damage included a break in a 60-inch raw water line.

  After the Northridge earthquake, the Los Angeles Aqueducts No. 1 and 2 were in and out of service for temporary and permanent repairs over several months, these facilities were not critical at that time. Alternate supplies were available and drought conditions limited supply to these aqueducts.

  Table AF-3 shows the length of outages for water operation during the Loma Prieta and Northridge earthquakes.

  Valley District's Emergency Operations Plan includes estimates for repair of Valley District facilities. Electrical and pipe repairs are estimated to take 35 to 77 days. Pump repairs are estimated to take 168 to 273 days.

  Tables AF-4 and AF-5 summarize the degree to which purveyors depend on Valley District facilities for deliveries over a period of days to one year. These tables presume normal operations by the purveyor with the exception that non-potable deliveries (West Valley and Yucaipa) are suspended.

Table AF-3 – Length of Outages for Water Operation during Loma Prieta and Northridge Earthquakes

Earthquake	Purveyors	Time to Restore Water Operation
Loma Prieta	San Jose WC	36 hrs/98%
	San Francisco	6 days/most areas
	East Bay MWD	3 days/normal operation
Northridge	City of L.A.	12-65 days

Table AF-4 – Percent of Present (P) and Future (F) Peak Day, Potable Demand conveyed by SBVWMD facilities when no local surface water is available. Assumes imported water used prior to local groundwater

Purveyor	Foothill Pipeline	SARC Pipeline	Greenspot Pump Station	Morton Canyon Connector	Greenspot Pipeline	Tate Pump Station	Crafton Hills PS	Crafton Hills Reservoir	Crafton Hills Pipeline	Bryant Street Pipeline	Yucaipa Pipeline	Lytle Pipeline	Baseline Feeder
San Bernardino Municipal Water Dept	0	0		0	0								
East Valley Water District	12 (P) 24 (F)	12 (P) 24 (F)		12 (P) 24 (F)	0								
Redlands	36 (P) 41 (F)	36 (P) 41 (F)	24 (P) 25 (F)	51 (P) 35 (F)	24 (P) 25 (F)	24 (P) 25 (F)							
Yucaipa Valley Water District	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)		24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	24(P) 49 (F)	0		
Fontana Water District	0	0		0	0							39 (P) 27 (F)	
West Valley Water District	0	0		0	0							23 (P) 36 (F)	12(P) 27 (F)
City of Rialto	0	0		0	0							7 (P) 6 (F)	unknown

Notes:
San Bernardino Municipal Water Department figure does not include deliveries of surface water for wells under the influence of surface water as it takes six to seven months for the hydrographs of these wells to respond. If these deliveries were included, they would be 14% of peak day demand.
Fontana Water Company percentages were developed without input from Fontana. Assumes all imported water comes through Lytle Pipeline rather than Metropolitan facilities.
Does not include deliveries for irrigation or indirect deliveries.
Gray shading indicates a conveyance facility that cannot under any circumstances be used to convey water to the agency.

Table AF-5 – Groundwater and Local Surface Water Production Capacity as percent of peak day demand

Purveyor	Percentage	Remarks
San Bernardino Municipal Water Department	113%	
East Valley Water District	104%	
Redlands	≈ 75 to 85%	Assumes late summer when local surface water supplies are low. When local surface water supplies are high, Redlands can produce approximately 85 to 95% of demand.
Yucaipa Valley Water District	95%	Yucaipa's intent is to maintain groundwater production facilities adequate to meet peak demand. As of August 2007, they do not meet this goal.
Fontana Water District	Significantly less than 100%	Historically, Fontana has depended on Cucamonga Valley Water District interconnection to meet peak day.
West Valley Water District	78%	Projected to decrease to 59% in the future.
Rialto	unknown	
Notes: Does not include non-potable use by West Valley and Yucaipa.		

5.2 Recommendations for Disaster Preparedness

This section includes the consultants recommendations based on the literature review and discussions with District staff and purveyors. The following recommendations have not been included in the administrative draft of the IRWM Plan. After these recommendations, the projects already included in the IRWM Plan that would enhance disaster preparedness will be reviewed.

5.2.1 General Recommendations

- Consider a Seismic Improvement Program/Water Infrastructure Reliability Project to review the adequacy of Valley District facilities to withstand an earthquake. East Bay Municipal Utilities District and Santa Clara Valley Water District (Santa Clara Valley Water District, 2005) are two agencies that have performed such studies. High priority facilities include Foothill Pipeline, Santa Ana River Connector, Morton Canyon Connector, and Greenspot Pipeline.
- Consider the opportunities that Big Bear Lake presents as an emergency source of water after an earthquake that interrupts SWP deliveries for many weeks.
- Consider using the existing MWD agreements to allow the use of Metropolitan Water District facilities to bypass failed Valley District facilities (and the reverse).

- Review ability to provide drinking water immediately following an earthquake. Arrangements to provide bottled water may be appropriate.
- The USGS Multi-hazards Demonstration Project (MHDP) is leading an effort to create a scenario document for a future M7.8 southern San Andreas Fault earthquake. The document will describe in detail the effects of the earthquake. It will form the basis for a November 2008 statewide earthquake response exercise. The USGS contact for this project is Dale Cox, dacox@usgs.gov, 916/997-4209. It is probable that useful information for disaster preparedness planning will come out of this effort.

5.2.2 Proposed Projects to Provide Conveyance System Redundancies for the Regional Facilities

Implementation of the following projects (included in the IRWM Plan) may be of particular benefit during major disasters by providing redundancies for the conveyance system.

Project 12 - Central Feeder Pipeline

The Central Feeder System, including projects 12.1 through 12.7, provides ability to convey Bunker Hill Basin groundwater to purveyors. This project is particularly important because it provides redundancy for the Foothill Pipeline.

Project 36 - West End Pump Station

By conveying Bunker Hill Basin groundwater to the west, provides redundancy to the Baseline Feeder West Extension and the Lytle Creek Pipeline.

Project 37 - 9th Street Feeder

This project conveys Bunker Hill Basin groundwater to East Valley, which provides redundancy for the Foothill Pipeline.

Project 39.1 - Mentone Pipeline

This series of projects, projects 39.1 through 39.5, provide redundancy to the SARC pipeline, Morton Canyon Connector I, Greenspot Pump Station, and Greenspot Pipeline. This provides redundancy for deliveries to the east—YVWD and SGPWA.

Project 54 - Bunker Hill Regional Water Supply

Improves ability to produce groundwater and place that groundwater into regional transmission systems

Project 57 - Bunker Hill Basin Water Supply Reliability Project

This project improves the ability to convey Bunker Hill Basin groundwater to the west and provides alternative conveyance to the Baseline Feeder and Lytle Creek Pipeline. This project also provides redundancy for Project 54.

Project 60 - Baseline Feeder West Extension

This project provides a method to deliver Bunker Hill Basin Groundwater west beyond West Valley's service area, providing alternative supply to Fontana Water Company.

5.3 Alternative Local Supplies

This section is intended to initiate a discussion of options that would improve the water supply reliability in case of a catastrophic failure of portions of the Valley District water system.

5.3.1 Interties between Purveyors

Table AF-6 lists interconnections between purveyors. These interties could be used to balance supplies between purveyors. An interconnection between the City of San Bernardino and East Valley is currently being used to facilitate blending. This use is anticipated to end in the near future. Fontana Water Company has historically depended on supplies delivered through its interconnection with Cucamonga Valley to meet peak day demand.

Table AF-6 – System Interties between Purveyors

Transfer	Direction	Capacity (MGD)	Remarks/data source
City of San Bernardino/East Valley	Either	4	Three interties. One currently used to facilitate blending.
City of San Bernardino/Riverside	To San Bernardino	2	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/West Valley	Either	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Loma Linda	Either	5	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Colton	To Colton	3	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/Rialto	Either	3.6	(San Bernardino UWMP, Pg 2-10)
City of San Bernardino/ Riverside Highland	To Riverside/ Highland	3	(San Bernardino UWMP, Pg 2-10)
Fontana/Cucamonga Valley	To Fontana	3.6	Fontana UWMP (2500 gpm)
West Valley/Fontana	Either		West Valley UWMP.
West Valley/Rialto	Either		West Valley UWMP.
West Valley/Colton			West Valley UWMP.
Redlands/Loma Linda	To Loma Linda		Greg Gage
Rialto[1]/Marigold	To Marigold		Rialto has historically conveyed 1,500 afy of groundwater to Marigold. The agreement under which this was accomplished is expiring.

Sources: San Bernardino Municipal Water Department 2005 UWMP; Jack Nelson, Yucaipa Valley; Ron Buchenwald, East Valley; Greg Gage, Valley District, West Valley 2005 UWMP.

[1] Rialto has several connections with other systems, including four connections with West Valley Water District, and connections with the City of San Bernardino, Fontana Water Company, and Riverside Highland Water Company.

Based on the limited sources of data, this list may be incomplete.

5.3.2 Big Bear Lake

Big Bear Lake has a capacity of over 70,000 acre-feet, most of which is owned by the Bear Valley Mutual Water Company. To enhance tourism, Big Bear Municipal Water District entered into an agreement with BVMWC and Valley District whereby Valley District makes deliveries to BVMWC “in lieu” of BVMWC taking delivery from the lake. The net effect is that water remains in the lake to enhance tourism. An agreement could be written that might make water from the lake available for municipal use in case of a catastrophe.

5.3.3 Increased Groundwater Production Capacity and Reliability

If the catastrophe is an earthquake, the most likely impact on groundwater production capacity will be damage to the electrical system of the well or to the electricity supplier’s system.

Thus, providing emergency generators for "key" wells would help improve the area's ability to operate after a catastrophic failure.

5.4 Alternative Conveyance of Surface Water

5.4.1 Alternatives to Foothill Pipeline System

The following systems could provide some alternative conveyance of surface water should portions of the Foothill Pipeline System fail:

- Metropolitan's Inland Feeder can convey water stored in Diamond Valley north to the Valley District service area. The conveyance capacity of the Inland Feeder operating from Diamond Valley Lake to the north is reported to be 250 cfs.

- Once completed, the tunnel portion of the Inland Feeder, with proper interties, will be able to convey SWP water from Devil Canyon Afterbay into the Foothill Pipeline.

- The Central Feeder, portions of which are under construction, would increase the ability to convey groundwater between agencies following a catastrophe. Connecting the Central Feeder to the Santa Ana Valley Pipeline and to the Crafton Hills Pump Station would provide redundancy for the Foothill Pipeline.

- The proposed East Branch Extension Phase II will convey SWP water from the eastern portion of the Foothill Pipeline to Crafton Hills Pump Station. This will provide redundancy for the SARC Pipeline, Greenspot Pump Station, Morton Canyon Connector I, and Greenspot Pipeline.

- The proposed State Water Project Extension (previously called the Desert Aqueduct) contemplates extension of the State Water Project to Coachella Valley. Depending on the alignment chosen, this project could provide an alternative for conveying SWP water to portions of the Valley District service area or to San Gorgonian's service area.

5.4.2 Alternatives to the Lytle Pipeline

- Metropolitan's Foothill Feeder, also called the Rialto Pipeline, parallels the Lytle Creek Pipeline from Devil Canyon east for approximately nine miles. With turnouts it could provide alternative conveyance to West Valley's and Fontana's surface water treatment plants.

- The Baseline Feeder conveys groundwater to West Valley and Rialto. This groundwater is an alternative to SWP water conveyed by the Lytle Pipeline. It should be noted that Rialto's connection to Lytle Pipeline is not yet completed.

5.4.3 Alternatives to Baseline Feeder System

- The Lytle Creek Pipeline conveys SWP water to West Valley and can convey SWP water to Rialto when the connection is completed. This surface water is an enhancement to groundwater conveyed by the Baseline Feeder.

5.5 Back-Up Power Supplies

5.5.1 Power Supplies for Groundwater Wells

A catastrophic earthquake may cause loss of electricity for an indeterminate amount of time. In order to ensure water supplies in the immediate aftermath and weeks following a major earthquake, it is critical to have back-up generators or internal combustion engines for important production wells throughout the Region.

- Inventory wells in the Region with back-up generators.
- Determine the number of wells that could be equipped with internal combustion engines.
- Rank groundwater wells by their ability to supply water to purveyors. Wells with higher production capacities, more conveyance connections, or delivery pipeline options are preferential.
- Select a distribution of wells across the basin to be provided with back-up generators or internal combustion engines, decreasing the likelihood of a localized event impacting a majority of the most important wells.

5.5.2 Back-Up Power Supplies for Other Water Supply Facilities:

Similar evaluations should be conducted for other facilities such as water treatment plants and the key pumping plants, and back-up power generation should be put in place for use during emergencies.

6 Water Shortage Contingency Plan

Each water agency in the region is required by law to have a water shortage plan and emergency catastrophe plan. If there is a shutdown in the SWP system or a long-term drought that affects imported or local supplies, each agency in the region should participate in conservation activities that maximize use of the shared water supplies, both local surface water and ground water. These conservation efforts should be coordinated at a regional level.

The following provides examples of rules, regulations, and procedures that could be implemented to restrict or reduce water use. These could be implemented upon determination that there exists, or there is a threat of, a water shortage that affects the region's ability to provide adequate potable water supplies for the purveyors to deliver to their customers. Each agency should have a water shortage plan that is tailored to their customers in order to reach water conservation targets.

6.1 Stage I Conservation – Additional 20% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving an additional **20 percent** reduction in water consumption—the water conservation measures referenced in Stage I, and the following:

(a) All outdoor irrigation should occur only after 8 p.m. and before 7 a.m.

(b) Prohibit the use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground, and other hard-surface areas by direct application.

(c) Prohibit the use of non-drinking-water fountains, except for those using recycled water.

(d) Prohibit the use of water that results in any flooding or run-off in gutters or streets. Limit water deliveries to residential and non-residential users to 90 percent of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **200 percent** on all water use in excess of the maximum water use allotment referenced in subparagraph (a) above, assessed to the account of the customer.

(c) Limit the use of water from fire hydrants to fire suppression and/or other activities immediately necessary to maintain health, safety, and welfare of residents.

(d) Prohibit the use of potable water for dust control and compaction for construction projects.

(e) Prohibit the washing of automobiles, trucks, trailers, boats, and other types of mobile equipment not occurring upon the immediate premises of a commercial car wash and/or commercial service station that uses recycled water.

(f) Encourage restaurants to refrain from serving water to their customers, except upon specific request.

(g) Limit the use of potable water to irrigate grass, lawns, ground cover, shrubbery, crops, vegetation, ornamental trees, etc., to Saturdays, Mondays, and Wednesdays for even-numbered addresses and Sundays, Tuesdays, and Thursdays for odd-numbered addresses, or as otherwise established by resolution from the Board of Directors of the respective agencies.

(h) Limit water main flushing to emergency situations only.

(i) Wait list applications for Intent to Serve Letters and suspend their further processing.

Pursue a vigorous public information campaign regarding current water supply conditions and the need to reduce water consumption by such means deemed appropriate.

Meet with other water purveyors, public school districts, park agencies, and golf courses that use water sources other than purveyor-supplied water, to seek voluntary reduction in irrigation of decorative landscape and reduce irrigation of turf and play areas.

In addition to those measures stated above, adoption of water conservation measures on an urgency basis may be warranted.

6.2 Stage II Conservation – Additional 35% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving up to an additional **35 percent** reduction in water consumption. The water conservation measures referenced in Stage I and Stage II, and the following:

(a) Limit water deliveries for residential uses to **65 percent** of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **400 percent** on all water use in excess of the maximum water use allotment reflected in subparagraph (a) above, and that can be assessed to the account of the customer.

(c) Require all swimming pools to be covered when not in use.

(d) Prohibit the use of potable water to irrigate grass, lawns, ground cover, shrubbery, crops, vegetation, ornamental trees, etc., and lock all irrigation meters.

(e) Suspend Intent-To-Serve Letters. However, the expiration period can be extended commensurate with the time of suspension.

In addition to those measures stated above, adoption of water conservation measures on an urgency basis may be necessary.

6.3 Stage III Conservation – Additional 50% Reduction

Upon determination that additional water conservation is needed, the following prohibitions can be considered and adopted with the goal of achieving up to an additional **50 percent** reduction in water consumption. The water conservation measures referenced in Stage I, II, and III above, and the following:

(a) Limit water deliveries for residential uses to **50 percent** of their water consumption for the same billing cycle during a pre-determined Base Year.

(b) Levy a surcharge of **500 percent** on all water use in excess of the maximum water use allotment reflected in subparagraph (a) above, and that can be assessed to the account of the customer.

(c) Prohibit the setting of new water meters and suspend all Will-Serve Letters.

In addition to those measures stated above, adoption of additional water conservation measures on an urgency basis may be necessary.

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Ron Buchwald, East Valley, August 2007
Tom Crowley, West Valley, August 2007. Email on August 28.

Chris Diggs, Redlands, August 2007
Jack Nelson, Yucaipa Valley, August 2007
Matt Litchfield, August 2007

2005 Urban Water Management Plans:
East Valley Water District
Fontana Water Company
City of Redlands
West Valley Water District
Yucaipa Valley Water District

Attachment 1

Earthquake Literature Search

This section has been prepared based on the insights included in reports prepared by water agencies outside this IRWM Plan area that summarize their experience and include their after-action reports prepared following earthquakes.

Loma Prieta, California, Earthquake of October 17, 1989.

The U.S. Geological Survey's Professional Paper on the performance of the built environment in the Loma Prieta Earthquake was compiled of a number of separate papers. Information from two of those papers that focused on water systems is discussed here (Schiff, 1998).

A section of the Professional Paper (Le Val Lund, primary author) had the following conclusions:

"On the basis of this preliminary reconnaissance survey, the 1989 Loma Prieta earthquake has reinforced the lessons learned in previous earthquakes that water and wastewater systems should do the following.

- Provide emergency power for critical operating, treatment, and support facilities
- Maintain portable light plants, generators, chlorinators, and pumps
- Develop a separate radio-communication system, independent of the telephone system
- Maintain an inventory of repair materials, parts, and fuel
- Improve the State-wide and mutual-aid programs
- Establish guidelines for State-wide emergency water-quality sampling and public notification
- Conduct an earthquake-response assessment of system facilities
- Develop an emergency-response plan
- Incorporate into local or regional emergency-response plans a more active participation by water and wastewater agencies
- Provide a method, possibly computer based, for logging problems and system operations to establish priority for repair activities
- Conduct a cross-training program to include all personnel in emergency response
- Train personnel in appropriate communication procedures
- Conduct regular periodic emergency-response exercises
- Provide flexible pipe joints
- Provide flexible pipe connections to wells, tanks, pumps, and other rigid structures

- Provide adequate anchorage for air valves and other heavy appurtenances that are installed in an inverted-pendulum position
- Design mechanical appurtenances in treatment-plant basin facilities for wave action
- Provide for a breakaway or fusible connections and (or) safety cables or chains to prevent malfunctioning mechanical equipment from interfering with other equipment in treatment-based basins
- Provide for redundancy in water and wastewater systems
- Install isolation valves and establish a regular valve-maintenance program
- Anchor water-quality-testing equipment and supply cabinets"

A separate section of the Professional Paper (Mark Pickett, primary author) focused in part on the lessons learned from the Loma Prieta Earthquake for utility operations, including preparedness and response. A brief review of the points made on utility operations is below:

- **Organization**. Important improvements in organization that were frequently identified were (1) better definition of leadership roles, (2) clearer statement of unit duties, (3) improved emergency planning to reflect the detailed events that must be dealt with in real disasters, and (4) better preparation through "what if" thinking and plan exercising.
- **Energy Sources**. Points that could provide better preparedness for loss of electrical power included:
    - Maintain close relationships with the local electrical-power company to ensure priorities of the utility and the water agency are understood.
    - Portable electrical-power generators should be provided with the proper fittings and connections for each intended use. Generators should be periodically tested.
    - Permanent engine-driven generator sets should be provided at critical support facilities.
    - Regularly scheduled periodic tests should be conducted under load.
- **Portable Equipment.** All utility personnel noted that more portable equipment was needed than was on hand in their organization. Portable equipment needs scheduled maintenance and safe and accessible storage. Personnel need to know how to operate the equipment and the equipment limitations.
- **Communications and Public Information.** Pre-disaster preparation includes development of "fill-in-the-blank" media-release forms, development of procedures to disseminate information to the media, securing of communications equipment and access to communications networks, and preparation for post-disaster investigations.
- **Inventory.** Adequate supplies and access to those supplies needs to be maintained.

- **Emergency-Response Planning**. In general, utility emergency-response plans were not well documented or pre-exercised before the earthquake.
- **Mutual-Aid Planning.** Adequate mutual-aid planning includes coordination with other water agencies, participation in regional meetings and test exercises, preparation to provide aid to adjacent Federal and State organizations, and authorization from fire department officials for utilization of fire engines as booster equipment.
- **Training**. Extensive training of employees is required.
- **Long-Term Recovery Planning.** Recovery planning needs to take into account reconstruction, rate-structure changes, integration of new knowledge into operations, collection of revenues, and record keeping for State or Federal reimbursement.

Northridge Earthquake, California, Magnitude 6.8 Earthquake of January 17, 1994

The National Institute of Standards and Technology report on the lifeline performance in the Northridge Earthquake had the following observations and recommendations concerning the performance of water facilities (Schiff, 1997).

"Seismic performance of dams, large buried reservoirs, and wells in the 1994 Northridge earthquake showed significant improvement from the 1971 San Fernando earthquake. Facilities constructed since the San Fernando earthquake that incorporated lessons learned from that earthquake performed well. These include concrete tanks and pumping stations that were subjected to very strong ground motions. The prestress-concrete water tanks were constructed using criteria more conservative than those contained in AWWA Standards for Wire-Wound Circular Prestressed Water Tanks (AWWA D110)."

"There is a need for performance criteria for water systems so that piping systems and other water system facilities and equipment can be evaluated and seismic specification established in a consistent manner. With performance criteria, water systems performance and the consequences of disruption can be evaluated. With this information a case can be made for getting public support to enhance system performance in a timely and cost-effective manner."

"The largest impact on water system performance was the failure of water lines, both large supply lines and smaller lines in the distribution system. Most pipeline damage has the result of ground deformations. This earthquake had no surface faulting, but there were many areas with ground deformations in locations that had not previously been predicted. Thus, a general level of improved materials and methods may be needed to improve system performance rather than concentrating on special problems of fault crossings. The uncertainty in predicting the location of damage increases the importance of system redundancy and alternate supplies from other sources, such as groundwater basins and alternate aqueduct systems for water supplies."

"Many of the pipe failures appear to be related to cracks in bells that are probably associated with their method of fabrication. There is a need to study the seismic strength of welded steel bell and spigot joints and methods to improve the seismic performance of the joint. The joint performance should be compared with the current (AWWA) Standard for Welded Steel Pipe."

"The performance of surface-supported tanks was poor and damage was similar to that observed in previous earthquakes. Many of the damaged tanks were old and predate current seismic design standards. The loss of tank contents was frequently associated with failure of input and output pipe connections. These failures are due to the use of cast iron fittings and inadequate flexibility to accommodate the movement of the tank, which was typically lifting rather than sliding. The roofs and upper parts of side walls on several tanks were damaged due to sloshing. Several examples of elephant foot buckling were observed."

"There is a need for follow up surveys to determine the performance of tanks constructed using current seismic standards and to determine the relative performance of anchored and unanchored tanks. Methods to address the damage due to sloshing should be identified for existing and new tanks. Based on the effect of tank performance on water system performance, the need for reducing the risk of tank damage by improving anchorage, stiffening to prevent buckling, and reducing effects of sloshing can be determined."

"Sloshing in large basins in water filtration and water reclamation plants caused damage in both 1989 Loma Prieta and the Northridge events. Although not critical, the damaged equipment can cause malfunction of other equipment. For example, sloshing caused the jamming of the chain drive sludge scrapers in seven out of 44 final clarifiers of a water reclamation plant. There is a continuing need to consider sloshing and shaking in the design of mechanical equipment and baffles in large basins of water and wastewater treatment plants."

"Air and vacuum valves on pipelines are configured in an inverted pendulum above the ground surface. In the Northridge event many valves toppled, had cracked bodies or damaged floats (balls). Also the damage may have been caused by transient pressures in the pipeline. A study is required to improve the performance of these valves in an earthquake."

"The disruption of commercial power emphasizes the need for reliable emergency power supplies. While emergency power for pumping stations and treatment plants performed well, there were indications that testing units under full load may enhance performance.

"The 1971 San Fernando and 1987 Whittier Narrows earthquakes experience had encouraged water agencies to prepare emergency response plans and establish emergency operations centers. These plans have been tested and implemented by lifeline agencies. Water system emergency response plans generally worked well in the Northridge earthquake. This was attributed to their periodic testing. It is important that plans address expected problems in communicating with personnel and with transportation problems. Because of transportation

problems and the disruption of several lifelines, it is important that water system disaster plans make provisions for supporting most needs of their workers, including food and temporary housing. In the recovery after the earthquake, outside contractors may be retained to speed the recovery. It is important that all personnel be aware of OSHA requirements for entering confined spaces, such as large diameter pipes, conduits and tunnels. To improve the performance of utility work crews, utilities should consider providing support for worker families that have been directly affected by the earthquake. For example, this could include providing assistance with getting shelter or help in evaluating damage to homes."

"Boil water orders were issued as a precaution. Because of the time needed to confirm that water is safe once an order is issued, the public may be needlessly inconvenienced. Consideration should be given to developing a mobile water quality laboratory to expedite, in the field after repairs have been made, the determination if the water is safe for drinking. More rapid methods for evaluating the safety of water should be explored."

"There is a need for adequate documentation of emergency response and recovery costs. For public utilities, as is the case for most water systems, a record is needed for reimbursement from FEMA. Documentation is also needed to substantiate insurance claims."

"The disruption of the water supply demonstrated that many critical facilities were not prepared with emergency water supplies or even a means for connecting an external source into their system."

"This is a need for better public education about the consequences of water system disruption and use of appropriate mitigation measures."

"While the performance of customer water is outside of the jurisdiction of water utilities, damage to these systems was costly and disruptive in the Northridge earthquake. The Oliveview Hospital, which was reconstructed after experiencing sever damage in the San Fernando earthquake had to be evacuated due to the failure of water systems within the hospital. The vulnerability of water systems in buildings should be evaluated and standards improved to reduce the losses and disruption from these systems."

This report also addresses damage and repair of supply pipelines. Since supply pipelines are the main facilities of SBVWMD, these estimates may be of particular interest. They are summarized in Table 1.

Table 1– Repair of Supply Pipelines after Northridge Earthquake

Pipeline Description	Repair time	Remarks
54- to 33-inch modified prestressed concrete cylinder pipe	65 days	Castaic Lake Water Agency's pipeline from treatment plant to service area. 35 leaks. New fabricated sections were installed and pulled rubber gasket joints were welded in place.
SWP – West Branch, 85-inch welded steel pipe to Jensen WTP	2 days	10-foot section of damaged pipe replaced with pipe fabricated at MWD yard.
Los Angeles Aqueduct No.1		Aqueduct No. 1 had damage at four locations; and it was able to be operated at very low flow for about a week to allow repairs to Aqueduct No. 2, then shut down for repairs. Operated at one-half capacity, after temporary repairs were made, during a planned Metropolitan shutdown. It was out of service from April 1 until summer for permanent repairs.
Los Angeles Aqueduct No. 2	One week	Out of service for the first week after earthquake for repairs.
78-inch North Branch Feeder (Metropolitan)	45 days	From Jensen Plant to Simi Valley. 15 to 20 major pulled pints and 500 cracks. Replacement air and vacuum valves delivered by manufacturer in two days.
48-inch, Granada Trunk Line (LADWP)	12 days	Welded Steel Pipe and modified prestressed concrete cylinder pipe. Four major pulled mechanical couplings and two tension and compression failures.
68-inch, WSP, Rinaldi Trunk Line (LADWP)		Welded Steel Pipe. Three pulled welded bell and spigot joints and a tension and compression failure.

Santa Clara Valley Water District Water Infrastructure Reliability Project

At the time of Santa Clara's Water Infrastructure Reliability Report, the system could suffer up to a 60-day outage if a major event, such as a 7.9 magnitude earthquake on the San Andreas Fault, were to occur.

Recommended improvements to the system included:

- Life Safety – retrofit of all operations buildings
- Emergency Planning and Studies – Recovery Plan and Retailer Shortages Agreement
- Agreements – Mutual aid, contractor retainer, pipe rental companies, welder retainer, retailer incentives
- Capital Improvements – SCVWD-owned well fields
- Operational Improvements – Stockpile pipes and system materials
- SCADA Improvements

The estimated cost of these improvements was $150 million (report data May 2005). With these improvements the estimated outage period would reduce to 7 to 14 days.

San Simeon, California, Magnitude 6.5 Earthquake of December 22, 2003

The San Simeon earthquake damaged two of 19 dams in the area.

There was no reported damage to groundwater wells other than the loss of power from a few hours to several days.

Steel water tanks damaged included two in the City of Paso Robles water system, one in a private system serving a mobile home park, three (of four) at the City of Templeton, and an elevated tank in the City of Guadalupe.

Pipeline breaks were reported in most purveyor systems (Lund, 2003).

Denali, Alaska, Magnitude 7.9 Earthquake of November 3, 2002

Population near the epicenter is limited to about 10,000 people in rural locations. Nearly all residents rely on private wells for water supply. Two events of well casings ejecting out of the ground were reported. These events may be attributed to accumulated frost heave forces on casing pipe that lost its soil resistance temporarily due to shaking and/or liquefaction.

City of San Diego

In 2001, the City of San Diego completed a study of the expected operational performance of the City of San Diego Water Supply pipelines when exposed to possible future scenario earthquakes. The analysis used a specialized GIS software package.

For the most serious earthquake, the study determined that it would take 1.7 days to stabilize the system, 20 days to restore backbone pipes, 35 days to restore distribution pipes, and 74 days to complete all pipe repairs.

The study also examined the costs and benefits of different seismic improvement programs and developed benefit/cost ratios for each program (Collins, 2001).

While the City of San Diego has a large number of reservoirs in the distribution system, this study did not examine those systems.

City of Vancouver, Canada

In 2000, the City of Vancouver completed a study of the expected operational performance of the Regional Water Distribution System. In the event of a Design Basis Earthquake, a 475-year event, the report concluded the following (JELC Working Committee, 2000):

1. The present system will be severely impacted. Chlorine facilities evaluated have life safety concerns. Fiberglass tanks containing sodium hypochlorite and ammonia may overturn due to lack of anchorage.

2. An estimated 30 pipeline failures will occur, making much of the system inoperable.

3. All pump stations that were evaluated will likely be inoperable as a result of nonstructural and, in some cases, structural damage. All but two pump stations are dependent on commercial power. If power is out, pump stations without self-contained power will be inoperable.

4. All reservoir roofs/column supports are vulnerable. Some may collapse. In general, tanks should remain operable.

A later discussion of the development of an alternate water supply for Vancouver proposed development of procedures to allow use of two existing irrigation wells for potable supply should the city's supplies from reservoirs fail in an earthquake. In addition, a dedicated fire protection system, possibly supplied with sea water, was proposed (City of Vancouver).

San Fernando, California, Magnitude 6.7 Earthquake of 1971

Immediately following the earthquake, approximately 100,000 customers were without water, and a citywide "boil water" advisory was issued. Within 5 days, water service was restored to all but a few thousand customers; after 10 days, less than 100 scattered customers were without water. All "boil water" orders were lifted after 12 days (Housing and Urban Development, 2001).

Two dams, Van Norman and Pacoima were seriously damaged by this earthquake. Van Norman was replaced and Pacoima was repaired.

Kobe, Japan, Magnitude 6.8 Earthquake of January 17, 1995

An estimated 2,000 water pipeline failures occurred, draining reservoirs and limiting water available for fire suppression. Transmission and distribution pipeline and water purification plant damage resulted in 300,000 people still without water one month following the earthquake.

An aggressive earthquake mitigation program had replaced most of the city's cast iron pipe prior to the earthquake. Without that, program failures and restoration time could have been far greater. About 6 percent of Kobe's ductile iron pipe had a special seismic joint that appears to have had little or no damage. An earthquake monitoring and control system isolated 18 reservoirs saving the water for drinking in the days following the event.

The earthquake monitoring and control system consists of an earthquake ground motion monitoring center, telemetry, and reservoirs with earthquake isolation valves at 21 locations. There are dual reservoirs at each of the 21 sites; one has an isolation valve to be controlled following an earthquake, and one does not. This concept allows shutdown of one reservoir while maintaining service should the second reservoir inadvertently shut down. If the system can keep up with system leakage, the isolated reservoir can be put back on line from the control center. If the system cannot keep up with demand, the reservoir remains isolated (Ballantyne, 1995).

There were two major issues identified that had delayed system restoration:

- No water pressure was available to check the repairs while the tunnels remained out of service.
- Access – limited by collapsed buildings and traffic congestion.

California Division of Mines and Geology Planning Scenarios

The California Division of Mines and Geology has prepared two special publications intended to provide an understanding of the impacts of major earthquakes in southern California. The first was a Magnitude 8.3 Earthquake on the San Andreas Fault (California, 1982). The second was a magnitude 7 earthquake on the San Bernardino Valley segment of the San Jacinto Fault (California, 1993). Both studies anticipate significant damage to the State Water Project. That information is discussed in a later section of this report that focuses on the State Water Project. Impacts to other water facilities in the SBVWMD service area are discussed here.

The San Andreas publication hypothesized an earthquake in which the southern limit of surface fault rupture is outside of the San Bernardino service area (approximately 10 miles northwest of Devil Canyon Power Plant). Thus, it does not directly address facilities within the San Bernardino service area. Within the area that is affected (generally west and north of San Bernardino), it does not anticipate widespread damage to primary transmission lines, although some pipe failures will occur. In distribution lines, there will be hundreds of breaks and thousands of leaks. Pumping plants are generally more compact structures and, with the exception of related electrical equipment and transformers, will probably not suffer as great of damage as distribution pipelines.

The San Jacinto publication hypothesized an earthquake within Valley District's service area and thus, substantially more impact on SBVWMD. The publication's planning scenario states that within 25 miles of the fault, damage to treatment facilities, pumping stations, and transmission and distribution pipelines will reduce service by 20 percent for up to five days. Restoration will take up to two weeks. People will be asked to use emergency supplies, boil their water, or take other safety measures against contamination. Delays will be necessary because waste water lines must be repaired before fresh water lines. The most serious problems will be concentrated in the low lying areas of San Bernardino and the Santa Ana

River Basin. The extent of damage and contamination of wells and groundwater will depend on groundwater levels at the time of the earthquake.

Specific failures hypothesized by the San Jacinto publication to facilities that convey SBVWMD water include (State Water Project facilities are discussed in a later section):

- San Gabriel Valley MWD's pipeline closed for 5 to 10 days. Fault displacement.
- Valley District's Foothill Pipeline closed for 4 to 6 days. Moderate liquefaction potential.
- Valley District's Baseline Feeder closed for 4 to 6 days.

The main source for this hypothesis was the then General Manager of SBVWMD, Louis Fletcher.

Regional Electrical System Vulnerability

During this evaluation, no recent information was available from Southern California Edison on the anticipated likelihood of a widespread failure of the electrical system serving the San Bernardino Area. Nor was information found on the times required to restore power after the Loma Prieta Earthquake. In the absence of that data, we reviewed the impacts of the Northridge earthquake.

The total generating capacity supplying the greater Los Angeles area at the time of the Magnitude 6.8 Northridge Earthquake of January 17, 1994, was approximately 10,000 MW. When the earthquake occurred at 4:30 AM the southern California area was exporting approximately 1800 MW to the Northwest over AC and DC interties that link Southern California to Oregon and Washington State. As a result of the earthquake, the AC and DC interties were opened and the power grid in the United States west of Denver was spilt into three separate islands. Due to the loss of power, there were short-term outages, up to three hours, in British Columbia, Montana, Wyoming, Idaho, Oregon, and Washington.

Within the City of Los Angeles, restoration times of power at major substations varied from 6:18 AM to 11:03 PM on the day of the earthquake. Due to distribution system failures, power remained out for a longer period for some customers. But, within 24 hours power was restored to over 90 percent of its customers. Had the earthquake occurred during the summer when loads are heavier, restoration would have taken longer.

San Bernardino Municipal Water Department

Rule and Regulation 21

Exhibit "A"

CITY OF SAN BERNARDINO MUNICIPAL WATER DEPARTMENT

300 North "D" Street
San Bernardino, CA 92401

RULE AND REGULATION NO. 21
GENERAL WATER SERVICE/WATER RATES

The following rates shall be charged for all water furnished for domestic, commercial, industrial, municipal water use within the City of San Bernardino, and any other purpose for which no rate is specified.

A. MINIMUM MONTHLY CHARGE: All users will be assessed a minimum monthly charge to recover fixed costs, such as meter replacement, customer service, mailing costs, bill payment and debt service. The rates will be as follows:

Meter Size	February 1, 2010	January 1, 2011	January 1, 2012
½ inch or ⅝ inch	$ 10.55	$ 12.20	$ 12.90
¾ inch	$ 13.00	$ 15.15	$ 16.15
1 inch	$ 17.90	$ 21.00	$ 22.60
1½ inch	$ 30.15	$ 35.75	$ 38.80
2 inch	$ 44.85	$ 53.45	$ 58.20
3 inch	$ 79.15	$ 94.75	$ 103.50
4 inch	$ 128.15	$ 153.70	$ 168.20
6 inch	$ 250.70	$ 301.15	$ 330.00
8 inch	$ 397.75	$ 478.10	$ 524.15
10 inch	$ 569.30	$ 684.55	$ 750.65

B. COMMODITY CHARGE: This charge recovers water production and treatment costs, as well as associated variable costs of the Department. This rate is charged per hundred cubic feet (hcf) of water sold.

Commodity Charge per hcf	February 1, 2010	January 1, 2011	January 1, 2012
	$1.05	$1.10	$1.15

C. REPLENISHMENT CHARGE: This charge recovers the cost of water purchased to replenish the local basin and may be adjusted up or down, depending upon the amount of replenishment required. This rate is charged per hundred cubic feet (hcf) of water sold.

Replenishment Charge per hcf	February 1, 2010	January 1, 2011	January 1, 2012
	$0.09	$0.09	$ 0.09

D. ELEVATION CHARGE: This charge recovers electrical costs to transport water through the system and is specific to each zone. The electric cost incurred at plant facilities within each elevation level is distributed across water usage within that zone. This rate is charged per hundred cubic feet (hcf) of water sold.

Elevation zone	February 1, 2010	January 1, 2011	January 1, 2012
Zone 1	$0.09	$0.10	$0.11
Zone 2	$0.17	$0.18	$0.19
Zone 3	$0.15	$0.16	$0.17
Zone 4	$0.12	$0.13	$0.14
Zone 5	$0.21	$0.22	$0.23
Zone 6	$0.21	$0.22	$0.23

Note: the Energy Surcharge previously collected is now included in this Elevation Charge.

E. CONSERVATION CHARGE AND TIERS: To encourage conservation, customer accounts placing a greater demand on the water system will be assessed a higher cost. Initially, customers using in excess of 150% of their class average will pay a higher rate for water usage that falls in the second tier. To encourage greater conservation over a longer period of time, each tier and charge will adjust annually. This rate is charged per hundred cubic feet (hcf) only on that usage above the level defined in the tier table below. Revenues recovered from these charge will fund conservation programs sponsored by the Department.

Conservation Charge per hcf	February 1, 2010	January 1, 2011	January 1, 2012
	$0.25	$0.30	$0.35

All usage in hundred cubic feet (hcf) in excess of that listed below, by class, is billed the conservation charge. *As an example:* During 2010, residential use equal to or below 36 hcf in a monthly billing period will not be assessed an additional conservation charge. However, each hcf billed above 36 will be assessed an additional 25¢ per hcf. The table below indicates the hcf cutoff for each customer class by meter size.

Conservation Tiers	February 1, 2010	January 1, 2011	January 1, 2012
Residential	36	34	32
MDU (2)	46	44	42
MDU (2+) per unit	19	18	17
Non-residential ⅝"	27	25	24
Non-residential ¾"	40	38	36
Non-residential 1"	75	70	65
Non-residential 1½"	170	160	150
Non-residential 2"	270	260	250
Non-residential 3"	800	770	740
Commercial ⅝"	46	44	42
Commercial ¾"	65	60	55
Commercial 1"	150	140	130
Commercial 1½"	305	290	275
Commercial 2"	485	465	445
Commercial 3"	965	920	875
Commercial 4"	2,660	2,530	2,400
Commercial 6"	9,950	9,475	9,000

F. MUNICIPAL CHARGE: Water furnished to the City of San Bernardino will be exempt from all water service charges so long as such usage does not exceed 110% of the fiscal year 1994/1995 municipal water usage (645,625 hundred cubic feet). All water usage in excess of that shall be charged the municipal rate, billed per hundred cubic feet of water sold.

Municipal contracts and other designated service customers will be billed the municipal rate, per hundred cubic feet of water sold, where no other rate is set forth in the specific contract or agreement.

Municipal Charge per hcf	**February 1, 2010**	**January 1, 2011**	**January 1, 2012**
	$0.37	$0.40	$0.45

G. ASSESSMENT DISTRICT CHARGE: Water furnished to the City for landscape assessment districts or funded from other than the City's General fund will be charged the following rate per hundred cubic feet (hcf) of water sold.

Assessment District Charge per hcf	**February 1, 2010**	**January 1, 2011**	**January 1, 2012**
	$0.37	$0.40	$0.45

H. UNMETERED CHARGE: A "jumper" may be substituted for a water meter during single or multi-family housing construction at a charge of $50 per month for a maximum of 120 calendar days or until the lot landscaping begins. Thereafter, a water meter shall be installed subject to all fees and charges as listed above prior to the issuance of a certificate of occupancy. Water used for tract grading and jetting of trenches is not covered in the above charge and is subject to the fees and charges listed in Rule and Regulation No. 16.

I. SURCHARGE – OUTSIDE CITY LIMITS: Any service installed outside the incorporated territory of the City after February 1, 1991 may be billed the meter charge and all required consumption related charges as set forth in this rule and regulation, multiplied by 1.5.

J. WATER SUPPLY SHORTAGE RATES: To comply with State of California mandates, the City of San Bernardino Municipal Water Department shall implement the following procedure in response to drought or water supply shortage declarations or similar service interruptions in the delivery of water to its customers.

During any drought or water supply shortage condition, the Department's General Manager may declare any one of three shortage level responses with ratification by the Board of Water Commissioners (Board) within three calendar days. A declaration of a water supply shortage may result from:

- interruption of service through major plant failure;
- interruption of replenishment water from various resources;
- rainfall level at twenty-five (25%) or more below normal levels for at least six months; or
- a natural disaster or other emergency event.

Stage I incurs no financial penalties but requires an ongoing commitment to a water conservation program. During Stage I, the Department shall:

- offer educational resources and landscaping classes;
- offer rebate programs for water smart appliances and other water saving devices;
- encourage voluntary conservation through continued media announcements;
- request the City Manager to direct city parks, facilities and golf courses to restrict landscape watering to off-peak hours to reduce demand on the water system and eliminate the 60% evaporation rate during daytime watering.
- provide reminder notices regarding noted water waste; and
- offer community outreach programs.

Due to the continuous conservation efforts required to preserve San Bernardino's water supply in the region's arid climate, Stage I will be maintained at all times.

Stage II will impose a five percent (5%) reduction in water usage and assess financial penalties on usage in excess of those amounts.

A base allowance for each customer will be established based upon their prior year's water usage. A ten percent (10%) surcharge will be applied to each billing unit that exceeds the (5%) required reduction in base allowance.

As an example: A customer used 20 billing units in March 2008. During a Stage II five percent (5%) usage reduction, the customer is permitted 19 billing units during the March 2009 billing period.

20 hcf x 5% = 1 hcf
20 hcf – 1 hcf = 19 hcf

If that customer utilizes 19 or less billing units, no financial penalty is assessed. However, should that customer utilize 25 billing units, a ten percent (10%) surcharge will be assessed for each billing unit in excess of 19:

25 hcf – 19 hcf = 6 hcf x 10% x commodity rate.

Additionally, during Stage II, the Department shall:

- increase advertisement of conservation measures;
- maintain a message center for reporting water waste;
- determine course of action to remediate reported water waste;
- request the City Manager to direct parks, facilities and golf courses to limit outdoor watering for irrigation to four days per week during off-peak hours only.

***Stage III** (Water Shortage Emergency)* will impose a ten percent (10%) reduction in water usage and assess financial penalties on usage in excess of those amounts.

A base allowance for each customer will be established based upon their prior year's water usage. A twenty percent (20%) surcharge will be applied to each billing unit that exceeds the 10% required reduction in base allowance.

> *As an example:* A customer used 20 billing units in March 2008. During a Stage III ten percent (10%) usage reduction, the customer is permitted 18 billing units during the March 2009 billing period.
>
> 20 hcf x 10% = 2 hcf
> 20 hcf – 2 hcf = 18 hcf
>
> If that customer utilizes 18 or less billing units, no financial penalty will be assessed. However, should that customer utilize 25 billing units, a twenty percent (20%) surcharge will be assessed for each billing unit in excess of 18:
>
> 25 hcf – 18 hcf = 7 hcf x 20% x commodity rate penalty for that billing month.

Additionally, during Stage III, the Department shall:

- increase advertisement of conservation measures;
- maintain a message center for reporting water waste;
- determine course of action to remediate reported water waste;
- request the City Manager to direct parks, facilities and golf courses to limit outdoor watering for irrigation to four days per week during off-peak hours only;
- prohibit all water consumption for irrigation of private residences and school grounds;
- deny all new construction meter requests;
- remove or lock out all existing construction meters in service; and
- prohibit vehicle washing unless conducted at a commercial car wash facility.

Notices of Violation:

- Step 1: Warning letter to the customer describing the waste issue and notice of potential fines for continuing waste, providing a Department customer service contact for conservation information and assistance.

- Step 2: Customer site visit to discuss nature of the waste and potential solutions. A second warning letter allowing seven calendar days to remedy the waste situation and comply with conservation restrictions.

- Step 3: Twenty-five dollar ($25) penalty after failure to comply with second warning letter.

- Step 4: Additional penalties increasing incrementally by twenty-five dollars ($25) per occurrence.

- Step 5: The Department may restrict the amount of water supplied to any customer failing to comply with conservation standards. The provisions of this section shall be applied in addition to any other penalties provided in this rule and shall be applied at the discretion of the Department.

  Exceptions: The restrictions of water consumption outlined herein are not applicable to water usage necessary for public health and safety or for essential governmental services, such as police, fire, and emergency services. The Department reserves the right to waive any water restriction penalty when, in its discretion, such consumption is required in order to maintain an adequate level of public health and safety.

Payment of Surcharges and Penalties:

All surcharges and penalties imposed under this rule and regulation shall be added to customers' water bills and become payable at the same time and in the same manner as such bills or by such other method of collection and payment as established by the Department.

Right to Hearing:

Any customer shall have a right to a hearing with the General Manager of the Department, or his/her designee, on a notice of violation, the assessment of a surcharge or penalty, or the denial and/or lock out of a construction meter, upon written request to the Department. Customer's written request for a hearing must be received by the Department within ten calendar days from the date of notice of violation, or customer's right to a hearing shall be deemed waived.

Customer shall be deemed notified of a violation, surcharge, penalty, or denial and/or lockout of a construction meter upon (1) the personal delivery of the notice to customer or (2) the date of lock out and/or denial of construction meter. If personal delivery is not given, the date on which the notice is placed in the regular mail shall be deemed the date of notification.

Customer's timely written request for a hearing shall automatically stay the imposition of a penalty until the General Manager or his/her designee renders a decision; except that denial of a construction meter request or lock out of an existing construction meter shall remain in effect until the General Manager or his/her designee renders a decision.

The decision of the General Manager or his/her designee may be appealed to the Board of Water Commissioners, provided that the customer files a written notice of appeal with the Department within five calendar days of notification of the decision.

The decision of the General Manager, his/her designee, or the Board (if an appeal is timely filed) shall be final and conclusive and shall not be subject to appeal to the Mayor and Common Council. Once the decision becomes final as provided in this rule and regulation, the time in which judicial review of the decision must be sought shall be governed by California Code of Civil Procedure Section 1094.6, or other applicable State law.

Other Water Conservation Measures:

The Board may order implementation of other water conservation measures in addition to those set forth in this rule and regulation. Such additional water shortage measures shall be implemented in the manner provided in this rule.

Conclusion of a Water Supply Shortage Condition:

The General Manager shall notify the Board when the water supply shortage condition stage level should be reduced. The Board may ratify the General Manager's reduction of stage level. All bills issued after the Board's ratification date shall not include water supply shortage surcharges.

Use of Surcharge Funds:

Any surcharges and fines will be segregated into a restricted cash account managed by the Department to supplement the conservation efforts of the Department.

Approved by BOWC:	January 5, 2010
Effective:	February 1, 2010
Supersedes:	June 3, 2008

RESOLUTION NO. 763

A RESOLUTION OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF SAN BERNARDINO AMENDING GENERAL WATER SERVICE/WATER RATES, AS SET FORTH IN RULE AND REGULATION NO. 21 OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF SAN BERNARDINO.

WHEREAS, Article IX, Section 163 of the City Charter empowers the Board of Water Commissioners to establish all water rates; and

WHEREAS, water rates are set forth in the Rules and Regulations of the Board of Water Commissioners; and

WHEREAS, the current rates set forth in Rule and Regulation No. 21, General Water Service/Water Rates, are not sufficient to cover the costs to maintain, repair, improve, and operate the water system; and

WHEREAS, the proposed water rate adjustments have been calculated, and this hearing has been noticed forty-five days; and

WHEREAS, a Public Hearing was held on January 5, 2010, to receive comments from the public on proposed water rates, and less than fifty percent of affected property owners protested.

NOW THEREFORE BE IT RESOLVED, by the Board of Water Commissioners of the City of San Bernardino, as follows:

SECTION 1: That the proposed rates set forth in Rule and Regulation No. 21 of the City of San Bernardino Municipal Water Department, General Water Service/Water Rates, attached hereto and marked "Exhibit A," incorporated herein as though fully set forth at length, are hereby approved, effective February 1, 2010.

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A RESOLUTION OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF SAN BERNARDINO AMENDING GENERAL WATER SERVICE/WATER RATES, AS SET FORTH IN RULE AND REGULATION NO. 21 OF THE BOARD OF WATER COMMISSIONERS OF THE CITY OF SAN BERNARDINO.

I HEREBY CERTIFY that the foregoing resolution was duly adopted by the Board of Water Commissioners of the City of San Bernardino at a regular adjourned meeting thereof held on the 5th day of January 2010, by the following vote to wit:

AYES: COMMISSIONERS CALLICOTT,COCKE,FERNANDEZ,HENDRIX

NAYS: _____

ABSENT: COMMISSIONER MILLER

Robin L. Ohama

ROBIN L. OHAMA
Deputy City Clerk & Ex-Officio Secretary

(SEAL)

Yucaipa Valley Water District 2000 Urban Water Management Plan and Water Shortage Contingency Plan

2000 Urban Water Management Plan
and
Water Shortage Contingency Plan

Prepared For The

Yucaipa Valley Water District

December 2000

Prepared By:

WATER 3 ENGINEERING, INC.
WATER • WASTEWATER • RECYCLED WATER

In Association With:

Byron Buck
Peter McLaggan
Olson Communication
Dudek and Associates

YUCAIPA VALLEY WATER DISTRICT
2000 URBAN WATER MANAGEMENT PLAN
AND
WATER CONTINGENCY PLAN

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YUCAIPA VALLEY WATER DISTRICT
2000 URBAN WATER MANAGEMENT PLAN
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SECTION 1
INTRODUCTION

1.0 INTRODUCTION

This Urban Water Management Plan has been prepared by the Yucaipa Valley Water District in conformance with the California Urban Water Management Planning Act, California Water Code Division 6, Part 2.6 Urban Water Management Planning. This Plan is a revision and update of the District's 1990 Urban Water Management Plan. The plan was developed in coordination with revision of the District's Water and Wastewater Master Plan updates.

1.1 PUBLIC PARTICIPATION

This plan was developed during the summer and fall of 2000. A public workshop on the plan was held by the YVWD Board of Directors on November 16, 2000. A public hearing on the plan was held December 20, 2000 to review the plan with local agencies and to announce the availability to the general public. In addition to the above, individual meetings were held with major property developers and various local agencies. Notifications of the Plan development was also made directly to the following:

Public Agencies and Government

- City of Yucaipa
- City of Calimesa
- San Bernardino Valley Municipal Water District
- San Gorgonio Pass Water Agency
- California Regional Water Quality Control Board
- County of San Bernardino
- County of Riverside
- City of Beaumont Wastewater Authority
- Beaumont Cherry Valley Water District
- City of Redlands
- Yucaipa-Calimesa Joint Unified School District
- Riverside LAFCO
- San Bernardino LAFCO
- East Valley RCD

Private Water Purveyors

- Western Heights Water Company
- South Mesa Water Company

Environmental/Interest Groups

- San Timoteo Greenway Conservancy
- Oak Glen Community Services Organization

Media

- Yucaipa & Calimesa News Mirror
- Press Enterprise
- The San Bernardino Sun

Notification of the Plan development also appeared on the YVWD website.

1.2 SUPPLIER SERVICE AREA CHARACTERISTICS

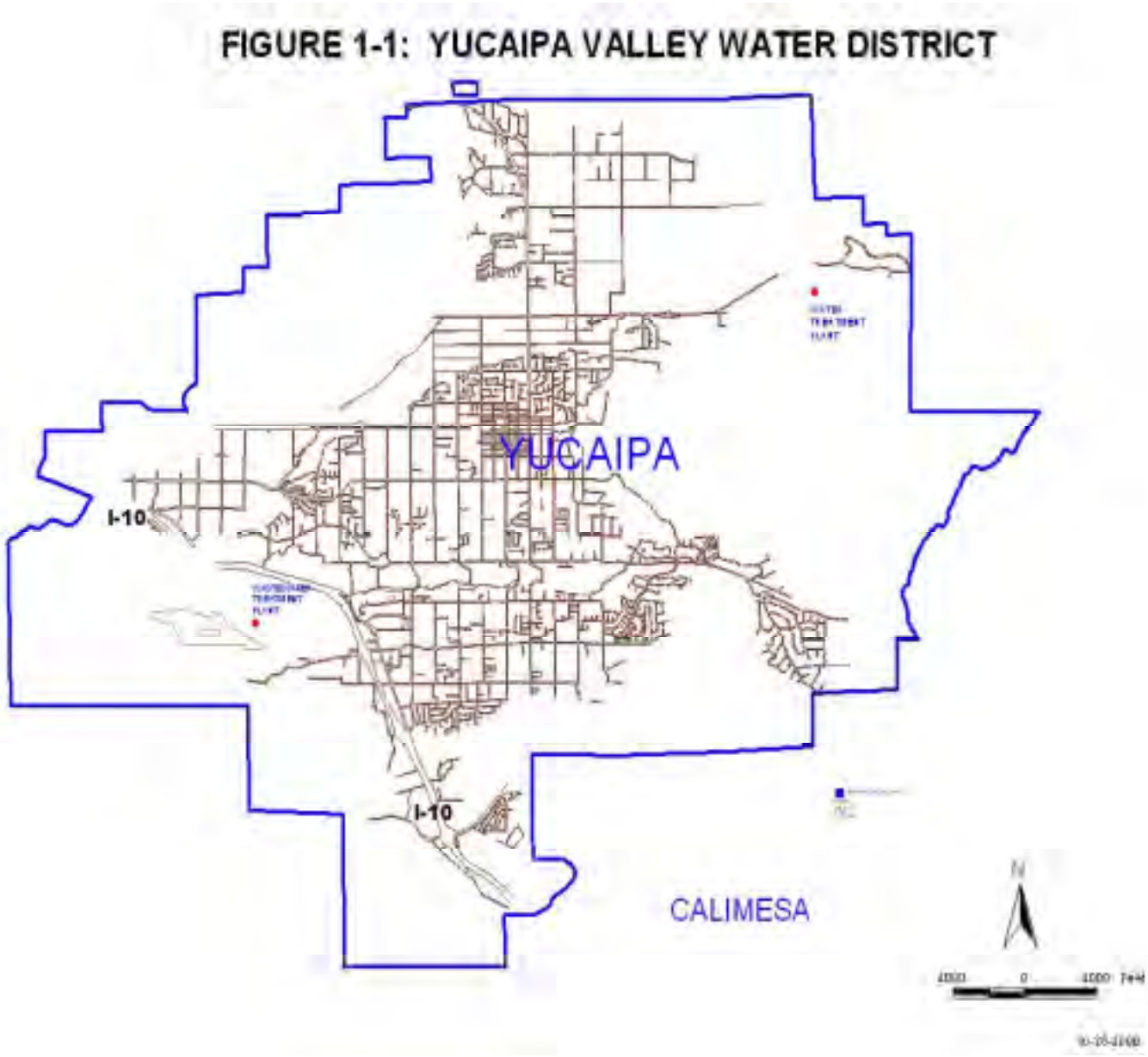
The Yucaipa Valley Water District provides water, wastewater and recycled water services to customers in the Cities of Calimesa and Yucaipa, and portions of Riverside and San Bernardino County (**Figure 1-1**). The District was formed in 1971, acquiring many of the private water companies serving the Yucaipa Valley. The District has continued to consolidate water services in the region, acquiring the Harry V. Slack Water Company in 1987 and the Wildwood Canyon Mutual Water Company in 1992.

Water was developed in the region to serve a predominantly agricultural base of orchard crops. Recently agriculture is giving way to urban and suburban development and demands are growing apace with population increases. In order to determine the rate and amount of growth in the community, the District relies on the development approval processes of the City of Yucaipa, the City of Calimesa, the County of San Bernardino, and the County of Riverside. The District utilizes the planning projections of these agencies together with the demands of the current residents and businesses to ensure a safe and reliable water supply is maintained

The Yucaipa Valley is bounded by the San Bernardino National Forest to the north and east, low lying hills to the south and the Crafton Hills to the northwest. The District serves elevations ranging from 2,000 feet above sea level to about 3,300 feet above sea level. The City of Yucaipa lies in the middle of this range at about 2,500 feet.

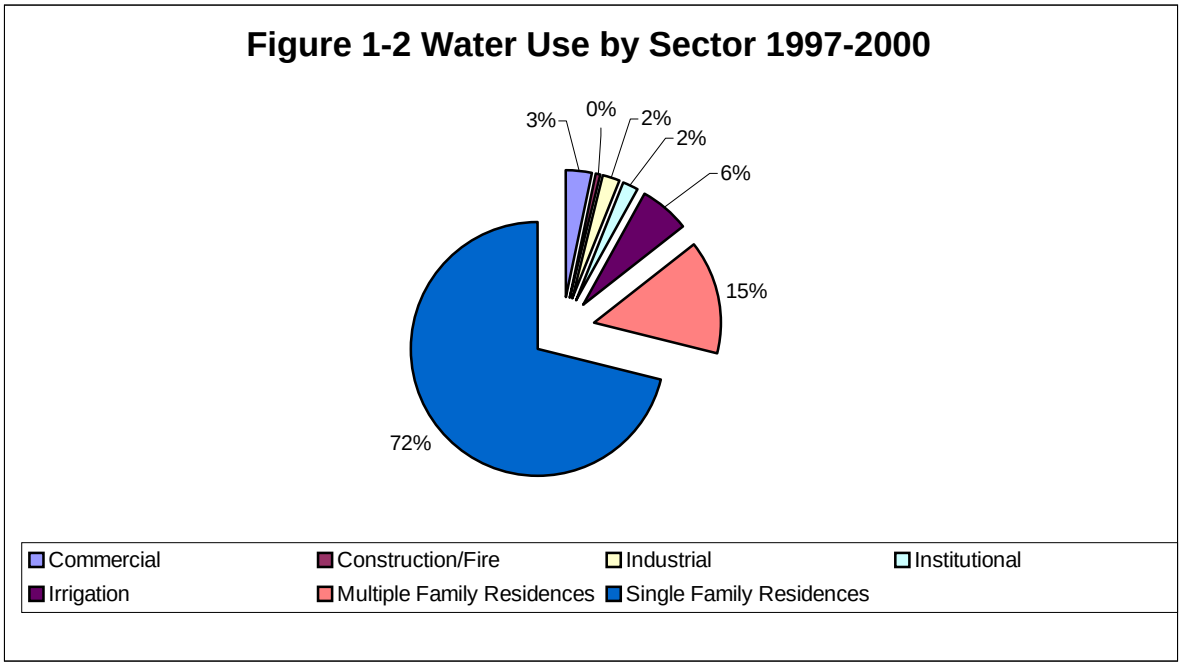
The climate of the region is a Mediterranean type with dry, warm summers and cool wet winters, with significant precipitation variation year to year. The average annual temperature for Redlands, California near Yucaipa but lying a lower elevation, is 78 degrees (F). The average July maximum is 94.5 degrees and the average minimum is 60.5 degrees. The average January maximum is 64.7 degrees and minimum is 39.3 degrees. Average total precipitation is 13.5 inches with 86% of precipitation occurring December through April. Daytime temperatures in the portions of the Yucaipa Valley served by the District will average 2 to 7 degrees cooler than Redlands due to elevation differences.

Precipitation is also greater towards the mountains above the Yucaipa Valley due to the effect of orographic lift.

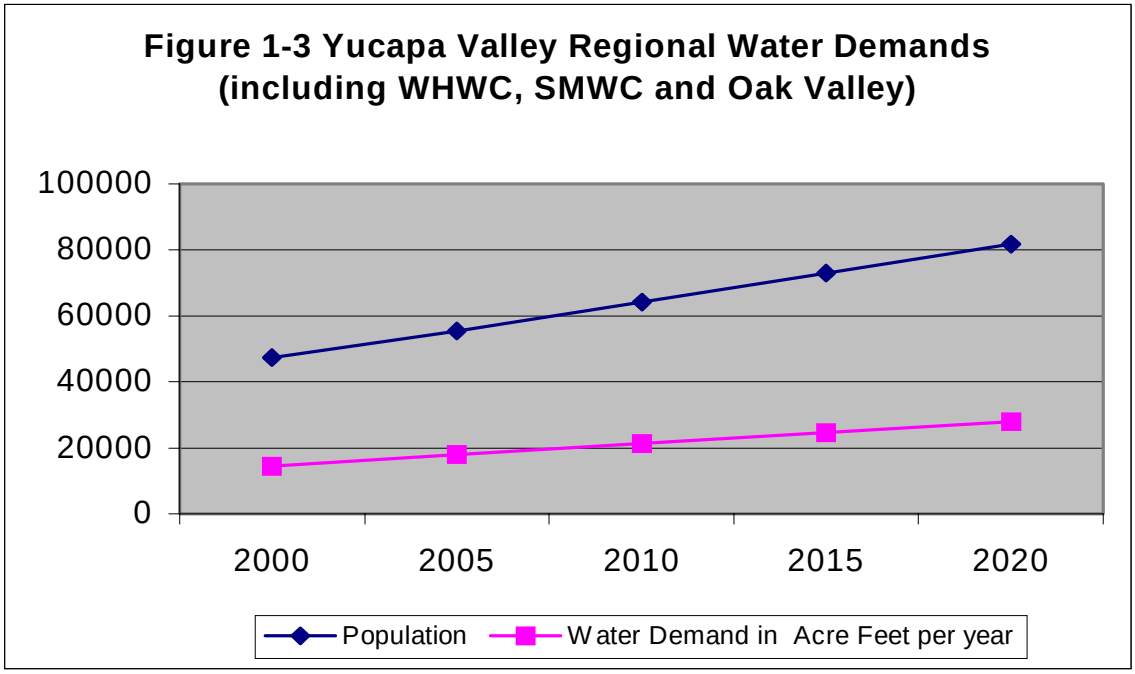


Current and Future Water Use

Current water demand within the District is about 9,500 acre-feet per year. Including areas served by the Western Heights Water Company and the South Mesa Water Company, the demand total grows to about 14,500 acre feet per year. Water use within the district only is predominantly single family residential as show in **Figure 1-2**, accounting for about 8,600 acre feet or 72 percent of water used.



Based upon projected population growth estimates from the State Department of Finance, the Planning Departments of the cities of Yucaipa and Calimesa in addition to data from the Oak Valley Environmental Impact Report, the area population is expected to grow to about 81,800 persons in 2020. Based upon an average per capita demand of 275 gallons per day, total demands in 2020 are expected to grow to about 27,880 acre feet per year, as shown in **Figure 1-3**.



YUCAIPA VALLEY WATER DISTRICT
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SECTION 2
WATER SOURCES AND RELIABILITY

2.1 GROUNDWATER

The Yucaipa Valley Water District has traditionally met the bulk of service area customer needs from groundwater through the District's thirty-one primary water wells. Two additional wells were under construction in 2000 replacing capacity from wells with degraded production. Most of these wells pump from the Yucaipa Groundwater Basin, with less than 1,000 acre-feet being pumped from the Beaumont Basin. Demand has grown in the last two decades to where the District alone is now pumping at about the calculated safe yield of the Yucaipa Basin, just over 9,000 acre-feet per year. Coupled with pumping by the Western Heights Municipal Water Company and South Mesa Water Company of about 2,400 acre-feet per year for each Company and the basin is technically in an overdraft situation, though water levels are currently at or near historic highs.

The Yucaipa Groundwater Basin is subdivided into seven sub basins as follows:

- Mill Creek
- Gateway
- Crafton
- Oak Glen
- Calimesa
- Wilson Creek
- San Timoteo

The Wilson Creek and Calimesa sub basins are the largest and most important of these sub basins. Total capacity of the basin is estimated at 807,517 acre-feet (Fox, 1990). Groundwater is typically reached within 200-280' below the land surface. If pumping were to reduce groundwater levels to an average depth of 400', an additional 300,000 acre-feet of water would be available. These sub basins historically have declined during dry cycles and risen during wet ones. No subsidence due to water pumping has been noted. Minor amounts of groundwater recharge (less than 1000 af/yr) through surface water spreading have occurred in the Wilson spreading grounds, an area of four spreading basins located within the District along Wilson Creek.

Significant potential exists to increase spreading of water in the Wilson creek spreading grounds and utilization of the Oak Glenn Creek stream channel for additional recharge. By maximizing the existing spreading grounds and expanding spreading acreage along Oak Glen Creek (25-50 acres), the capability

exists to spread from 7,000 to 14,000 acre feet of surface water annually into the Yucaipa basin.

The YVWD is currently involved with development of a groundwater management plan (AB 3030 Plan) to proscribe collective management of the basin. With ample storage, ability to recharge the basin by spreading surface waters and apparent flexibility in managing groundwater levels without subsidence problems, the Yucaipa Basin could be conjunctively managed both to meet normal annual demands and to meet water resource needs in the event of a drought and curtailment or loss of inconsistent surface water supplies, resulting in a highly reliable water supply. Current goals are to secure agreements to not pump beyond the safe yield of the basin, supplementing supplies with imported surface or groundwaters.

The YVWD will also be able to receive water from the San Bernardino Basin via the East Branch extension of the State Water Project pipeline. This water would be served as part of a conjunctive management scheme for the Basin coordinated with the San Bernardino Valley Municipal Water District, the regional wholesaler of SWP water in San Bernardino County. A portion of the San Bernardino Basin known as the Bunker Hill Pressure Zone, has encountered problems from high groundwater tables occurring mainly after a series of wet years. This high groundwater creates direct impacts in portions of the pressure zone, flooding basements and underground garages, and creates a high liquefaction potential for areas overlying the Zone in the event of an earthquake. Conjunctive management of this Zone along with other portions of the Basin can lower unacceptably high groundwater and allow for recharge in areas upgradient from the Pressure Zone such as the Lytle Creek subbasin.

In October of 2000, the District entered into a Memorandum of Understanding with the California Department of Water Resources, the San Gorgonio Pass Water Agency, the City of Beaumont, the City of Banning, the Beaumont-Cherry Valley Water District and the South Mesa Water Company to work cooperatively on formulating a conjunctive water management program to enhance the dependable yield of the San Gorgonio Pass Area Basins.

2.2 SURFACE SUPPLIES

Surface water supplies currently and prospectively available to the District are all considered inconsistent in that the available amounts will vary year to year based upon hydrology and other demands on these resources.

2.2.1 Local Surface Water Sources

The YVWD has traditionally received about 1,000 acre feet of surface water supplies from the Wildwood Canyon and Oak Glen watersheds. Production from these sources has recently been declining to less than 500 acre-feet annually.

These sources are both minor and relatively unreliable due to their greater availability only in wet periods.

2.2.2 Mill Creek Supplies

Though the Santa Ana – Mill Creek Cooperative Water Project Agreement YVWD is able to exchange up to 32 cfs of State Water Project water for Mill Creek water when available. This water can be delivered by gravity to the Wilson Creek spreading grounds and when the District's water treatment plant is built, this water can serve direct delivery needs. The SWP exchange water is delivered to the City of Redlands Hinckley or Tate water treatment plants. This source is highly variable, however, depending upon local hydrology. Flows in the creek can range from 10,000-120,000 acre-feet per year with the bulk of high water flows in the winter months. This is the least expensive supplemental surface water supply for the District. However, lack of storage limits the ability to exchange this water often available in wet years, for water during dry years.

2.2.3 Santa Ana River Supplies

In addition to the Mill Creek supplies, the District will be able to receive exchange water from Santa Ana River water rights holders once the water filtration plant is completed in 2004 and connected to the East Branch Extension pipeline to be completed in 2002. Phase II of the extension project will expand transmission capacity to the Yucaipa area to 88 cfs, with 48 cfs of capacity rights held by San Gorgonio Pass Water Agency and 40 by the San Bernardino Valley Municipal Water District. Santa Ana River water availability to Yucaipa would be subject to availability and exchange of SWP water.

2.2.4 Seven Oaks Dam Supplies

The recently completed Seven Oaks Dam operated by the U.S. Army Corps of Engineers will operate with a conservation pool of between 10,000 and 50,000 acre feet. The precise amount is the subject of ongoing negotiations. When the East Branch extension pipeline and water filtration plant is in service in 2004, Seven Oaks water could be delivered to Yucaipa for direct delivery to consumers. The long term average yield for the 50,000 acre-foot conservation pool is about 11,700 acre-feet annually. Flow from this conservation pool would be available generally from late spring through early fall, after the prime flood control obligations of the facility have ended each year.

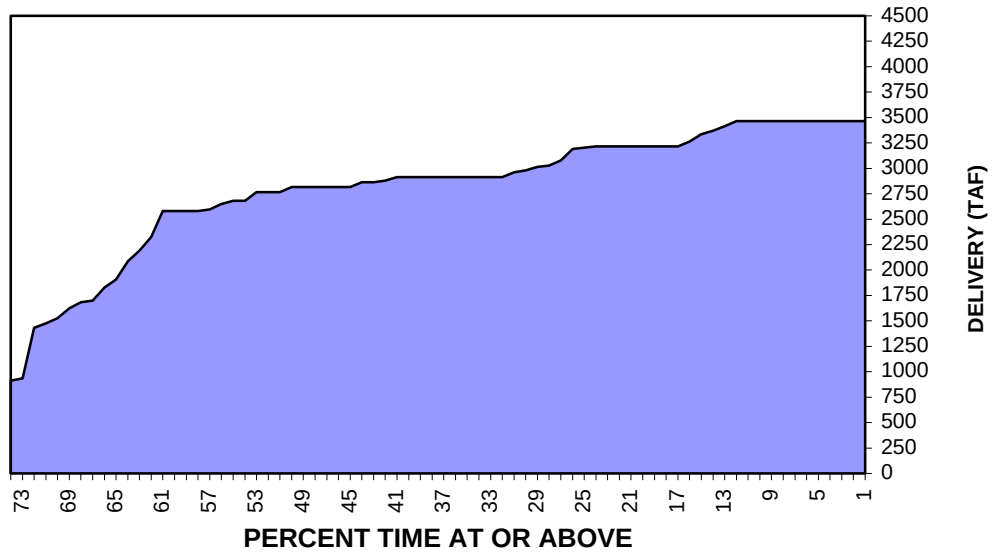
2.2.5 State Project Water

The San Bernardino Valley Municipal Water District encompasses much of the YVWD and holds an entitlement to SWP water in the amount of 102,600 acre-feet annually. The San Gorgonio Pass Water Agency serves the remainder of YVWD through its SWP entitlement of 17,300 per year. SWP water will be

available directly or by exchange when the East Branch extension pipeline is completed in 2002. This water would only be available for groundwater recharge until a water filtration plant is on line in 2004

SWP reliability has been negatively affected due to the State's inability to complete the project as contracted. Despite efforts, it is likely that the full 4.2 million acre-feet design delivery capacity will never be reached due to environmental limitations. Currently the maximum delivery capability for the project is somewhat less than 3.5 million acre feet. In most years this amount cannot be delivered due to infrastructure limitations and environmental restrictions. **Figure 2-1** depicts the current supply reliability frequency for the project recognizing current curtailment requirements under State Water Resources Control Board Order 95-6 related to San Francisco Bay-Delta outflow requirements and SWP Delta pumping operations, in addition to fishery flow requirements as a result of the Central Valley Project Improvement Act Anadromous Fisheries Restoration Plan. As can be seen from the figure, full entitlement demands on the project could be met only about 10% or less of the time, with 25% or higher shortages occurring more than 40% of the time based upon historical hydrology.

Figure 2-1 Frequency of SWP Entitlement Delivery (Not Including Interruptible & Losses) 1995 Level

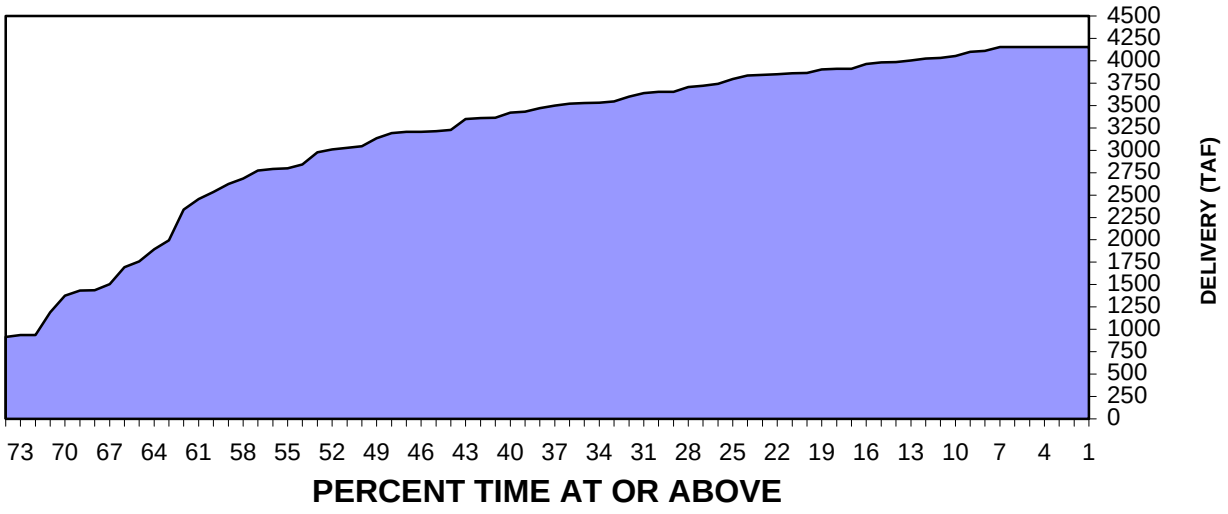


By 2020, with current fishery restrictions, the State assumes it will have added capacity in the system that will meet full entitlement demands only less than 10%

of the time. As shown by **Figure 2-2** in half the years, shortages of up to 25% will occur. In about one in three years, shortages will be 50% of demands or more. It should be recognized however, that demands are not the same as entitlements. In 1995 for example, deliveries to SWP contractors were just over 2 million acre feet or only about 58% of entitlements. It not be before 2020 when actual demands in most years exceed entitlements.

Actual shortages will be a function of actual versus entitlement demands and changes in outflow and fishery requirements. These demands will become closer as time goes on as agency demands served by the SWP grow into their full entitlements. In sum, the above reveals that the SWP is incapable of reliably meeting the full entitlement demands and it will become an increasingly unreliable water source for meeting a high percentage of an agency's ongoing annual water needs as demands on the system grow.

Figure 2-2 Frequency of SWP Delivery (Not Including Interruptible & Losses) 2020 Demand Level



2.3 RECYCLED WATER

The District has been planning for development of recycled water throughout the 1990's. Recycled water meeting Title 22 requirements is available through the Henry N. Wochholz Wastewater Treatment Facility and dual plumbing is currently being installed in new developments. Recycled water is being delivered to three

customers and will be expanding in 2001. Delivery amounts are expected to grow to about 6,700 acre-feet by 2020, or about 24% of total agency water demands.

The District's Recycled Water Master Plan is currently being revised for consideration in 2001. This process is currently revising recycled water demands and developing a revised phasing program optimizing the development of recycled water transmission and delivery systems. General system development can be seen in **Figure 2-3**. Current and projected wastewater flow and projected recycled water appears in **Table 2-1**. With expanded residential and recreational development in the District, significant opportunities for utilization of recycled water are being capitalized upon. Revised recycled water use estimates derived from the master plan update will be incorporated in the 2005 UWMP revision.

Table 2-1
Annual Wastewater Flow (mgd)

Source	2000	2020
Yucaipa	3.5	5.1
Calimesa	0.7	0.8
Oak Valley	--	2.0
Total	4.2	7.9
Total Annual WW Available (Acre-feet)	4,700	8,850
Projected Recycled Water Use Annually (Acre-Feet	--	6,700
Percent Utilized	0%	76%

2.4 WATER SUPPLY RELIABILITY STRATEGY

Despite rapidly growing demands on the YVWD, ample opportunities exist to provide a reliable supply for the community through to its ultimate buildout. In the near term, the District will stabilize its demands on the groundwater basins, continue developing recycled water and utilize surface waters for direct delivery to customers beginning in 2004 to meet increased demands. Surface supply availability from the State Water Project, San Bernardino Basin Bunker Hill Pressure Zone, Seven Oaks Dam, Mill Creek and Santa Ana River can be used interchangeably depending upon local and statewide hydrology to supplement a stable local groundwater yield. Additionally, the District will incorporate recycled water delivery systems into new development, focusing service of new irrigation demands on recycled water. Recycled water will give the District a new local

YUCAIPA VALLEY WATER DISTRICT
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SECTION 3
DEMAND MANAGEMENT MEASURES

3.0 INTRODUCTION

Demand management refers to methods a water supplier may undertake to reduce demand on the water system. The Urban Water Management Planning Act requires a description of sixteen specified demand management measures. For those measures not being currently implemented or planned for implementation, an evaluation of those measures and a comparison against expanded or additional water supplies must be made. Preference in the Act is given to those measures offering lower incremental costs than expanded or additional supplies. The Act also requires that economic and noneconomic factors including environmental, social, health, customer impact and technological factors be considered in the evaluation, however no specific guidance on evaluation methodology is given. Additionally, the description of measures in the act is brief, leaving much definition of both conservation devices and activities to be employed in many of the demand management measures to the analyst. A summary of measures recommended for implementation appears in **Table 3-1**.

3.1 DEMAND MANAGEMENT MEASURES UNDER IMPLEMENTATION

The District is implementing a public information program that includes information on interior and landscape water conservation and maintenance of a xeriscape demonstration garden. The District also implements metering and commodity rates for its water services with a tiered or inclining block rate structure with five tiers or blocks. Sewer rates are flat rates for residential service. Commercial and industrial service is a flat rate based upon an equivalent service unit. The District has adopted a water waste prohibition ordinance.

State law requires land use planning jurisdictions to enact a landscape water conservation ordinance consistent with the State Model Landscape Ordinance, or one that uses a water budget approach or one that has rules and regulations without tracking usage. Four land use jurisdictions operate within the District: San Bernardino County, Riverside County and the Cities of Calimesa and Yucaipa. Each have landscape ordinances complying with state law. The District does not independently review development plans for compliance with such ordinances as it does not have the legal authority to do so.

3.2 EVALUATION OF DEMAND MANAGEMENT MEASURES NOT CURRENTLY BEING IMPLEMENTED

The Urban Water Management Planning Act under California Water Code Section 10631 (g) requires an evaluation of water demand management measures specified in the Act which are not currently being implemented or scheduled for implementation. As noted above, preference is given to implementing measures that offer lower incremental costs than expanded or additional water supplies. The evaluation must do all of the following:

Table 3-1
Summary of Recommended Demand Management Actions

Conservation Measure	Currently Implemented	Recomm-ended	Reason For Recommendation	**Begin Imple-menting Date**
Interior and Exterior Audits	No	Yes	Cost effective	'03
Plumbing Fixture Retrofits	No	Yes	Cost effective	'03
Distribution System Audits	Yes	Yes	Continuing program	N/A
Metering with Commodity Rates	Yes	Yes	Continuing program	N/A
Large Landscape Audits	No	Yes*	Pilot program initially recommended; potentially effective	'01
Landscape Conservation Requirements	Yes	Yes	Continuing program	N/A
Public Information	Yes	Yes	Continuing program	N/A
School Education	No	Yes	Inexpensive and complements other savings programs	'02
Commercial Industrial Conservation	No	No	Few such uses in District	N/A
New Commercial Industrial Review	No	No	'92 plumbing code already produces savings	N/A
Conservation Pricing	Yes	Yes	Continuing program	N/A
Landscape Conservation - Single Family Homes	Yes	Yes	Cost effective	'01
Water Waste Prohibition	Yes	Yes	Continuing ordinance	N/A
Water Conservation Coordinator	No	Yes	Required for overall implementation	'03
Financial Incentives	No	Yes**	As part of other actions	Varies
Ultra Low Flow Toilets	No	No	Not cost effective	N/A

* Pre Screening Survey Recommended Prior to Pilot Program
** Included in Individual Programs

1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact and technological factors
2) Include a cost benefit analysis, identifying total benefits and costs
3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost

4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation
5) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation
6) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation

3.2.1 Evaluation Methodology

While Water Code Section 10631 (g) specifies elements of the evaluation methodology, considerable room for professional judgement on how to address each element remains with the analyst. This section is describes the general approach used herein.

- Accounting for economic and noneconomic factors including environmental, social, health, customer impact and technological factors. To some degree, these factors can all be reduced to dollar impact values and indeed some are imbedded in the cost/benefit factors which will be used in the cost benefit analysis. Where such factors cannot be incorporated in the cost/benefit analysis or significant implementation issues exist with respect to these factors, a qualitative evaluation will be made.

- Cost Benefit Analysis. Cost benefit analysis is generally understood to be a quantitative analysis analyzing the total benefits of an action less the total costs of the action, accounting for the present value of money. Where the net present value is positive, an action is said to make sense economically. With respect to conservation programs in general, this area is controversial and easily subject to manipulation of outcome based upon the assessments of costs and benefits and in particular, reduction of non-monetary benefits to monetary terms. In the conservation arena, reliable estimates of costs and savings vary by the activities. Local implementation issues such as particular land use make-up, age of structures, demographics, and implementation costs make translation of verified program costs and benefits from one location to another for analysis purposes prone to error. This analysis will utilize the most recent published data where available and appropriate. It must be recognized that many of the demand management measures, such as public information programs cannot of themselves be analyzed for water savings. However, such programs can help to market conservation measures such as plumbing retrofit programs, increasing their effectiveness. Additionally, depending upon measure design, there can be overlap between the demand management measures. For instance, a general residential water audit program can overlap with a single-family landscape water audit program.

The following benefits and costs will be quantified and considered utilizing DWR's Cost Effectiveness Tool, Version 1.1, a model created to provide some uniformity in analyzing costs and benefits of conservation programs within the context of Urban Water Management Plans. The analysis will be made from the perspective of the Yucaipa Valley Water District. This model provides that if a measure's net present value (NPV) is positive then the tactic should be implemented. A summary of the input data used with the DWR Cost Effectiveness Tool is included in **Appendix A**.

The following benefits will be assessed in the cost/benefit analysis.

- *Costs avoided by the water supplier of constructing production, transport, storage distribution capacity and wastewater treatment facilities, if any.*
- *Operating cost avoided by the water supplier, including but not limited to, energy and labor associated with the treatment of water deliveries and wastewater that no longer must be made.*
- *Avoided costs of water purchases by the water supplier.*

The costs above collectively determine the marginal cost of an additional increment of water supply. From the perspective of the water agency, the next cheapest increment of supply would simply be purchases of additional State Project Water from either the San Gorgonio Pass Water Agency or the San Bernardino Valley Water District for treatment and distribution. No additional facilities that could otherwise be avoided will be necessary within the District to accommodate these new demands. Operational and water cost savings would occur, however. These avoided costs are as follows: $132/AF imported raw water cost savings, avoided water treatment, $80/AF, avoided energy (pumping) $20/AF, and avoided wastewater treatment of $20/AF for a total avoided cost of $252/AF.

It is generally recognized that the SWP cannot meet its contractual commitments in dryer years and that incremental improvements under the CALFED Bay-Delta program are being made to increase the marginal supply capacity and reliability of the project. CALFED has estimated the costs of a variety of demand management and supply augmentation actions for the project. The least expensive of the augmentation options include modifications to the South Delta facilities allowing the project pumps to utilize their current maximum capacity of 10,300 cfs and additional storage. The lower range of these costs to the end user are about $800 per acre foot. However, given the cost structure for the SWP, any additional supplies and their costs would be blended into the current rate structure, i.e., the new higher cost supplies would be averaged in with the current supply costs. If the cost effectiveness example were being taken from the state or societal perspective, it might be appropriate to use

these projects as the marginal supply cost. However from the District's perspective, such incremental rates do not apply.

Environmental costs and benefits will not be quantified as there is no generally approved methodology for this.

The following costs are assessed in the cost benefit analysis.

- *Capital expenditures incurred by the water supplier for equipment or conservation devices*
- *Financial incentives to other water suppliers or retail customers*
- *Operating expenses for staff or contractors to plan, design or implement the program*

- Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost. Additional purchases of water from the SWP function as the marginal supply to the District. Costs of these purchases are passed through to the ratepayer as water is sold.

- Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation. The District has the legal authority to implement and recover cost for all of the recommended measures. Where programs are pursued and there are joint agency beneficiaries, contributions will be sought in proportion to the costs avoided and benefits received.

- Existing Conservation Savings. The District's active demand management programs include public information, target replacement of leaking delivery lines and faulty meters, public information and landscape design review for new development. However, no empirical estimate is available for the effect of this existing conservation effort and its effect on the District's ability to further reduce demand. However, it is recognized that much passive conservation is occurring due to public information efforts, the development of a changed water ethic due to the 1987-1992 drought, and in particular plumbing code amendments which eliminate high-flow showerheads, faucets and toilets for new installations or replacement. It is estimated that such passive conservation has lowered demands which otherwise would have occurred by about 10% (DWR Bulletin 160-98). Additionally, generally less conservation potential exists in rapidly growing regions such as served by the District as the housing stock tends to be newer, incorporating low water use appliances. This new stock however, does provide an ongoing opportunity for outdoor savings as such new stock invariably incorporates automatic irrigation systems that must be monitored for maximum efficiency.

3.3 PROGRAMS EVALUATED

1. Interior and exterior water audits and incentive programs for single family residential, multifamily residential, governmental, and institutional customers.

Program Description: These programs generally involve sending a qualified water auditor to customer locations to audit water use. Interior water using fixtures are assessed and where leaking or high-flow devices are noted, the customer is informed. Exterior audits of irrigation systems are often included, from simple audits looking for leaks and broken sprinklers, checks of the system times and development of irrigation schedules, to irrigation uniformity audits. Programs can include provision of low flow showerheads, toilet flappers and toilet displacement devices.

Evaluation of Economic and Noneconomic Factors: Surveys of this type have become common among agencies with demand management programs. However, research on their cost-effectiveness has shown that the long term savings from these programs is much less than originally anticipated. That is, savings achieved through these measures decay over time due to equipment failure, failure of the customer to consistently follow recommendations and customer turnover. Savings decay rates average about 15% per year. Single family surveys can be expected to initially save 15 gpd per survey and multi family about 6.5gpd. Direct survey costs are estimated $125 and $330 per survey, respectively with a multi-family survey covering an average of 10 units per survey ($33/unit) (CUWA, 2000). Agencies generally target high use accounts for surveys and while customers who feel their water use is unexplainably high often opt for surveys, many customers are reluctant to avail themselves of a survey. Such surveys raise insurance and liability issues for site visits and any modifications made by surveyors which must be considered in program design. All other factors being equal, surveys that reduce demands are environmentally preferable over development of additional supplies or deliver of more water.

Cost Benefit Analysis Results: Based upon assumptions above the net present value of water savings from single family residential surveys is positive a $73 per survey. Multi-family audits however show a positive net present value of $162 per survey (assuming 10 units per survey visit).

Recommendation, Implementation and Schedule: Single family audits appear to be reasonably cost effective. It is recommended the District offer a program in FY-02 targeted at the top 10% of residential users. Multi-family surveys show an even higher net benefit to justify initiation of a program. A multi-family survey program will be developed focusing on multi-family units of 10 or more per site beginning in FY-02

2. Enforcement of plumbing fixture efficiency standards and programs to retrofit less efficient fixtures.

Program Description: These programs include two general components, 1) working with the land use jurisdiction to assure use of complying plumbing devices and, 2) distributing and/or installing retrofit kits including high quality low flow showerheads, toilet displacement devices, faucet aerators and toilet flappers to pre 1992 housing. Few agencies find it cost effective to fund or monitor land use jurisdiction's enforcement of plumbing standards. Given that the standards require manufacture of these low flow devices and that is all that is available on the legitimate retail market, such activity is deemed unnecessary. However, many agencies with conservation programs have initiated plumbing retrofit programs, either dropping retrofit kits at pre-1992 housing (hang and pray programs) or offering direct installation.

Economic and Noneconomic Factors: Offering or installing retrofit kits to pre-1992 homes has been a common program among water agencies with active conservation programs. Issues that must be considered are relatively high natural replacement levels for such fixtures as showerheads and recognition that replacement heads already meet the federal 2.5 gpm standard. Direct installation programs have a higher implementation rate than drop off or "hang and pray" distribution methods. However, direct installation programs are more costly and bring insurance and liability issues. It is estimated that these "hang and pray" types of retrofit programs provide average savings of 5.65 gpd per installation with a life expectancy of 10 years even assuming that just over 50% of the kits become installed Costs are relatively low at $13 per kit distributed. All other factors being equal, retrofit programs, which reduce demands, are environmentally preferable over development of additional supplies or delivery of more water.

Cost Benefit Analysis Results: Given the low costs of administering
These projects, the "Hang and pray" retrofit programs result in a net present value of $173 for every installation.

Recommendation, Implementation and Schedule: A simplified retrofit program offering leak detection dye tablets, a high quality low-flow showerhead, toilet flappers and faucet aerators will is recommended for implementation in FY-02, for pre-1992 housing only. If the District decides not to pursue a ULFT retrofit program, toilet dams should be considered as additions to the kits.

3. Distribution System Water Audits Leak Detection and Repair

Program Description: These audits compare total water sales against water production to make sure that unaccounted for water does not exceed 5%, the generally accepted industry standard for unaccounted water. Prior to 1984 the district loss rate was about 15 percent. Through an aggressive program of meter

retrofits and leak reduction program this figure has been brought to within industry standards.

Evaluation of Economic and Noneconomic Factors: Performance of prescreening audits comparing gross system production vs. sales is an accepted industry practice generally done on an annual basis. If results from this prescreening note excessive unaccounted water then a more detailed audit focusing on loss possibilities (system leakage, undermetering, illegal connections, fire flow water and system flushing etc.) are made. No significant social, environmental or technological factors are relevant for this activity.

Cost Benefit Analysis: As a system prescreening audit is current District practice, no cost-effectiveness evaluation was performed.

Recommendation, Implementation and Schedule: Continue with annual prescreening audits. Perform detailed audits where unaccounted water exceeds five percent.

4. Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

Program Description: The District currently meters all connections and a five-tier inclining block commodity rate structure.

5. Large Landscape Water Audits and Incentives

Program Description: These programs identify large landscapes over three acres (schools, parks, golf courses, cemeteries, etc.) offering surveys and development of evapotranspiration (ETo) - based water budgets. Billing information is often correlated with the water budget. Irrigation system training is offered, often in a multilingual format. Financial incentives can be offered through ETo based rate structures to encourage efficient use. Incentives can also be given for irrigation system retrofits and subsidies for irrigation training.

Evaluation of Economic and Noneconomic Factors: Large landscapes are often viewed as water conservation targets by the general public. Generally, however, and especially where dedicated meters exist, large landscapes are more efficiently managed than landscapes which are part of a mixed use setting. This is due to professional management and a direct correlation between the water bill and irrigation practices, where dedicated meters exist. This creates a financial incentive for conservation. Regardless, opportunity exists to improve irrigation efficiency. The California Irrigation Management Information System (CIMIS) operated by the Department of Water Resources provides real-time evapotranspiration and other climatic data available on the Internet to help manage irrigation demands.

While these programs implemented elsewhere have shown promising savings potential, achieving that potential often requires significant investment on the part of the customer which often is uneconomic. Many districts have found it cost-effective to subsidize a portion of irrigation system improvements, increasing the implementation rates of survey recommendations. This analysis assumes average direct and administrative costs are estimated at $500 per survey and incentive payments average $750 per survey for a total cost of $1250 per survey. Savings average from 0.53 to 1.13 af/year per survey.

Cost Benefit Analysis Results: Based upon the costs and average savings above, large landscape surveys show a net positive present value of $10 per survey. A larger value for the District could be achieved by lessening incentive payments to participants. However, that would likely lower implementation rates.

Recommendation, Implementation and Schedule: Given the small positive net present value for a large landscape audit program, it is recommended the District do a pre-screening of large landscape customers of three acres and above. In this pre-screening, the general efficiency and sophistication of the irrigation system can be assessed and the operators can be queried regarding their interest in a systematic survey and their interest and likelihood of being able to invest in efficiency improvements. If sufficient interest exists a pilot program targeting the largest and likely least efficient users could be initiated. Results of the pilot program would drive investment in a full scale program. Pre screening for this program would be initiated in FY-01 with a pilot program beginning in FY-02 if warranted.

While large landscape surveys are often not the most cost-effective conservation technique, they are generally cost-effective if survey recommendation results are implemented. Additionally, with their high public visibility, having a large landscape audit program can be helpful public relations. Given their relatively high rate of consumption, owner and operators of large landscapes are generally cooperative with such surveys as the money savings potential creates and economic incentive for participation. However, as noted above, the cost of implementing survey recommendations can be an impediment to achieving actual savings.

6. Landscape Conservation Requirements for New and Existing Commercial and Industrial , Governmental and Multifamily Developments

Program Description: State law requires local land use jurisdictions to enact and implement a landscape water conservation ordinance consistent with the State Model Landscape Ordinance, or one that uses a water budget approach to with water allowances for landscaping needs, or one that has rules and regulations that promote water conservation without tracking usage. Four land use jurisdictions have authority within the bounds of the Yucaipa Valley Water

District, The Counties of San Bernardino and Riverside and the cities of Yucaipa and Calimesa. Each of these jurisdictions maintains a landscape water conservation ordinance for new development. As such the responsibility for this demand management measure resides with the respective land use jurisdictions.

7. *Public Information*

Program Description: as noted above, the District has an ongoing public education program.

8. School Education

Program Description: These programs generally consist of provision of teacher training materials and teacher inservice training to elementary (4th grade) and above. Materials consist of general information regarding the water cycle, information on California's water system, groundwater resources, drinking water quality and the role of individuals in water conservation and water quality protection. The intent of the materials and in-service training is to educate educators about California's water system, a conservation ethic and to have those teachers incorporate this information into the curriculum for their classrooms. A populace with basic education on water issues assists in resolving water supply and quality problems. Some districts develop their own materials and provide in-classroom instruction. Others utilize materials from the nonprofit Water Education Foundation and their in-service teacher training programs, whose materials are consistent with the standards of California's Framework for Science and History/Social Science Education. A variety of programs are available from the Foundation along with in-service training for those programs.

Evaluation of Economic and Noneconomic Factors: Beginning a school education program will require nominal investment from the District. This investment, however provides dividends in terms of a more educated customer base and improves community relations.

Cost-Benefit Analysis: Water savings data do not exist for education programs. Consequently, no cost benefit analysis is possible. However, education programs complement other conservation activities and are believed to lower overall consumption.

Recommendation, Implementation and Schedule: The District will begin a program in FY-01 dedicating $2,500 to a secondary school program, grades 4-6. Utilizing program materials from the Water Education Foundation, these funds would allow provision of materials and in-service training for up to 125 teachers within the District.

9. Commercial and Industrial Water Conservation

Program Description: These programs consist of identifying commercial and industrial accounts and offering surveys and/or incentives for conservation where the surveys indicate an opportunity for conservation.

Economic and Noneconomic Factors: The District service area historically has been a residential retirement community with only one significant industrial customer, and egg processing plant. Recent residential and supporting commercial growth is changing the customer makeup. However, since this commercial growth is occurring subsequent to the 1992 Plumbing Code amendments, it is deemed to be relatively efficient. Commercial and industrial audits in other regions have found most of the savings opportunity in the replacement of high flow toilets, as these toilets receive relatively high usage rates. The literature reveals that surveys for this sector have resulted in about 1.27AF of savings per year against an average cost of $1,200 per survey. Industrial surveys are more complicated than commercial surveys and thus survey costs for the District are estimated to be about $400. Incentive costs (mostly ULFT rebates) are estimated at $500 per survey at @$75 per toilet for the District.

Cost Benefit Analysis: Given the lack of significant commercial and industrial uses prior to 1992, no analysis was performed.

Recommendation, Implementation and Schedule: As the District develops, new development will both be subject to landscaping water use standards of the land use jurisdictions and the 1992 plumbing code. As such, commercial/industrial retrofit opportunities are largely absent and a program is not recommended.

10. New Commercial and Industrial Water Use Review

Program Description: These programs involve reviews of potential water consumption and conservation potential during the development review process.

Economic and Noneconomic Factors: Given the specialized nature of industrial water use and a high cost to assess process water use, and gains made by the 1992 Plumbing code amendments which cover conventional uses, few water agencies invest in such programs. This action has been dropped from the California Urban Water Conservation Council's list of Best Management Practices.

Cost-Benefit Analysis: No data exists for water savings for this demand management measure; consequently no cost benefit analysis was performed.

Recommendation, Implementation and Schedule: No program is recommended.

11. Conservation Pricing for Water Service and Conservation Pricing for Sewer Service, Where the Urban Water Supplier Also Provides Sewer Service.

Program Description: As noted above in section 10.2, the district practices conservation pricing for its water service with a commodity rate structure which includes five tiers. Sewer service is based upon a flat service charge for residential customers and charges based upon equivalent service units for commercial and industrial customers. With an incentive to conserve on the water rate, it is deemed unnecessary to attempt to construct a commodity rate structure for sewer service. Additionally, the accuracy of such rate structures are questionable as they generally assess charges based upon winter season demands which vary depending on hydrology of a given year and landscaping demands.

12. Landscape Water Conservation for New and Existing Single Family Homes

Program Description: These programs generally involve providing information and incentives for installation of water efficient and xeriscape landscapes.

Economic and Noneconomic Factors: These programs overlap with implementation of landscape ordinances for new construction as required by state law. However, in many new developments, only front yard landscaping is provided, leaving rear yard landscaping to the discretion of the homeowner. Opportunity exists to provide information to new homeowners and to work with developers to provide xeriscape landscape options.

Cost Benefit Analysis: No published data for water savings exist on such programs; no analysis was performed. However, implementation costs for these programs can be nominal and attractive conservation opportunity exists.

Recommendation, Implementation and Schedule: Beginning in FY-01 the District will meet with major developers in the region to encourage their offering xeriscape options for front landscaping. Additionally, the District will work with developers to provide xeriscape landscaping information materials to new homeowners at move-in.

13. Water Waste Prohibitions

Program Description: The District has a water waste prohibition ordinance in place.

14. Water Conservation Coordinator

Program Description: This action consists of designating a water conservation coordinator among the staff of the District or hiring a new person for the function. The person oversees and coordinates the District's conservation programs.

Economic and Noneconomic Factors: Having a designated coordinator helps improve the effectiveness of a water agency's conservation efforts. Depending upon the scope of the program and size of the District, along with other staffing demands, these duties can be a part or full time responsibility.

Cost Benefit Analysis: This action cannot be analyzed for cost-effectiveness

Recommendation, Implementation and Schedule: The District will review the overall conservation program as recommended herein and either designate an existing staff member or hire a new staff member for the function in FY-01.

15. Financial Incentives to Encourage Water Conservation

Program Description: Financial incentives are often provided by water agencies to reduce demand where cost effective. They are usually used in the context of other demand management measures where savings have been identified.

Economic and Noneconomic Factors: The justification for financial incentives is made via specific analysis of other demand management measures as described in this chapter.

Cost Benefit Analysis: See analyses for other program measures in this chapter

Recommendation, Implementation and Schedule: See other program measures in this chapter.

16. Ultra Low Flush Toilet Replacement

Program Description: This program consists of measures to replace older 7gal/flush and 3.5 gal/flush toilets with 1.6 gal/flush toilets. Agencies have approached this program generally in three ways: 1) requiring a retrofit on resale ordinance where homes are required to retrofit to low flow fixtures upon a resale; 2) Direct distribution of toilets to local community groups who oversee installation; and, 3) Rebate programs where vouchers or rebates are given for toilet replacement.

Economic and Noneconomic Factors: ULFT replacement programs have generally been the most successful of demand management measures. A number of issues exist, however. Program cost-effectiveness varies by program design. Retrofit on resale ordinances are very inexpensive from the District's

perspective as costs are shifted to the home repurchasers/sellers. These ordinances tend to be very unpopular with the real estate community and home sellers, however, as it can impede a sale due to timing and often requires replacing floor coverings around the toilet. Direct distribution programs have the highest cost-effectiveness but don't necessarily reach all potential customers. Rebate programs are generally effective but have a higher incidence of "free ridership" where some customers would be replacing a toilet anyway and receive the rebate. Regardless, savings for these programs have been shown to be 35-45 gal. per replacement per day. Higher savings are found in higher density housing and commercial/industrial settings. Savings also persist as toilet life is generally about 25 years. Implementation costs for simple rebate programs, the most popular average about $100 per unit.

It should be recognized that given the revised plumbing code, allowing for only 1.6 gal/flush toilet models to be purchased, that natural turnover, usually in the range of 3-4% per year will eventually replace all of the older, high water use models. ULFT incentive programs accelerate these savings and as such can help defer or eliminate other capital investment needs.

Customer acceptance issues often are raised with these programs. Complaints about the function of early models of ULFTs, bowl cleanliness, double flushing, etc. have been raised as reasons to avoid such programs. With the experience manufacturers have gained in recent years however, such complaints have diminished and data shows that these toilets work as well or better than the older models. Recent federal legislation intending to repeal the low-flow plumbing standards in part due to anecdotal complaints of poor performance of ULFTs was defeated when supporters could not produce customer confidence data and opponents showed empirical data indicating consumer satisfaction was high.

Cost Benefit Analysis: Two potential ULFT retrofit programs were analyzed. A rebate program assuming a rebate of $75 and administrative costs of $25 per toilet installed was assumed in the first program. To account for the natural replacement factor and free ridership, savings attributed to the program were discounted 40% per toilet rebate, resulting in a net unit savings of 24 gallon per rebate per day. Program life was set at 15 years, a conservative assumption given toilets last about 25 years. In the second analysis a direct distribution program was assumed, which lowers the natural replacement and free ridership factor to 20 percent.

Recommendation, Implementation and Schedule: Neither program as posed above produced a positive net present value. The rebate program resulted in a -$6 NPV and the direct distribution program -$33. Sensitivity analysis was done lengthening the program life and savings attributed to the program but that did not improve the NPV. Therefore, this program is not recommended for implementation.

YUCAIPA VALLEY WATER DISTRICT
2000 URBAN WATER MANAGEMENT PLAN
AND
WATER SHORTAGE CONTINGENCY PLAN

SECTION 4
WATER SHORTAGE CONTINGENCY PLAN

4.0 INTRODUCTION

Section 10632 et. Seq. of the California Water Code requires the preparation and maintenance of a Water Shortage Contingency Analysis including the following elements:

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

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

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

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

e) Consumption reduction methods in the most restrictive stages. Each 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 supply.

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

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

h) A draft water shortage contingency resolution or ordinance.

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

The Yucaipa Valley Water District adopted its current Water Shortage Contingency Plan January 30, 1992. This plan builds on that original plan, the District's experience in implementation during the 1987-1992 drought and changed requirements under the law. It also is a supplement to the District's 2000 Urban Water Management Plan.

4.1 THREE-YEAR MINIMUM SUPPLY

The District currently relies on groundwater to provide over 95% of its supply needs. Given the large capacity of the basin, current storage volumes, and current and near-term well capacity, in the near term, the District should be able to meet full service demands in a hydrologic shortage regardless of the hydrology. Therefore, the driest three year sequence on record is not immediately relevant. Some curtailments due to current summertime peak capacity limitations, rather than hydrologic limitations could occur, however.

When State Project water and access to other surface waters come on line in 2002 the system will be able to maintain nearly 100% reliability over any three-year dry cycle sequence. Aggressive recycled water development will also underpin overall supply reliability and lower demands on inconsistent imported water resources. Ultimately if in total, surface water supplies become unacceptably unreliable, the District can develop additional well capacity to match total overall demands, less recycled water availability. In this way, droughts can be managed through conjunctive use of the groundwater basin: drawing down the basin in hydrologic shortages and recharging the basin during supply availability surpluses in wetter years.

4.2 DROUGHT MANAGEMENT

Water shortages can be triggered by a hydrologic limitation in supply, e.g. a prolonged period of below normal precipitation and runoff, limitations or failure of supply and treatment infrastructure, or both. Hydrologic or drought limitations tend to develop and abate more slowly whereas infrastructure failure tends to happen quickly and relatively unpredictably. Additionally, California's imported water supply system is vulnerable to unpredictable restrictions on water storage and delivery due to conflicts with sensitive aquatic species.

California's climatic regime is one typified by distinct seasonal patterns of precipitation and cyclical patterns of a number of years of above or below average precipitation. Therefore, water systems and management mechanisms need to be able to cope with these variations. The Urban Water Management Planning Act requires water agencies to plan for varying levels of temporary or prolonged shortages of up to 50 percent of normal supplies. This plan segregates water shortage scenarios into five stages, outlining progressively more restrictive requirements on water users as shortages become more pronounced.

Customers and the general public will be kept informed of water shortage management actions of the district through direct mail as necessary combined with water billings and at all times through the District's website. A link to the California Department of Water Resources website location for water supply information will be provided on the site *(http://cded.water.ca.gov/water_supply.html)*

4.3 CATASTROPHIC EVENTS

Over the past ten years the District has been upgrading its supply infrastructure to better meet the needs of its customers. Additionally, the age of the District's infrastructure is relatively young with only three percent of the pipeline inventory over 35 years old. However, the District is in a very active seismological area and is also subject to power outages that can limit production from wells and the District's planned treatment plant for imported water. The District has available diesel back-up power generation capability for its well system and treatment plant. Backup power units are portable and can be moved from well site to well site depending upon the location and extent of outage.

In addition to being able to invoke the water shortage contingency actions as stated herein, the District in 1998 adopted a Major Disaster Plan and Alerting Procedures. This plan deals with non-drought related water shortages. This plan addresses shortages that might result from earthquakes, power outages, pipeline ruptures, terrorism threats and water quality limitations/contamination. It outlines the responsibilities of the District's designated emergency response personnel, alerting procedures, alternate headquarters, communications, transportation and relationships with regional and state emergency response officials. District water supply facilities are operated though an independent and reliable radio and telemetry network designed to operate under emergency conditions.

In addition to in-house emergency plans and procedures, the District is a member of the Yucaipa Valley Emergency Services Committee. Other member include the City of Yucaipa Fire and Police departments, County Sheriff's Department and the Yucaipa-Calimesa Joint Unified School District.

4.4 WATER SHORTAGE RESPONSE STAGES, PROHIBITIONS AND PENALTIES

This plan provides for five levels of progressively more aggressive water demand reduction requirements as displayed in **Table 4-1**.

Table 4-1
Water Shortage Response Stages

Stage	Type Program	Water Use Reduction	Overall Reduction
I	Voluntary	10% from selected areas	--
II	Voluntary	Up to 15% district wide	15%
III	Mandatory	Up to 30% district wide	30%
IV	Mandatory	Up to 40% district wide	40%
V	Mandatory	Up to 50% district wide	50%

Drought events which trigger these stages will likely be those affecting imported water sources provided the Yucaipa groundwater basin continues to be managed in a safe yield condition over the long term. As such, the amount of imported water shortage imposed by wholesalers to the District, San Bernardino Valley Water District and the San Gorgonio Pass Water Agency will in most instances drive the required stage. Additionally, to the extent well capacity exists, the Yucaipa basin can be temporarily exercised beyond its long term safe yield of about 9,270 acre feet per year (Mann,Todd, 1990) to compensate for imported water shortages.

The shortage response stages may also be invoked during a non-drought water emergency to handle short-term events such as earthquake damage, pipeline ruptures and water quality problems.

The stages were developed based upon recognition of the need for equity and recognition of the priority for health and safety issues during the extreme shortage conditions. Through the water allocation system they also recognize the variation in water use within a customer class. The system attempts to recognize prior conservation by allocating set amounts per use with partial modification of allocations based upon prior use.

While certain water use prohibitions apply at each stage, in stages III-V the plan balances between achieving savings through those prohibitions and providing an allocation for users to apply as they deem appropriate, consistent with obeying the

prohibitions. This allows the individual consumer to exercise independent judgement as to how best to use their allocation.

The District Board of Directors will determine the appropriate stage of implementation, although they may delegate the authority to implement Stage I or II to the General Manager. Triggers for consideration of invoking a specific stage of the Contingency Plan will be notification from the District's water wholesalers, the San Bernardino Valley Water District and the San Gorgonio Pass Water Agency, collectively or individually, that those districts intend to curtail imported water deliveries to YVWD. For example, where imported water requested deliveries are expected to be curtailed by 10 percent a Stage I action will be considered. Where deliveries are expected to be curtailed by up to 15, 30, 40 and 50 percent, respective shortage stages will be considered (Stages II-V). Inasmuch as imported supplies will make up only a portion of District supplies, the District will determine the total supply available, the likely duration of the imported water shortage and invoke the appropriate stage to reduce overall demands to available supply. As shortage conditions ease, the District will consider relaxing the shortage stages based upon notification from wholesalers that supply conditions are improving.

Use restrictions as follows below, other than water waste ordinance provisions, shall not apply to the use of recycled water.

4.4.1 Stage I Actions – up to 10% Shortage

The District has significant geographic variation in its water consumption, particularly in residential areas, due to land use and a variety of pressure zones. Under Stage I the relatively high water consuming areas would be asked to implement the following measures on a voluntary basis.

Prohibitions

- Landscape watering on an odd-even day basis based upon address number and avoiding irrigation between 0800 and 1700 hours.
- Elimination of hosing of hardscape surfaces, except where health and safety needs dictate.
- Usage of buckets and automatic hose shut off devices for car washing and outside cleaning activities.
- Repair water leaks and adjust sprinklers to eliminate over-spray.

Other Activities

- The District shall notify customers in the target areas of the shortage and indicate requested curtailments of use. Such notification shall provide avenues of additional information assisting customers in achieving requested conservation.

4.4.2 Stage II Actions – up to 15% Shortage

Prohibitions

- Stage II Actions would extend the voluntary requests under Stage 1 district-wide. Additionally, new meter sales for land development would be restricted, allowing meter sales only to property owners of presently existing parcels

Other Actions

- All customers would be notified of the shortage and requested curtailments of use. Such notification shall provide avenues of additional information assisting customers in achieving requested conservation.

- Initiate media campaign to educate the District customers of conservation needs

4.4.3 Stage III Actions – up to 30% Shortage

Prohibitions

- During Stage III the voluntary action requests from Stages I and II become mandatory as a water emergency would be declared by the District's Board of Directors pursuant section 350 of the water code.

- Issuance of construction water meters would cease for the duration of the Stage III event and meters would be installed for new accounts only where the building permit was issued prior to the declaration of the water shortage emergency.

- Mandatory use prohibitions will be enforced through water patrol personnel who may issue a warning notice for a first offense, provide for a water bill surcharge of $25 for a second offense, $75 for a third offense and shut-off of water service for a fourth offense. For a fourth offense normal water use initiation fees would apply for restoration of the service.

Other Actions

- In addition to the prohibited actions, the District would establish average monthly allotments for each connection based upon a base period selected by the District as follows:

    1. Each single family residential connection shall receive no more than 14 hcf per month plus 20% of the average annual usage in excess of 240 hcf.

2. Each multifamily residential unit shall receive no more than 9 hcf per month plus 40% of the average annual usage in excess of 145 hcf.

3. Each commercial, industrial and governmental connection shall receive no more than 80% of its average monthly usage.

4. Each landscaping connection (dedicated irrigation meters) shall receive 40% of the average monthly usage except those accounts determined by District staff to have met applicable landscape design criteria under city or county ordinance which shall receive 80% of average monthly usage.

5. Each recreational connection shall be allotted 70% of the average monthly usage.

6. Exceeding the usage rates above are subject to 100% surcharge of the applicable rate for each use.

4.4.4 Stage IV Actions – up to 40% Shortage

Prohibitions

- All prohibitions from Stage III would be in effect

Other Actions

- In addition to the prohibited actions, the District would establish average monthly allotments for each connection based upon a base period selected by the District as follows:

  1. Each single family residential connection shall receive no more than 14 hcf per month plus 10% of the average annual usage in excess of 240 hcf.

  2. Each multifamily residential unit shall receive no more than 9 hcf per month plus 20% of the average annual usage in excess of 145 hcf.

  3. Each commercial, industrial and governmental connection shall receive no more than 70% of the average monthly usage.

  4. Each landscaping connection (dedicated irrigation meters) shall receive 20% of the average monthly usage except those accounts determined by District staff to have met applicable landscape design criteria under city and county ordinance which shall receive 70% of average monthly usage.

5. Each recreational connection shall be allotted 50% of average monthly usage.

6. Exceeding the usage rates above are subject to 200% surcharge of the applicable rate for each use.

4.4.5 Stage V Actions – up to a 50% shortage

Prohibited Actions

- All prohibited actions in Stage IV would be in force except as noted below.
- No meters would be installed for new accounts for the duration of the Stage V emergency.

Other Actions

- In addition to the prohibited actions, the District would establish average monthly allotments for each connection based upon a base period selected by the District as follows:

  1. Each single family residential connection shall receive no more than 10 hcf per month.

  2. Each multifamily residential unit including mobile homes shall receive no more than 6 hcf per month.

  3. Each commercial, industrial and governmental connection shall receive no more than 65% of the average monthly usage.

  4. Each landscaping connection (dedicated irrigation meters) shall receive no allotment except those accounts determined by District staff to have met applicable landscape design criteria under city and county ordinance, which shall receive 15% of average monthly usage.

  5. Each recreational connection shall receive no water. In the case of irrigation of golf courses, irrigation shall be limited to tees and greens only.

  6. Exceeding the usage rates above are subject to 500% surcharge of the applicable rate for each use.

4.5 ALLOTMENT APPEALS PROCEDURES

1. Any person who wishes to appeal their customer classification or allotment shall do so in writing using forms provided by the District.

2. Appeals will be reviewed by the Assistant General Manager and site visits scheduled if required.
3. A condition of approval shall be that all applicable plumbing fixtures or irrigation systems be replaced or modified for maximum water conservation prior to considering and appeal.
4. Appeals may be granted for the following:
   a. Proof of substantial medical requirements
   b. Residential connections with more than four residents in a single family household or four residents at a multifamily household may be awarded an additional 2 HCF per person. During a Stage V shortage, a census will be conducted to determine the actual number of residents per dwelling unit. Water may be granted to additional permanent residents – defined as five days a week, nine months per year.
   c. Commercial/Industrial accounts may appeal for increased allocations where it can be shown that allocations would otherwise cause unemployment, decreased production or mechanical equipment damage, after confirmation by a District water auditor that the account has instituted all applicable water efficiency improvements.
   d. Nonagricultural customers can appeal for additional water for livestock.
   e. Government agencies (parks, school, county, etc.) may have their separate allotments for each meter combined into one “agency” allotment.
5. In the event an appeal for additional allotment is requested for irrigation of trees or vegetation in residential categories or for any agricultural use, the District may use the services of a qualified consultant in determining the validity of the request.
6. The District General Manager shall approve or deny appeals.
7. If the District General Manager and the applicant are unable to reach accord, then the appeal shall be heard by the Water District Board of Directors, who will make the final determination.
8. All appeals shall be reported monthly to the Board of Directors

4.6 REVENUE AND EXPENDITURE IMPACTS

It is difficult to precisely gauge the revenue and expenditure impacts of implementation of the water shortage contingency plan. As the plan provides for both prohibitions, water use allotments and penalty pricing for exceeding allotments, the ultimate revenue impacts will be based upon a mix of responses to these requirements. Additionally, weather can be a factor as well. Customers may find it more difficult to meet allocations during hot weather where a desire to maintain landscaping uses at a higher level exists and therefore more customers may find themselves paying penalty rates.

For planning purposes it is assumed that District Conservation goals are met at each stage and that revenue losses are proportional to the commodity rate revenue not received, exclusive of penalty rates, plus revenue losses due to particular prohibitions.

It is also assumed that additional District expenses for implementing the plan would be offset by excess use penalties. Potential revenue losses are listed in table 4-2.

Table 4-2
Annual Potential Revenue Losses by Plan Stage
(based on 2001 Revenue and Expenses)

Revenue Source	Stage I[1]	Stage II	Stage III	Stage IV	Stage V
Domestic Water Sales	$112,500	$337,500	$675,000	$900,000	$1,125,000
Construction Water Sales	$0	$20,000	$50,000	$50,000	$50,000
Meter Sales	$0	$20,000	$25,000	$25,000	$32,500
Water Sales Losses	$112,500	$377,500	$750,000	$975,000	$1,207,500
Less Production Cost Reductions	($59,700)	($179,300)	($358,500)	($478,000)	($597,500)
Net Water Revenue Reduction	$52,800	$198,200	$391,500	$497,000	$610,000
Percent Total Water Revenue Loss	1.0%	4.1%	8.1%	10.3%	12.6%

4.7 MEASURES TO OVERCOME IMPACTS

Based upon the District's current fiscal situation, Impacts during stages I and II could be absorbed by District reserves without requiring a rate increase provided the shortage

[1] Stage 1 assumes 5% drop in sales; all other stages at maximum shortage, e.g., Stage IV=40%

condition did not persist for more than two years. Impacts beyond two years would need to be reassessed. Stages III and beyond could require reductions in the pay-as-you go portion of the District's Capital Improvement Program. Additionally, deferring non-critical maintenance items and filling some personnel vacancies would be considered. Should revenue loss impacts begin to affect essential District operations, a temporary emergency surcharge on the base water rate could be imposed to fund District operations.

4.8 REDUCTION MEASURE MEASURING MECHANISM

As the districts accounts are fully metered, accounting for actual consumption will be afforded for each customer against any allocation. Well production records and imported water purchases will also be tallied to discern overall production amounts versus conservation goals. Collectively these data will be analyzed to assess any need for alterations to the Shortage Response Plan.

Yucaipa Water District Shortage Appeals Form

Date: _____

Name: _____

Address: _____

_____

_____

Phone: _____

Account Number: _____

Name on Account if different from Above: _____

Relationship to Account Holder : _____

Signature:_____
Under the penalty of perjury, I certify that the above information is true and correct

Change in Classification Request

Current Customer Classification[2]: _____

Requested Reclassification (if Applicable) _____

Reason(s) supporting classification change request:

_____
_____
_____
_____

Change in Water Allocation Request

Reason(s) for additional allocation:

_____
_____
_____
_____

District Use Only

Action: _____ by:_____ date: _____

Appeal to Board of Directors

Action: _____

Date:

[2] e.g., single family residential, multi-family residential, commercial, industrial, recreation

YUCAIPA VALLEY WATER DISTRICT
URBAN WATER MANAGEMENT PLAN
AND
WATER SHORTAGE CONTINGENCY PLAN

SECTION 5.0
REFERENCES

1. California Department of Water Resources, CALSIM Operations Studies – State Water Project Frequency Distribution Curves, 1999.

2. California Department of Water Resources, Cost Effectiveness Tool Version 1.1, 1997.

3. California Urban Water Agencies, Urban Water Conservation Potential Draft Final Report, October, 2000.

4. California Urban Water Conservation Council, Guide to Data and Methods for Cost-Effectiveness Analysis of Urban Water Conservation Best Management Practices, May, 2000.

5. Camp Dresser and McKee Consulting Engineers, Water Facilities Master Plan for the Yucaipa Valley Water District, 1994.

6. Fox, Robert C., Consulting Engineering Geologist. Groundwater Resouces Monitoring Plan. Prepared for the Yucaipa Valley Water District. 1990

7. Mann, John F. Consulting Geologist and Hydrologist. Revised Safe Yield of the Yucaipa Basin. 1986.

8. San Bernardino Valley Municipal Water District, Regional Water Facilities Master Plan, 1995

9. Yucaipa Valley Water District, Major Disaster Plan and Alerting Procedure, 1998.

10. Yucaipa Valley Water District, Resolution 43-1999, 1999.

11. Yucaipa Valley Water District, Urban Water Management Plan Update, 1990

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program 1. Single Family Water Audits

avoided water cost=$252/af

Savings Assumptions

single family survey 15 gpd/survey
15% annual savings decay rate
effective life: 10 years
program cost: $125 /survey

Savings	Gallons	Avoided Supply Value	
year 1	5,475	$	4.23
year 2	4,653	$	3.59
year 3	3,955	$	3.06
year 4	3,362	$	2.60
year 5	2,857	$	2.20
year 6	2,429	$	1.88
year 7	2,064	$	1.57
year 8	1,755	$	1.36
year 9	1,491	$	1.15
year 10	1,267	$	0.98
total	29,308		

DWR Model Result: net present value =$73

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program 1. Multi-family water audits

avoided water cost=$252/af

Savings Assumptions

multi family survey: 6.5 gal per unit; 10 units per survey
15% annual savings decay rate
effective life: 10 years
program cost: $330 /survey

Savings	Gallons	Avoided Supply Value
year 1	23,725	$ 18.35
year 2	20,166	$ 15.59
year 3	17,141	$ 13.25
year 4	14,570	$ 11.27
year 5	12,384	$ 9.58
year 6	10,556	$ 8.16
year 7	8,947	$ 6.92
year 8	7,605	$ 5.88
year 9	6,465	$ 5.00
year 10	5,495	$ 4.25
total	127,054	

DWR Model Result: net present value =$162

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program 2. Retrofit Program

avoided water cost=$252/af

Savings Assumptions

retrofit savings: 5.65 gpd/retrofit (model based on ten units)
10% annual savings decay rate
effective life: 10 years
program cost: $13 /per installation ($130 model)

Savings	Gallons	Avoided Supply Value	
year 1	23,725	$	18.35
year 2	20,166	$	15.59
year 3	17,141	$	13.25
year 4	14,570	$	11.27
year 5	12,384	$	9.58
year 6	10,556	$	8.16
year 7	8,947	$	6.92
year 8	7,605	$	5.88
year 9	6,465	$	5.00
year 10	5,495	$	4.25
total	127,054		

DWR Model Result: net present value =$173

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program 5. Large Landscape Program

avoided water cost=$252/af

Savings Assumptions

survey savings range: 0.53-1.13 afy = avg .83
10% annual savings decay rate
effective life: 10 years
program cost: $500 survey with $750 incentive payment = $1250 total

Savings	Gallons	Avoided Supply Value
year 1	270,414	$ 209.00
year 2	243,372	$ 188.00
year 3	216,331	$ 167.00
year 4	189,289	$ 146.00
year 5	162,248	$ 125.00
year 6	135,207	$ 105.00
year 7	108,165	$ 84.00
year 8	81,124	$ 63.00
year 9	54,082	$ 41.00
year 10	27,041	$ 21.00
total	1,487,273	

DWR Model Result: net present value =$10.00

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program16. Ultra Low Flow Replacement - rebate program

avoided water cost=$252/af

Savings Assumptions

ulft savings per unit per year=8760 gallons
no savings decay rate
effective life: 15 years
free-ridership factor:40%
program cost: $100 per unit

Savings	Gallons	Avoided Supply Value	
year 1	8,760	$	6.77
year 2	8,760	$	6.77
year 3	8,760	$	6.77
year 4	8,760	$	6.77
year 5	8,760	$	6.77
year 6	8,760	$	6.77
year 7	8,760	$	6.77
year 8	8,760	$	6.77
year 9	8,760	$	6.77
year 10	8,760	$	6.77
year 11	8,760	$	6.77
year 12	8,760	$	6.77
year 13	8,760	$	6.77
year 14	8,760	$	6.77
year 15	8,760	$	6.77
total	131,400		

DWR Model Result: net present value = -$6

Input data for DWR Water Conservation Cost Effectiveness Evaluation Tool 1.1

Program 16. Ultra Low Flow Replacement - direct distribution program

avoided water cost=$252/af

Savings Assumptions

ulft savings per unit per year=13140 gallons
no savings decay rate
effective life: 15 years
free-ridership factor:20%
program cost: $150 per unit

Savings	Gallons	Avoided Supply Value	
year 1	13,140	$	10.16
year 2	13,140	$	10.16
year 3	13,140	$	10.16
year 4	13,140	$	10.16
year 5	13,140	$	10.16
year 6	13,140	$	10.16
year 7	13,140	$	10.16
year 8	13,140	$	10.16
year 9	13,140	$	10.16
year 10	13,140	$	10.16
year 11	13,140	$	10.16
year 12	13,140	$	10.16
year 13	13,140	$	10.16
year 14	13,140	$	10.16
year 15	13,140	$	10.16
total	197,100		

DWR Model Result: net present value = -$33

City of Colton Draft No Waste Ordinance, Draft Resolution to Declare a Water Shortage Emergency, and Draft Moratorium on New Connections During a Water Shortage

NO WASTE ORDINANCE (DRAFT)

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF COLTON PROHIBITING THE WASTEFUL USE OF WATER AND SETTING FORTH REGULATIONS AND RESTRICTIONS ON WATER USE

The City Council of the City of Colton does hereby ordain as follows:

That in order to conserve the City's water supply for the greatest public benefit, and to reduce the quantity of water used by the City's water customers, that wasteful use of water should be eliminated. Water customers of the City shall observe the following regulations and restrictions on water use:

SECTION 1. No customer shall waste water. As used herein, the term "waste" means:

a. Use of potable water to irrigate turf, ground-cover, shrubbery, crops, vegetation, and trees (agricultural accounts are excluded from the time of irrigation restriction) between the hours of 10:00 o'clock A.M. and 6:00 o'clock P.M. or in such a manner as to result in runoff for more than five (5) minutes;
b. Use of potable water to wash sidewalks, walkways, driveways, parking lots, open ground or other hard surfaced areas except where necessary for public health or safety;
c. Allowing potable water to escape from breaks within the customer's plumbing system for more than twenty-four (24) hours after the customer is notified or discovers the break;
d. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment;
e. Use of potable water to clean, fill or maintain decorative fountains, lakes or ponds unless such water is recycled.

SECTION 2. The following restrictions are effective during a declared Water Shortage Emergency:

a. No restaurant, hotel, cafe, cafeteria or other public place where food is sold, served or offered for sale, shall serve drinking water to any customer unless expressly requested;
b. Use of potable water for street or parking lot sweeping, building washdown where non-potable or recycled water is sufficient;
c. Use of potable water for sewer system maintenance or fire protection training without prior approval by the Director of Water and Wastewater;
d. Use of potable water for any purpose in excess of the amounts allocated for each class of service.

SECTION 3. Other restrictions may be necessary during a declared Water Shortage Emergency, to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

DRAFT

ENFORCEMENT

Any customer violating the regulations and restrictions on water use set forth in this chapter shall receive a written warning for the first such violation. Upon a second violation, the customer shall receive a written warning and the City may cause a flow-restrictor to be installed in the service. If a flow-restrictor is placed, the cost of installation and removal shall be paid by the violator. Any willful violation occurring subsequent to the issuance of the second written warning shall constitute a misdemeanor and may be referred to the County District Attorney's Office for prosecution. The City may also disconnect the water service. If water service is disconnected, it shall be restored only upon payment of the turn-on charge fixed by the City Council.

PENALTY FOR VIOLATIONS

Except as provided in the enforcement section for the first and second violations, any person, firm, partnership, association, corporation or political entity violating or causing or permitting the violation of any of the provisions of this section or providing false information to the district in response to the City's requests for information needed by the district to calculate consumer water allotments shall be guilty of a misdemeanor punishable by imprisonment in the county jail for not more that thirty days or by a fine not exceeding one thousand dollars or both. Each separate day or portion thereof in which any violation occurs or continues without a good faith effort by the responsible party to correct the violation shall constitute a separate offense and, upon conviction thereof, shall be separately punishable.

APPEALS

Variances from the requirements of this Section may be granted by the City Council only after denial of a variance request by the general manager. Appeals of variance request denials shall be made in writing to the secretary of the City Council at least 2 weeks prior to the meeting at which they will be heard. Upon granting any appeal, the City Council may impose any conditions it determines to be just and proper. Variances granted by the City Council shall be prepared in writing, and then furnished to the applicant. The City Council may require it to be recorded at applicant's expense.

REMEDIES/CUMULATIVE

The remedies available to the City to enforce this ordinance are in addition to any other remedies available under the City Council's code or any state statutes or regulations, and do not replace or supplant any other remedy, but are cumulative.

DRAFT

RESOLUTION TO DECLARE A WATER SHORTAGE EMERGENCY (DRAFT)

CITY OF COLTON
SAN BERNARDINO COUNTY, CALIFORNIA
Date

The City Council, City of Colton does hereby resolve as follows:

PURSUANT to California Water Code Section 350 et seq., the City Council has conducted duly noticed public hearings to establish the criteria under which a water shortage emergency may be declared.

WHEREAS, the City Council finds, determines, and declares as follows:

(a) The City is the water purveyor for the property owners and inhabitants of the City of Colton, certain portions of the City of Loma Linda, and certain unincorporated areas of the County of San Bernardino;

(b) The demand for water service is not expected to lessen;

(c) When the combined total amount of water supply available to the City from all sources falls at or below the Stage 3 triggering levels described in the City of Colton 2005 Urban Water Management Plan, the City will declare a water shortage emergency. The water supply would not be adequate to meet the ordinary demands and requirements of water consumers without depleting the City's water supply to the extent that there may be insufficient water for human consumption, sanitation, fire protection, and environmental requirements. This condition is likely to exist until precipitation and inflow dramatically increases or until water system damage resulting from a disaster are repaired and normal water service is restored.

NOW, THEREFORE, BE IT RESOLVED that the City Council, City of Colton hereby directs the Director of Water and Wastewater to find, determine, declare, and conclude that a water shortage emergency condition exists that threatens the adequacy of water supply, until the City's water supply is deemed adequate. After the declaration of a water shortage emergency, the Director of Water and Wastewater is directed to determine the appropriate Rationing Stage and implement the City's Water Shortage Emergency Response.

FURTHERMORE, the City Council shall periodically conduct proceedings to determine additional restrictions and regulations which may be necessary to safeguard the adequacy of the water supply for domestic, sanitation, fire protection, and environmental requirements.

DRAFT

MORATORIUM ON NEW CONNECTIONS DURING A WATER SHORTAGE (DRAFT)

CITY OF COLTON
SAN BERNARDINO COUNTY, CALIFORNIA
Date

The City Council, City of Colton does hereby resolve as follows:

The Municipal Code of the City of Colton is hereby amended to read as follows:

XX-1 MORATORIUM ON SERVICE COMMITMENTS AND CONNECTIONS

1. When the City declares a water shortage emergency, the following regulations shall become effective immediately and shall continue in full force and effect to prohibit the following while it remains in full force and effect:

    a. The City shall not issue oral or written commitments to provide new or expanded water service, including will-serve letters.
    b. The City shall not sell meters for water service connections, despite the prior issuance of will-serve letters or other oral or written service commitments, unless building permits have been issued.
    c. The City shall not provide new or expanded water service connections, despite the prior issuance of will-serve letters or other oral or written service commitments and meters, unless building permits have been issued.
    d. The City shall not provide water for use on any new plantings installed after the declaration of a Water Shortage Emergency.
    e. The City shall not annex territory located outside the City's service boundary.

2. The following uses are exempt from the moratorium and upon application to the City shall receive necessary water service commitments and connections to receive water from the City:

    a. Uses, including but not limited to, commercial, industrial, single and multifamily residential, for which a building permit has been issued by the City on or before the declaration of a Water Shortage Emergency.
    b. Uses, including but not limited to, commercial, industrial, single and multifamily residential, for which a retail meter had been purchased from the City before the declaration of a Water Shortage Emergency, as evidenced by a written receipt and for which a building permit has been issued and remains in full force and effect.
    c. Publicly owned and operated facilities, including but not limited to schools, fire stations, police stations, and hospitals and other facilities as necessary to protect the public health, safety, and welfare.

DRAFT