Phase 2 Refine the Ultimate Groundwater Management Plan

Phase 1 Short Term Implementation will develop policies and data necessary for defining the ultimate groundwater management plan. Phase 2 consists of the detailed engineering, environmental and financial work to describe and implement the ultimate management plan. The complexity and cost for the analyses described below are dependent on the management plan elements included in the management plan. Phase 2 consists of four tasks that are described below.

Task 2-1 Prepare Facility and Operation Plans. This task will produce an initial set of facility and operational plans. The initial plans will be based on the results of Phase 1 and will be used in *Task 2-2 Prepare Project Specific Environmental Impact Report.* The initial facility and operational plans will include plans and cost opinions. The facility and operational plans will be modified in this task, based on the Task 2-2 effort to minimize undesirable environmental impacts and to include mitigation measures. The facility and operational plan will be finalized with the EIR prepared in Task 2-2. An optimum management plan will be developed that is consistent with the management plan goal and its constraints.

Task 2-2 Prepare Project Specific Environmental Impact Reports (EIR). EIR's will be prepared for the implementation of specific groundwater management elements that are developed in Phase 1. This Task consists of the following sub tasks.

Prepare and Distribute Notice of Preparation (NOP). The NOP will be prepared based on the results of the initial environmental study prepared in Task 1-5 and the facility and operational plans developed in Task 2-1. The final scope of work for the EIR studies will be based on the NOP and comments received on the NOP.

Estimate Environmental Impacts and Develop Mitigation Plans. This work will include: biological assessments, archaeological assessments, impact assessments and development of mitigation plans. This Task includes the evaluation of other environmental impacts such as construction related impacts, growth inducing impacts and cumulative impacts. Alternative facility and operational plans and mitigation measures will be developed in coordination with *Task 2-1 Prepare*

Facility and Operation Plans. This task includes the development of mitigation and mitigation monitoring plans.

Prepare and Distribute Draft EIR(s).

Conduct Meetings, Public Hearings and Respond to Comments.

Finalize EIR(s).

Task 2-3 Prepare Engineering Report for a Planned Recharge Project. California Department of Health Services is requiring that new projects that involve planned recharge of reclaimed water follow the proposed regulations for planned recharge projects. This has recently occurred in the Los Angeles Central Basin, the Chino Basin and in the Riverside-Colton Basins. The data and models developed in Phase 1 will be used to evaluate the hydraulic and water quality response from reclaimed water recharge. This task consists of the following subtasks.

Describe the Impacts from Reclaimed Water Recharge. This subtask includes estimating the impacts of wastewater recharge at the regional and local levels. The data and models developed in Phase I will be used to estimate the regional and local impacts. If warranted, the facility and operational plans will be revised and the impact analysis repeated.

Develop a Groundwater Production Management and Monitoring Plan. A groundwater production management and monitoring plan will be developed consistent with proposed DHS regulations. The implementation of this plan will be included in the EIR's developed in Task 2-2 and the institutional plan developed in Task 2-4.

Prepare Engineering Report.

Task 2-4 Institutional Planning. This task consists of institutional planning necessary for implementation of the groundwater management plan. The work will be iterative with the institutional plans and agreements evolving throughout Phase 2. This task consists of the following subtasks.

Describe Powers and Limitations of Entities Involved in Groundwater Management Plan. This subtask consists of identifying and describing the

statutory responsibilities, powers and limitations of participants, regulatory agencies and third party interests.

Describe Regulatory and Water Rights Implications of Groundwater Management Plan. This task consists of describing the existing and proposed regulatory limits and water rights implications of the groundwater management plan; and the development of institutional arrangements and agreements necessary for implementation of plan elements.

Conduct Economic Analysis of Groundwater Management Plan. The capital and operating costs of the groundwater management plan will be evaluated and updated throughout Phase 2. Using Task 2-1 results, the economic benefits and costs for participating entities and third parties will be evaluated. The results of the economic analysis will feed back to Task 2-1, providing the opportunity to optimize the groundwater management plan.

Develop Preliminary Financing Plan. Financing alternatives will be developed throughout the Phase 2 effort that will be consistent with the facilities described in Task 2-1 and the financing capabilities of the participating agencies.

Describe Institutional Arrangements Necessary to Implement Groundwater Management Plan. This subtask consists of finalizing alternative institutional arrangements for participation, facility construction, ownership and management, payment and collection of fees, etc..

Develop Agreements. This subtask consists of preparing draft agreements for all the agreements that will be necessary to implement the ultimate groundwater management plan.

Phase 3 Ultimate Groundwater Management Plan Implementation

The facility plans, environmental documentation and draft agreements developed in Phase 2 will be converted to construction documents, project-specific environmental documentation and final agreements. These projects will then be constructed and operated. The sequencing and sizing of the management elements will depend on actual future water demands and the availability of

funds for construction. It is premature to speculate on the magnitude of the effort required by most of these tasks because of uncertainties in what facilities and operating plans will be included in the groundwater management plan and the timing of the tasks.

Task 3-1 Prepare Final Design and Bid Documents. This task consists of final engineering, design and preparation of bid documents. The types of facilities that will be included are wells, pipelines, reservoirs, treatment facilities, and spreading basins.

Task 3-2 Prepare Project Specific Supplemental EIR's and Negative Declarations. This task consists of the preparation of supplemental project-specific EIR's and negative declarations (if applicable). These documents will be for specific elements in groundwater management plan projects that will include wells, pipelines and recharge facilities.

Task 3-3 Prepare Final Agreements. This task consists of developing and finalizing the agreements that allow the groundwater management plan to be constructed and operated.

Construction and Operation. Several series of tasks will need to be developed to describe the construction and operational process for the groundwater management plan elements that will actually be constructed.

MANAGEMENT AND MONITORING

The management and monitoring of the groundwater management plan will occur while the elements of ultimate groundwater management plan are being implemented. The management and monitoring activities developed in Phase 1 will be adopted by EMWD board action. Future modifications to management and monitoring programs will be incorporated as warranted by change conditions.

SCHEDULE AND COST

The Phase 1 work should take about two years to complete. Phase 2 will take about two years to complete and will overlap Phase 1 by about one year. The cumulative time required to complete phases 1 and 2 will be about three years. Phase 3 could take up to 10 years to complete with

some projects (e.g., blending) coming on line within a couple of years and other projects (e.g., large scale surface recharge) taking 10 years to implement.

The cost to complete Phases 1 and 2 is estimated to range between 2 to 3 million dollars. The cost to complete Phase 3 cannot be estimated until the ultimate plan is described at the conclusion of Phase 2.

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REFERENCES

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APPENDIX A

A-1

AB 3030 with AB 1152 Amendments

PART 2.75

GROUNDWATER MANAGEMENT

Chapter		Sectio
1.	General Provisions	107
2.	Definitions	107
3.	Groundwater Management Plans	107
4.	Finances	107
5.	Miscellaneous	107

Part 2.75 was added by Stats.1992, c. 947 (A.B.3030), § 2.

Former Part 2.75, Groundwater Resources, consisting of §§ 10750 to 10767, was added by Stats.1991, c. 903 (A.B.255), § 1, and repealed by Stats.1992, c. 947 (A.B.3030), § 1.

CHAPTER 1

GENERAL PROVISIONS

Section		Section	
10750.	Legislative findings, declarations and intent.		ny without agreement prohibited application of section.
10750.2.	Application of part.	10750.8.	Management by local agencies within service area of another agency without agreement prohibited; application of section.
10750.4.	Adoption of groundwater management plan or program not required.	10750.9.	Groundwater management program procedures to establish commence prior to January 1, 1993; completion amendment.
10750.6.	Authority of local agencies or watermaster to manage groundwater not affected.	10750.10.	Other powers.
10750.7.	Management by local agencies within service area of another agency, water corporation or mutual water compa-		

Chapter 1 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10750. Legislative findings, declarations and intent

The Legislature finds and declares that groundwater is a valuable natural resource in California, and should be managed to ensure both its safe production and its quality. It is the intent of the Legislature to encourage local agencies to work cooperatively to manage groundwater resources within their jurisdictions.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

(a) Subject to subdivision (b), this part applies to all groundwater basins in the state.

(b) This part does not apply to any portion of a groundwater basin that is subject to groundwater management by a local agency or a watermaster pursuant to other provisions of law or a court order, judgment, or decree, unless the local agency or watermaster agrees to the application of this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10750, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.4. Adoption of groundwater management plan or program not required

Nothing in this part requires a local agency overlying a groundwater basin to adopt or implement a groundwater management plan or groundwater management program pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.6. Authority of local agencies or watermaster to manage groundwater not affected

Nothing in this part affects the authority of a local agency or a watermaster to manage groundwater pursuant to other provisions of law or a court order, judgment, or decree.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10750.7. Management by local agencies within service area of another agency, water corporation or mutual water company without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency, a water corporation regulated by the Public Utilities Commission, or a mutual water company without the agreement of that other entity.

(b) This section applies only to groundwater basins that are not critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.8. Management by local agencies within service area of another agency without agreement prohibited; application of section

(a) A local agency may not manage groundwater pursuant to this part within the service area of another local agency without the agreement of that other entity.

(b) This section applies only to groundwater basins that are critically overdrafted.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10762, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10750.9. Groundwater management program; procedures to establish commenced prior to January 1, 1993; completion; amendment

(a) A local agency that commences procedures, prior to January 1, 1993, to adopt an ordinance or resolution to establish a program for the management of groundwater pursuant to Part 2.75 (commencing

with Section 10750), as added by Chapter 903 of the Statutes of 1991, may proceed to adopt the ordinance or resolution pursuant to * * * Part 2.75, and the completion of those procedures is deemed to meet the requirements of this part.

(b) A local agency that has adopted an ordinance or resolution pursuant to Part 2.75 (commencing with Section 10750), as added by Chapter 903 of the Statutes of 1991, may amend its groundwater management program by ordinance or resolution of the governing body of the local agency to include any of the plan components set forth in Section 10753.7.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 1.)

§ 10750.10. Other powers

This part is in addition to, and not a limitation on, the authority granted to a local agency pursuant to other provisions of law.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10766, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10751. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

The repealed section, added by Stats.1991, c. 903 (A.B. 255), § 1, set forth definitions. See, now, § 10752.

CHAPTER 2

DEFINITIONS

Section
10752. Definitions.

Chapter 2 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10752. Definitions

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

(a) "Groundwater" means all water beneath the surface of the earth within the zone below the water table in which the soil is completely saturated with water, but does not include water which flows in known and definite channels.

(b) "Groundwater basin" means any basin identified in the department's Bulletin No. 118, dated September 1975, and any amendments to that bulletin, but does not include a basin in which the average well yield is less than 100 gallons per minute.

(c) "Groundwater extraction facility" means any device or method for the extraction of groundwater within a groundwater basin.

(d) "Groundwater management plan" or "plan" means a document that describes the activities intended to be included in a groundwater management program.

(e) "Groundwater management program" or "program" means a coordinated and ongoing activity undertaken for the benefit of a groundwater basin, or a portion of a groundwater basin, pursuant to a groundwater management plan adopted pursuant to this part.

(f) "Groundwater recharge" means the augmentation of groundwater, by natural or artificial means, with surface water or recycled water.

(g) "Local agency" means any local public agency that provides water service to all or a portion of its service area, and includes a joint powers authority formed by local public agencies that provide water service.

(h) "Recharge area" means the area that supplies water to an aquifer in a groundwater basin and includes multiple wellhead protection areas.

(i) "Watermaster" means a watermaster appointed by a court or pursuant to other provisions of law.

(j) "Wellhead protection area" means the surface and subsurface area surrounding a water well or well field that supplies a public water system through which contaminants are reasonably likely to migrate toward the water well or well field.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 2.)

Historical and Statutory Notes

1992 Legislation
Former § 10752 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.

Derivation: Former § 10751, added by Stats.1991, c. 903 (A.B.255) § 1.

CHAPTER 3. GROUNDWATER MANAGEMENT PLANS

Section		Section	
10753.	Adoption or implementation of plan.	10753.6.	Written protest; contents; majority protest.
10753.2.	Hearing; notice; resolution of intention to adopt plan.	10753.7.	Plan components.
10753.3.	Publication of resolution of intention.	10753.8.	Rules and regulations to implement and enforce plan.
10753.4.	Preparation of plan; adoption; expiration of resolution of intention.	10753.9.	Potential impact of rules and regulations on business activities; consideration.
10753.5.	Second hearing; notice; protests to adoption of plan.		

Chapter 3 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10753. Adoption or implementation of plan

(a) Any local agency, whose service area includes a groundwater basin, or a portion of a groundwater basin, that is not subject to groundwater management pursuant to other provisions of law or a court order, judgment, or decree, may, by ordinance, or by resolution if the local agency is not authorized to act by ordinance, adopt and implement a groundwater management plan pursuant to this part within all or a portion of its service area.

(b) Notwithstanding subdivision (a), a local public agency, other than an agency defined in subdivision (g) of Section 10752, that provides flood control, groundwater management, or groundwater replenishment, or a local agency formed pursuant to this code for the principal purpose of providing water service that has not yet provided that service, may exercise the authority of this part within a groundwater basin * * * that is located within its boundaries within areas that are either of the following:

(1) * * * Not served by a local agency.

(2) * * * Served by a local * * * agency * * * whose governing body, by a majority vote, declines to exercise the authority of this part and enters into an agreement with the local public agency pursuant to Section 10750.7 or 10750.8.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 3.)

Historical and Statutory Notes

1992 Legislation
Former § 10753 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.2.

Derivation: Former § 10752, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.2. Hearing; notice; resolution of intention to adopt plan

(a) Prior to adopting a resolution of intention to draft a groundwater management plan, a local agency shall hold a hearing, after publication of notice pursuant to Section 6066 of the Government Code, on whether or not to adopt a resolution of intention to draft a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(b) At the conclusion of the hearing, the local agency may draft a resolution of intention to adopt a groundwater management plan pursuant to this part for the purposes of implementing the plan and establishing a groundwater management program.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10753, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.3. Publication of resolution of intention

(a) After the conclusion of the hearing, and if the local agency adopts a resolution of intention, the local agency shall publish the resolution of intention in the same manner that notice for the hearing held under Section 10753.2 was published.

(b) Upon written request, the local agency shall provide any interested person with a copy of the resolution of intention.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10754, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.4. Preparation of plan; adoption; expiration of resolution of intention

The local agency shall prepare a groundwater management plan within two years of the date of the adoption of the resolution of intention. If the plan is not adopted within two years, the resolution of intention expires, and no plan may be adopted except pursuant to a new resolution of intention adopted in accordance with this chapter.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.5. Second hearing; notice; protests to adoption of plan

(a) After a groundwater management plan is prepared, the local agency shall hold a second hearing to determine whether to adopt the plan. Notice of the hearing shall be given pursuant to Section 6066 of the Government Code. The notice shall include a summary of the plan and shall state that copies of the plan may be obtained for the cost of reproduction at the office of the local agency.

(b) At the second hearing, the local agency shall consider protests to the adoption of the plan. At any time prior to the conclusion of the second hearing, any landowner within the local agency may file a written protest or withdraw a protest previously filed.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10755, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10753.6. Written protest; contents; majority protest

(a) A written protest filed by a landowner shall include the landowner's signature and a description of the land owned sufficient to identify the land. A public agency owning land is deemed to be a landowner for the purpose of making a written protest.

(b) The secretary of the local agency shall compare the names and property descriptions on the protest against the property ownership records of the county assessors.

(c) (1) A majority protest shall be determined to exist if the governing board of the local agency finds that the protests filed and not withdrawn prior to the conclusion of the second hearing represent more than 50 percent of the assessed value of the land within the local agency subject to groundwater management pursuant to this part.

(2) If the local agency determines that a majority protest exists, the groundwater plan may not be adopted and the local agency shall not consider adopting a plan for the area proposed to be included within the program for a period of one year after the date of the second hearing.

(3) If a majority protest has not been filed, the local agency, within 35 days after the conclusion of the second hearing, may adopt the groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former §§ 10756, 10757, added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10753.7. Plan components

A groundwater management plan may include components relating to all of the following:

(a) The control of saline water intrusion.

(b) Identification and management of wellhead protection areas and recharge areas.

(c) Regulation of the migration of contaminated groundwater.

(d) The administration of a well abandonment and well destruction program.

(e) Mitigation of conditions of overdraft.

(f) Replenishment of groundwater extracted by water producers.

(g) Monitoring of groundwater levels and storage.

(h) Facilitating conjunctive use operations.

(i) Identification of well construction policies.

(j) The construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects.

(k) The development of relationships with state and federal regulatory agencies.

(*l*) The review of land use plans and coordination with land use planning agencies to assess activities which create a reasonable risk of groundwater contamination.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.8. Rules and regulations to implement and enforce plan

(a) A local agency shall adopt rules and regulations to implement and enforce a groundwater management plan adopted pursuant to this part.

(b) Nothing in this part shall be construed as authorizing the local agency to make a binding determination of the water rights of any person or entity.

(c) Nothing in this part shall be construed as authorizing the local agency to limit or suspend extractions unless the local agency has determined through study and investigation that groundwater replenishment programs or other alternative sources of water supply have proved insufficient or infeasible to lessen the demand for groundwater.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10753.9. Potential impact of rules and regulations on business activities; consideration

In adopting rules and regulations pursuant to Section 10753.8, the local agency shall consider the potential impact of those rules and regulations on business activities, including agricultural operations, and to the extent practicable and consistent with the protection of the groundwater resources, minimize any adverse impacts on those business activities.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

CHAPTER 4

FINANCES

Section		Section	
10754.	Local agencies; water replenishment district powers; fees and assessments.		payment of costs; remediation program excluded.
10754.2.	Annual fees and assessments based on amount of groundwater extracted;	10754.3.	Elections to authorize assessments or fees.

Chapter 4 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10754. Local agencies; water replenishment district powers; fees and assessments

For purposes of groundwater management, a local agency that adopts a groundwater management plan pursuant to this part has the authority of a water replenishment district pursuant to Part 4 (commencing

with Section 60220) of Division 18 and may fix and collect fees and assessments for groundwater management in accordance with Part 6 (commencing with Section 60300) of Division 18.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10754 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.3.

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.2. Annual fees and assessments based on amount of groundwater extracted; payment of costs; remediation program excluded

(a) Subject to Section 10754.3, except as specified in subdivision (b), a local agency that adopts a groundwater management plan pursuant to this part, may impose equitable annual fees and assessments for groundwater management based on the amount of groundwater extracted from the groundwater basin within the area included in the groundwater management plan to pay for costs incurred by the local agency for groundwater management, including, but not limited to, the costs associated with the acquisition of replenishment water, administrative and operating costs, and costs of construction of capital facilities necessary to implement the groundwater management plan.

(b) The local agency may not impose fees or assessments on the extraction and replacement of groundwater pursuant to a groundwater remediation program required by other provisions of law or a groundwater storage contract with the local agency.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), § 4.)

Historical and Statutory Notes

Derivation: Former §§ 10759, 10760 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10754.3. Elections to authorize assessments or fees

Before a local agency may levy a water management assessment pursuant to Section 10754.2 or otherwise fix and collect fees for the replenishment or extraction of groundwater pursuant to this part, the local agency shall hold an election on the proposition of whether or not the local agency shall be authorized to levy a groundwater management assessment or fix and collect fees for the replenishment or extraction of groundwater. The local agency shall be so authorized if a majority of the votes cast at the election is in favor of the proposition. The election shall be conducted in the manner prescribed by the laws applicable to the local agency or, if there are no laws so applicable, then as prescribed by laws relating to local elections. The election shall be conducted only within the portion of the jurisdiction of the local agency subject to groundwater management pursuant to this part.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

Derivation: Former § 10761, added by Stats.1991, c. 903 (A.B.255), § 1.

CHAPTER 5

MISCELLANEOUS

Section		Section	
10755.	Annexed land; compliance with plan.		powers agreements; agreements with public entities or private parties.
10755.2.	Coordinated plans for local agencies within same groundwater basin; joint	10755.3.	Meetings to coordinate plans.
		10755.4.	Limitation on application of part.

Chapter 5 was added by Stats.1992, c. 947 (A.B.3030), § 2.

§ 10755. Annexed land; compliance with plan

(a) If a local agency annexes land subject to a groundwater management plan adopted pursuant to this part, the local agency annexing the land shall comply with the groundwater management plan for the annexed property.

(b) If a local agency subject to a groundwater management plan adopted pursuant to this part annexes land not subject to a groundwater management plan adopted pursuant to this part at the time of annexation, the annexed territory shall be subject to the groundwater management plan of the local agency annexing the land.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

Historical and Statutory Notes

1992 Legislation

Former § 10755 was repealed by Stats.1992, c. 947 (A.B.3030), § 1. See, now, § 10753.5.

Derivation: Former § 10764, added by Stats.1991, c. 903 (A.B.255), § 1.

§ 10755.2. Coordinated plans for local agencies within same groundwater basin; joint powers agreements; agreements with public entities or private parties

(a) It is the intent of the Legislature to encourage local agencies, within the same groundwater basin, that are authorized to adopt groundwater management plans pursuant to this part, to adopt and implement a coordinated groundwater management plan.

(b) For the purpose of adopting and implementing a coordinated groundwater management program pursuant to this part, a local agency may enter into a joint powers agreement pursuant to Chapter 5 (commencing with Section 6500) of Division 7 of Title 1 of the Government Code with public agencies, or a memorandum of understanding with public or private entities providing water service.

(c) A local agency may enter into agreements with public entities or private parties for the purpose of implementing a coordinated groundwater management plan.

(Added by Stats.1992, c. 947 (A.B.3030), § 2. Amended by Stats.1993, c. 320 (A.B.1152), §5.)

Historical and Statutory Notes

Derivation: Former §§ 10758, 10763 added by Stats. 1991, c. 903 (A.B.255), § 1.

§ 10755.3. Meetings to coordinate plans

Local agencies within the same groundwater basin that conduct groundwater management programs within that basin pursuant to this part shall, at least annually, meet to coordinate those programs.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§ 10755.4. Limitation on application of part

Except in those groundwater basins that are subject to critical conditions of groundwater overdraft, as identified in the department's Bulletin 118–80, revised on December 24, 1982, the requirements of a groundwater management plan that is implemented pursuant to this part do not apply to the extraction of groundwater by means of a groundwater extraction facility that is used to provide water for domestic purposes to a single-unit residence and, if applicable, any dwelling unit authorized to be constructed pursuant to Section 65852.1 or 65852.2 of the Government Code.

(Added by Stats.1992, c. 947 (A.B.3030), § 2.)

§§ 10756 to 10767. Repealed by Stats.1992, c. 947 (A.B.3030), § 1

Historical and Statutory Notes

Sections 10756 and 10757, see, now, § 10753.6.

Section 10758, see, now, § 10755.2.

Sections 10759 and 10760, see, now, §§ 10754 and 10754.2.

Section 10761, see, now, § 10754.3.

Section 10762, see, now, §§ 10750.7 and 10750.8.

Section 10763, see, now, § 10755.2.

Section 10764, see, now, § 10755.

Section 10766, see, now, § 10750.10.

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Proposed Regulation: Title 22, California Code of Regulations
Division 4. Environmental Health, Chapter 3 Reclamation Criteria

PROPOSED REGULATION:

Title 22, CALIFORNIA CODE OF REGULATIONS

DIVISION 4. ENVIRONMENTAL HEALTH

CHAPTER 3. RECLAMATION CRITERIA

ARTICLE 1. DEFINITIONS

Section 60301. Definitions.

(a) **Reclaimed Water.** Reclaimed water means water which, as a result of treatment of domestic wastewater, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.

(b) **Reclamation Plant.** Reclamation plant means an arrangement of devices, structures, equipment, processes and controls which produce a reclaimed water suitable for the intended reuse.

(c) **Regulatory Agency.** Regulatory agency means the California Regional Water Quality Control Board in whose jurisdiction the reclamation plant is located.

(d) **Direct Beneficial Use.** Direct beneficial use means the use of reclaimed water which has been transported from the point of production to the point of use without an intervening discharge to waters of the State.

(e) **Food Crops.** Food crops mean any crops intended for human consumption.

(f) **Spray Irrigation.** Spray irrigation means application of reclaimed water to crops by spraying it from orifices in piping.

(g) **Surface Irrigation.** Surface irrigation means application of reclaimed water by means other than spraying such that contact between the edible portion of any food crop and reclaimed water is prevented.

(h) **Restricted Recreational Impoundment.** A restricted recreational impoundment is a body of reclaimed water in which recreation is limited to fishing, boating, and other non-body-contact water recreation activities.

(i) **Nonrestricted Recreational Impoundment.** A nonrestricted recreational impoundment is an impoundment of reclaimed water in which no limitations are imposed on body-contact water sport activities.

(j) **Landscape Impoundment.** A landscape impoundment is a body of reclaimed water which is used for aesthetic enjoyment or which otherwise serves a function not intended to include public contact.

(k) **Approved Laboratory Methods.** Approved laboratory methods are those specified in the latest edition of "Standard Methods for the Examination of Water and Wastewater," prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control

Federation and which are conducted in laboratories approved by the State Department of Health.

(l) **Unit Process.** Unit process means an individual stage in the wastewater treatment sequence which performs a major single treatment.

(m) **Primary Effluent.** Primary effluent is the effluent from a wastewater treatment process which provides removal of sewage solids so that it contains not more than 0.5 milliliter per liter per hour of settleable solids as determined by an approved laboratory method.

(n) **Oxidized Wastewater.** Oxidized wastewater means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

(o) **Biological Treatment.** Biological treatment means methods of wastewater treatment in which bacterial or biochemical action is intensified as a means of producing an oxidized wastewater.

(p) **Secondary Sedimentation.** Secondary sedimentation means the removal by gravity of settleable solids remaining in the effluent after the biological treatment process.

(q) **Coagulated Wastewater.** Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated by the addition of suitable floc-forming chemicals or by an equally effective method.

(r) **Filtered Wastewater.** Filtered wastewater means an oxidized, coagulated, clarified wastewater which has been passed through natural undisturbed soils or filter media, such as sand or diatomaceous earth, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 turbidity units and does not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(s) **Disinfected Wastewater.** Disinfected wastewater means wastewater in which the pathogenic organisms have been destroyed by chemical, physical or biological means.

(t) **Multiple Units.** Multiple units means two or more units of a treatment process which operate in parallel and serve the same function.

(u) **Standby Unit Process.** A standby unit process is an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment for the entire design flow of the unit for which it is a substitute.

(v) **Power Source.** Power source means a source of supplying energy to operate unit processes.

(w) **Standby Power Source.** Standby power source means an automatically actuated self-starting alternate energy source maintained in immediately operable condition and of sufficient

capacity to provide necessary service during failure of the normal power supply.

(x) **Standby Replacement Equipment.** Standby replacement equipment means reserve parts and equipment to replace broken-down or worn-out units which can be placed in operation within a 24-hour period.

(y) **Standby Chlorinator.** A standby chlorinator means a duplicate chlorinator for reclamation plants having one chlorinator and a duplicate of the largest unit for plants having multiple chlorinator units.

(z) **Multiple Point Chlorination.** Multiple point chlorination means that chlorine will be applied simultaneously at the reclamation plant and at subsequent chlorination stations located at the use area and/or some intermediate point. It does not include chlorine application for odor control purposes.

(aa) **Alarm.** Alarm means an instrument or device which continuously monitors a specific function of a treatment process and automatically gives warning of an unsafe or undesirable condition by means of visual and audible signals.

(bb) **Person.** Person also includes any private entity, city, county, district, the State or any department or agency thereof.

(cc) **Direct Injection.** The controlled subsurface addition of water directly into the groundwater basin that results in the

replenishment of groundwater used or suitable for use as a source of domestic water supply.

(dd) **General Mineral.** Water analyses for bicarbonate, carbonate, and hydroxide alkalinity, calcium, chloride, copper, foaming agents, iron, magnesium, manganese, pH, sodium, sulfate, specific conductance, total dissolved solids, total hardness, and zinc.

(ee) **General Physical.** Water analyses for color and odor.

(ff) **Initial Percolative Capacity.** The rate (unit volume per unit area per unit time or unit length per unit time) at which water moves through the soil prior to recharge conditions.

(gg) **Organics Removal.** Granular activated carbon adsorption or reverse osmosis treatment designed to remove organic compounds from the reclaimed water.

(hh) **Planned Groundwater Recharge Project.** Any water reclamation project designed for the purpose of recharging groundwater suitable for use as a source of domestic water supply.

(ii) **Project Category I.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(jj) **Project Category II.** A surface spreading recharge project which uses reclaimed water that has been oxidized, filtered, and disinfected.

(kk) **Project Category III.** A surface spreading recharge project which uses reclaimed water that has been oxidized and disinfected.

(ll) **Project Category IV.** A direct injection recharge project which uses reclaimed water that has been oxidized, filtered, disinfected, and subjected to organics removal.

(mm) **Project Sponsor.** An agency or agencies that receives from a Regional Water Quality Control Board water reclamation requirements for a planned groundwater recharge project.

(nn) **Surface Spreading.** The controlled application of water to the ground surface for the purpose of replenishing groundwater used or suitable for use as a source of domestic water supply.

(oo) **Total Organic Carbon (TOC).** The oxidizable organic carbon present in the reclaimed water measured by the methods prepared and published jointly by the American Public Health Association, the American Water Works Association, and the Water Pollution Control Federation in Section 5310 of the 17th edition of Standard Methods for the Examination of Water and Wastewater and which are conducted in laboratories approved by the State Department of Health Services.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

ARTICLE 5.1. GROUNDWATER RECHARGE

~~Section 60320. Groundwater Recharge.~~

~~(a) Reclaimed water used for groundwater recharge of domestic water supply aquifers by surface spreading shall be at all times of a quality that fully protects public health. The State Department of Health Services' recommendations to the Regional Water Quality Control Boards for proposed groundwater recharge projects and for expansion of existing projects will be made on an individual case basis where the use of reclaimed water involves a potential risk to public health.~~

~~(b) The State Department of Health Services' recommendations will be based on all relevant aspects of each project, including the following factors: treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, and distance to withdrawal.~~

~~(c) The State Department of Health Services will hold a public hearing prior to making the final determination regarding the public health aspects of each groundwater recharge project. Final recommendations will be submitted to the Regional Water Quality Control Board in an expeditious manner.~~

Section 60320.01. Planned Groundwater Recharge Projects.

(a) This article shall apply only to planned groundwater recharge projects using reclaimed water. The creation or operation of recharge facilities to cause the infiltration or

injection of reclaimed water into a groundwater basin is evidence of a planned groundwater recharge project.

(b) A wastewater disposal project which is not designed for groundwater recharge, but which incidentally results in portions of the treated wastewater reaching groundwater or discharging to an ephemeral stream, is not covered by this article.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.02. Source Control.

All reclaimed water used for planned groundwater recharge projects shall be from a wastewater collection system operating under a comprehensive program for the control of discharge of toxic wastes from point sources, which is approved by the Regional Water Quality Control Board.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.03. Treatment Requirements and Performance Standards.

(a) Reclaimed water used for planned groundwater recharge projects shall comply with the following treatment requirements and treatment performance standards. Monitoring requirements and the basis for determining compliance with treatment performance standards are specified in Section 60320.06.

(1) Oxidized Wastewater.

Oxidized wastewater is required for all project categories. The oxidized wastewater prior to recharge shall not exceed 20 milligrams per liter (mg/L) total organic carbon (TOC), 30 mg/L suspended solids (SS), and 30 mg/L biochemical oxygen demand (BOD).

(2) Filtered Wastewater.

(A) Filtered wastewater is required for project categories I, II, and IV.

(B) The turbidity of the filtered wastewater prior to recharge shall not exceed an average of 2 turbidity units.

(C) The turbidity of the filtered wastewater prior to recharge shall not exceed 5 turbidity units more than 5 percent of the time during any 24-hour period.

(3) Disinfected Wastewater.

(A) Disinfected wastewater is required for all project categories.

(B) For project categories I, II, and IV, the median number of total coliform organisms in the disinfected wastewater shall not exceed 2.2 per 100 milliliters (mL). The number of total coliform organisms shall not exceed 23 per 100 mL in more than one sample within any 30-day period.

(C) For project category III, the median number of total coliform organisms in the disinfected wastewater shall not exceed 23 per 100 mL. The number of total coliform organisms shall not exceed 240 per 100 mL in more than one sample within any 30-day period.

(4) Organics Removal.

Reclaimed water used for project categories I and IV shall be subjected to organics removal. The TOC in the wastewater prior to recharge shall be reduced to the concentration specified in Table 1 as identified by the reclaimed water contribution to any affected domestic water supply well and by project category. The entire reclaimed water stream used for project category IV shall be subjected to organics removal.

Table 1. Maximum Allowable TOC after Organics Removal

Reclaimed Water Contribution (%)	Maximum TOC (mg/L)	
	Surface Spreading (Category I)	Direct Injection (Category IV)
0-20	20	5
21-25	16	4
26-30	12	3
31-35	10	3
36-45	8	2
46-50	6	2

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.04. Reclaimed Water Quality Requirements.

(a) The level of general physical characteristics, radioactivity, and the concentration of general mineral, inorganic chemicals (excepr nitrogen compounds), and organic chemicals in the reclaimed water prior to recharge shall not exceed the maximum contaminant levels specified in Chapter 15, Sections 64435, 64443, 64444.5, and 64473.

(b) The total nitrogen concentration of the reclaimed water shall not exceed a standard of 10 mg/L as nitrogen unless the project sponsor demonstrates that the standard can be consistently met prior to reaching the groundwater level.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.05. Recharge Site Requirements.

(a) Maximum Reclaimed Water Contribution.

(1) For project categories II and III, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 20 percent of the total flow.

(2) For project categories I and IV, all the water of reclaimed water origin extracted from any domestic water supply well shall not exceed 50 percent of the total flow.

(3) Calculation of the percent in section 60320.05(a)(1 and 2) shall be based upon the reclaimed water contribution of all planned groundwater recharge projects affecting the basin.

(b) Minimum Depth-To-Groundwater Requirement.

(1) Planned groundwater recharge projects using surface spreading shall meet the minimum depth-to-groundwater requirements specified in Table 2 by project category and initial percolative capacity.

(2) Planned groundwater recharge projects shall not be allowed where the initial percolative capacity exceeds 0.3 in/min.

(3) The initial percolative capacity shall be determined once by representative testing of the spreading area prior to the start of groundwater recharge and shall reflect conditions throughout the required depth to groundwater. The testing procedure and results shall be described in the engineering report submitted pursuant to Section 60320.07.

(A) For existing surface spreading basins using reclaimed water or other waters, the initial percolative capacity shall be determined at least 14 days after the basins which make up a spreading area have been drained and at least 24 hours after pre-recharge conditions have been restored in the bottom of the basin.

(B) For proposed surface spreading basins, the initial percolative capacity shall be determined in a prototype basin or basins.

Table 2. Minimum Required Depth-to-Groundwater for Surface Spreading Groundwater Recharge Projects

	Minimum Depth-to-Groundwater (ft)		
Initial Percolative Capacity (in/min)	Project Category		
	I	II	III
≤0.2	10	10	20
≤0.3	20	20	50

(c) Minimum Retention Time Underground and Horizontal Separation Requirements.

(1) Reclaimed water shall be retained underground a minimum of 6 months prior to being withdrawn at a domestic water supply well for project categories I and II.

(2) Reclaimed water shall be retained underground a minimum of 12 months prior to being withdrawn at a domestic water supply well for project categories III and IV.

(3) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic

water supply well shall be 500 feet for project categories I and II.

(4) The minimum horizontal separation between an area where reclaimed water is applied by surface spreading and a domestic water supply well shall be 1000 feet for project category III.

(5) The minimum horizontal separation between the point where reclaimed water is applied by direct injection and a domestic water supply well shall be 2000 feet for project category IV.

(6) The project sponsor shall prevent the use of groundwater for drinking water within the area required to achieve the minimum retention time and minimum horizontal separation pursuant to Section 60320.05 (c)(1-5).

(d) Monitoring Wells.

Monitoring wells shall be provided to detect the influence of the recharge operation. As a minimum, monitoring wells shall be located at points one-quarter and one-half of the distance (plus or minus 10%) from the recharge area to the nearest domestic water supply well. The number and location of the proposed monitoring wells shall be described in the engineering report submitted pursuant to Section 60320.07.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.06. Monitoring and Compliance.

(a) Treatment Performance Standards.

(1) Oxidized Wastewater. For all project categories, the BOD, SS, and TOC concentration of the oxidized wastewater shall be determined from 24-hour composite samples. Compliance with Section 60320.03(a)(1) shall be determined monthly for each constituent by averaging the results of all samples collected during the month and comparing the average to the standard in Section 60320.03(a)(1).

(A) The BOD samples for all project categories shall be collected at least weekly.

(B) The SS samples for all project categories shall be collected at least daily.

(C) The TOC samples for project categories II and III shall be collected at least daily.

(D) The TOC samples for project categories I and IV shall be collected at least weekly.

(2) Filtered Wastewater. For project categories I, II, and IV, the turbidity of the filtered wastewater shall be continuously measured and recorded.

(A) Turbidity measurements shall be read at least once every 4 hours. Compliance with the average operating turbidity pursuant to Section 60320.03(a)(2)(B) shall be

determined monthly by averaging the results of all turbidity samples read during the month and comparing the average to the turbidity standard in Section 60320.03(a)(2)(B).

(B) The turbidity record shall be read daily. Compliance with the high turbidity duration standard pursuant to Section 60320.03(a)(2)(C) shall be determined monthly by determining the highest percent of a day during the month that the filtered wastewater exceeded 5 turbidity units and comparing that percent to the standard in Section 60320.03(a)(2)(C).

(3) **Disinfected Wastewater.** For all project categories, bacteriological samples shall be collected and tested for coliform to monitor the performance of the disinfection process each day reclaimed water is produced for planned groundwater recharge projects. Compliance with the disinfected wastewater requirements pursuant to Section 60320.03(a)(3) shall be determined daily by determining the median coliform result of the last 7 days for which analyses have been completed and comparing that median to the appropriate coliform standard in Section 60320.03(a)(3).

(4) **Organics Removal.** For project categories I and IV the TOC concentration in the wastewater after the organics removal process shall be determined daily from 24-hour composite samples. Compliance with the organics removal requirement pursuant to Section 60320.03(a)(4) shall be determined daily

by averaging daily TOC concentrations for the last 90 days of operation and comparing that average to the appropriate maximum TOC concentration in Section 60320.03(a)(4).

(b) Reclaimed Water Quality.

(1) On a quarterly basis, grab or 24-hour composite samples of reclaimed water shall be collected and analyzed for the general mineral and general physical constituents listed in subsections 64433(1) and (2), for the inorganic chemicals (excepr nitrogen compounds) listed in Section 64435 (Table 2), and for gross alpha and gross beta. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64473 (Table 6), Section 64435 (Table 2), and Section 64443 (Table 4).

(2) On a quarterly basis, grab samples of reclaimed water shall be collected and analyzed for the organic chemicals in Table 5, Section 64444.5. Compliance with Section 60320.04(a) shall be determined annually by averaging the results of all samples collected during the previous 12 months and comparing the average to the standards in Section 64444.5 (Table 5).

(3) On a weekly basis, grab or 24-hour composite samples shall be collected and analyzed for total nitrogen. Compliance with Section 60320.04(b) shall be determined annually by averaging the results of all samples collected

during the previous 12 months and comparing the average to the total nitrogen standard in Section 60320.04(b).

(c) Recharge Site Requirements.

(1) Maximum Reclaimed Water Contribution.

(A) The reclaimed water contribution, pursuant to Sections 60320.03(a)(4) and 60320.05(a), shall be determined annually and at the domestic water supply well which receives the highest percentage of reclaimed water. The method used for the annual determination shall be described in the engineering report pursuant to Section 60320.07. Compliance with the maximum reclaimed water contribution shall be determined by averaging the last five annual determinations of reclaimed water contribution and comparing that average to the appropriate maximum percent contribution in Section 60320.05(a).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services that the maximum reclaimed water contribution pursuant to Section 60320.05(a) will not be exceeded.

(2) Minimum Depth-to-Groundwater Requirement.

(A) The depth-to-groundwater shall be measured every day reclaimed water is present in the spreading basin.

Compliance with Section 60320.05(b) shall be determined daily by averaging the previous 30 daily depth-to-groundwater measurements taken when reclaimed water was present in the spreading basin and comparing the result to the appropriate standard in Table 2.

(B) When the average depth-to-groundwater is less than the depth-to-groundwater requirement pursuant to Section 60320.05(b), the discharge of reclaimed water onto the spreading basin shall be halted until the depth-to-groundwater measurement exceeds the required depth-to-groundwater pursuant to Section 60320.05(b).

(C) The depth-to-groundwater shall be measured at at least one monitoring well located at each spreading basin. The location of this well shall be specified in the engineering report pursuant to Section 60320.07. The monitoring well shall be sited so that the groundwater level is measured at a point where it is closest to the bottom of the spreading basin.

(3) Minimum Retention Time Underground and Horizontal Separation Requirements.

(A) The retention time underground, pursuant to Section 60320.05(c), shall be determined annually and at the domestic water supply well in which the reclaimed water has the shortest retention time underground. The method used for the annual determination shall be described in the

engineering report pursuant to Section 60320.07. Compliance with the minimum retention time underground shall be determined by averaging the last five annual determinations of retention time and comparing that average to the appropriate retention time in Section 60320.05(c).

(B) The project sponsor shall demonstrate and document, once every five years, in a complete engineering report to the Regional Water Quality Control Board and Department of Health Services that the minimum retention time underground pursuant to Section 60320.05(c) will not be exceeded.

(C) Compliance with the horizontal separation requirement pursuant to Section 60320.05(c) for surface spreading and direct injection projects shall be determined by taking field measurements of the shortest distance between a point of recharge and a domestic water supply well. In no case shall the distance be less than the horizontal separation requirement pursuant to Section 60320.05(c).

(d) Monitoring Well Requirements.

Samples shall be collected from monitoring wells at least quarterly and analyzed for TOC and total nitrogen.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.07. Engineering Report.

(a) Any project sponsor proposing a groundwater recharge project using reclaimed water shall submit an engineering report on the proposed groundwater recharge project to the regulatory agency. The report shall be prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, in conjunction with a geologist, experienced in hydrogeology and registered in California.

(b) Groundwater recharge projects not in operation by January 1, 1993, shall not recharge reclaimed water until the project sponsor submits a complete engineering report to the Regional Water Quality Control Board and the Department of Health Services. For direct injection projects, the Department will not schedule a hearing pursuant to section 13540, Article 6, until a complete engineering report has been received by the Department.

(c) For existing groundwater recharge projects, project sponsors have five years from January 1, 1993 to submit a completed engineering report to the Regional Water Quality control Boards and Department of Health Services.

(d) For existing and proposed groundwater recharge projects, the engineering report shall consist of a thorough investigation and evaluation of the groundwater recharge project, impacts on the existing and potential uses of the impacted groundwater basin, and proposed means for achieving compliance with Sections

60320.01 to 60320.06. The engineering report shall include, but not be limited to the following:

(1) An engineering plan of the reclamation plant, transmission facilities, spreading basins/direct injections wells, and monitoring wells.

(2) A physical description of the proposed groundwater recharge project.

(3) A hydrogeologic study on the impacted groundwater basin. The study shall describe the impact of the recharge project on domestic groundwater sources. The study shall describe the source, area of recharge, quantity, quality, and groundwater flow patterns of all basin recharge waters. The study shall identify all quantities and sources of water used to determine the percent reclaimed water contribution. The study shall identify the aquifer zone in which the maximum allowed reclaimed water contribution is not met pursuant to Section 60320.05(a). The study shall identify the aquifer zone in which the provided organics removal is not sufficient for the reclaimed water contribution to the groundwater pursuant to Section 60320.03(a)(4). The study shall identify all wells that will be impacted by the proposed project and describe the groundwater quality in the impacted basin. The study shall identify the well(s) subject to the highest reclaimed water contribution and shortest reclaimed water retention time. The study shall also include quantitative

descriptions of the soil, soil layers, infiltration rates, aquifer transmissivity, groundwater movement, historic depth-to-groundwater, safe yield of the basin, and usable storage capacity of the basin.

(4) A description of the operational and management personnel, their qualifications, experience, and responsibilities.

(5) A description of how the project will be operated to comply with the recharge site requirements of maximum reclaimed water contribution, minimum depth-to-groundwater, horizontal separation, and retention time underground pursuant to Section 60320.05 (b and c).

(6) Identification of the agency responsible for preventing the use of groundwater for drinking water within certain areas pursuant to Section 60320.05 (c)(6), and the mechanism that will be used.

(7) A contingency plan for redirection of reclaimed water when treatment performance standards or depth-to-groundwater requirements are not met.

(8) A description of the methods of determination and results for initial percolative capacity, maximum reclaimed water contribution, minimum retention time underground, and horizontal separation.

(9) The number and location of monitoring wells in the spreading basin and groundwater basin.

(10) A plan for the monitoring well network to monitor groundwater flow and water quality in the impacted groundwater basin.

(11) A water quality monitoring plan for the treated wastewater, reclaimed water, and monitoring wells.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.08. Alternatives.

(a) Alternatives to the recharge site requirements specified in Section 60320.05 (b) and (c) (2, 4, and 5), or the treatment performance standards specified in Section 60320.03 (a)(1 to 4) may be allowed if the project sponsor demonstrates to the regulating agency that the proposed alternative reliably achieves an equal degree of public health protection. Alternatives may not be used to reduce the retention time below 6 months in Section 60320.05 (c)(2) or the horizontal separation below 500 feet in Section 60320.05 (c)(4 and 5). Alternatives to Sections 60320.01 to 60320.07, inclusive, shall not be allowed, unless the planned groundwater recharge projects meet the requirements of Section 60320.08 (b to e) or 60320.09

(b) Alternatives to achieve a disinfected and filtered wastewater pursuant to Section 60320.03(a)(2) and (a)(3)(B and C)

shall be accepted if the project sponsor demonstrates to the regulating agency that the alternatives reliably provide an equal degree of public health protection. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(c) Alternatives to the granular activated carbon or reverse osmosis treatment processes shall be accepted if the project sponsor demonstrates to the regulating agency that the organics removal treatment performance standards pursuant to Section 60320.03 (4) can be reliably met. Such a demonstration shall be based on the results from a prior equivalency demonstration, pilot-plant testing, or full-scale testing on an installation that is treating a wastewater with similar flow and wastewater quality characteristics as the wastewater proposed for treatment.

(d) The results of any alternative demonstration shall be presented in a complete report prepared and signed by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply. Such alternatives shall not be accepted until the Regional Water Quality Control Boards and the Department of Health Services have reviewed the reports.

(e) Within 60 days following the first full year of operation of any alternative approved by the regulating agency, the project

sponsor shall submit an report, prepared by an engineer registered in California and experienced in the fields of wastewater treatment and public water supply, describing the effectiveness of the plant operation. The report shall include results of all water quality tests performed and shall evaluate compliance with established performance standards under actual operating conditions. It shall also include an assessment of problems experienced, corrective actions needed, and a schedule for providing needed improvements.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

Section 60320.09. Research and Demonstration Projects.

The maximum percentage reclaimed water contribution in the total flow extracted from any domestic water supply well pursuant to Section 60320.05(a)(2) shall not apply to a project which the Department has designated as a research and demonstration project for the purpose of conducting special monitoring, treatment, health effects, or other research studies.

NOTE: Authority cited: Section 208, Health and Safety Code and Section 13521, Water Code. Reference: Section 13520, Water Code.

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Drinking Water Standards and Health Advisories Table

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105

DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

DECEMBER 1993

DRINKING WATER AND GROUNDWATER PROTECTION BRANCH

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REGION 9 DRINKING WATER STANDARDS AND HEALTH ADVISORIES TABLE

The USEPA Region 9 Drinking Water Standards and Health Advisories Table is a compendium of numerical standards, advisories and related information for chemicals and other contaminants which may be found in ground and surface waters. It provides a comprehensive listing of all current and proposed National Primary Drinking Water Regulations (NPDWRs), specific Maximum Contaminant Levels (MCLs) for California, Arizona and Hawaii, and California Drinking Water Action Levels. Where available, it includes USEPA Integrated Risk Information System (IRIS) cancer risk levels and oral reference dose (RfD) values, and USEPA Office of Ground Water and Drinking Water (OGWDW) Health Advisories for drinking water contaminants.

In order to make this table a manageable size, very few explanations or caveats for the values are included in the body of the table. Because of this, and the fact that background documentation and understanding of the derivation of specific values are critical to the proper use of this information, this table should not be used as a sole source of information for decision making. While the Appendix contains brief explanations of the different standards, criteria and advisories, consideration must be given to the context in which these numbers will be used. The appropriate reference materials should be consulted to determine the applicability of the number being considered. Some references are listed in the Appendix.

The values in this table are current to the publication date, but are subject to change. The user is advised to contact Bruce Macler, Regional Toxicologist, USEPA Region 9, at (415) 744-1884, if questions arise regarding current values.

INFORMATION IN THIS TABLE

The information for specific contaminants in this table is arranged by contaminant type. Inorganic chemicals are listed first, followed by radionuclides, organic chemicals, microbial contaminants and water quality factors.

For each contaminant, any applicable or proposed USEPA National Primary Drinking Water Regulation is listed. These include the enforceable **Maximum Contaminant Levels (MCLs)**, the health-based **Maximum Contaminant Level Goals (MCLGs)**, and the aesthetics-based **Secondary MCLs**. A given contaminant may have both a MCL and a Secondary MCL, as well as a MCLG. The regulatory status of these values is indicated. **Proposed MCLs or MCLGs** have been formally proposed by USEPA, but not promulgated. **Final MCLs or MCLGs** have been promulgated, but are not yet effective as of the

publication date. The effective date, if available, is indicated. **Current MCLs or MCLGs** are in effect.

In addition to regulatory information, health risk information is provided in the table. Data from IRIS for cancer and non-cancer health effects associated with drinking water contaminants is listed. The **RfD** is the daily oral intake (on a body weight basis) that is below the level USEPA believes to be without adverse, non-cancer health risks (i.e., zero risk). The IRIS **10^{-6} risk level** is that contaminant concentration (in ug/liter) in drinking water that might yield no greater than an additional risk of one-in-a-million (10^{-6}) after a lifetime of drinking that water. The USEPA OGWDW Health Advisories provide information on acceptably safe levels of exposures to contaminants in drinking water. The **Acute 10-day** values apply specifically to acute toxic effects on children, but should be protective for adults. The **chronic (lifetime)** values for non-cancer health effects should be protective of health even with a lifetime exposure. In most cases, this value will be the same as the MCLG, if one has been established. The chronic (lifetime) values for cancer are set at a level that should yield no greater than an additional 10^{-6} risk over a lifetime exposure. EPA **cancer weight of evidence** determinations are listed to provide additional information on EPA's judgement of carcinogenicity for each chemical. The weight of evidence classifications are as follows:

A known human carcinogen
B1 probable human carcinogen based on human data
B2 probable human carcinogen based on animal data
C possible human carcinogen based on animal data
D insufficient data to classify chemical
E not a human carcinogen

APPLICABILITY AND USES OF THIS TABLE

The different types of standards and advisories contained in this table are based upon approaches and assumptions that are specific to each and consequently may have varying applications depending on their derivation. Use of specific types of information should be guided by the relevant legal requirements and an understanding of the meaning of the information itself.

MCLs and treatment techniques are the only federally enforceable NPDWRs. They are set to be health protective as well as feasible. More stringent state-specific MCLs are enforceable in the indicated state. MCLGs are not enforceable, but provide health-based guidance for decision making. MCLGs for chemicals causing non-carcinogenic health effects are based on the RfD and set at a level believed to be safe. MCLGs for chemicals believed to be carcinogens are set at zero, from the perspective that no level of carcinogen is safe. Feasibility is not considered in setting MCLGs. Secondary MCLs are not enforceable, but provide information on aesthetics and palatability.

Health advisories and criteria are not formally promulgated in regulations and are subject to change as new data and analyses become available. MCLGs, values in IRIS and health advisories are developed by different offices and on different schedules. Therefore, values for similar effects from a given chemical may not be consistent throughout the table. The derivations of MCLGs and chronic (lifetime) health advisories for non-carcinogenic chemicals are based on the same assumptions regarding endpoints of toxicity. In theory, the MCLG and lifetime health advisory should be the same for a specific contaminant. Slight differences in the table are due to rounding of numbers.

When considering a value to use for determining an acceptable level of contaminant in drinking water, the MCL should be selected first. In the absence of existing or proposed MCLs, users may have to decide which criteria are most appropriate. USEPA recommends a priority ranking to first consider any proposed MCLG (if other than zero), followed by the IRIS RfD or cancer risk level, and finally the chronic health advisory values.

Under the **Superfund Program**, remdial actions must comply with the **Applicable or Relevant and Appropriate Requirements (ARARs)**. For actions involving contamination of drinking water supplies, the ARARs under the Safe Drinking Water Act are the MCLs. Where there are no MCLs, or where the MCLs are determined to be insufficiently protective because of multiple contaminants, reference should be made to Superfund guidance documents to determine clean-up policy. For remedial actions impacting aquatic organisms and waters regulated under the Clean Water Act, consult the National Ambient Water Quality Criteria (NAWQC).

SYMBOLS USED IN THE TABLE

mg/l = milligrams per liter, equivalent to parts per million (**ppm**)
ug/l = micrograms per liter, equivalent to parts per billion (ppb)

Note: values in table are in ug/l unless otherwise stated

IRIS = USEPA Integrated Risk Information System
RfD = Reference dose for daily oral ingestion in micrograms per kilogram body weight per day (ug/kg-d)
10^{-6} = one in a million excess lifetime cancer risk
TT = treatment technique, set in lieu of numeric MCL
+ = value from USEPA Final Draft Health Advisory
td = temperature dependent value
LOQ = Limit of quantification
T&O = taste and odor refers to a value based upon organoleptic data for controlling undersirable taste and odor qualities

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aluminum	Secondry	50-200								1000		
Ammonia							30,000		D			
Antimony	Current	6	6	0.4		15	3		D			
Arsenic	Current	50		0.3	0.02			0.02	A	50		50
Asbestos	Current	7E+6 long fi	7E+6 bers						A			
Barium	Current	2,000	2,000	70			2,000+		D	1,000		1000
Beryllium	Current	4	4	5	.008	30,000		0.008	B2			
Boron				90		900	600		D			
admium	Current	5	5	.5		40+	5+		D	10		10
Chloramine				100		1000	2600		D			
Chlorate									D			
Chloride	Secondry	250ppm										
Chlorine									D			
Chlorine Dioxide				3			80		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorite												
Chromium(Total)	Current	100	100	5		1,000+	100+		D	50		50
Copper	Current Secondry	TT## 1,000	1,300						D			
Cyanide	Current	200	200	22		200+	200+		D			
Fluoride	Current Proposed secondry	4,000 2,000	4,000	120					D	1400- 2400td		
Iron	Secondry	300										
Lead	Current	TT#	0						B2	50		
Manganese	Secondry	50		140								
Mercury (inorganic)	Current	2	2	0.3			2+		D	2		
Molybdenum				5		80	35		D			
Nickel	Current	100	100	20		1,000+	100+		D			
Nitrate (as N)	Current	10ppm	10ppm	1600		10,000+***			D	45ppm as NO3		10ppm (as N)
Nitrite (as N)	Current	1,000	1,000	160		1,000+***			D			
Selenium	Current	50	50	5						10		50

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
- Treatment technique triggered at Action Level of 1300 ppb
td - td- temperature dependent value
- Treatment technique and public notification triggered at Action Level of 15 ppb
*** - 10-day HA for nitrate/nitrite for 4kg child (protective of 10kg child & adults); also used for chronic (lifetime)

INORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Silver	Secondry	100		5		200	100		D	50		50
Strontium				600		25,000	17,000		D			
Sulfate	Secondry	250 ppm										
Thalium	Current	2	0.5	0.07		7	0.4					
Vanadium				7					D			
Zinc	Secondry	5,000		300		6,000	2,000		D			5,000
Acrylonitrile					0.06	20+		0.06+	B1			10
RADIONUCLIDES												
Gross Alpha, excl. Uranium & Radon	Current	15pCi/l						.15pCi/l	A	15pCi/l		
Gross Beta	Current	4mrem per yr						0.04mrem per year	A	50pCi/l		
Radium 226	Current Proposed	5 pCi/l (+228) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radium 228	Current Proposed	5 pCi/l (+226) 20pCi/l	 0					.22-.26 pCi/l	A	5 pCi/l (+Ra 22		
Radon	Proposed	300 pCi/l	0					1.5pCi/l	A			
Strontium 90									A	8pCi/l		

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RADIONUCLIDES Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Tritium									A	20nCi/l		
Uranium	Proposed	20 ppb	0					0.7 ppb	A	20pCi/l		35pCi/l
ORGANIC												
Acenaphthylene (acenapthene)				60								
Acephate				4					C			
Acetone				100					D			
Acetophenone				100								
Acifluorfen				13	1.0	2,000+		1.0+	B2			
Acrolein									C			320
Acrylamide	Current	TT	0	0.2	.01	30+		0.01+	B2			
Adipates (di(ethylhexyl)-adipate)	Current	400	400	600	0.03	20,000	400	0.03	C			
Alachlor	Current	2	0	10	0.4	100+		0.4+	B2		LOQ (.2)	0.2
Aldicarb	Final(a)	3	1	1.0			7+		D		10	9
Aldicarb Sulfone	Final(a)	2	1	1.0			7+		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
a - Effective date postponed

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Aldicarb Sulfoxide	Final(a)	4	1	1.0			7+		D			
Aldrin				0.03	.002	0.3		0.002	B2		LOQ (0.05)	
Allyl alcohol				5								
Ametryn				9		9,000+	60+		D			
Ammonium Sulfamate				280		20,000+	2,000+		D			
Anthracene (PAH)				300					D			
Atrazine	Current	3	3	35	0.16	100+	3+		C	3		(HI 3)
Baygon (Propoxur)				4		40+	3+		C		90	
Benefin				300								
Bentazon (Basagran)				2.5		300+	20+		D	18		
Benzene	Current	5	0		1	200+		1.0+	A	1		5
Benzene hexachloride α, β isomers (BHC)											0.7 α 0.3 β	
Benz(a)anthracene (PAH)	Proposed	0.1	0						B2			
Benzo(a)pyrene (PAH)	Current	0.2	0						B2			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Benzo(b)fluoranthene (PAH)	Proposed	0.2	0						B2			
Bolero (thiobencarb)										70		
Bromacil				130		5,000+	90+		C			
Bromochloromethane				13		1,000	90					
Bromodichloro-methane (THM)	Current	100 @		20	0.6	7,000+		0.6	B2			
Bromoform (THM)	Current	100 @		20	4	2,000		4	B2			
Bromomethane (Methyl Bromide)				1		100+	10+		D			2.5
Butyl benzyl-phthlate (PAE)	Proposed	100	0	200					C			
Butylate				50		2,000+	350+		D			
Captafol				2	4				C			
Captan				130					B2		350	
Carbaryl				100		1,000+	700+		D		60	
Carbofuran	Current	40	40	5		50+	40+		E	18		36
Carbon Disulfide				100								830

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Carbon Tetrachloride	Current	5	0	0.7	0.3	200+		0.3+	B2	0.5		5
Carboxin				100		1,000+	700+		D			
Chloral Hydrate				0.2		1,400	60		D			
Chloramben				15		3,000+	100+		D			
Chlordane	Current	2	0	0.06	0.03	60+		0.03+	B2	0.1		
2,4-Dinitrotoluene				2	50	500		50	B2			
Chlorobenzene (Monochlorobenzene)	Current	100	100	20		2,000+	100+		D	30		
Chlorodibromomethane (THM)	Current	100 @		20		7,000	60		C			
Chloroform (trichloromethane) (THM)	Current	100 @		10	6	4,000		6.0	B2			
bis-2-Chloroisopropyl ether				40		4,000+	300+		D			
Chloromethane				4		400	3		C			
2-Chlorophenol				5		50	40		D			
Chloropicrin											50(37 T&O)	
Chlorothalonil				15	1.5	200+		1.5+	B2			

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ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Chlorotoluene(o,p)				20		2,000+	100+		D			
CIPC (Chlorpropham) (isopropylN(3chloro-phenyl) carbamate)				200							350	
Chlorpyrifos				3		30+	20+		D			
Cresol(o,m)				500					C			
Cyanazine				2		100+	1		C			
DDT				0.5	0.1				B2			
Dalapon	Current	200	200	26		3,000+	200+		D			
DCPA (Dacthal)				500		80,000+	4,000+		D			
Di(ethylhexyl)-adipate (Adipates)	Current	400	400	600	0.03	20,000	400+	0.03	C			
Diazinon				0.09		20+	0.6+		E		14	
Dibromochloro-methane (THM)	Current	100 @		20		7,000	60		C			
1,2-Dibromo-3-chloro propane (DBCP)	Current	0.2	0		0.03	50+		0.03	B2	0.2		(HI.04)
Dibutyl phthalate (PAE)				100					D			
Dicamba				30		300+	200+		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Dichloroacetic Acid				8		50,000+			B2			
Dichloroacetonitrile				8		1000+	6+		C			
1,2-Dichlorobenzene (o-Dichlorobenzene)	Current Proposed secondry	600 10	600	90		9,000+	600+		D		130 *** (10T&O)	
1,3-Dichlorobenzene (m-Dichlorobenzene)	Current	600	600	90		9,000+	600+		D		130 *** (20T&O)	
1,4-Dichlorobenzene (p-Dichlorobenzene)	Current Proposed secondry	75 5	75	100		10,000+	75+		C	5		750
Dichlorodifluoro-methane (Freon 12)				200		40,000+	1,000+		D			1.0
1,1-Dichloroethane										5		
1,2-Dichloroethane	Current	5	0		0.4	700+		0.4	B2	0.5		5.0
1-Dichloroethylene	Current	7	7	9		1,000+	7+		C	6		7.0
cis-1,2-Dichloro-ethylene	Current	70	70	10		3,000+	70+		D	6		
trans-1,2-Dichloro-ethylene	Current	100	100	20		2,000+	100+		D	10		
Dichloromethane (Methylene chloride)	Current	5	0	60		2,000+		5+	B2		40	
2,4-Dichlorophenol				3		30+	20+		D			
2,4-Dichlorophenoxy -acetic acid (2,4-D)	Current	70	70	10		300+	70+		D	100		100

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*** - Action Level is for a single isomer or sum isomers

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,2-Dichloropropane	Current	5	0		0.5	90+		0.5+	B2	5		
1,3-Dichloropropene				0.3	0.2	30+		0.2+	B2	0.5		
Dieldrin				0.05	.002	0.5+		0.002+	B2		LOQ-(0.05)	
Diethylphthalate (PAE)				800			5000+		D			
Diisopropylmethyl-phosphonate				80		8,000+	600+		D			
Dimethoate				0.2							140	
Dimethrin				300		10,000+	2,000+		D			
Dimethylaniline				20	0.05				C			
2,4-Dimethylphenol				200							400 (T&O)	
2,6-Dinitrotoluene				1.0	50 (tg)	400		50 (tg)	B2 (TG)			
1,3 Dinitrobenzene				0.1		40	1		D			
Dinoseb	Current	7	7	1		300+	7+		D			
1,4-Dioxane (p-Dioxane)					7	400+		7+	B2			
Dioxin (2,3,7,8-TCDD)	Current	3E-5	0	1E-6	2E-7	1E-4		2E-7+	B2			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
tg - technical grade dinitrotoluene only

ORGANIC Chemicals	EPA Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Diphenamid(e)				30		300+	200+		D		40	
Di(ethylhexyl)-phthalate (PAE) (Phthalates)	Current	6	0	20	3			3+	B2	4		
Diquat	Current	20	20	2.2			20+		D			
Disulfoton				0.04		10+	0.3+		E			
Diuron				2		1,000+	10+		D			
Endothall	Current	100	100	20		800+	100+		D			
Endrin	Current	2	2	0.3		20+	2+		D	.2		0.2
Epichlorohydrin	Current	TT	0	2	4	100+		4	B2			
hion				0.5							35	
Ethylbenzene	Current Proposed secondry	700 30	700	100		3,000+	700+		D	680		
Ethylene Dibromide (dibromoethane) (EDB)	Current	0.05	0		4E-4	8		0.0004	B2	0.02		(HI.04)
Ethylene Glycol				2,000		6,000+	7,000+		D			
Ethylene Thiourea (ETU)				0.08	0.3	300+		0.3	B2			
Fenamiphos				0.25		9+	2+		D			

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Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
HI - State of Hawaii MCL

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Fluometuron				13		2,000+	90+		D			
Fluorotrichloro-methane				300		7,000+	2,000+		D			
Folpet				100					B2			
Fonofos				2		20+	10+		D			
Formaldehyde				150		5,000+	1,000+		B1		30	
Glycidaldehyde				4					B2			
Glyphosate	Current	700	700	100		20,000+	700+		D	700		
HMX				50		5,000+	400+		D			
Heptachlor	Current	0.4	0	0.5	.008	10+		0.008+	B2	0.01		
Heptachlor epoxide	Current	0.2	0	0.013	.004			0.004	B2	0.01		
Hexachlorobenzene (Perchlorobenzene) (HCB)	Current	1	0	0.8	0.02	50+		0.02+	B2			
Hexachlorobutadiene				2		300+	1+		C			
Hexachlorocyclo-pentadiene (HEX)	Current Proposed secondry	50 8	50	7					D			
n-Hexane						4,000+			D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Hexazinone				33		3,000+	200+		D			
Isophorone				200		15,000+	100+		C			
Lindane (gamma-HCCH) (gamma-BHC)	Current	0.2	0.2	0.3		1,000+	0.2+	0.03	C	4		
Linuron				2					C			
MCPA				1.5		100+	11+		E			
Malathion				20		200+	200+		D		160	
Maleic Hydrazide				500		10,000+	4,000+		D			
Cresol(p)				5					C			
erphos				0.3								
Methomyl (Lannate)				25		300+	200+		D			
Methoxychlor	Current	40	40	5		50	40		D	100		
Methylene Chloride (Dichloromethane)	Current	5	0	60	5	2,000+		5+	B2		40	
Methyl ethyl ketone (MEK,2-Butanone)				600					D			
Methyl Parathion				.25		300+	2+		D		30	

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona
Methyl t-butyl ether				5		3,000+	40+		D			
Metolachlor				150		2,000+	100+		C			
Metribuzin				25		5,000+	200+		D			
Mirex				0.2	.02				B2			
Molinate				2						20		
Naphthalene				4		500+	20+		D			
Nitroguanidine				100		10,000+	700+		D			
Oxamyl (Vydate)	Current	200	200	25		200+	200+		E			
Paraquat				4.5		100+	30+		E			
Parathion (Ethyl Parathion)				6					C		30	
Pentachloronitro-benzene (Terrachlor)				3	0.1				C		0.9	
Pentachlorophenol	Current	1	0	30	0.3	300+		0.3	B2		30	
Phenol				600		6,000+	4,000+		D		5(T&O) Cl2Syst	
Phthalates (di(ethylhexyl)-phthalate)	Current	6	0	20	3			3+	B2	4		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Picloram	Current	500	500	70		20,000+	500+		D			
Polychlorinated Biphenyls (PCBs)	Current	0.5	0		.005			0.005	B2			
Polynuclear Aromatic Hydrocarbons (PAHs) (benzo(a)pyrene)	Current	0.2	0						B2			
Prometon				15		200+	100+		D			
Pronamide				75		800+	50+		C			
Propachlor				13		500+	90+		D			
Propazine				20		1,000+	10+		C			
Propham				20		5,000+	100+		D			
ɔx				3	0.3	100+	2+	.3	C			
Simazine	Current	4	4	5		70	4+		C	10		
Styrene	Current Proposed secondry	100 10	100	200		2,000+	100+		C			
Tebutiuron				70		3,000+	500+		D			
Terbacil				13		300+	90+		E			
Terbufos				.13		5+	0.9+		D			

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
Terrachlor (pentachloro-nitrobenzene)				3	0.1				C		0.9	
1,1,1,2-Tetrachloro-ethane				30	1	2,000+	70+	1+	C			
1,1,2,2-Tetrachloro-ethane									C	1		
Tetrachloroethylene (Perchloroethylene)	Current	5	0	10	0.7	2,000+		0.7+	B2	5		
2,3,7,8-Tetrachloro-dibenzo-p-dioxin (Dioxin)	Current	3E-5	0	1E-6	2E-7	1E-4+		2E-7+	B2			
Thiobencarb										70		
Toluene	Current Proposed secondry	1,000 40	1,000	200		2,000+	1,000+		D		100	
Toxaphene	Current	3	0	100	0.03	40+		0.03+	B2	5		5
Tribromomethane (Bromoform)(THM)	Current	100 @		20	4	2,000+		4	B2			
1,1,2-Trichloro-1,2, 2-Trifluoroethane (Freon 113)										1200		
Trichloroacetic acid				40		2000	1000		C			
1,2,4-Trichloro-benzene	Current	70	70	10		100+	70		D			
1,3,5-Trichloro-benzene				6		600+	40+		D			
1,1,1-Trichloro-ethane	Current	200	200	35		40,000+	200+		D	200		200

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform

ORGANIC Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
1,1,2-Trichloro-ethane	Current	5	3	4		400+	3+		C	32		
Trichloroethylene	Current	5	0		3			3	B2	5		5
Trichlorofluoro-methane (Freon 11)				700						150	150	
2,4,6-Trichloro-phenol					3			3	B2			
2,4,5,-Trichloro-phenoxyacetic acid (2,4,5-T)				10		800+	70+		D			
2,4,5 Trichlorphen-oxypropionic acid (2,4,5-TP) (Silvex)	Current	50	50	7.5		200+	50+		D	10		10
1,2,3-Trichloro-propane				6		600+	40+		B2			(HI .8)
Trifluralin				7.5		80+	5+	5+	C			
ihalomethanes (THM) (See Chloroform)	Current	100 @							B2	100		
Trinitroglycerol						5	5					
Trinitrotoluene				0.5	1	20	2	1	C			
Trithion											7	
Vinyl Chloride	Current	2	0		.015	3,000+		0.015+	A	0.5		
Xylenes- sum of isomers	Current Proposed secondry	10ppm 20	10ppm	2000		40,000+	10,000+		D	1750		

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
HI - State of Hawaii MCL
@ - Total Trihalomethanes MCL includes 4 compounds: chloroform, bromodichloromethane, dibromochlormethane, bromoform
TT - Treatment technique in lieu of numeric MCL

MICROB.-TURBIDITY Chemicals	Standard	EPA MCL	EPA MCLG	IRIS RfD µg/kg-d	IRIS 10^{-6} Risk	Health Advisories Acute 10 Day	Health Advisories Chronic(lifetime) Non-Cancer	Health Advisories Chronic(lifetime) Cancer	Wt. of Evid.	California MCL	California Action Level	Arizona MCL
MICROB.-TURBIDITY												
Giardia Lamblia	Current	TT	0									
Heterotrophic Plate Count	Current	TT β	NA									
Legionella	Current	TT β	0									
Total Coliforms	Current	P/A ∞∞	0									
Turbidity	Current	1/5 NTU	NA									
Viruses	Current	TT β	0									
WATER QLTY.-SECONDARY MAX.CONT.LEV												
Color	Secondry	15color units										
Corrosivity	Secondry	Noncor-rosive										
Foaming Agents	Secondry	500										
Odor (Odor threshold)	Secondry	3.0 OT#										
Total Dissolved Solids (TDS)	Secondry	500 ppm										
pH	Secondry	6.5-8.5										

Values are indicated in micro grams per liter (µg/l) [equivalent to parts per billion (ppb)] unless otherwise stated

Oral Referenced Doses (RfD) are in micrograms per kilogram per day (µg/kg-d), 10^{-6} risk levels are in micrograms per liter.
TT - Treatment technique in lieu of numeric MCL
β - Surface waters and groundwater under the direct influence of surface water only.
∞∞ - P/A - MCL is based on the presence/absence of total coliforms
∂ - 1 NTU Monthly average, 5 NTU two-day consecutive average
- Odor Threshold Numbers

TABLE 2

PRIORITY LIST OF CONTAMINANTS WHICH MAY REQUIRE REGULATION UNDER THE SDWA (1991 VERSION)

Microorganisms

Cryptosporidium

Inorganics

Aluminum
Boron
Chloramines
Chlorate
Chlorine
Chlorine dioxide
Chlorite
Cyanogen chloride
Hypochlorite ion
Manganese
Molybdenum
Strontium
Vanadium
Zinc

Pesticides

Asulan
Bentazon
Bromacil
Cyanazine
Cyromazine
DCPA (and acid metabolites)
Dicamba
Ethylenethiourea
Fomesafen
Latofen/Acifluorfen
Metalaxyl
Methomyl
Metolachlor
Metribuzin
Parathion degradation product (4-nitrophenol)
Prometon
2,4,5-T
Thiodicarb
Trifluralin

Synthetic Organic Chemicals

Acrylonitrile
Bromobenzene
Bromochloroacetonitrile
Bromodichloromethane
Bromoform
Bromomethane
Chloroethane
Chloroform
Chloromethane
Chloropicrin
o-Chlorotoluene
p-Chlorotoluene
Dibromoacetonitrile
Dibromochloromethane
Dibromomethane
Dichloroacetonitrile
1,3-Dichlorobenzene
Dichlorodifluoromethane
1,1-Dichloroethane
2,2-Dichloropropane
1,3-Dichloropropane
1,1-Dichloropropene
1,3-Dichloropropene
2,4-Dinitrophenol

Synthetic Organic Chemicals (con't)

2,4-Dinitrotoluene
2,6-Dinitrotoluene
1,2-Diphenylhydrazine
Fluorotrichloromethane
Hexachlorodutadiene
Hexachloroethane
Isophorone
Methyl ethyl ketone
Methyl isobutyl ketone
Methyl t-butyl ether
Naphthalene
Nitrobenzene
1,1,1,2-Tetrachloroethane
1,1,2,2-Tetrachloroethane
Tetrahydrofuran
Trichloroacetonitrile
1,2,3-Trichloropropane

Chlorination/ chloramination byproducts (misc.): haloacetic acids, haloketones, chloral hydrate, 3-chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (MX-2), N-organochloramines

Ozonation byproducts: aldehydes, epoxides, peroxides, nitrosamines, bromate, iodate

APPENDIX

DESCRIPTION OF STANDARDS AND ADVISORIES

Authority

Under the authority of the Safe Drinking Water Act (SDWA, Public Law 93-523), the USEPA is mandated to establish National Primary Drinking Water Regulations for contaminants occurring in drinking water. Primary NPDWRs are established and enforced to protect the public from adverse health effects resulting from a drinking water contaminant. Included in these regulations are the drinking water standards which set either 1) treatment techniques to control a contaminant, or 2) the Maximum Contaminant Level (MCL) allowable for the contaminant in drinking water. An MCL is set when an appropriate method of detection for the contaminant exists. A treatment technique approach is used when it is not possible to quantify the contaminant at the level necessary to protect public health. Secondary standards are established based on non-health related aesthetic qualities of appearance, taste and odor. These secondary standards are not federally enforceable.

States may choose to accept responsibility (Primacy Status) for the oversight and enforcement of US drinking water regulations. States which have primacy status from USEPA must adopt State drinking water standards that are at least as stringent as federal standards. A state may choose to enforce secondary standards as well as primary standards.

USEPA Maximum Contaminant Level Goals (MCLGs)

MCLGs are developed by the Office of Science and Technology in the USEPA Office of Water as a required first step toward promulgation of NPDWRs. MCLGs are non-enforceable health goals which are to be set at levels at which no known or anticipated adverse effects on the health of persons occur, and which allow for an adequate margin of safety. Prior to the SDWA Amendments of 1986, these levels were called Recommended Maximum Contaminant Levels (RMCLs). MCLGs are strictly health-based levels and are derived from relevant toxicological data.

For chemicals that produce adverse health effects and are not believed to be carcinogenic (non-carcinogens), the MCLG is based on the Reference Dose (RfD). A RfD is calculated from toxicological data to represent a contaminant level that should be without risk of adverse health effects even with a lifetime exposure. USEPA assumes that a threshold exists for non-cancer health effects from chemical contaminants, below which the effect will not occur. Thus the MCLG will be a non-zero number. The RfD, which is based on the

total daily amount of contaminant taken up by a person on a body weight basis, is converted to a Drinking Water Equivalent Level (DWEL) concentration and adjusted for the percentage contribution of other sources (relative source contribution, RSC) of the contaminant besides drinking water (air, food, etc) to arrive at the MCLG. This calculation assumes a lifetime consumption of 2 liters of drinking water per day by a 70 kg adult. Unless otherwise noted, the RSC from drinking water for organic and inorganic compounds is respectively 20% and 10%.

USEPA assumes that no threshold exists for cancer and thus, there is no absolutely safe level of contamination. For chemicals that are known (Group A) or probable (Group B) human carcinogens, USEPA policy directs that the MCLG be set at zero, in accordance with a recommendation by the US Congress. For contaminants believed to be possible human carcinogens (Group C), the MCLG may be derived based on relevant non-cancer health effects as described above. In this case, the RfD is divided by an additional uncertainty factor of 10. In some cases, Group C chemicals will have MCLGs set based on calculated maximum lifetime cancer risks of between 1/10,000 and 1/million.

Maximum Contaminant Levels (MCLs)

MCLs are federally enforceable limits for contaminants in drinking water established as NPDWRs. The MCL for a given contaminant is set as close to the corresponding MCLG as is feasible. "Feasible" is defined in the 1986 SDWA Amendments as "feasible with the use of the best technology, treatment techniques and other means which the Administrator finds, after examination for efficacy under field conditions and not solely under laboratory conditions, are available (taking cost into consideration)." To promulgate a MCL for a contaminant requires that a method of detection for that contaminant is available suitable for the level desired and a Best Available Technology is identified that can feasibly remove the contaminant to the desired level.

Secondary Maximum Contaminant Levels

Secondary MCLs are established under the SDWA to protect the public welfare. Such regulations apply to contaminants in drinking water that adversely affect its odor, taste or appearance and consequently cause a substantial number of persons to discontinue its use. Secondary MCLs are not based on direct adverse health effects associated with the contaminant, although some contaminants may have both a MCL and a SMCL. SMCLs are considered as desirable goals and are not fereally enforceable. However, states may choose to promulgate and enforce SMCLs at the state level.

Health Advisories

Health Advisories (HAs) for drinking water contaminants are levels considered to be without appreciable health risk for specific durations of exposure. HAs should be considered guidance and are not enforceable drinking water standards. HAs were previously know as Suggested No Adverse Response Levels (SNARLs).

USEPA HAs are developed and published initially as External Review Drafts, and then as a Final Draft. This designation indicates that the HA will be always subject to change as additional information becomes available. HAs are developed for one-day, 10-day, longer-term (approximately 7 years) and lifetime (70 year) exposures based on data describing non-carcinogenic health effects resulting from the contaminant. One-day and 10-day HAs use parameters which reflect exposures and effects for a 10 kg child consuming 1 liter of water per day. Lifetime HAs consider a 70 kg adult consuming 2 liters of water per day. Longer-term HAs can incorporate either child or adult parameters. A relative source contribution from water is also factored into the lifetime HA calculation to account for exposures from other sources (air, food, soil, etc) of the contaminant.

For known or probably human carcinogens, the lifetime HA level is based on an upper-bound excess lifetime cancer risk of 1/million. This means that **USEPA considers that the risk from a lifetime consumption of water at the given level is unlikely to be greater than 1/million, is most likely substantially less and may be zero.**

Reference Dose (RfD) and Drinking Water Equivalent Level (DWEL)

The RfD is a daily exposure level which is believed to be without appreciable health risk to humans over a lifetime. The RfD is usually derived from an experimental "no observed adverse effect level" (NOAEL), identified as the highest dose in the most relevant study that did not result in a known adverse effect. The NOAEL is divided by various uncertainty factors to derive the RfD. These uncertainty factors account for the variation in human response, extrapolation to human responses if animal experiments were used, data quality and relevance. The RfD takes the form of dose ingested per unit body weight per day (ug/kg-d).

The DWEL is the conversion of the RfD into an equivalen water concentration. It assumes that a 70 kg adult consumes two liters of water per day and that the total dose to a person results solely from drinking water. It is important to remember that actual exposures in the environment may occur through other routes, such as inhalation or dermal contact, or from other sources, such as from food or soil.

California Action Levels

California Department of Health Services Action Levels are health-based criteria derived much in the same way as EPA Health Advisories. Specific approaches to determining cancer risks and exposure assumptions may differ in some ways from those used by USEPA. California Action Levels are not enforceable drinking water standards, but are levels at which CA DOHS strongly urges water purveyors to take corrective action to reduce the level of contamination in the water they supply. Action Levels cease to exist when CA State MCLS are promulgated.

Integrated Risk Information System (IRIS)

IRIS is an EPA catalogue of Agency risk assessment and risk management information for chemical substances. It is available electronically in several formats. The risk assessment information contained in IRIS, unless specifically noted, has been reviewed and agreed upon by intra-agency work groups and represents Agency consensus. Chemical contaminants listed in IRIS may have descriptions of relevant toxicological experiments and risk assessment approaches used in the determination of RfDs, cancer risks and health advisories. Extensive bibliographies are included. Regulations and regulatory status for different media may be presented.

REFERENCES

EPA MCLs: Code of Federal Regulations, Title 40, Part 141.

EPA Final Rule and Proposed Rule, Fluoride: Federal Register Vol. 50, No. 220, November 14, 1985.

EPA Final Rule and Proposed Rule, Volatile Synthetic Organic Chemicals: Federal Register Vol. 50, No. 219, November 13, 1985.

EPA Final Rule, Fluoride National Primary and Secondary Drinking Water Regulations: Federal Register Vol. 51, No. 63, April 2, 1986.

EPA Final Rule, Volatile Organic Chemicals Drinking Water Regulations: Federal Register Vol. 52, No. 130, July 8, 1987.

EPA Proposed Rule, National Primary and Secondary Drinking Water Regulations; Synthetic Organic Chemicals and Inorganc Chemicals Federal Register, Vol. 55, No. 143, July 25, 1990.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 20, January 30, 1991.

EPA Final Rule, Maximum Contaminant Level Goals and National Primary Drinking Water Regulations for Lead and Copper; Federal Register, Vol. 56, No. 110, June 7, 1991.

EPA Final Rule, National Primary Drinking Water Regulations; Federal Register, Vol. 56, No. 126, July 1, 1991.

NAS Health Advisories: Drinking Water and Health, National Academy Press, Volumes 1 (1977), 3 (1980), 4 (1982), 5 (1983), 6 (1986), and 7 (1988).

EPA Health Advisories: are from the EPA Office of Drinking Water. These are published and are available from the National Technical Information Service (NTIS).

IRIS, Integrated Risk Information System, EPA, Office of Health and Environmental Assessment, Office of Research and Development, Washington, D.C. 20460.

Arizona Department of Health Services, Office of Risk Assessment and Investigation, 3008 N. 3rd Street, Phoenix, Arizona 85012.

California Department of Health Services, Office of Drinking Water, 2151 Berkeley Way, Berkeley, CA 94704.

APPENDIX B

TABLE B-1
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
T2S/3W 31N1	1955 - 1983			21	4	metals, organics
31R1	1957 - 1963			12		
_36E1	1949			1		
T2S/4W 36R1	1956 - 1960			2		
T3S/2W 7R	1985 - 1993	1	1	1		
7P1	1953 - 1967			29		
_8E1	1973			1		
18R1	1963 - 1973			3		
18R2	1973 - 1992			2		
21A1	1969			1		
21A2	1973			1		
21B1	1963			1		
21C1	1949			1		
26L1	1973			1		
26M1	1963 - 1973			3		
27G1	1963 - 1993	1	1	4		
28L	1992	1	1			
28Q1	1975 - 1992	1	1	2		
29R1	1952			1		
30C1	1963			1		
32C1	1967			1		
32G1	1959 - 1964			2		
32R1	1963 - 1965			2		
33A	1967			1		
34E	1992	1	1			
34M	1967			2		
34Q	1967			1		
34Q1	1967			1		
35M	1967 - 1992			2		
35M1	1965 - 1967			2		
35Q2	1973			2		
32E	1985			1		
32D1	1985			1		
T3S/3W 2H1						
2L1	1973			1		
2L2	1973 - 1991	2	2	2	2	metals, pesticides
6D	1970 - 1985			6		
6D2	1991			2	2	metals
6M1	1967 - 1970			2		
6N3	1967 - 1983			6	1	metals
7F1	1968			1		
7Q1	1977	1				
12K1	1973 - 1991	1		10		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
18A1	1977			1		
20A	1958 - 1960			2		
20G2	1977	1				
21A1	1977	1				
21A2	1965 - 1977			3		
21C	1958			1		
21C1	1950 - 1977	1		5		
22D1	1960 - 1976			9		
22D	1977	1				
_29E1	1958 - 1978	1		21		
29M1	1953 - 1983			24		
30H1	1977	1		1		
30J1	1977	1		1		
30Q1	1977	1		1		
31B1	1993	1	1			
32M1	1958 - 1959			1		
T3S/4W1J1	1974 - 1982			5		
4W10	1981 - 1983			3		
4W10	1981 - 1983				3	metals
24C1	1976 - 1982			2		
24D1	1976 - 1983			3		
24D2	1976 - 1983			3	1	pesticides
T4S/2W 2C	1953 - 1973			6		
2D1	1963 - 1967			2		
2D2	1965			1		
2K1	1973			1		
2N2	1949			1		
3P	1967			1		
7J	1991	1	1			
7P	1992	1	1			
7Q	1991	1	1			
8B	1991	1	1			
_8E1	1967			1		
8G	1993	1	1			
8Q	1967			1		
8R	1967 1993		1	1		
8K	1993		1			
8Q	1993		1			
9M1	1973 - 1979			8		
10A	1993	1	1			
10A1	1975 - 1993	1	1	1		
10B1	1975			1		

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
10C1	1963 - 1967			2		
10E	1964 - 1993		1	2		
11B1	1964 - 1974			10		
11B2	1972 - 1974			4		
11C1	1963 - 1979			19		
11C2	1993	1	1			
11D1		1	1			
_11E1	1964			1		
_11E2	1963 - 1967			3		
11F	1964			1		
11F1	1972			1		
12N	1967			1		
12N1	1958			1		
17D2	1965 1976			16		
18A1	1965 1989		1	18		
18B1	1965 1989			13		
18D	1990	1	1			
18D1	1977	1				
18G1	1987		1			
18G3	1939 1979			13		
24H1	1957 1984		1	13	2	metals
24J1	1972 1973			2		
27H2	1974 1979			9		
_36E1	1993	1	1			
36J1	1954 1958			7		
36J2	1963			1		
36M	1985			1		
36N	1983 1991				2	bacteriological
T4S/3W 6A3	1975 - 1981	1		3		
6C	1991			3	1	organics
6C1	1994	1	1			
6C2	1975 - 1977	1		2		
6F1	1977	1		1		
6H1	1970 - 1979			6	2	pesticides
6H2	1973 - 1983			5		
6Q1	1954 - 1993	2	1	32	1	organics
6Q2	1986				2	organics
6Q3	1967 - 1988			15	5	organics,metals radiological
7G2	1953 - 1977	1		1		
7H1	1977	1		1		
7J1	1955 - 1977	1		28		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
7J2	1993	1	1			
_8E1	1969 - 1977	1		2		
8N1	1963			1		
9N2	1966			1		
9N3	1966 - 1977	1		4		
9P	1993	1	1			
10E	1981			2		
_10E1	1980 - 1983			2		
_10E3	1967			1		
13Q1	1955 - 1969			25		
16B				1		
16C	1985 - 1993			1	1	organics & metals
16N1	1958 - 1977	1		22		
17A1	1959 - 1968			18		
17C1	1954 - 1965			24		
17J1	1956 - 1978			11		
17J3	1977	1		1		
18	1970			1		
18J	1972			1		
18J2	1975 - 1988			7	4	organics & metals
19A1	1953 - 1993	2	1	3		
19A3	1977	1				
20P1	1954			1		
21F	1956 - 1976	1		28		
21D	1958 -			1		
24B	1990		1			
24B1	1963 - 1977	1		1		
24N	1969			1		
24P1	1943 - 1976			29		
25D2	1965 - 1977	1		3		
26J1	1958 - 1973			4		
26K	1989 - 1991	3	5	3		
28C1	1954					
28H1	1965 - 1968			13		
29C3	1977			2		
29G2	1970 - 1977	1		5		
29K1	1963 1977	1		2		
29Q	1969			1		
29Q1	1959 1969			2		
32B	1965			1		
4S/4W 1A1	1993	1	1			
4S/4W 1G1	1993	2	1			
T5S/1W 30D	1992			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
30D2	1977			1		
_30E2	1992			1		
30M1	1957 - 1960			8		
T5S/2W 7E	1990		1			
14R	1980 - 1981			2		
15A1	1958 - 1960			6		
_15E1	1953 - 1956			4		
15F1	1963			1		
15G1	1982 - 1985			2		
15H	1982	1	1			
16F	1982			1		
16F1	1993	1	1			
16G	1983			1		
17B	1982 - 1985	2	2	2		
17B	1982			1		
17B1	1969 - 1978			18		
17C	1982			1		
17C1	1953 - 1967			27		
17F	1982 - 1985			2		
19N1	1953 - 1979			49		
21M2	1993	1				
2.20E+03	1993	1				
23J	1972			1		
23P1	1989				4	bacteriological
23P1	1989		2			
23Q	1986			1		
23R	1989				3	bacteriological
23R	1986			1		
23R1	1973			1		
24B	1981			1		
24B1	1993	1	1			
25C	1979			1		
25C1	1965 - 1977			3		
_25E1	1959 - 1963			2		
25J	1991	1	1			
26B	1987			1		
26G1	1968			1		
26G2	1957			1		
26H2	1963			1		
26H3	1964			1		
26L1	1963			2		
27N1	1988		1	1	1	bacteriological
30D	1991			1	1	radiological
30J1	1975			1		
31N1	1975			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
31R	1987			1		
31R	1987				1	metals
33E	1981	1				
35A	1991			1		
35A1	1993	1				
35B1	1969 - 1993	1		1		
35D2	1993	1	1			
36D	1991			3		
36D4	1993		1			
T5S/3W 2Q1	1993	1	1			
3Q2	1975			1		
3R1	1963 - 1968			3		
3R1	1977	1				
3R2	1977	1				
7B1	1975			1		
10H1	1975			1		
11M1	1953			1		
11M2	1955 - 1981			23		
13A	1977 - 1981			2		
13A1	1993	1	1			
13H1	1993	1	1			
14P1	1985			1		
14P1	1977	1				
14P1	1975			1		
15H1	1993	1	1			
16D1	1993	1	1			
16F1	1993	1	1			
16P1	1955 - 1958			6		
16P2	1977 - 1981			2		
17R1	1991			1		
21C1	1975			1		
21C1	1977	1				
21D1	1962 - 1971			17		
21D2	1960 - 1975			16		
21D2	1977	1				
21K	1993	1	1			
24C1	1993	1	1			
27L1	1975			1		
28M1	1993	1	1			
28M2	1993	1	1			
28M3	1993	1	1			
28M4	1993	1	1			
29H1	1955 - 1959			8		
29Q1	1958			1		
32G	1976			1		

Mark J. Wildermuth
Water Resources Engineer

TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

State Well Number	Period of Record	Types of Analysis				
		TDS	NO3	Gen Min	Other	Other Type
33R2	1991			1		
33R2	1991				1	organics
35N	1992			1		
35P1	1956 - 1968			4		
35Q	1977 - 1993	2	1			
36D1	1963 - 1968			4		
36K1	1962 - 1963			2		
36N	1977	1				
36N1	1991			1		
36P	1992			5		
36P1	1953 - 1956			3		
36Q1	1958 - 1965			11		
T6S/2W 1A2	1976			1		
2G1	1963			1		
2N1	1963			1		
3R2	1962 - 1970			5		
4R1	1988			1		
4R2	1988		1			
7A	1988		1			
7A1	1993	1	1			
7N	1975			1		
7R2	1993	1	1			
T6S/3W 1	1991			4		
1D1	1965			1		
1D2	1975			1		
_1E1	1977	1				
1J1	1975			1		
1J2	1993	1	1			
2A	1993	1	1			
2F1	1963 - 1968			4		
2C1	1975			1		
2D	1993	1	1			
2E	1993	1	1			
2G	1991	2	2	5	2	organics
2H	1991	1	1	2	2	organics
3C	1967			1		
3C1	1975 - 1991			3		
3C2	1975			1		
3H2	1977 - 1991	1		1		
3L1	1993	1	1			
3L2	1993	1	1			
4K1	1953 - 1963			2		
9B1	1975			1		
Totals		106	79	1015	48	

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TABLE B-1 (Continued)
AVAILABILITY OF GROUNDWATER QUALITY DATA FOR WELLS IN THE WEST SAN JACINTO AREA

	Statistics			
	Total	Average	Maximum	Minimum
Length of Record (years)		5.18	40	1
Number of Samples per Well		4.14	49	1
Samples per Year		1	11	0
Year of Last Sample		1979	1994	1949
Total Number of Wells with Data	301			
Fraction of Wells with Only One Sample	63%			

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Water Resources Engineer

F

Appendix F: Hemet/San Jacinto Groundwater Management Area Water Management Plan

Hemet/San Jacinto

Groundwater Management Area



Water Management Plan

Prepared for:

Eastern Municipal Water District, Since 1950

Lake Hemet Municipal Water District, Incorporated 1955

City of Hemet, Riverside County, California

San Jacinto

in coordination with:

Department of Water Resources, State of California

Prepared by:

ωRIME Water Resources & Information Management Engineering, Inc.

in association with Stetson Engineers and Geoscience

November 7, 2007

Water Resources & Information
Management Engineering, Inc.

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www.wrime.com

Hemet/San Jacinto Groundwater Management Area
Water Management Plan

November 7, 2007

Prepared for:

Eastern Municipal Water District
Lake Hemet Municipal Water District
City of Hemet
City of San Jacinto

in coordination with
California Department of Water Resources

Prepared by:

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SELECTED ACRONYMS, ABBREVIATIONS, AND TERMINOLOGY

Advisor	independent engineering firm or a qualified individual
AF	acre-foot
AFY	acre-feet per year
Agreement	Settlement Agreement
Association	Hemet/San Jacinto Groundwater Association
CAM	Consultants-Attorneys-Managers
CEQA	California Environmental Quality Act
cfs	cubic feet per second
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EMWD	Eastern Municipal Water District
FMWC	Fruitvale Mutual Water Company
GIS	Geographic Information System
Hemet North	Hemet North portion of the Lakeview/Hemet North
IRRP	Integrated Recharge and Recovery Program
JPA	Joint Powers Authority
JUDGMENT	Stipulated Judgment
Legal Counsel	independent attorney or legal firm
LHMWD	Lake Hemet Municipal Water District
Management Area	Hemet/San Jacinto Groundwater Management Area
MGD	million gallons per day
MOU	Memorandum of Understanding
MWD	Metropolitan Water District of Southern California
PC	Policy Committee
Plan	Hemet/San Jacinto Water Management Plan
Plan Participants	EMWD, LHMWD, Private Water Producers, and Cities of Hemet and San Jacinto (collectively)
Principles	Principles for Water Management
Private Water Producers	Property owners who are pumping groundwater pursuant to overlying water rights
Public Agencies	EMWD, LHMWD, and Cities of Hemet and San Jacinto (collectively)
RCFC&WCD	Riverside County Flood Control and Water Conservation District
RWQCB	Santa Ana Regional Water Quality Control Board
RWRD	Regional Water Resources Database
S.A.A.	Settlement Agreement Approval
S.J.A.	Stipulated Judgment Approval
Soboba Tribe	Soboba Band of Luiseno Indians
TC	Technical Committee
TDS	Total Dissolved Solids

TM	Technical Memorandum
TMDL	Total Maximum Daily Load
Upper Pressure	San Jacinto - Upper Pressure Management Zone
USGS	United States Geological Survey
UWMP	Urban Water Management Plan
Watermaster	Watermaster Governing Board
WRIME	Water Resources & Information Management Engineering, Inc.

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BACKGROUND AND GOALS

The stakeholders in the Hemet/San Jacinto Groundwater Management Area (Figure ES.1) have developed the Hemet/San Jacinto Water Management Plan (Plan) to provide a foundation that guides and supports responsible water management into the future. The Participants in the Plan are Eastern Municipal Water District (EMWD), Lake Hemet Municipal Water District (LHMWD), Cities of Hemet and San Jacinto (Public Agencies), and Private Water Producers.

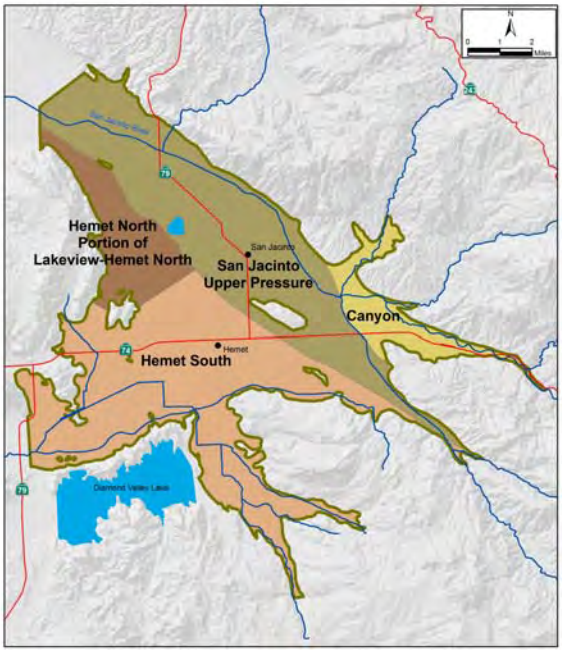

Figure ES.1 Hemet/San Jacinto Groundwater Management Area and Management Zones

Private Water Producers are those property owners who are pumping groundwater pursuant to overlying water rights, typically for agricultural or domestic uses. Private Water Producers may elect two levels of participation in the Plan, with varying levels of benefits and responsibilities, or may elect not to participate. The details on this matter are described in Section 2 of the Plan document.

The Plan, adopted by the governing bodies of the Plan Participants, has eight primary goals:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,

- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale judgment and agreement.

GROUNDWATER AS A CORNERSTONE FOR WATER MANAGEMENT

The goals of the Plan are interrelated and begin with maintaining groundwater as a high-quality, low-cost, flexible source of water. Efforts are needed to make this happen, as historical groundwater pumping in excess of the Safe Yield of the groundwater basin has resulted in decreasing trends in water levels. In addition, historical land and water use practices for agricultural irrigation and dairy industry waste have raised the levels of nitrates and total dissolved solids in groundwater. Safe Yield, the long-term average quantity of water that can be pumped without causing undesirable results, has been estimated at 40,000 to 45,000 AFY, while average annual production exceeds this amount by approximately 10,000 to 15,000 AFY. The 10,000 to 15,000 AFY difference between the long-term average annual groundwater production and Safe Yield is known as overdraft, which can be responsible for creating undesirable conditions in the basin, including degradation of groundwater quality. The Plan assumes a pragmatic and economic approach in setting the target to reduce overdraft, and assumes an overdraft of 10,000 AFY. This will allow the Plan Participants and the Watermaster to initiate and adopt plans and policies to eliminate overdraft with implementation of economically feasible and cost-effective projects. The Plan intends to stabilize or reverse the decreasing trend in water levels through reducing groundwater production to a level that brings the basin production within the Safe Yield of the Management Area. Higher water levels will increase water in storage, decrease energy costs for pumping, and inhibit the migration of poor quality groundwater from surrounding basins, helping to protect groundwater quality in the Management Area.

INTEGRATION OF GROUNDWATER WITH OTHER WATER SOURCES AND DEMAND MANAGEMENT TO MEET FUTURE WATER NEEDS

The Plan Participants have several options available to increase water supply and reliability in the Management Area. Water used in the Management Area for agricultural and domestic use comes from groundwater, surface water, imports, and recycled water. As shown on Figure ES.2, most of this water has historically been from groundwater, based on 2004 data. This allows significant opportunities for underutilized sources, particularly recycled water and

winter-time imported water, to replace or augment groundwater production. The regional cooperation developed over the years is also of importance as the supply mix varies between the different water users in the Management Area; by cooperating, the water users can fully utilize their available water resources.

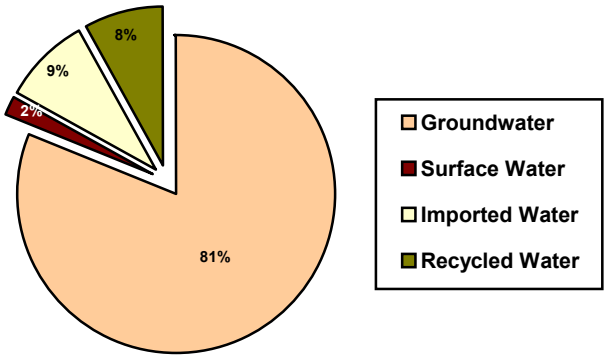

Figure ES.2 Components of Management Area Water Supply

The high-quality groundwater basin also plays an important role in future water availability. Historical declines in groundwater levels are a concern and a major impetus for the development of this Plan. However, even the dewatered portion of the groundwater basin is a significant asset and allows for the full utilization of the available water supplies mentioned above. The new water supplies can be introduced into the system filling the empty portions of the groundwater basin by either substitution for pumping groundwater (in-lieu recharge) or by placing the water in the groundwater system through seepage from specially designed ponds or through injection from wells (direct recharge). Both these methods benefit the Management Area groundwater basin, which is composed of materials that can store large quantities of water and holds high quality groundwater that can be pumped for usage at a later time. A complex system of faults and other geologic features separate the groundwater system into four Management Zones (see Figure ES.1), which require some degree of individual attention in planning and designing recharge and extraction projects, based on each Management Zone's unique attributes.

The numerous water supply opportunities along with water conservation by both the Public Agencies and Private Water Producers will be utilized to meet the current and future water needs of the Management Area. Based on the latest data and information on land and water practices, general plans, urban water management plans, and other specific plans, water demand in the Management Area is projected to increase over the course of next 15-20 years (Figure ES.3). Based on these projections, there will also be a shift from agricultural water use

to urban water use, resulting in more stringent water quality requirements to meet drinking water standards.

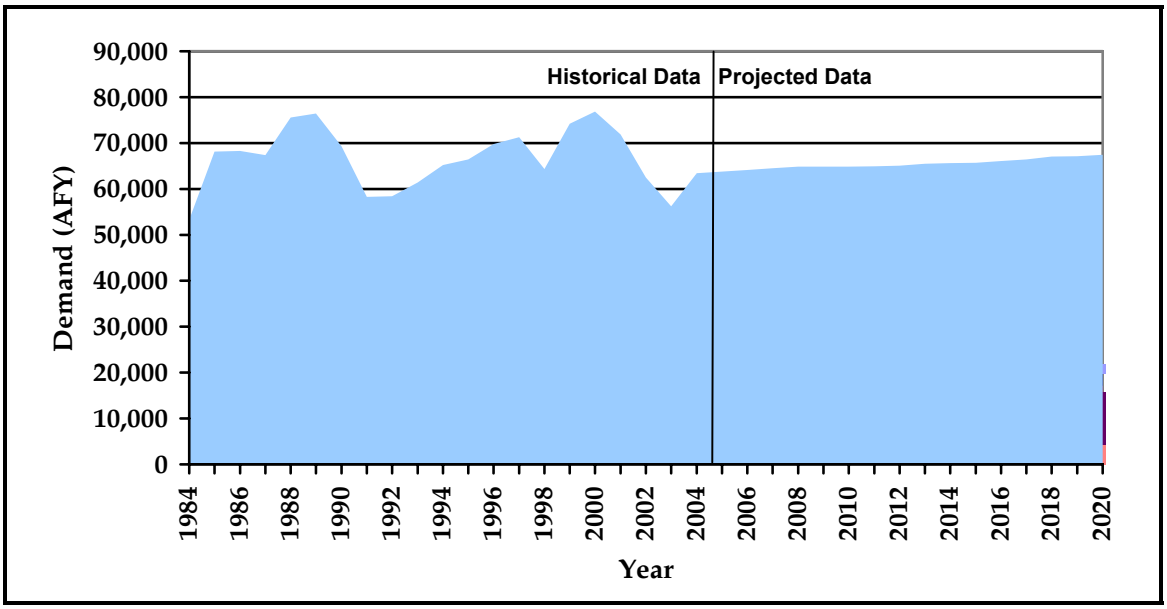

Figure ES.3 Historical and Projected Water Demand

PHYSICAL SOLUTION IS THE BASIS OF WATER SUPPLY PROJECT IN THE MANAGEMENT AREA

As described in the Stipulated Judgment, the Physical Solution is the court decreed method of managing the water supply in the Management Area to maximize the reasonable and beneficial use of the waters, eliminate overdraft, protect the prior rights of the Soboba Tribe, and provide for the substantial enjoyment of all water rights by recognizing their priorities. The Physical Solution consists of numerous water supply and conjunctive use projects, including direct and in-lieu recharge, increased use of recycled water, increased conservation, and improved monitoring. The core project in the Physical Solution is the Hemet/San Jacinto Integrated Recharge and Recovery Program (IRRP). Phase I of the IRRP has been designed, funded, the necessary environmental permits have been acquired, and construction is currently underway. Phase II is in planning stages. The IRRP is a regional recharge and recovery program to meet the following goals:

- Satisfy Prior and Paramount Soboba Tribe water rights;
- Offset the estimated 10,000 AFY overdraft in the Management Area; and
- Provide an additional 15,000 AFY to help meet the projected demand increases.

In addition to IRRP, the Plan identifies other projects that can potentially meet the above goals. These include direct recharge, in-lieu recharge, and recycled water projects.

A FIRM LEGAL AND INSTITUTIONAL ARRANGEMENT

Development of a comprehensive system of water management begins with the legal and institutional framework. To meet the goal of reducing groundwater production to eliminate overdraft, the Public Agencies agreed upon some basic principles as a basis for allocating Base Production rights. Base Production rights establish the initial amount that each Public Agency would be able to pump without the need to replenish the basin. The Base Production rights are calculated on the basis of actual production by Public Agencies during 1995-99 calendar years, and adjusted for specific historical operational activities, such as:

- Recharge Activities;
- MWD San Jacinto Tunnel Seepage;
- Fruitvale Entitlement Water Sold by EMWD to LHMWD, Hemet, and San Jacinto;
- Stream Diversions;
- Conveyance Water Deliveries; and
- Other Considerations.

The Public Agencies have, therefore, agreed to the following Base Production Rights:

Table ES.1 Public Agency Base Production Rights

Public Agency	Base Production Rights (AFY)	Base Production Rights (Percent)
EMWD	10,869	33.7
LHMWD	11,063	34.2
City of Hemet	6,320	19.6
City of San Jacinto	4,031	12.5
Total	**32,283**	**100**

Surface water rights are not impacted and/or changed by the Plan or any other recent agreements. LHMWD diverts water from the San Jacinto River and its tributaries through its pre-1914 water rights to meet their irrigation and municipal water demands, and EMWD has a license to divert water from the San Jacinto River for recharge purposes.

Soboba Tribal water rights are recognized throughout the Plan, and details of the monetary, water quantity, water quality, and property requirements to meet the obligations set forth in the settlement agreement with the Soboba Tribe are discussed in Section 8 of the Plan.

The Institutional Plan, discussed in Section 9 of the document, assigns the administration,

implementation, and monitoring of the Plan to a Watermaster. The Watermaster will consist of one elected official representing each of the Public Agencies and one representative selected by the participating Private Water Producers. The Watermaster will utilize the counsel of legal advisor, as well as provide technical oversight through an Advisor and Technical Advisory Committee. The Watermaster will utilize services of EMWD for recharge operations and administration and monitoring of the projects and the Plan. The relationships and basic responsibilities of these entities are summarized in Figure ES.4. The Watermaster will also review, approve, and adopt the annual budget, which will be funded by administrative assessments and replenishment assessments. The details of Watermaster administration are discussed in Section 9 of the Plan document.

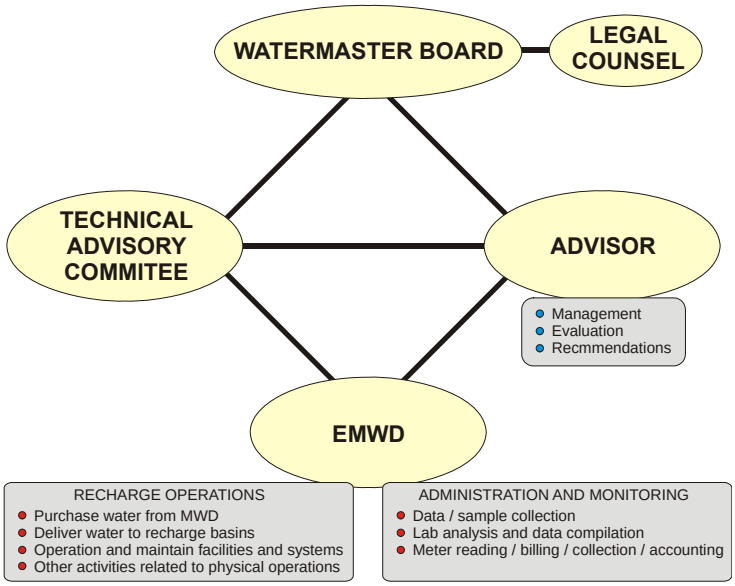

Figure ES.4 Plan Institutional Setup

IMPLEMENTATION AND PLAN EVOLUTION

The implementation of the Plan, along with any additions or modifications as may become appropriate, and all financial matters relating to Plan activities are the responsibility of the Watermaster. The implementation process can be divided into two processes: implementation and ongoing activities. The schedules for these processes are shown in Table ES.2 and Table ES.3.

Table ES.2 Implementation Schedule

Months after Approval of Stipulated Judgment	Implementation Item
Month 1	Determine the method of selection for the Private Pumper representative.
Month 2	Select Public Agency and Private Pumper representatives.
Month 3	Hold first meeting of the Watermaster. Contract with EMWD for Watermaster services.
Month 4	none
Month 5	none
Month 6	Retain legal council and advisor. Prepare and adopt Rules and Regulations for its own operation as well as for the operation of the Water Management Plan and Judgment. Review and reissue agreements and MOUs, as needed.
Upon Settlement Agreement Implementation	Recognize Tribal water rights.

Table ES.3 Ongoing Schedule

Timing	Frequency	Activity	Responsibility
January 1	Annual	Propose Monitoring Program.	EMWD
End of January	Annual	Review Monitoring Program.	Advisor
End of February	Annual	Approve budget for Monitoring Program.	Watermaster
1st Quarter	Annual	Advance payment of Administrative Assessments.	Public Agencies
1st Quarter	Annual	Payment of Replenishment Assessments.	Public Agencies
Four months after completion of calendar year monitoring	Annual	Submit Annual Hemet/San Jacinto Water Management Area Report.	EMWD
As needed	As needed	Revise safe yield.	Advisor
TBD	Annual	Prepare, File, and Distribute Watermaster Annual Report.	Watermaster

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SECTION 1 INTRODUCTION

1.1 PROJECT BACKGROUND

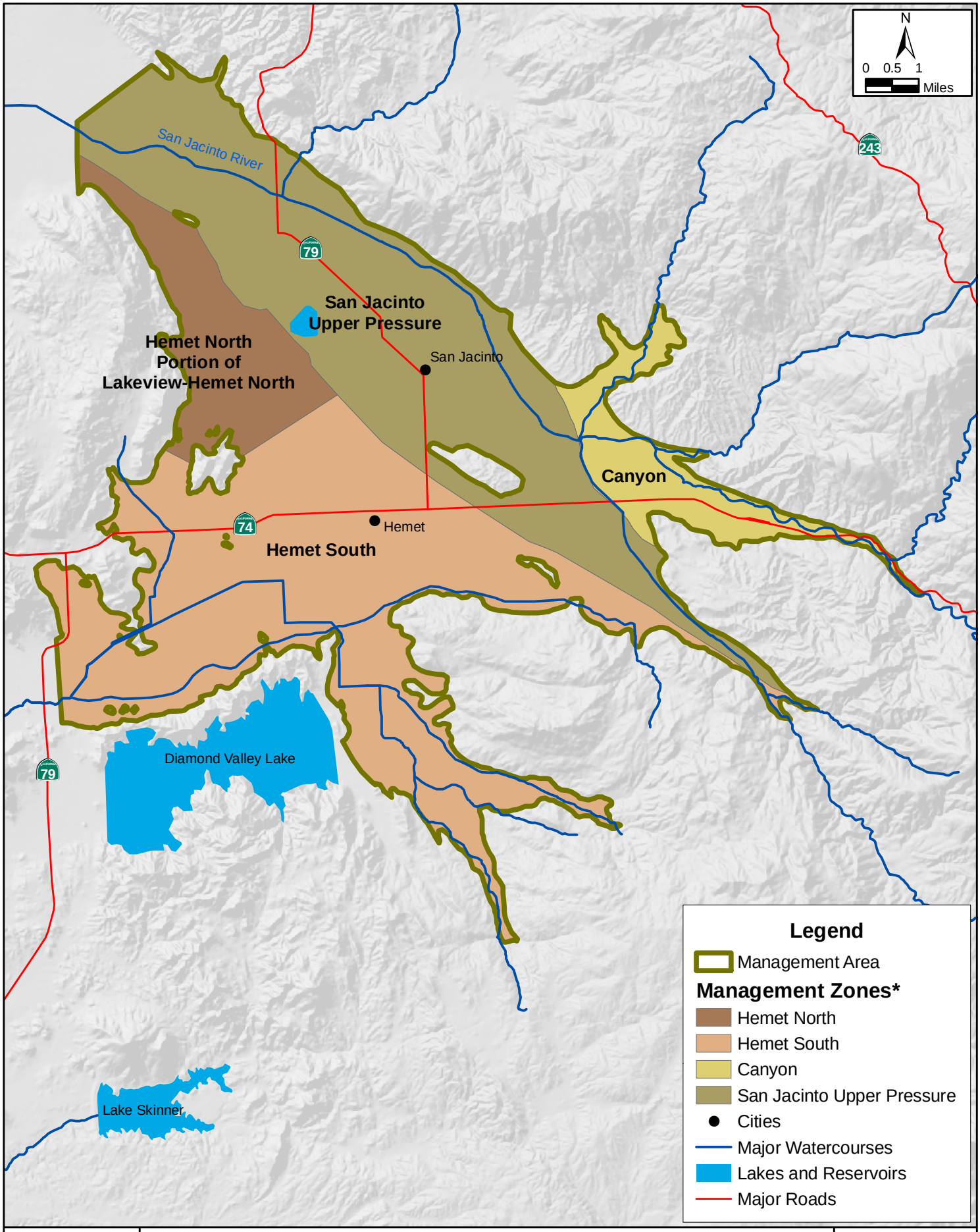
The stakeholders in the Hemet/San Jacinto Groundwater Management Area (Figure 1.1) (Management Area) have developed the Hemet/San Jacinto Water Management Plan (Plan) to provide a foundation that guides and supports responsible water management in the future. The local stakeholders involved in the Plan include Eastern Municipal Water District (EMWD), Lake Hemet Municipal Water District (LHMWD), Cities of Hemet and San Jacinto, and Private Water Producers, collectively referred to as "Plan Participants". EMWD, LHMWD, and the Cities of Hemet and San Jacinto are collectively referred to as "Public Agencies".

A Policy Committee (PC) of the Plan Participants developed and adopted the Principles for Water Management (Principles), which guide the management, development, and governance of local water supplies. The adopted Principles, along with a variety of technical analyses, guided development of the Plan. The PC established the Principles based on the historical data on the operation of the groundwater basin; historical and projected water demands; and existing and potential future facilities. The California Department of Water Resources (DWR) provided financial, facilitation, and technical support to the PC.

A Technical Committee (TC) supported the PC and served as the investigative and review body to ensure that proper technical analyses were conducted to provide a defensible technical foundation for the Plan. The TC provided technical input to support decisions by the Public Agencies, Private Water Producers, and other stakeholders. DWR also provided financial and technical support to the TC.

A Consultants-Attorneys-Managers (CAM) committee served as an interim body to develop and review technical, legal, institutional, and financial documents, plans, and standards. The CAM committee discussed the technical/policy/legal issues in anticipation of evolving documents and recommendations for action by the policy makers for the PC.

EMWD and LHMWD have also worked with the Soboba Band of Luiseño Indians (Soboba Tribe) and the Federal Government to develop a Settlement Agreement (Agreement) (Appendix A) that would resolve past issues with respect to Tribal water rights and the water management practices in the basin. The Agreement will be supported by two stipulated



Management Area and Management Zones

Hemet / San Jacinto Water Management Plan

*Source: EMWD

October 2007

Figure 1.1

judgments[1] that will provide the legal and technical basis for future water supplies for the Soboba Tribe.

1.2 WATER MANAGEMENT PLAN

The Plan, adopted by the governing bodies of the Plan Participants, will provide a roadmap for implementation of the Physical Solution, ensure adequate and reliable sources of future water supply for the Management Area, and meet the Prior and Paramount Soboba Tribe water rights requirements. The Plan may be modified and updated in the future based on, among other things, the availability of new data, updated technical analysis, and changes in the institutional/financial structure of the stakeholders.

1.3 PHYSICAL SOLUTION

As described in the Stipulated Judgment (Appendix B), the Physical Solution is the court decreed method of managing the water supply in the Management Area to maximize the reasonable and beneficial use of the waters, eliminate overdraft, protect the prior rights of the Soboba Tribe, and provide for the substantial enjoyment of all water rights by recognizing their priorities. Therefore, the Physical Solution is a group of water supply and conjunctive use projects that would serve this purpose.

The project that is considered to be the core of the Physical Solution is Phase I of the *Hemet/San Jacinto Integrated Recharge and Recovery Program (IRRP)*. Phase I of the IRRP has been designed, funded, and the necessary environmental permits are being acquired. Phase II is in planning stages. The complete project is designed to recharge (replenish) imported water and extract groundwater at a capacity such that the following goals are met:

1. Satisfy Prior and Paramount Soboba Tribe water rights;
2. Offset the estimated 10,000 acre-feet per year (AFY) overdraft in the Management Area; and
3. Provide an additional 15,000 AFY to help meet the projected demand increases.

Major elements of Phase I of the Project are:

- Modifications to Pump Stations (Warren and Commonwealth);
- Construction of Pipelines;

[1] These judgments are in the case of Soboba Tribe v. Metropolitan Water District, et. al.; U.S. District Court in Los Angeles, Case No. 00-04208 GAF, and in a Riverside County Superior Court action, yet to be filed.

- Design and Construction of Recharge Basins;
- Drilling Three Extraction Wells;
- Installation of Pumps and Chlorination Equipment for Three Extraction Wells; and
- Design and Drilling of Three Monitoring Wells.

Additional details on Phase I of the IRRP are presented in Section 3.2.2 of this Plan, and details on Phase II are presented in Section 5.3.1.

In addition to the *San Jacinto River Integrated Recharge and Recovery Project*, there are other projects that the TC has identified as potential projects to be further considered in the future as part of the Physical Solution for the Management Area. These include *direct recharge* and *in-lieu recharge* projects and are described in Section 5.3 of this Plan.

1.4 WATER MANAGEMENT PLAN GOALS

The Principles include eight primary goals for the management of water resources in the Management Area. These are:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,
- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale judgment and agreement.

SECTION 2 MANAGEMENT PLAN FRAMEWORK

This section briefly describes the geographic boundaries of the four divisions, or Management Zones, that make up the Management Area and provides a brief history and background on each of the primary stakeholder organizations. Past agreements and related activities leading to the Plan are discussed below, including the role of the state and public participation.

2.1 MANAGEMENT AREA

The Management Area is divided into four Management Zones: The Canyon, San Jacinto Upper Pressure (Upper Pressure), Hemet South, and the Hemet North portion of the Lakeview/Hemet North (Hemet North). The locations of the Management Zones are shown in Figure 1.1. The delineation of the Management Zones is based on the recent update by the Santa Ana Regional Water Quality Control Board (RWQCB) in the *Water Quality Control Plan - Santa Ana River Basin (RWQCB, as amended 2004)*. The RWQCB defined these boundaries on the basis of hydrogeologic conditions to support implementation of specific water quality criteria. Additional descriptions of the basin hydrogeology are provided in Section 4.

2.2 MANAGEMENT PLAN PARTICIPANTS

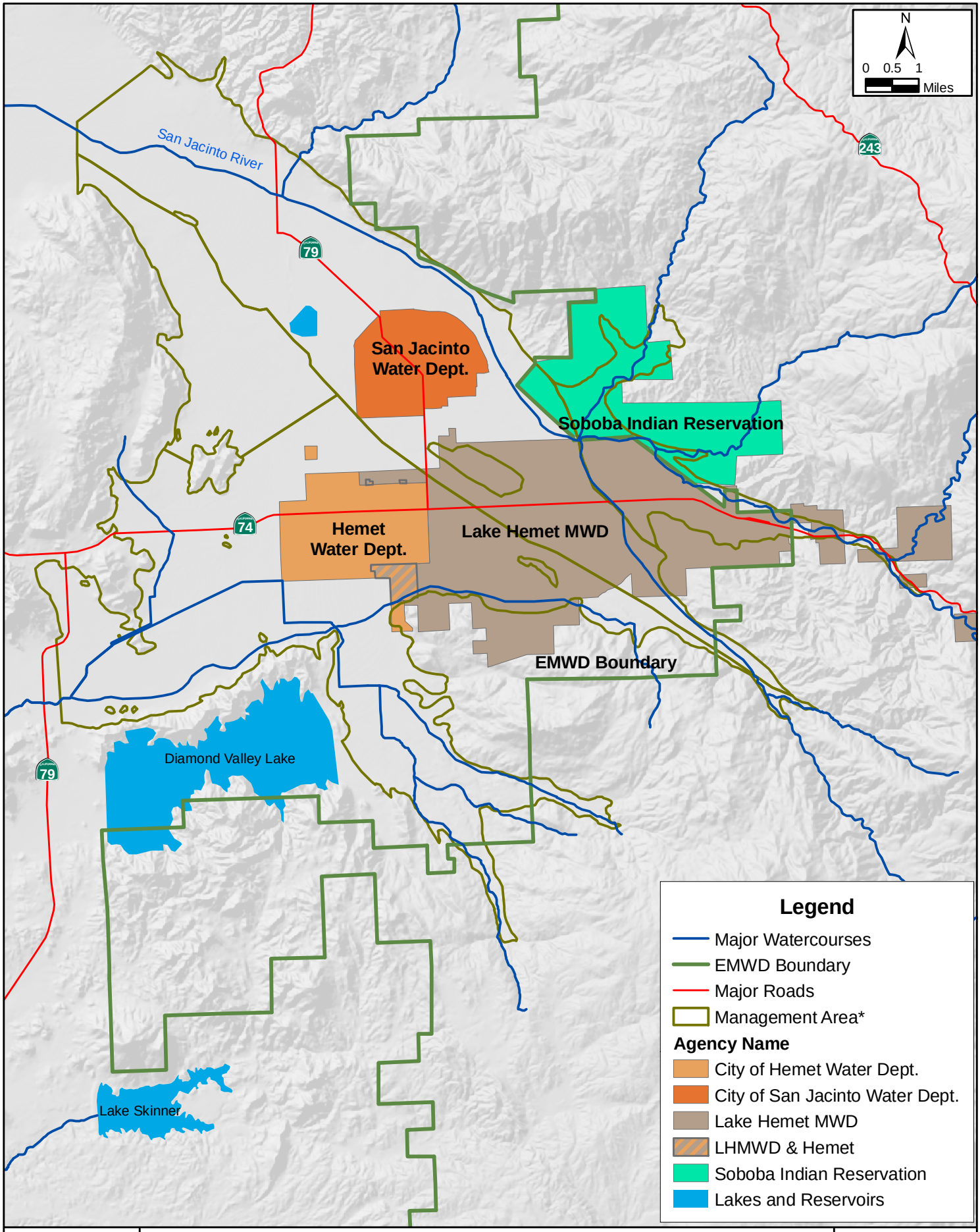
A map of the service areas of the Public Agencies near the Management Area and the Soboba Reservation is provided in Figure 2.1. The Plan Participants are briefly described below.

2.2.1 PUBLIC AGENCIES

EMWD, LHMWD, the City of Hemet, and the City of San Jacinto provide water service in various areas of the Canyon, Upper Pressure, Hemet South, and Hemet North Management Zones. A list of governing bodies is provided in Appendix C. Additionally, there are a number of Private Water Producers extracting groundwater for agricultural and domestic use.

2.2.1.1 Eastern Municipal Water District (EMWD)

Since its formation in 1950, EMWD has matured from a small agency primarily serving agriculture to one whose major demands come from domestic customers. In 1951, EMWD annexed to the Metropolitan Water District of Southern California (MWD). With the purchase of the Fruitvale Mutual Water Company (FMWC) in 1971, EMWD acquired all of Fruitvale's



WRIME

Public Agencies and Soboba Reservation

Hemet / San Jacinto Water Management Plan

*Source: EMWD

October 2007

Figure 2.1

assets including appropriative, prescriptive, and riparian water rights; water system, wells, well sites, pumps, and storage; real property, easements, rights, and interests; and franchises, permits, and licenses. Over time, the agency has continued to grow. Today, in addition to providing retail service, EMWD provides wholesale water to the seven local water agencies within its service area, including the three remaining Public Agencies in the Management Area.

As of 2005, EMWD serves approximately 113,000 retail connections, including approximately 200 agricultural connections, in a service area with an estimated population of 567,000 within the 555-square-miles, including many areas outside the Management Area. The population within EMWD's boundaries is expected to grow to 830,000 by 2025 (EMWD, 2005a), not including the population of the Rancho California Water District.

In addition to wholesale and retail potable water supply, EMWD's services include wastewater collection and treatment as well as water recycling. The San Jacinto Valley Regional Water Reclamation Facility is an 11 million gallons per day (MGD) plant that provides most of the treatment and water recycling capability for the Management Area.

The five-member Board of Directors comprise the governing body of EMWD and are responsible for setting the policies guiding the operations of the District. Board members are elected to four-year terms by the registered voters from five geographic divisions, which are apportioned on the basis of population distribution. Terms of service are staggered to ensure continuity; public elections are held in at least two divisions every two years. Directors must reside within the division from which they are elected.

The 2004 water use in the portion of the EMWD service area within the Management Area was 13,900 AFY, and it is projected to increase to 21,000 AFY by the year 2020 (EMWD, 2005b).

2.2.1.2 Lake Hemet Municipal Water District (LHMWD)

LHMWD was created in its present form in 1955, but its origins date back to the late 1880s. The service area covers 16,500 acres in the Hemet/San Jacinto Valley area with an additional 2,200 acres in Garner Valley. LHMWD provides water to residential and agricultural customers in its service area. All wastewater collection and treatment within the LHMWD area is performed by EMWD.

LHMWD operates the Hemet Dam and reservoir. The dam, an engineering marvel at the time of its construction in 1895, is a gravity-type, granite dam. LHMWD historically treated a portion of this surface water for domestic use, however since 1998 the surface water treatment plant has been offline and all surface water usage has been for untreated agricultural uses.

LHMWD usually maintains approximately 11.7 million gallons in storage in the Hemet/San Jacinto Valley.

LHMWD customers are represented by a publicly elected board of five directors from five divisions, representing approximately 13,700 domestic and 52 agricultural connections within a 21-square mile service area with a 2005 population of approximately 39,100. The population within the LHMWD service area is expected to grow to approximately 49,500 by 2025 (LHMWD, 2005).

The 2004 water use within the LHMWD service area was estimated to be 16,900 AFY. Due to the expected benefits of more robust conservation efforts, demand is projected to remain fairly constant over the next several years despite an increasing number of service connections. Demand in 2020 is expected to be 16,300 AFY before increasing above the 2004 demand level in years thereafter (LHMWD, 2005).

2.2.1.3 The City of Hemet

The development of Hemet began in 1887 with the formation of the Lake Hemet Water Company and the Hemet Land Company by W. F. Whittier and E. L. Mayberry. The completion of the Hemet Dam in 1895, the formation of Lake Hemet behind the dam, and a water distribution system to and through the valley made future development of the Hemet area possible.

As of 2005, the city had a population of 78,600 with an area of approximately 26 square miles. City of Hemet anticipates a population growth to 154,000 by 2025 (Hemet, 2006).

The City of Hemet was incorporated on January 20, 1910 with a population of 992. The city government is a Council/Manager form of government with seven elected positions, which includes five Council Members, one City Treasurer, and one City Clerk. The Mayor is elected by the Council Members and serves a one-year term. All Council Members serve a four-year term.

The City of Hemet Water Department treats and distributes water to 9,500 connections, covering 5 square miles of the city area. The 2005 population of the Water Department's service area is 20,200 and is projected to grow to 22,300 by 2025. EMWD and LHMWD serve the remaining 21 square miles of the city, with 7,830 and 3,025 connections, respectively. All wastewater collection and treatment within the City of Hemet area is performed by EMWD.

The 2004 water use within the City of Hemet Water service area was estimated to be 6,000 AFY, and is projected to increase to 6,700 AFY by year 2020 (Hemet, 2006).

2.2.1.4 The City of San Jacinto

Incorporated in 1888, San Jacinto is one of the oldest communities in Riverside County. The city has a Council/Manager form of government with a five member Council that includes a Mayor and Vice Mayor. The City of San Jacinto Water/Wastewater Divisions are responsible for the health and safety of the community through the delivery of the potable water supply and the collection of wastewater. The city wastewater collection system is maintained by this Division while wastewater treatment service is provided by EMWD.

The 2005 population of the city was 34,100; it is anticipated the population of the city will grow to 63,600 by 2025 (San Jacinto, 2005). The City of San Jacinto Water Department serves the central portion of the city with approximately 3,700 residential and commercial service connections. The 2005 population of the Water Department's service area is 13,200 and is projected to grow to 24,000 by 2025. The remaining portions of the city are served by EMWD and LHMWD, which have 4,636 and 475 service connections within the city boundaries, respectively.

The 2004 water use within the City of San Jacinto water service area was estimated to be 3,100 AFY, and is projected to increase to 5,100 AFY by year 2020 (San Jacinto, 2005).

2.2.2 PRIVATE WATER PRODUCERS

Private Water Producers are those property owners who are pumping groundwater pursuant to overlying water rights, typically for agricultural or domestic uses. Historically there was no comprehensive metering program in-place to monitor groundwater production and/or water use by the Private Water Producers. EMWD collected groundwater data through an informal, voluntary monitoring program. In 2004 the Hemet/San Jacinto Groundwater Monitoring Program was initiated by the Public Agencies and the DWR to collect, analyze, and compile groundwater-related data (EMWD, 2005).

It is estimated, on the basis of limited data and land use analysis, that the 2004 water use by Private Water Producers was about 22,200 AFY. This annual level of water use is unusually low, compared to a long-term average of 31,000 for 1984-2004 (WRIME, 2003a). Water use is expected to drop to approximately 16,000 AFY by 2020.

The Public Agencies recognize the overlying water rights of Private Water Producers, and the Principles provide several options for voluntary participation in the Plan by the Private Producers. For more details, please see the Principles provided in Appendix D.

There are two classes of participants, Class A and Class B; both agree to have their wells metered and to have those meters read by EMWD personnel at no cost to the participants. The two types of participants are further explained below.

2.2.2.1 Class A Participants

A Private Water Producer can sign an agreement acknowledging the existence of the Plan, while not being required to participate in Plan implementation. Class A participants are allowed to vote for and/or serve as the Private Water Producer representative on the Watermaster board. The Class A participants may continue to pump from their property without assessments by the Watermaster, so long as the water is put to a reasonable and beneficial use as authorized by California law.

The Class A participants have the right to convert to Class B during a grace period that ends 3 years after the entry of the Stipulated Judgment, and upon payment of the total assessments without interest, as if they were Class B participants to begin with.

2.2.2.2 Class B Participants

A Private Water Producer can become a Class B participant by electing to limit annual pumping to their estimated average annual production during the 1995 – 1999 calendar years and by agreeing to pay replenishment assessments on amounts in excess of that average annual production.

Like Class A Participants, Class B Participants can vote for and/or serve as the Private Water Producer's representative on the Plan's governing board. Additional benefits are given to Class B Participants as well. Under certain conditions, the Class B Participant can convey their Adjusted Production Right to the Plan or to a Public Agency. Also, upon conversion from agricultural to urban uses, Class B Participants would receive credits from the Public Agency toward the satisfaction of any requirements then in effect for water supplies and toward any fees associated with water supply that the Public Agency may then have in effect. For more information on production rights, please see Section 6.

2.2.2.3 Non-Participants

A Private Water Producer can elect not to participate in the Plan and not to formally acknowledge its existence. These non-participants will continue to exercise their water rights unaffected by the Plan.

2.2.3 ROLE OF STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES

In June 2001, the DWR executed a Memorandum of Understanding (MOU) with EMWD, LHMWD, and the Cities of Hemet and San Jacinto. Initially, DWR worked to bring the group together to establish a mutual understanding of the issues in the Management Area. The goals of the group were determined and included the following: (i) finalizing an approach to groundwater management; (ii) settling on a mechanism to involve the Plan Participants in the water rights claim by the Soboba Tribe; (iii) agreeing on the basic components of a regional conjunctive use program; and (iv) establishing the necessary institutional structures. Major involvement of the DWR to-date include providing technical support to the TC and PC on resolving various technical and data analysis issues, providing facilitation and mediation support to the PC and the CAM committee, providing financial support on a number of studies and projects, including the Plan document.

2.2.4 PUBLIC PARTICIPATION

There have been numerous opportunities for public input into the development of the Plan. Meetings were held for the public at the beginning of the Plan process to provide information and gather input. While the Plan was being developed, more opportunities were provided for public input, including TC and PC meetings and meetings with the Private Water Producers, all of which were open to the public. The public was also given the opportunity to review the draft of the Plan and submit comments.

2.3 PREVIOUS AGREEMENTS AND INSTITUTIONAL BODIES

During the course of history of water supply in the Management Area, there have been other agreements and institutional bodies that have been formed and operated to facilitate the management of water supplies. Following is a brief description of these agreements and institutional bodies, which are no longer active or are superseded by this Plan.

2.3.1 FRUITVALE JUDGMENT AND DECREE

The Fruitvale Judgment and Decree (The City of San Jacinto, et al., v. Fruitvale Mutual Water Company, et al., No. 51546, Riverside County) was entered into Book 72, Page 164 of Judgments, Riverside County, on June 4, 1954. Under the Judgment and Decree, FMWC could extract groundwater from an area which largely corresponds to the Canyon Management Zone without any restrictions as long as a specified criteria regarding static depth to groundwater and production limits were met. After purchase of FMWC, EMWD was subject to the

provisions of the Judgment and Decree. The Water Management Plan and related Stipulated Judgment will subsume and supersede the 1954 Fruitvale Judgment and Decree, along with any other agreements between EMWD and other agencies related to the FMWC acquisition, provided that none of the service area agreements included in the Fruitvale documents or those related to mutual aid or system interties are affect by this Plan or the Stipulated Judgment.

In 1971, EMWD purchased all of FMWC's assets and water rights, and FMWC was dissolved. EMWD also agreed to continue to provide to the Cities of Hemet and San Jacinto and LHMWD the amounts of water which they had been entitled to receive as shareholders in FMWC. These deliveries were known as "entitlement water" and the water was provided at a fixed rate, subject to annual adjustments. The amounts of water to be provided were:

- City of Hemet: 6.39% of the greater of FMWC pumping or 9,000 AFY;
- City of San Jacinto: 0.38% of FMWC pumping; and
- LHMWD: 3.74% of FMWC pumping.

The reporting by EMWD since the purchase of FMWC shows that an average of approximately 10,000 AFY was pumped from FMWC wells. Of this total, an average of 61% was from Upper Pressure, 33% was from Canyon, and 6% AFY was from Hemet South.

2.3.2 HEMET/SAN JACINTO GROUNDWATER ASSOCIATION

The Hemet/San Jacinto Groundwater Association (Association) was formed in 1991 to provide an over-arching organization to proactively address groundwater issues in the Management Area. The Association Board of Directors included representatives from the Private Water Producers, EMWD, LHMWD, and the Cities of Hemet and San Jacinto.

The Mission Statement and Articles of Association were approved on September 9, 1991. The Mission Statement read: *The Hemet/San Jacinto Groundwater Association serves as the regional groundwater management entity for portions of the San Jacinto Valley groundwater basins. The Mission of the Association is to maintain a secure reliable and reasonably priced supply of high quality water for groundwater producers in the basin. The Association will implement its Mission by developing and applying sound groundwater basin management concepts.*

With regard to the area covered by the Association, the Articles of Association state: *The portions of the San Jacinto Valley Groundwater Basins shall include the Canyon area, the Intake area, and the upper pressure area, of the San Jacinto Hydrologic Subarea; the Hemet Hydrologic Subarea; and a portion of the Winchester Hydrologic Subarea. Such also being that portion of the San Jacinto Valley southeasterly of Bridge Street and northeast of one-quarter mile west of California Avenue in the area of Simpson Road, together with tributary basins, streams, and watersheds.*

In May 1994, following receipt of the Soboba Band of Mission Indians water rights settlement claim, requests were submitted to the U.S. Department of the Interior by EMWD, the Association, and the Soboba Tribe, to appoint an Indian Water Rights Settlement team to participate in settlement negotiations. The activities of the Association stopped when the current negotiations took precedence.

2.4 ACTIVE INSTITUTIONAL BODIES

As part of the on-going activities leading to the development and adoption of the Principles, the Stipulated Judgment, and agreement with the Soboba Tribe, the following institutional bodies are formed:

- Hemet/San Jacinto Policy Committee (PC),
- Hemet/San Jacinto Technical Committee (TC), and
- Hemet/San Jacinto Consultant-Attorney-Managers Committee (CAM).

Following is a brief description of each body, their role, and participants.

2.4.1 HEMET/SAN JACINTO POLICY COMMITTEE

The PC is comprised of elected officials representing EMWD, LHMWD, the Cities of Hemet and San Jacinto, and representatives of the Private Water Producers. Each entity, including the Private Water Producers, has three representatives on this committee. In the case of the Public Agencies, the PC representatives are two members of the Board of Directors or City Council and the agency or city manager. Three representatives reflecting the Private Water Producers interests (agricultural, dairy, golf course, etc.) are selected by the Private Water Producers. Each entity participates and votes as a unit in the PC. The decision making process is based on consensus. DWR provides a facilitator, a project manager, and technical experts to support and facilitate the decisions of the PC and TC members. Observers to the PC include other Private Water Producers, attorneys, and/or consultants representing various members, and representatives of the Soboba Tribe.

The list of participants in the PC at the time of adoption of this Plan is presented in Appendix E.

2.4.2 HEMET/SAN JACINTO TECHNICAL COMMITTEE

The PC formed a TC to compile, share, interpret, evaluate, and reach agreement on data; to define problems; and to address the PC's technical issues and make recommendations to the PC. Committee membership consists of representatives assigned by the Public Agencies, the Private

Water Producers, and DWR and an engineering consultant provided by DWR as a neutral third-party participant. The representative from LHMWD served as the TC chairman. Through a collaborative effort, the TC developed the data set (WRIME, 2003a) that provides the basis for understanding the area's hydrology, and has identified potentially feasible initiatives, programs, and projects to enhance the safe yield of the Management Zones.

The list of participants in the TC at the time of adoption of this Plan is presented in Appendix E.

2.4.3 HEMET/SAN JACINTO CONSULTANT-ATTORNEY-MANAGERS COMMITTEE

The PC formed the CAM Committee, consisting of technical, legal, and management representatives of each Public Agency, assisted by the DWR project manager and facilitator. The role of the CAM Committee is to facilitate the preparation of technical and legal documents in support of the Stipulated Judgment, the Agreement, and the Plan. Tasks assigned to the CAM Committee include: the development of contractual agreements and MOUs, and the evaluation of the financial impacts to the community for consideration and action by the PC. The CAM Committee provides administrative or policy recommendations to the PC.

The list of participants in the CAM Committee at the time of adoption of this Plan is presented in Appendix E.

2.5 RELATED GROUNDWATER MANAGEMENT ACTIVITIES

There have been numerous investigations and technical analyses conducted in the Management Area. This section highlights more recent reports that were produced to support the Plan, reviewed by the TC, and used by the PC to make decisions. There has been a significant amount of work completed by the local agencies documented in the form of presentations to the PC and the TC. These include:

- Analysis of EMWD Fruitvale water transfer and use by other agencies;
- Analysis of Conveyance (export) water from the Management Area;
- Reconciliation of the Groundwater Production records amongst the participants;
- Estimation of basin overdraft;
- Review and assessment of the San Jacinto Watershed Groundwater Model; and
- Recycled water use and activities.

A Basin Assessment Study was undertaken in 2003 by the local stakeholders with the support of DWR in order to evaluate the existing conditions of the Management Area, evaluate likely future conditions, and develop and evaluate potential conjunctive use opportunities in the

Management Area. To support the Basin Assessment Study, the following Technical Memoranda (TM) and reports were produced:

- *Operational Yield Study, Hemet/San Jacinto Groundwater Management Area (WRIME, 2003d);*
- *Technical Memorandum No. 1 (TM1), Assessment of Historical and Projected Land and Water Use Data (WRIME, 2003a);*
- *Technical Memorandum No. 2 (TM2) - Description of Preferred Potential Conjunctive Use Projects (WRIME, 2003c);*
- *Basin Assessment Study Executive Summary (ES) (WRIME, 2003b); and*
- *Draft Technical Memorandum No. 3 (TM3) - Analysis of Impacts of Conjunctive Use Projects (January 2004).*

The *Operational Yield Study, Hemet/San Jacinto Groundwater Management Area* presents estimates of the operational yield of the Management Area. Several time periods were used to examine the water budgets of each Management Zone and the Management Area as a whole under various hydrologic conditions. The purpose of the report was to review the previous estimates of hydrologic water budget and reconcile differences in the previously prepared water budgets, and to achieve a consensus on the assumptions, data, methods, and yield of the basin. The long-term period of 1958-2001 was used since it had the best available data at the time and represented a balanced hydrologic period, with wet, dry, and normal periods similar in frequency to the overall historical record.

Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 1 (TM 1), Assessment of Historical and Projected Land and Water Use Data presents background and available data, and analyzes the quality and utility of the data for evaluating basin conditions. The data presented in TM 1 include historical groundwater production, water diversions, water sales, and imported water. The purpose of the report was to obtain agreement on existing conditions, document assumptions, and provide a baseline for purposes of future comparison.

Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 2 (TM 2), Identification and Description of Potential Conjunctive Use Projects presents the process and basis of selection of sites for further evaluation for potential conjunctive use projects. Seven sites were selected from an initial group of 15. The sites were ranked based on screening criteria that included: general site characteristics (size, recharge needs, ownership, etc.), recharge water sources, hydrogeologic suitability, sub-basin interactions, engineering suitability, land use suitability, and environmental impacts. An initial screening was also performed for two potential in-lieu projects.

Hemet/San Jacinto Basin Assessment Study – Executive Summary provides a summary of TM 1 and TM 2.

Draft Hemet/San Jacinto Basin Assessment Study – Basin Assessment Report/Integrated Water Management Plan, Technical Memorandum No. 3 (TM 3), Analysis of Impacts of Conjunctive Use Projects (January 2004) presents a summary of available information on seven potential recharge sites and two potential in-lieu sites for conjunctive use. Draft TM 3 synthesizes information from multiple sources to compare potential recharge sites and proposes preferred sites and documents any additional study or data needs. The TM 3 was presented to the TC in draft form, and comments were received. Due to initiation of the development of the Water Management Plan, the work to finalize TM 3 was re-scoped, which obviated the need to prepare a final TM 3.

Significant other work has been performed and documented by EMWD. These reports include planning documents and feasibility studies with modeling efforts:

- *West San Jacinto Groundwater Basin Management Plan;*
- *Hemet/San Jacinto Water Management Area 2004 Annual Report;*
- *Hemet-San Jacinto Recharge and Recovery Program- Feasibility Study;*
- *Regional Groundwater Model for the San Jacinto Watershed;*
- *Hemet-San Jacinto Integrated Recharge and Recovery Program- Feasibility Study Groundwater Flow Model;*
- *Lake Elsinore and Canyon Lake Nutrient Source Assessment;*
- *Groundwater Infiltration Predictions Using Surface Water Model Output for the San Jacinto Watershed;*
- *Development of the Regional Water Resources Database (RWRD); and*
- *Preliminary Design Report for the San Jacinto Agricultural In-Lieu Water Supply Project.*

West San Jacinto Groundwater Basin Management Plan (EMWD, 1995). This plan was prepared in accordance with Assembly Bill 3030. This groundwater management plan covers the western portion of the EMWD service area in the San Jacinto Watershed. Since the groundwater management in the eastern San Jacinto watershed was being developed under Association in the early 1990s, the Management Area was excluded from the AB3030 planning process. The goal of the West San Jacinto Groundwater Basin Management Plan is "to maximize the use of groundwater for all beneficial uses in such a way as to lower the cost of water supply and to improve the reliability of the total water supply for all water users in the West San Jacinto Groundwater Basin Management Area" (EMWD, 2004). Implementation of the plan included the establishment of an Advisory Committee; Management Zone prioritization; and

groundwater resources evaluation including groundwater quality and level monitoring, extraction monitoring, and hydrogeophysical investigations.

Hemet/San Jacinto Water Management Area 2004 Annual Report (EMWD, 2005b). As part of the reporting process to the Management Area stakeholder group, EMWD produces annual reports that summarize groundwater quality, level, and extraction monitoring results, and provide an update on activities and progress toward meeting the previous year's recommendations and goals of the groundwater management plan. The first annual report for the Hemet/San Jacinto Area was produced in June 2005.

Hemet-San Jacinto Recharge and Recovery Program- Feasibility Study (Psomas, 2003). This report documents the feasibility of a proposed recharge project. The proposed Hemet/San Jacinto Integrated Recharge and Recovery Program consists of average annual recharge of 43,750 acre-feet (AF) based on long-term hydrology at a site within the City of Hemet and near the San Jacinto River's confluences with Poppet and Bautista Creeks. This program involves the construction of approximately 15 recharge ponds on a 100-acre site in the San Jacinto River channel, construction of new pipeline facilities, upgrade of existing pump stations, and construction of new extraction wells at various locations within the Management Area. In order to assess the feasibility of the proposed program, a comparative analysis was completed to evaluate potential alternatives to the preferred option of recharging imported water.

Regional Groundwater Model for the San Jacinto Watershed (TechLink Environmental, 2002a). This report documents the development of a regional groundwater flow and transport model for the San Jacinto watershed basin within EMWD's service area, an area that includes the Management Area as well as the areas to the west included in the *West San Jacinto Groundwater Basin Management Plan. Regional Groundwater Model for the San Jacinto Watershed* includes review of available data, development of a conceptual model, setup of a flow and transport model, calibration of the model, and simulation of management scenarios.

Hemet-San Jacinto Integrated Recharge and Recovery Program - Feasibility Study Groundwater Flow Model (TechLink, 2002b). This report documents the application of the regional groundwater model to evaluate the various recharge and recovery activities and alternative water supplies. These model simulations are intended to compare project and no-project alternatives, evaluate the aquifer capability to store large volumes of water, and evaluate the availability of recharged water for extraction.

Lake Elsinore and Canyon Lake Nutrient Source Assessment (TetraTech, 2003). TetraTech developed a watershed model of the San Jacinto watershed for the Lake Elsinore and San Jacinto Watershed Authority and the RWQCB as part of the Lake Elsinore and Canyon Lake Nutrient Source Assessment. The model provided a framework for nutrient source assessment through representation of contributing land uses in a subwatershed network and subsequent

determination of required nutrient load reductions and allocations to Total Maximum Daily Load (TMDL) objectives. Relating to the Management Area, the report showed that nutrients from the Management Area only reach the lakes when Mystic Lake overflows.

Groundwater Infiltration Predictions Using Surface Water Model Output for the San Jacinto Watershed (TetraTech, 2004). This report documents the update and modification of the watershed model by TetraTech to support EMWD's development of a groundwater model of the San Jacinto River basin to simulate aquifer storage in the region. The update and modification included extension of the modeling period from January 1984 to March 2003, division of one subwatershed into 4 subwatersheds, and modification of model output. The model was validated and scenarios were run.

Regional Water Resources Database (EMWD, 2005c). A RWRD was developed for EMWD in 2004 to house the existing and future groundwater-related records and to interface Geographic Information System (GIS) maps and aerial photographs. The RWRD contains information for groundwater levels and extraction; streamflow and diversions; well information, construction data, downhole logs, and well/aquifer pump tests; precipitation; temperature; evaporation; imported water usage and quality; conjunctive use; and water quality data from other laboratories and published reports. While no formal document is available to-date describing the full development and implementation of this project, *Regional Water Resources Database* presents a concise summary of the capabilities of this important component of data management in the region.

Preliminary Design Report for the San Jacinto Agricultural In-Lieu Water Supply Project (Engineering Resources of Southern California, 2005). This report details how recycled water could be incorporated into existing irrigation infrastructure and how to be consistent with the regulatory constraints associated with recycled water use. This included study of water demands, pipeline alignment and size, and environmental issues and resulted in the development of a preliminary plan and cost estimate. The preliminary plan included 13,200 feet of 24-inch pipeline serving Rancho Casa Loma and Scott Brothers Dairy Farms. Total irrigation demand from these farms is estimated at 8,640 AFY. Of this amount, the project could deliver 3,215 AFY due to limited availability of recycled water during the summer months. The project is estimated to take 13 months to complete.

SECTION 3 WATER MANAGEMENT PLAN ELEMENTS

The elements of this Plan include water management goals and a set of management strategies that discuss and identify the actions necessary for meeting the goals.

3.1 MANAGEMENT PLAN GOALS

The Plan has eight primary goals derived from the Principles and the Agreement. Each of the goals, listed below, is briefly discussed in subsequent sections:

- Address pumping overdraft and declining groundwater levels,
- Provide for Soboba Tribe prior and paramount water rights,
- Ensure reliable water supply,
- Provide for planned urban growth,
- Protect and enhance water quality,
- Develop cost-effective water supply,
- Provide adequate monitoring for water supply and water quality, and
- Supersede the Fruitvale Judgment and Decree.

3.1.1 ADDRESS PUMPING OVERDRAFT AND DECLINING GROUNDWATER LEVELS

The Principles and the Stipulated Judgment recognize that groundwater levels within the Management Area have generally been declining for a number of years, and that the Management Area is presently in a condition of groundwater overdraft. The amount of groundwater overdraft is estimated to range from 10,000 to 15,000 AFY. This Plan has a goal of reducing the overdraft in the short-term, and completely eliminating the annual overdraft in the long-term. The timeframe will depend on the extent of overdraft, as more knowledge is gained through the years. For example, a six-year period would be needed to eliminate overdraft if there is an annual overdraft of 10,000 AF.

The Principles identify management strategies to be included in the Plan to reduce overdraft and ensure a long-term supply of reliable water for current and future uses. The Plan contains both management (non-structural) and capital facility (structural) elements to reduce demand and/or increase the available supply. The management elements include: reduction in native groundwater production; enhanced recharge with local runoff, imported, and/or recycled water; and water conservation programs. Short-term planned reductions in pumping are part

of the Plan while further supplies are obtained through the identified management elements. The management strategies are described in more detail in Section 3.2.

3.1.2 PROVIDE FOR SOBOBA PRIOR AND PARAMOUNT WATER RIGHTS

The Agreement with the Soboba Tribe provides for financial obligations, settlement of all water rights claims, and water purchases from MWD, including infrastructure and groundwater storage. The Plan requires that all parts of the Agreement with the Soboba Tribe be met. The management elements to ensure this include: recognition of 9,000 AFY of Soboba Tribe water rights and up to 4,100 AFY of water use in Canyon and Upper Pressure Management Zones for the first 50 years from the date of Settlement, purchase of replenishment water, and MWD's long-term average delivery of 7,500 AFY of imported water.

3.1.3 ENSURE RELIABLE WATER SUPPLY

Reliability is a key component of any water supply system. This goal of the Plan is to ensure that the Public Agencies have a consensus and commitment to develop a comprehensive water supply portfolio that realizes all potential opportunities, and that plans are in place to adapt to changing demands, natural disasters, and drought conditions. Such a portfolio should rely on a range of sources of water supply and include a large component of local supply and storage. These objectives minimize, to the extent possible, reliance on weather patterns, over-stressed aquifers, and over-allocated imported water. The Plan elements that address these goals include imported and recycled water use.

3.1.4 PROVIDE FOR PLANNED URBAN GROWTH

The Management Area, like much of the Inland Empire area of Southern California, is experiencing dramatic urbanization. The Principles and the Plan recognize and acknowledge that the Management Area will continue to experience residential, commercial, and industrial growth and development, and that the existing water production and service systems will need to be expanded to meet this growth. This urbanization will affect water supplies in several ways. Urban development on non-irrigated lands will increase water use. Urban development and conversion of irrigated lands may not significantly increase water use, but the urban water use requires a more dependable, higher quality water supply. It is estimated that at least 15,000 AFY incremental water supply capacities over the existing Base Production Rights of Public Agencies must be dedicated to adequately serve this growth. The Plan will help local communities comply with recent changes in state law effective January 2002 (SB 221 and SB 610) requiring municipal suppliers, water districts, and cities or counties to document water availability from all sources in normal, dry, and multiple dry years whenever land use decisions

are made. Planned urban growth, as identified in prevailing land use and general plans, or in approved Urban Water Management Plans (UWMP), provided the basis for all demand forecasts and assumptions in the Plan.

3.1.5 PROTECT AND ENHANCE WATER QUALITY

The Management Area has some of the highest quality groundwater in the San Jacinto Watershed, but it has its own problems and issues. Nitrates and Total Dissolved Solids (TDS) concentrations have historically increased as the area experienced urban and agricultural growth. As noted above, urban uses will replace agricultural uses, resulting in more stringent water quality standards for most constituents, including nitrates. The Plan seeks to meet goals for water quality through preventing degradation of the groundwater due to activities in the Management Area, and as a result of implementation of the Plan. Each of the Public Agencies also seeks to prevent degradation or to improve groundwater quality to avoid high costs for drinking water treatment.

3.1.6 DEVELOP COST-EFFECTIVE WATER SUPPLY

Equitable distribution of costs and benefits are part of the Plan. It is important that the Plan elements are selected and implemented in a way that keeps costs to a minimum so as to keep water bills as low as possible for customers. Cost management includes purchasing imported water at low rates; utilizing groundwater storage space; fully utilizing existing infrastructure; promoting conservation; efficiently implementing new infrastructure; and maintaining good quality groundwater and surface water to keep treatment costs low. The Public Agencies also seek to cost-effectively reclaim municipal wastewater for beneficial reuse whenever possible.

3.1.7 PROVIDE ADEQUATE MONITORING FOR WATER SUPPLY AND WATER QUALITY

Monitoring programs will be implemented to determine if the Plan's goals are being met; to document that anticipated benefits are being achieved; and to predict future needs. Included in the monitoring should be water quality, sampled at sufficient locations to be representative, with analysis for all constituents of concern. In addition, the monitoring program should include monitoring of water levels, well metering, and tracking of imported water and recycled water availability and deliveries. Monitoring can also be used to improve yield estimates and groundwater model performance through the development of better estimates of stream recharge and other components. The results of monitoring will be used to strengthen or relax actions needed to meet Plan goals.

3.1.8 SUPERSEDE THE FRUITVALE JUDGMENT AND DECREE

The Fruitvale Judgment and Decree (The City of San Jacinto, et al., v. Fruitvale Mutual Water Company, et al., No. 51546, Riverside County) was entered into Book 72, Page 164 of Judgments, Riverside County, on June 4, 1954. EMWD, as successor in interest to FMWC, is subject to the provisions of the Judgment and Decree. Provisions in the document are discussed and summarized in Section 2 of this Plan. The Stipulated Judgment and its Water Management Plan are to supersede the Fruitvale Judgment and Agreement subject to certain exceptions in Section 3.5 of the Stipulated Judgment.

3.2 WATER MANAGEMENT PLAN STRATEGIES

To meet the stated goals of the Plan, the stakeholders have adopted the following specific strategies.

3.2.1 REDUCE PUBLIC AGENCY NATIVE GROUNDWATER PRODUCTION

The Public Agencies have agreed to reduce native groundwater production so that total production is within the Safe Yield of the Management Area. The average annual groundwater production in the Management Area for the hydrologic period 1958-2004 is estimated to be 54,800 AFY. The initial estimate of Safe Yield is 45,000 AF. The Public Agencies have also agreed to a 10% reduction from each Base Production Right in the first full year after entry of the Stipulated Judgment. The Public Agencies' share of Safe Yield is calculated based on their Adjusted Production Right, and is discussed further in Section 11. Within the first six years, the Watermaster will make a determination of the Safe Yield of the Management Area. Thereafter, the Safe Yield shall be reviewed and modified, if necessary, upon the recommendation of the TC or as the Watermaster may determine. Until Adjusted Production Rights are consistent with the Public Agencies' share of Safe Yield, the Watermaster will determine the required reductions in Adjusted Production Rights in each subsequent year to achieve Safe Yield within a reasonable period of time as determined by the Watermaster. The Watermaster is to consider the extent of the overdraft, the economic impact on the parties bound by this Judgment, and other relevant factors in determining the total and pro-rata shares of Adjusted Production Rights. The goal is to achieve production at the same level as Safe Yield over a six-year period assuming an annual overdraft of 10,000 acre-feet. In the event the extent of the overdraft is different than assumed, then the period of time reasonably required to reach Safe Yield may be extended or reduced accordingly. However, in no event shall any reduction for any Public Agency be more than 10% of the Adjusted Production Rights of the prior year.

3.2.2 IMPLEMENT THE SAN JACINTO RIVER RECHARGE AND RECOVERY PROJECT

The stakeholders have agreed that Phase I of the IRRP is the primary project considered to be the core of the Physical Solution. The stakeholders are working towards an agreement for Phase I of the IRRP project which documents their agreement on the ownership, financing, and operation of the facilities.

The information presented here is based on previously published documents adjusted when appropriate based on the latest knowledge at the time of publication of the Plan.

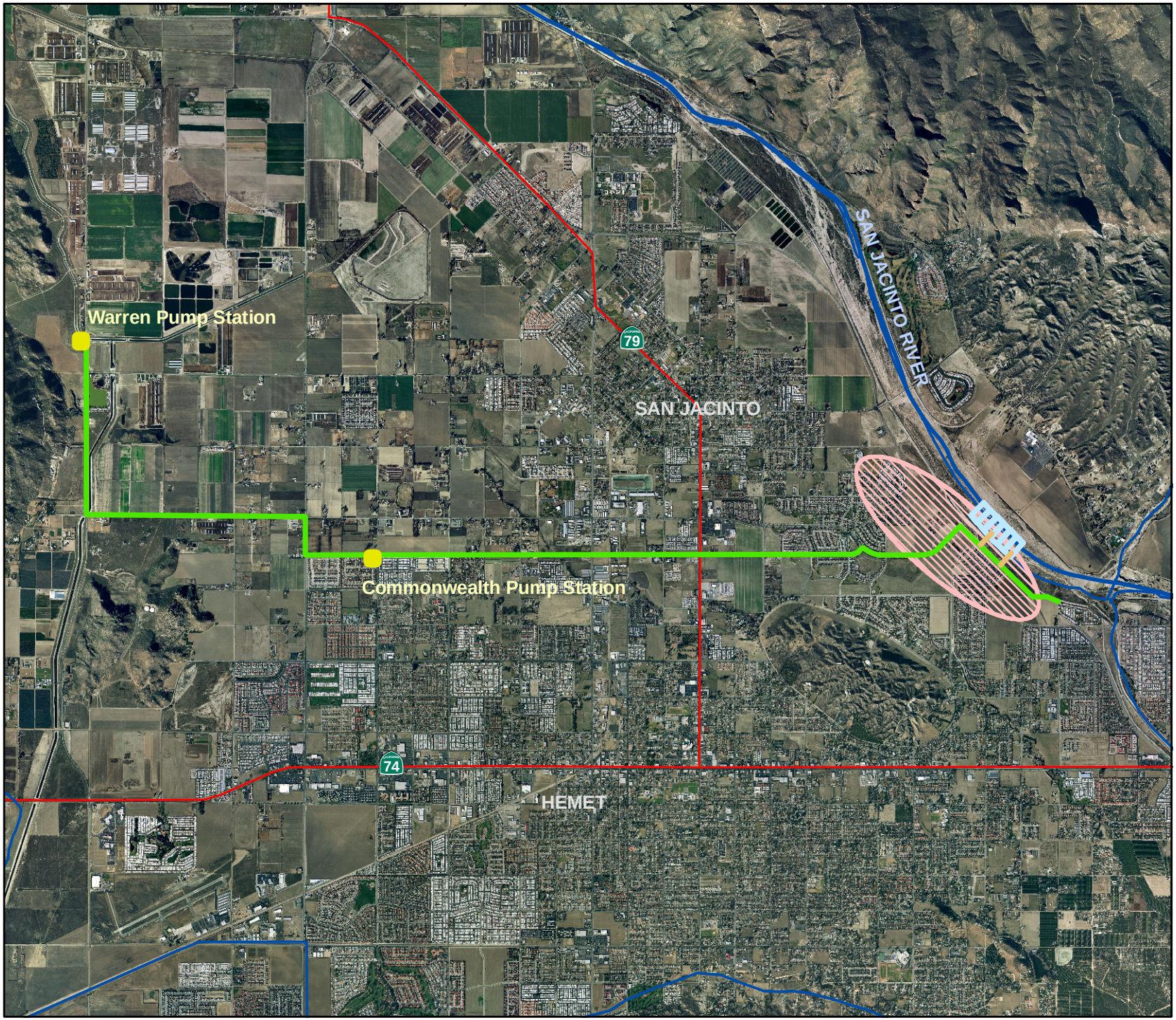
Phases I and II of the IRRP are designed to recharge (replenish) imported water and extract groundwater at a capacity such that the following goals are met:

- Satisfy the Tribe's prior and paramount rights as set forth in the Agreement with the Tribe by providing an average annual supply of 7,500 acre-feet pursuant to the terms of such agreement. The proposed Program would provide the MWD with the right to store up to 40,000 acre-feet of imported water in the Upper Pressure Sub-basin as advance deliveries under its agreement to provide an average annual supply of 7,500 acre-feet.
- Offset the existing overdraft of the Management Area, estimated at approximately 10,000 AFY.
- Provide approximately an additional 15,000 AFY of water storage to help meet projected demand increases.

Major elements of Phase I of the Project are (Figure 3.1):

- Modifications to Pump Stations (Warren and Commonwealth);
- Construction of Pipelines;
- Design and Construction of Recharge Basins;
- Drilling Three (3) Extraction Wells;
- Installation of Pumps and Chlorination Equipment for Three (3) Extraction Well; and
- Design and Installation of Three (3) Monitoring Wells.

The project is designed and implemented in two Phases. While project Phase I activities are defined in detail, Phase II of the project is defined at conceptual level and the detailed design will be developed in the future.



Hemet / San Jacinto Water Management Plan

Schematic of Integrated Recharge Recovery Program - Phase I

Figure 3.1

Legend

- Pump Station
- Phase I Pipeline
- Phase I Ponds
- Existing Pipeline
- Phase I Well Field

Source: EMWD

N

0 0.5 1 Miles

October 2007

WRIME

3.2.2.1 Phase I

This phase of the project consists of the construction of the San Jacinto Integrated Recharge and Recovery Project, which will provide up to 42 cubic feet per second (cfs)* of recharge water capacity. Phase I is scheduled to be completed by December 2008*, and will cost approximately $16.2* million. Major activities during Phase I are:

1. **Completion of Environmental Process -** The Environmental Impact Report (EIR) was prepared and adopted in August of 2004. Additional permitting requirements include Section 7 consultation with USFWS and issuance of Biological Opinion by the appropriate federal agency.
2. **Acquisition of Land -** A 100 acre parcel has been purchased by EMWD for required habitat mitigation measures for a 35 acre* parcel that is dedicated to recharge basins. In addition, EMWD is in the process of acquiring approximately one acre of land (in several parcels) for monitoring wells.
3. **Approval, Advertising, and Award of Construction Contract -** The EMWD Board of Directors has approved the bidding process.
4. **Drilling of Extraction Wells No. 1, 2, and 3 -** This includes construction and testing of three 18-inch diameter extraction wells, each to a depth of approximately 1,000 feet.
5. **Installation of Pump and Chlorination Equipment for Wells No. 1, 2, and 3 -** This includes installation of pump and chlorination equipment, appurtenances and site improvements required to complete and operate the new extraction wells.
6. **Modifications to the Pump Station -** This includes modifications to the Warren and Commonwealth Pump Stations. The modifications include upgrades to increase pump station capacity to provide a seasonal maximum of 42 cfs* to the recharge basins.
7. **Construction of Recharge Basins -** This activity includes construction of six recharge ponds within the San Jacinto river bed in two clusters of three ponds each. The footprint of the recharge area will be approximately 35 acres*, along the west side of the San Jacinto River, immediately upstream of the river confluence with the Meridian Channel.
8. **Construction of Pipelines -** This includes design and construction of pipelines and appurtenances to convey, regulate, and meter raw imported water flows into the recharge basins. Pipelines include two (2) 24-inch diameter laterals to convey water from an existing 33-inch diameter transmission main along the proposed Ramona Expressway alignment to the first basin in each of the two basin clusters. There will be appurtenances including regulation valves, meters to record water

* Number has been updated since the publication of the IRRP Feasibility Report.

flow, telemetry-based flow control systems, and discharge piping into the recharge basins.

9. **Design and Construction of Monitoring Wells -** Three monitoring wells will be constructed outside the river bed along the west berm. The wells are designed to monitor the vertical and lateral migration of recharge water into the underlying aquifer zones. These clustered wells will be multi-cased and perforated to monitor the groundwater levels at various depths.

The overall project size may change as a result of negotiations with regulatory agencies.

3.2.3 IMPLEMENT GROUNDWATER REPLENISHMENT PROGRAM

The groundwater aquifers in the Management Area are a valuable resource and provide many advantages to operating a reliable water supply system. For many Private Water Producers, groundwater is their sole source of water. Declining water levels increase costs for pumping water and can also cause wells to go dry, requiring deeper drilling, or can result in the intrusion of poor quality groundwater from neighboring Management Zones, rendering the groundwater unsuitable for many beneficial uses. Also, the replenishment of high quality imported water from the State Water Project or high quality runoff from the surrounding mountains can maintain or improve the quality of the groundwater in the Management Area.

Groundwater replenishment, therefore, is a major part of the water management strategies considered by the stakeholders. Replenishment efforts to increase water supply in the Management Area can be grouped into two categories:

1. Direct replenishment of groundwater to store water for future use; and
2. Augmentation of imported or recycled water supplies to provide immediate increases in water supply and the associated decrease in groundwater pumping. Often, these categories are combined, with increases in imported or recycled water being used to replenish groundwater for future use.

3.2.3.1 Enhancing Natural Replenishment

The Management Area already receives a significant amount of natural recharge, from sources such as direct recharge from precipitation and infiltration from the San Jacinto River and its tributaries. While much of this water is able to infiltrate naturally, natural recharge could be increased by capturing surface flows during storm events, allowing the water to infiltrate over time rather than be swept out of the Management Area. As part of the Basin Assessment Study, the TC has identified and considered several conjunctive use and natural replenishment projects that have the potential to address such a water supply management strategy. These are described in Section 5.3 of the Plan.

3.2.3.2 Additional MWD Replenishment Water

Utilizing replenishment allows for significant cost savings when purchasing imported water from MWD. MWD provides special rates for water used for replenishment purposes. This water is available during the low-demand winter period and currently costs $238/AF for untreated water, while full-service Tier 1 & 2 untreated water currently costs $331/AF and $427/AF, respectively.

3.2.4 EXPAND THE USE OF RECYCLED WATER

Recycled water is available from EMWD's San Jacinto Valley Regional Water Reclamation Facility. Currently, recycled water is used by agricultural users and other large-scale outdoor irrigators such as golf courses and municipal facilities in place of groundwater. The Watermaster will use recycled water as a significant part of its water supply strategy for replenishment of the groundwater basin. The Watermaster will work with EMWD to determine the operational constraints currently facing the availability of recycled water for replenishment of the basin. The recycled water is to follow the State and Federal guidelines. Future phases of the Plan include upgrade of the San Jacinto Valley Regional Water Reclamation Facility to tertiary treatment.

3.2.4.1 Continue and Expand the In-Lieu Replenishment with Recycled and/or Imported Water

In-lieu replenishment with recycled and/or imported water provides many benefits over direct replenishment of the groundwater. In-lieu involves utilizing an alternate source, in this case imported or recycled water, instead of pumping groundwater. Using in-lieu recharge means that there is no cost to pump groundwater, no land is needed for a spreading basin, and there is no constant recharge through a basin to push salts out of the unsaturated zone. Disadvantages include timing of the supplies with demand; that is, most in-lieu customers cannot use the quantity of water available during the off-peak time. To maximize use of water available for in-lieu replenishment, significant infrastructure will be needed to serve the maximum number of customers. This strategy would require the Watermaster to work with EMWD, other agencies, and Private Water Producers to develop specific plans for expanding the use of recycled water for in-lieu replenishment of the basin.

3.2.4.2 Expand and Upgrade the San Jacinto Valley Regional Water Reclamation Facility

The San Jacinto Valley Regional Water Reclamation Facility is currently an 11 MGD plant with capability to treat wastewater to a secondary level of treatment. While this plant is scheduled for upgrade to tertiary treatment, the recycled water discharge beyond the sale to the agricultural customers is currently being disposed of in the basin. The plant is scheduled for expansion in size and upgrade of the treatment level, and the upgraded plant will have the capacity to treat 14 MGD by 2011 and 18 MGD by 2024. The Watermaster shall have the right of first refusal to purchase all recycled water produced from the treatment facilities serving the Management Area that is not subject to then existing contracts. The Watermaster will analyze the need and decide on the amount of recycled water for direct recharge and/or direct delivery.

3.2.5 Provide for Reliable Water Supply to Meet the Future Demand

The Plan is to provide sufficient water supplies to meet future water demands in the Management Area. This strategy is tied directly to the IRRP that is designed to provide 15,000 AFY of additional supplies to meet the projected water demands. As part of this strategy, additional conjunctive use projects, identified in Section 5.3 of this Plan, will augment Phase II of the IRRP. These projects are mostly designed to capture winter run-off for recharge, unlike the IRRP that is designed to recharge imported water.

3.2.6 Implement Additional Water Conservation Measures

The current level of water conservation has significantly helped to reduce the water demand in the Management Area. In addition to the conservation measures implemented by the Public Agencies, additional conservation measures can be designed and implemented by the agricultural and dairy water users. The Watermaster, in coordination with the Agencies, should develop specific strategies for additional water conservation. In addition, they should identify practical steps and means for voluntary implementation by the agricultural and dairy water users that would help water management of the basin.

3.2.7 Implement and Expand Monitoring Program

At the heart of any water management plan is a robust monitoring program capable of assessing the status of the basin and monitoring the responses to future management actions.

EMWD, on a voluntary basis, has compiled historical groundwater elevation and quality data from mid-1950s through the present. In the early data collection efforts, the location and

frequency of monitoring were not as consistent as the more recent measurements. This was mostly due to the voluntary nature of participation in the monitoring program, as well as funding availability. This lack of consistency in data collection hampers rigorous and thorough analysis. However, long-term hydrographs as well as contours of groundwater levels have been produced by EMWD to present long-term trends in groundwater conditions over time, and with appropriate geographic extent.

In 2004, the Hemet/San Jacinto Groundwater Monitoring Program was initiated to collect, compile, and analyze groundwater-related data. This program was undertaken by the Public Agencies and DWR. The monitoring program provides the information necessary for a comprehensive view of the Management Area, and contains the following elements:

- Groundwater Level Monitoring;
- Groundwater Quality Monitoring;
- Groundwater Extraction Monitoring; and
- Inactive Well Capping and Sealing.

Finally, the monitoring program utilizes EMWD's RWRD, for assembling and assessing groundwater-related data in the Management Area. All Public Agencies provide data on their wells and assist in communicating with private well owners in their respective jurisdictions to collect their data and information.

This strategy reconfirms that the monitoring program, as established in 2004, should continue and be expanded to new areas. The Stipulated Judgment requires that the Watermaster implement a monitoring program to ensure that Plan activities follow best management and engineering principles to protect Management Area water resources, and to compile and analyze data on groundwater production, water levels, water quality, and groundwater in storage. The Watermaster, in coordination with EMWD and other Public Agencies, will develop plans for expansion of the monitoring program, as well as, specific actions for implementation of the monitoring program in the Management Area. Funding for the monitoring program will come from the Administrative Assessment, as detailed in Section 10.3.1.

3.2.7.1 Groundwater Monitoring

Groundwater level and quality monitoring are valuable, but can be costly and time consuming. A robust network of monitoring wells can be established to develop the optimum amount of data on groundwater. Some criteria to be used in the development or modification of the network may include:

- Monitor the same well for selected seasons over many years to understand trends and variability;
- Develop an unbiased distribution of monitoring wells, aerially and vertically, that account for differences in:
  - Topography,
  - Geology and soils,
  - Climate, and
  - Land Use;
- Maintain supporting data to aid in analysis, including:
  - Meteorological data,
  - Hydrologic data, and
  - Land use data, including pumping and irrigation;
- Monitor at a frequency that captures variability of water level and water quality fluctuations;
- Utilize wells, to the extent possible, intended solely for groundwater monitoring, not production; and
- Maintain high levels of data quality.

The Watermaster is to work cooperatively with the Public Agencies and Private Water Producers to establish an optimum network of monitoring wells for collection and analysis of groundwater trends and variability.

3.2.7.2 Surface Water Monitoring

Surface water monitoring would build on the existing cooperative program between EMWD and the United States Geological Survey (USGS). This program monitors streamflow on the San Jacinto River just upstream of State Street and on Lamb Canyon Creek near Victory Ranch. The USGS also monitors a gage on the San Jacinto River at the Cranston Ranger Station. Continued and additional surface water flow and quality monitoring would include the following criteria:

- Monitor the same location for many years to understand trends and variability;
- Maintain supporting data to aid in analysis, including:
  - Meteorological data,
  - Groundwater data, and
  - Land use data, including pumping and irrigation; and
- Maintain high levels of data quality.

Gaging station should be installed on reaches not currently being monitored, such as:

- San Jacinto River near Main Street;
- San Jacinto River near Highway 74 bridge crossing;
- Bautista Creek near Highway 74 bridge crossing; and
- Salt Creek near State Street.

The Watermaster is to work cooperatively with the Public Agencies to establish specific monitoring locations for collection and analysis of surface water trends and variability.

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SECTION 4 STATE OF THE MANAGEMENT AREA

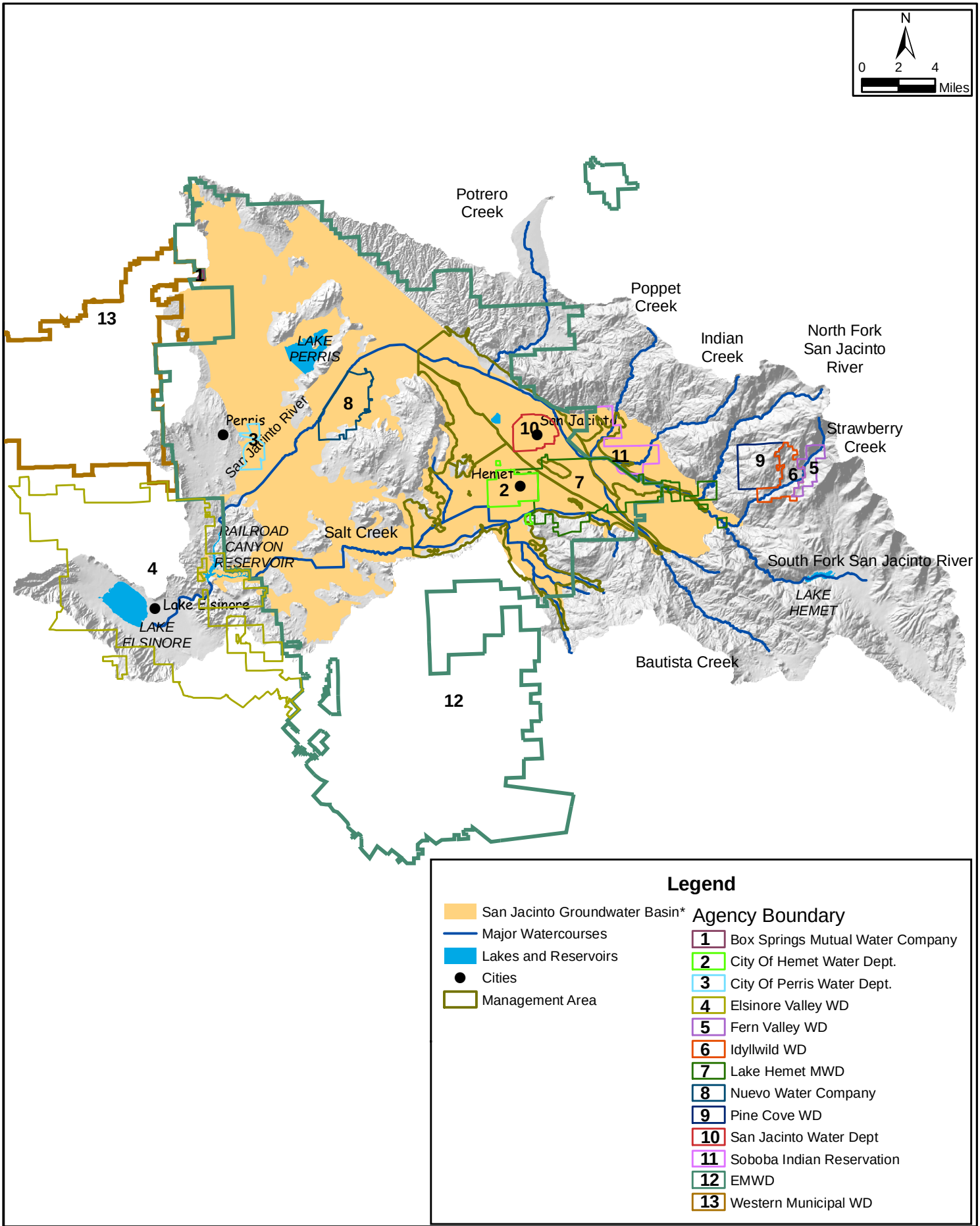
This section discusses the local geologic and hydrologic conditions that provide the foundation for the development of the Plan. The ability to manage available water supplies is to a large degree governed by naturally occurring conditions and the physical environment. This section further describes water supply conditions and sources; historical and current water demands; status of the groundwater basin; and summarizes water quality conditions.

4.1 GEOGRAPHY AND CLIMATE

4.1.1 GEOGRAPHY

The Management Area is located in western Riverside County, approximately 70 miles southeast of the City of Los Angeles. The area encompasses the Cities of Hemet and San Jacinto; unincorporated residential/commercial areas, including Valle Vista; and agricultural lands. State Highway 74 (Florida Avenue) crosses the valley in an east-west direction and State Highway 79 provides a north-south corridor for the region. The San Jacinto mountain range, to the east of the valley, is the dominant geographic feature of the region, rising to a height of 10,805 feet at Mount San Jacinto. Elevations on the valley floor range from approximately 1,400 to 1,800 feet. There are various bedrock outcrops in the area, none of which exceed 2,700 feet.

The San Jacinto Watershed (Figure 4.1) includes the Management Area and surrounding mountains and covers an area of approximately 728 square miles, measured above a point just downstream from Railroad Canyon Dam. All of the streams and rivers in the watershed are ephemeral, flowing only when precipitation occurs and losing much of this flow to groundwater infiltration. The San Jacinto River arises in and drains the western slopes of the San Jacinto Mountains. Waterways tributary to the river include the North and South Forks and Strawberry, Indian, Poppet, and Bautista Creeks. Lake Hemet, located in the mountains on the South Fork of the San Jacinto River, is a 12,775 AF capacity LHMWD-operated reservoir completed in 1895. The San Jacinto River recharges the groundwater basin, primarily in the area southeast of the City of San Jacinto. It then occasionally flows northwest past the Lakeview Mountains, filling Mystic Lake, before turning southwest to flow across the Perris Valley floor. The San Jacinto River ultimately flows into Lake Elsinore via Railroad Canyon and Canyon Lake. Lake Elsinore, when full, overflows into Temescal Wash, which joins the Santa Ana River near Prado Dam.



San Jacinto Watershed

Hemet / San Jacinto Water Management Plan

*Source: DWR, 2003

October 2007

Figure 4.1

4.1.2 CLIMATE

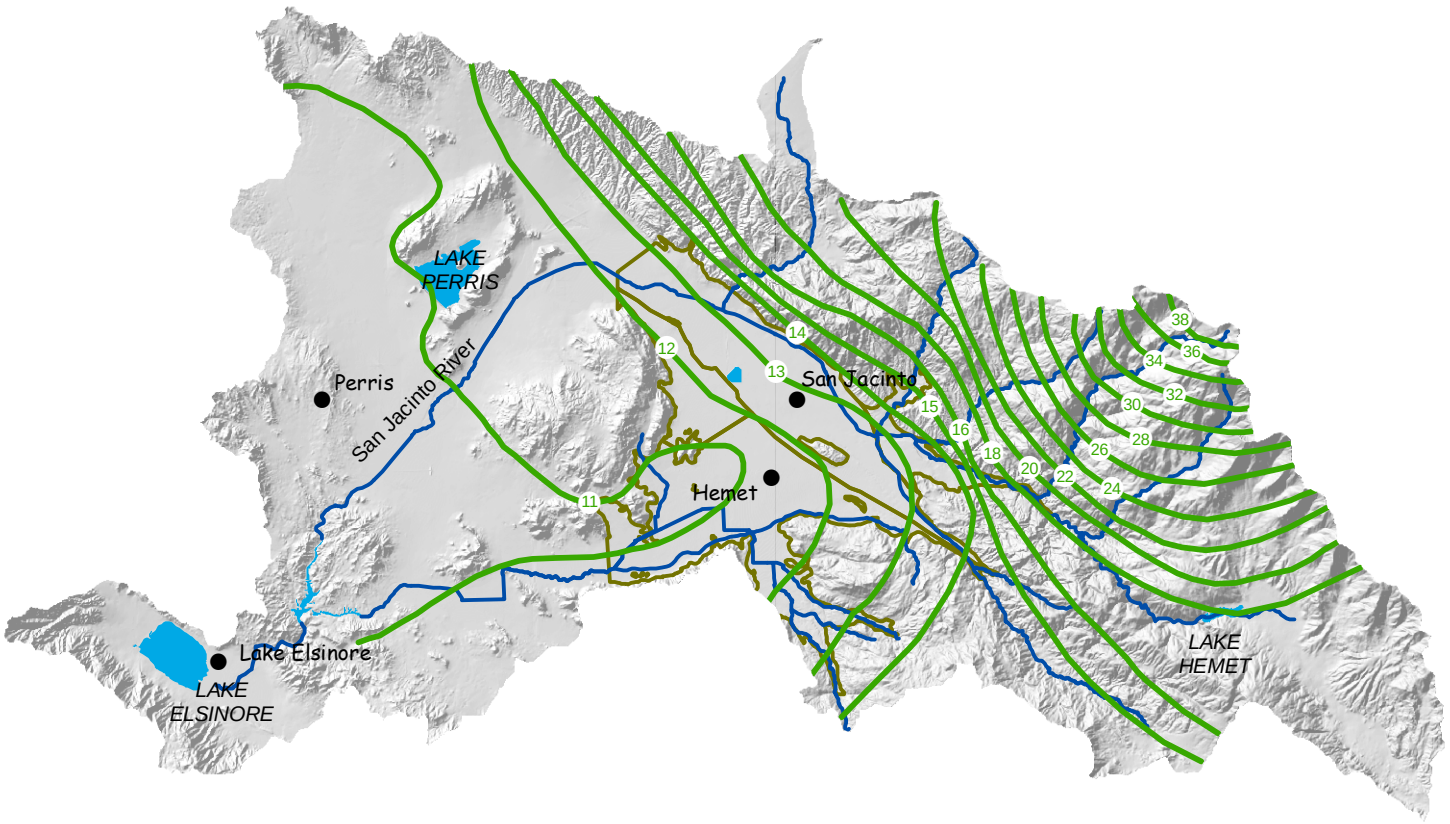
The climate of the area is that of a dry, semi-arid, near-Mediterranean zone, typical of the moderately elevated inland valleys of southern California. The climate is characterized by wet and dry seasons, generally low precipitation, and a large proportion of clear days, moderately high summer temperatures, and mild winter temperatures. The yearly average temperature at the City of San Jacinto is 62°F (25°C). Summer temperatures are often more than 100°F (38°C), and the recorded maximum at San Jacinto is 120°F (49°C). Frost occasionally occurs during the December through February period. The lowest recorded temperature was 7°F (-14°C). The average frost-free period is 247 days long, from March 15 to November 19. These temperatures for the San Jacinto climate station are considered to be generally representative of temperatures throughout the valley area.

Along with the rest of Southern California, the area is subject to the annual Santa Ana winds. Usually occurring in the fall of the year, these winds blow from the northeast, bringing hot, dry desert air with velocities of up to 50 miles per hour. Relative humidity has at times dropped below 5 percent with temperatures of 105°F (40°C) and higher. This phenomenon normally lasts only a few days, but has been known to last for several weeks, thereby greatly increasing the evaporation rate.

As a result of the hot, dry climate, the area has a high rate of evapotranspiration. Evapotranspiration is recorded as reference evapotranspiration (ETo; evapotranspiration from a standardized grass surface) by the DWR's California Irrigation Management Information System. Reference evapotranspiration averages 57 inches per year and is highly seasonal, with an average monthly maximum of 7.9 inches in July and average monthly minimum of 2.0 inches in December (DWR CIMIS, 2006).

Virtually all precipitation falls in the winter months, with some summer thunderstorms. Topography generally controls the relative amounts of precipitation from one location to the next. The average precipitation on the valley floor is about 13 inches, but near Mt. San Jacinto, the average precipitation is approximately 40 inches. Figure 4.2 shows the distribution of precipitation in the watershed.

The Riverside County Flood Control and Water Conservation District (RCFC&WCD) currently maintains precipitation records from the National Weather Service precipitation gauge at the California Division of Forestry Station at 1st Street and San Jacinto Avenue in San Jacinto (Site #186). Annual San Jacinto precipitation totals for the 1850/51 through 2004/05 rain years (July – June) are shown in Figure 4.3. For the 155 years from July 1850 through June 2005, average precipitation equaled 13.12 inches; median precipitation was 12.13 inches; the year with



Average Annual Precipitation

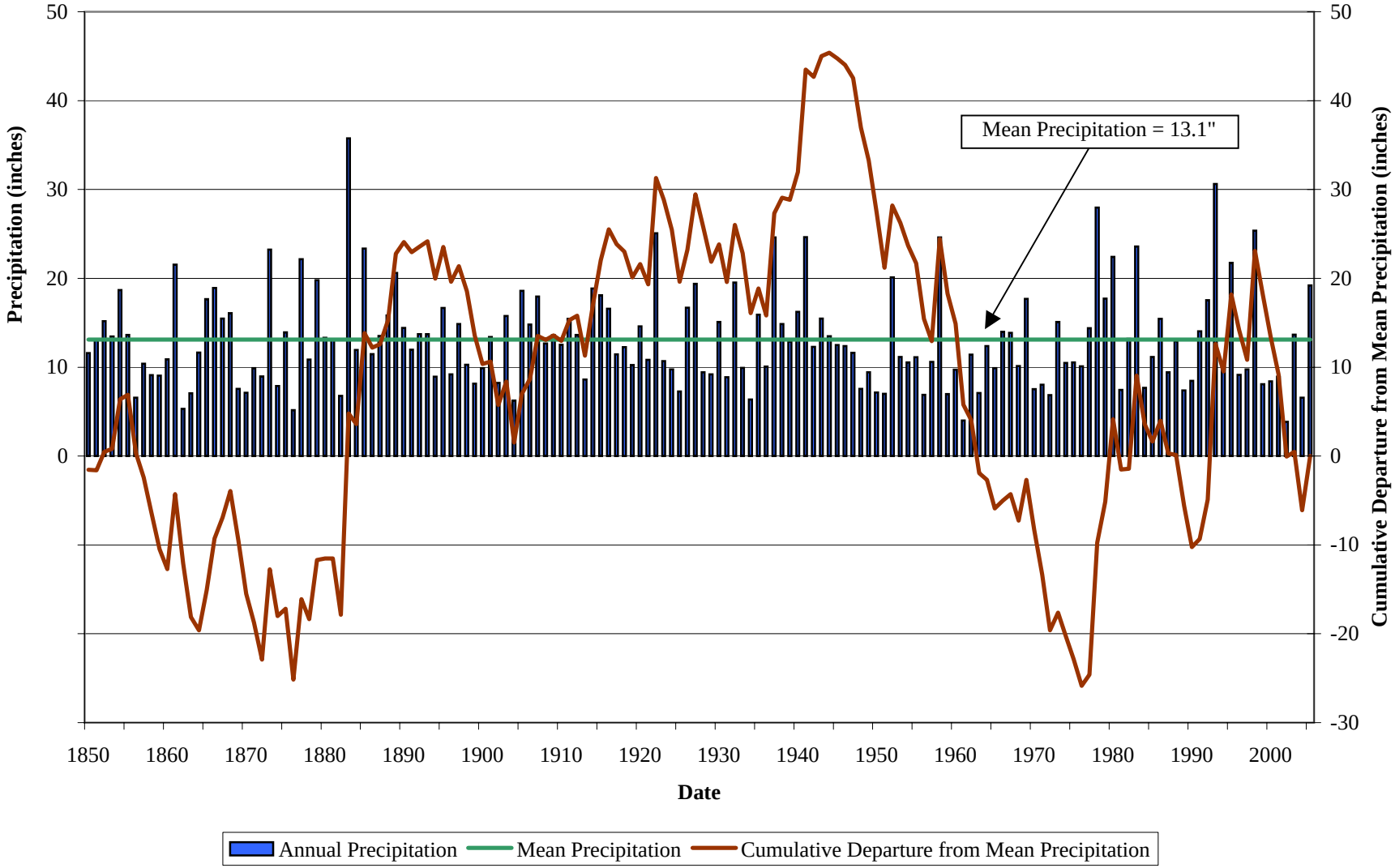
Hemet / San Jacinto Water Management Plan

*Source DWR, 1978 (1932 - 1964 data)

October 2007

Figure 4.2

Figure 4.3 Annual Precipitation and Cumulative Departure from Mean Precipitation



the highest precipitation was 1883/84 with 35.77 inches of rain; and the driest year was 2001/02 with 3.85 inches. Figure 4.3 also shows the cumulative departure from mean precipitation. This chart represents wet periods with increasing values, such as 1882-1890 and 1990-1998; normal periods with near-constant values, such as 1859-1881 and 1980-1988; and dry periods as decreasing values, such as 1944-1976 and 1999-2004.

4.2 SURFACE WATER CONDITIONS

The San Jacinto River and its tributaries are the primary surface water elements in the Management Area. This river and its tributaries provide water for direct use, artificial recharge, as well as for significant natural recharge to the groundwater system through the riverbeds. The San Jacinto River contains high quality water that flows from the mountain watershed and recharges groundwater. The river is a losing stream throughout the Management Area. Artificial and natural recharge of San Jacinto River water improves the overall quality and quantity of groundwater. Groundwater levels have been lowered over the years to the point where additional changes in groundwater levels has little or no impact on surface flows or vice versa, although in predevelopment conditions groundwater contributed to surface flows in swampy areas of the basin floor, particularly upgradient of faults.

EMWD and RCFC&WCD have partnered with USGS to monitor stream flows. USGS gaging stations along the San Jacinto River and its tributaries in the Hemet/San Jacinto and surrounding area are listed in Table 4.1, below.

In 1996, EMWD entered into a Cooperative Water Program Joint Funding Agreement with the USGS for a long-term water budget study in the San Jacinto area. As part of this project, the USGS installed two stream flow gages and three stage gages in the San Jacinto Watershed.

The USGS applied a rainfall-runoff model to estimate the water budgets for groundwater and surface water flows and to determine the hydrological effects of urbanization. The study used historical precipitation data with the model to produce a simulated long-term record of groundwater recharge and surface water runoff for a variety of potential urbanized conditions. The major objectives of the study were to:

1. Estimate groundwater recharge and surface water flows in the Canyon and Upper Pressure Management Zones;
2. Summarize the long-term water budget of the study area upstream of Mystic Lake; and
3. Determine the effects of urbanization in the study area.