

## APPENDIX A

### Significant Policies, Rules, and Regulations

#### *Introduction*

The development of recycled water is strongly influenced by political, regulatory, and economic factors. Recycled water policies shape both development and investment in recycled water. Clear policy at the federal and state levels can provide important guidance for local and regional agencies. Alternatively, unclear or conflicting policies can slow implementation at the local level, and overly restrictive policies can stifle development. Understanding the key federal, state, and local policies, therefore, is an important component to increasing recycled water use. The following sections define recycled water, present the basic political and regulatory framework, describe primary barriers and hurdles to greater recycled water development, and identify the primary stakeholders.

#### *Definition and Context*

Californians have been recycling water – in various ways – for over a century.<sup>1</sup> Different terms have been used to describe recycled water, including reclaimed water, reused water, and gray water. Each of these terms, however, has different connotations. Reuse of gray water, for example, can mean the direct application of (non-sewage) water on landscapes. Likewise, agricultural return flows may be considered “recycled” if they are used by downstream entities.<sup>2</sup> This project relies on the California Water Code’s definition of recycled water as “water which, as a result of treatment of waste, is suitable for a direct beneficial use or a controlled use that would not otherwise occur.”<sup>3</sup> This project focuses on recycled water generated by municipal wastewater facilities.

Typically, wastewater is treated to secondary or tertiary standards before it is discharged (Figure A-1). The degree of treatment required for recycled water is determined by public health protection requirements and the intended end use.<sup>4</sup> In California, recycled water is usually treated to tertiary standards, but may be treated to secondary standards in some instances. Table A-1 illustrates potential uses of secondary- and tertiary-treated recycled water.

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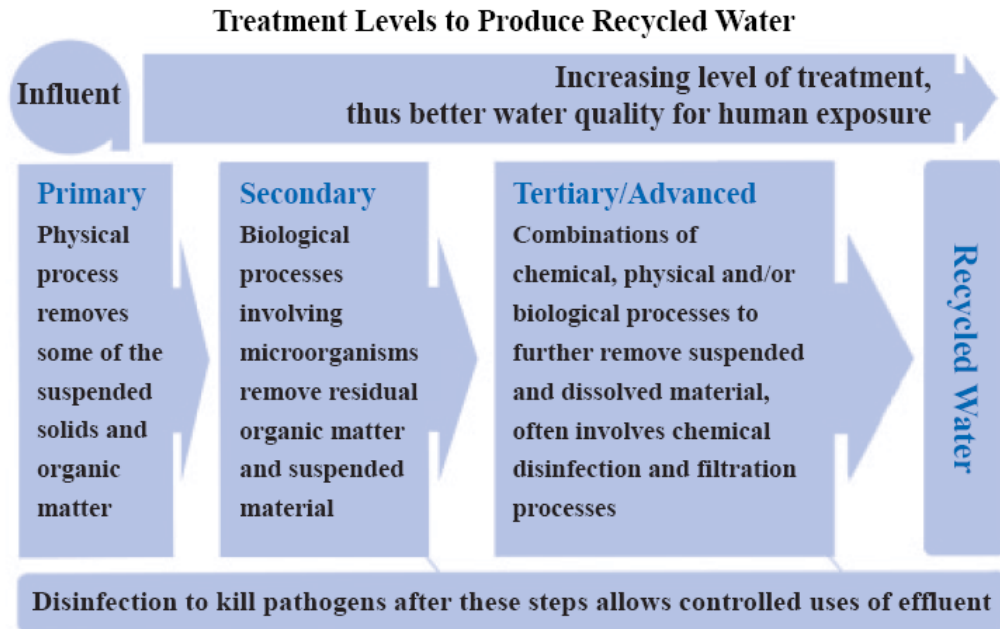
<sup>1</sup> Department of Water Resources, Water Facts No. 23: Water Recycling.  
<http://www.owue.water.ca.gov/recycle/docs/WaterFact23.pdf>

<sup>2</sup> Water Recycling 2030: Recommendations of California’s Recycled Water Task Force, June 2003, p. 2.

<sup>3</sup> California Water Plan Update 2005, page 16-1, consistent with California Water Code

<sup>4</sup> Water Recycling 2030, p.2

Figure A-1  
Treatment Stages for Recycled Water<sup>5</sup>



<sup>5</sup> Department of Water Resources, Water Facts No. 23: Water Recycling.  
<http://www.owue.water.ca.gov/recycle/docs/WaterFact23.pdf>

**Table A-1**  
**Potential Uses of Secondary- and Tertiary-Treated Recycled Water**  
**Demand Sectors and Examples of Minimum**  
**Treatment Levels for Specific Uses to Protect Public Health**

<i>Types of Use</i>	<i>Treatment Level</i>		
	<i>Disinfected Tertiary</i>	<i>Disinfected Secondary</i>	<i>Undisinfected Secondary</i>
<b>Urban Uses and Landscape Irrigation</b>			
Fire protection	☑		
Toilet & urinal flushing	☑		
Irrigation of parks, schoolyards, residential landscaping	☑		
Irrigation of cemeteries, highway landscaping		☑	
Irrigation of nurseries		☑	
Landscape impoundment	☑	☑*	
<b>Agricultural Irrigation</b>			
Pasture for milk animals		☑	
Fodder and fiber crops			☑
Orchards (no contact between fruit and recycled water)			☑
Vineyards (no contact between fruit and recycled water)			☑
Non-food bearing trees			☑
Food crops eaten after processing		☑	
Food crops eaten raw	☑		
<b>Commercial/Industrial</b>			
Cooling & air conditioning - w/cooling towers	☑	☑*	
Structural fire fighting	☑		
Commercial car washes	☑		
Commercial laundries	☑		
Artificial snow making	☑		
Soil compaction, concrete mixing		☑	
<b>Environmental and Other Uses</b>			
Recreational ponds with body contact (swimming)	☑		
Wildlife habitat/wetland		☑	
Aquaculture	☑	☑*	
<b>Groundwater Recharge</b>			
Seawater intrusion barrier	☑*		
Replenishment of potable aquifers	☑*		
<i>*Restrictions may apply</i>			

*Source: California Department of Water Resources.*

Recycled water may be used in various applications. Currently, most recycled water is used for irrigation of agricultural lands or urban landscapes such as greenbelts and golf courses. It can also be used for industrial applications, environmental purposes, groundwater recharge, and as a seawater intrusion barrier. Each application of recycled water may require a different level of treatment. For example, irrigation of non-food bearing trees can use undisinfected, secondary-treated wastewater, while groundwater recharge may require additional restrictions on top of tertiary treatment. Furthermore, some industrial applications require low total dissolved solids (TDS) in their water supplies, and may need to treat recycled water beyond the tertiary level.

Certain applications of recycled water have encountered significant public resistance in recent years. The “toilet to tap” stigma has plagued numerous recycled water projects. Projects that propose using recycled water to recharge a groundwater or surface reservoir (for indirect potable use) have faced the most resistance. Outdoor irrigation of schoolyards and parks have faced similar opposition, and new concerns about emerging contaminants – primarily pharmaceuticals – have revived the debate. Similarly, cross-connections between potable and recycled water supplies, and the use of recycled water on edible crops has raised concerns. Many of these issues, however, are also concerns for conventional surface and groundwater supplies. Las Vegas discharges its treated wastewater into Lake Mead on the Colorado River, and numerous cities discharge their treated wastewater into the Sacramento River – two of Southern California’s most important water supplies. With appropriate treatment, California’s State Water Resources Control Board (SWRCB) have approved indirect potable use of recycled water. In these cases, the tertiary-treated recycled water is expected to receive additional filtration or disinfection through natural processes (i.e., flowing through a groundwater aquifer).

In many regions, recycled water represents a local, reliable supply of water. It is not, however, always considered a new supply. In its statewide water supply model, the Department of Water Resources (DWR) does not consider recycled water a new water supply unless the reclaimed wastewater was previously discharged directly to the ocean or a salt sink. In all other cases, treated wastewater that is discharged to a natural water body becomes source water for downstream water users. Regardless, many water agencies and utilities consider recycled water a valuable new supply because it can offset their demand for other sources or supplies.<sup>6</sup>

### ***Regulatory and Policy Framework***

Regulations and guidelines for recycled water are developed at the federal, state, and local or regional levels. As of September 2004, the federal government provided no regulation for the use or development of recycled water, although several federal acts regulate water quality. At that time, at least 25 states had developed regulations or guidelines for recycled water.

California has numerous regulations and guidelines for use of recycled water, and is currently in the process of developing a consistent, statewide policy. This statewide policy, if approved,<sup>7</sup> would establish uniform requirements and provide guidance to the RWQCB on how to interpret statutes and regulations (see sidebar under California Regulations/Guidelines). In addition to these policies, numerous local and regional governmental agencies have developed regulations for recycled water.

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<sup>6</sup> Phone conversation, Martha Davis, Executive Manager of Policy Development, Inland Empire Utilities Agency, March 28, 2007.

<sup>7</sup> The SWRCB has deferred a decision on a new recycled water policy, allowing recycled water stakeholders 90 days (until mid-June) to deliver a counter-proposal to Board staff. The proposed policy and comments can be found at [http://www.waterboards.ca.gov/water\\_recycling\\_policy/index.html](http://www.waterboards.ca.gov/water_recycling_policy/index.html).

## **Federal Policies/Guidelines**

Two major federal policies affect recycled water projects: the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA). In addition to these regulations, the federal government serves as an important partner for state and local agencies in project development, and helps promote and fund project development.

The CWA protects water quality by regulating the discharge of pollutants into navigable bodies of water (which includes almost all rivers, lakes, and wetlands in the U.S.). This act regulates both point and non-point sources of pollution, and an NPDES (National Pollutant Discharge Elimination System) permit is required in order for an entity to discharge wastewater into a surface water body. The CWA regulates the quality of effluent produced by wastewater treatment plants, and because of pollutant discharge regulations, may encourage the reuse of treated wastewater (i.e., recycled water). In addition, the act has, in the past, provided resources to municipalities to develop or improve wastewater treatment plants (thereby reducing pollutant discharges to surface waters).<sup>8</sup>

The CWA has an additional implication for recycled water development. In situations where recycled water is being used for surface irrigation, incidental surface runoff may be discharged into an adjacent water body, which would require an NPDES permit. To address this issue, the California SWRCB has discussed several options, including issuing a “statewide permit” for discharges resulting from recycled water used in irrigation.<sup>9</sup> In the interim, a memo issued by the SWRCB on February 24, 2005, provides direction to the regional boards.<sup>10</sup>

The SDWA regulates the quality of drinking water in the U.S., from both surface and groundwater sources (including wells that serve more than 25 people). The SDWA does not directly affect recycled water projects; however, any projects that use recycled water to recharge surface reservoirs or groundwater aquifers for indirect potable reuse would be affected by the SDWA.

## **California Regulations/Guidelines**

California has encouraged the use of recycled water for nearly two decades. Early on, officials recognized the State’s limited water resources, and the value of conservation and maximum reuse of treated wastewater. California’s Water Reuse Law (Water Code Sections 461-465) and Water Recycling Law (Water Code Sections 13500-13556) encourage Californians to develop recycling projects to augment both surface and groundwater supplies. Numerous other laws have followed these regulations. Implementation of these laws at the local and regional levels has encountered challenges, which led to the development of the Recycled Water Task Force (RWTF) in 2003 and the development of a statewide recycled water policy (under development as of the date of this report).

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<sup>8</sup> <http://www.epa.gov/watertrain/cwa/index.htm>

<sup>9</sup> Discussed at the hearing in L.A. on October 2, 2007.

<sup>10</sup> [http://www.waterboards.ca.gov/docs/incidental\\_runoff\\_memo.pdf](http://www.waterboards.ca.gov/docs/incidental_runoff_memo.pdf)

Numerous state policies have provided guidance for recycled water development (Table A-2). In 1991, the California Water Recycling Act was adopted (CA Water Code 13577), setting a goal of recycling 700,000 acre-feet of water annually by the year 2000, and 1 million acre-feet by the year 2010. Adoption of this act helped prompt the development of more regulations and policies, and garnered public support for control of treated wastewater. Senate Bill 2095, Recycled Water in Landscaping Act passed in 2000, further endorsed the use of recycled water. The bill requires public and private entities that generate recycled water to notify the local governmental agency. In response, the local agency must adopt a recycled water ordinance within 180 days (unless it adopted one prior to January 1, 2001). Assembly Bill 371, passed in 2006, has similar requirements; the bill requires a recycled water producer to notify the Department of Transportation and the Department of General Services of its intent to produce recycled water that could be used in state landscape irrigation. In addition, the bill required DWR and the Department of Public Health (formerly the Department of Health Services) to adopt plumbing codes and design standards for buildings with both recycled and potable water systems (deadline of July 1, 2008).

### **California's Proposed Statewide Policy on Recycled Water**

In response to the 2003 Recycled Water Task Force report, the SWRCB has proposed a statewide policy for regulating recycled water. The policy will help the Regional Water Boards consistently apply state statutes and regulations. The proposed policy addresses the following elements:

- Salts (TDS)
- Recycled water irrigation projects
- Groundwater recharge projects
- Liability
- Conflict resolution procedures

The policy does not address

- Surface impoundments holding recycled water
- Incidental runoff of recycled water (this may be addressed in the future, possibly through an NPDES permit)
- Aquifer storage/recovery projects that do not use recycled water

Several other policies govern recycled water use in California. Title 22 of the California Code of Regulations regulates the quality of water discharged from wastewater treatment facilities. This regulation, enforced by the Department of Public Health, plays an important role in project permitting. The quality of wastewater treated at recycled water facilities is important; high levels of salt and other minerals makes treatment more expensive. To combat increasing salinity levels, Assembly Bill 334 was passed in 2003, which allows local agencies to regulate the use or prohibit the sale of water softeners in buildings that discharge to a community wastewater treatment facility.

Recycled water use has not increased as rapidly as was anticipated in 1991 when the first act was passed, because of a few factors. To more thoroughly identify the opportunities and constraints facing recycled water use in industrial and commercial applications, the DWR



convened a RWTF in 2003 (as required by Assembly Bill 331, passed in 2002). The Task Force identified 26 issues and corresponding recommendations to the Legislature, State government, public agencies, water recycling stakeholders, and the general public.

California’s state policies provide a framework for local agencies that implement the policies. Early state policies enabled recycled water project development by setting goals for its production and use, and have reduced barriers to development. While some state laws are clear, strict interpretation at the local level can lead to conflict and stall development. Because project development typically involves several agencies, most local agencies take a diplomatic approach to project development, as opposed to the regulatory approach required by SB 2095 (2000) and AB 371 (2006).

**Table A-2  
California’s Policies and Regulations Governing Recycled Water Use and Development**

Policy	Date	Description
Title 22 (CA Code of Regulations, Department of Public Health)		Defines water quality standards for recycled water, which impacts project permitting.
CA Water Code Sections 13500-13556, Water Recycling Law		State law that encourages California to develop water recycling projects to meet the state’s water needs and augment surface and groundwater supplies.
CA Water Code Sections 461-465, Water Reuse Law		State law that provides that the state’s interest in water conservation requires the maximum reuse of treated wastewater.
CA Water Code 13577, California Water Recycling Act	1991	Set water recycling goals of 700,000 afy by 2000 and of 1 million afy by 2010.
Senate Bill 2095, Water Recycling in Landscaping Act	2000	Requires entities producing recycled water (or those that anticipate producing recycled water within ten years) to notify local agencies. In turn, the law requires local agencies to develop recycled water use ordinances within 180 days of receipt of notification, unless they had already done so prior to January 1, 2001.
Assembly Bill 331, Recycled Water Task Force	2001	Directs the DWR to convene the 2002 RWTF to advise the DWR of opportunities and constraints on recycled water development.

Policy	Date	Description
Assembly Bill 334, Water Softening and Conditioning Appliances	2003	Allows local agencies to adopt ordinances to limit the availability of or prohibit the installation of water softeners in buildings that discharge to a community sewer system.
Assembly Bill 371, Water Recycling Act of 2006	2006	Requires a recycled water producer to notify the CA Department of Transportation and the Department of General Services if they intend to produce recycled water within 10 years <i>if</i> landscape irrigation (by the State) would require additional plumbing. In addition, bill requires DWR and the Department of Public Health to develop regulations on plumbing and design codes for dual-plumbed buildings (by July 1, 2008).

The RWTF identified numerous barriers to recycled water development in California. Among these was an inconsistency in how the RWQCB and local agencies have interpreted state policies and regulations. To address these inconsistencies and local agencies' uncertainty about future regulation of recycled water, the Task Force recommended developing a comprehensive statewide policy for recycled water. The SWRCB proposed a draft policy in October 2007. Several issues have catalyzed debate among stakeholders, including salinity management, the relationship between a recycled water policy and the state's anti-degradation policy, emerging contaminants, and the need for NPDES discharge permits. The SWRCB plans to meet in June 2008 to consider adoption of the proposed statewide policy.

### Local Regulations and Policies

Local development of recycled water varies substantially throughout the state. Currently, there is no statewide directive for using recycled water; however, local governments are increasingly viewing recycled water as a more reliable, cheaper water supply, and as a means of addressing water scarcity. Development of recycled water projects seems to have been driven more by local water demands, not state regulations. Several water agencies have been leaders in this regard, including Sonoma County, Inland Empire Utilities Agency, West Basin Municipal Water, and Santa Barbara.

Although the state does not have an explicit directive to use recycled water, it does require local agencies to address recycled water use in their Urban Water Management Plans (UWMPs). These plans, filed by local agencies every five years, must address the agency's water supply for the next 20 to 25 years. Recycled water must be considered and addressed in these supply projections, and agencies must assess the cost-effectiveness of recycled water. They are not, however, required to implement recycled water projects or take any actions that are not "cost effective".<sup>11</sup> New legislation [Assembly 2270 Laird] that would require statewide recycling

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<sup>11</sup>The issue of how cost-effectiveness of recycled water opportunities changes when both water and energy benefits are considered is the primary focus of this study.



targets (previously known as 'goals') to be updated every 5 years and be included in the California Water Plan Update (Department of Water Resources Bulletin 160).

## **Barriers and Hurdles**

Greater development of recycled water faces several key barriers and hurdles. The primary challenges fall into three categories: regulatory, public perception, and capital investment. These three factors are likely to affect all recycled water projects. Regional or local barriers may also be present, such as localized water quality concerns or conflicts of interest among governing agencies.

Recycled water is regulated by numerous federal, state, regional, and local agencies. As a result, recycled water use is accompanied by a complex water code. This code often treats recycled water in notably different terms than primary water sources. Because recycled water is considered wastewater and not a primary water source, it is subject to stricter regulatory requirements than other supplies. For example, treated wastewater effluent may have total dissolved solids (TDS) of 500 mg/L, while the TDS in the Colorado River is 800 mg/L. Despite its lower level of TDS, the wastewater effluent may require additional treatment before its use, simply because it is wastewater. In contrast, *indirect* water recycling is not subject to stricter requirements. In indirect reuse, wastewater effluent is treated, returned to a water body, and later withdrawn by another water treatment plant. In this case, the treated wastewater is considered a water source, rather than wastewater effluent. The inequities of the water code are often understood by experts, but not by legislators, thus creating greater challenges.

Public perception represents the second major challenge to increased recycled water use. Historically, the public has not accepted some applications of recycled water due to the “toilet to tap” stigma. Today, however, in Southern California, studies have shown that the public accepts many uses of recycled water, including irrigation of landscapes and golf courses, and industrial and commercial uses.<sup>12</sup> The public’s perception of recycled water influences political will and regulation, particularly at the local and regional level. For example, projects must be approved by the RWQCB; historically, the regional boards have not approved projects because of public resistance. This issue was identified by the RWTF.

The third major barrier to recycled water development is capital investment costs. The cost of additional infrastructure to meet regulatory requirements (i.e., a parallel plumbing system) often makes recycled water more expensive than the marginal supplies. To provide recycled water, an agency must make an initial investment in treatment plants and distribution systems. In contrast, agencies typically have minimal capital expenses associated with increasing water supplies purchased from wholesale agencies.

Several issues act as minor barriers to recycled water development. Water quality concerns can pose problems for recycled water facilities. Extensive use of water softeners in an area, for

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<sup>12</sup> City of San Diego study.

example, can create elevated levels of dissolved salts in the wastewater stream. Higher levels of salt concentrations can make wastewater treatment more expensive and may make recycled water economically prohibitive. Following wastewater treatment, discharge of brine or wastewater concentrate can create additional environmental problems.

Finally, recycled water development can have varying benefits and impacts on regional and local entities. The benefits of recycled water use are often seen at a regional level; locally, the impacts and cost burdens may be distributed inequitably. Furthermore, demand for recycled water may be in a different district from the wastewater supply. In addition, enhanced use of recycled water in one location may reduce discharge of wastewater to a natural water body, resulting in diminished water supplies for downstream users. Recycled water projects must take these impacts, whether local or remote, into consideration.

### **Incentives**

Two factors serve as the main incentives for enhancing recycled water use: reliability and cost. During a drought, when surface water supplies may be limited, recycled water supplies remain constant. Customers relying on recycled water typically can depend on receiving their annual allotment, while customers relying on traditional water sources may receive reduced deliveries. More importantly, facilities using recycled water typically are exempt from restrictions on water use (e.g., irrigation restrictions for landscapes).

Facilities must make high capital investments to take advantage of recycled water supplies. Therefore, most water agencies provide financial incentives or rebates to these customers. These financial incentives may range from low interest loans or grants to reduced rates for volume deliveries. For example, many utilities have designed tiered rate structures for customers using traditional water supplies. These rate structures charge a higher price for customers using larger volumes of water. In contrast, rates for recycled water may be set at a flat rate, often equal or lower than the base rate for traditional water supplies.

### **Stakeholders/Regulatory Agencies**

Several agencies at the federal, state, and local level influence the development of recycled water. These agencies provide funding, and regulatory guidance and oversight, or both to recycled water projects. In the following tables, the main agencies and their primary roles are identified.

Federal Agencies and Authorities		
Agency/ Authority	Primary Role	Activities
Bureau of Reclamation	Funding	Under Title 16, provides funding for local water recycling projects.
Environmental Protection Agency	Regulation, Funding	Provides guidelines for recycled water use. Guidelines addressing a variety of reuse applications were published by the USEPA in <i>Guidelines for Water Reuse</i> Table 4-13 (EPA/625/R-04/108, September 2004).  Provides loans through the State Revolving Fund (SRF) Loan Program, which was created by the Amendments to the Federal Clean Water Act. These low-interest loans may be used by public agencies to plan, design, and construct wastewater treatment facilities and water recycling projects. <sup>13</sup> In California, Bond loans, low interest loans, and grants are administered by the SWRCB.

State Agencies		
Agency/ Authority	Primary Role	Activities
Executive Branch (Governor)	Funding, Regulation	Recycled water projects may be funded through bond measures. Executive branch oversees the California EPA.
Legislative Branch	Regulation	Establishes law and policy.
Resources Agency		Parent agency for the Department of Water Resources.
California EPA		Parent agency for the State Water Resources Control Boards.
Department of Public Health	Regulation	Specifies the required level of treatment for recycled water, as published in Title 22 of the California Code of Regulation. In addition, agency enforces treatment and cross connection prevention requirements through local health departments.

<sup>13</sup> Additional Note: Combines Federal funds grants, State general obligation bonds funds, and revenue bonds.

<b>State Agencies</b>		
<b>Agency/ Authority</b>	<b>Primary Role</b>	<b>Activities</b>
State Water Resources Control Board	Regulation, Funding	Through the permitting process, the SWRCB is involved in the regulation/enforcement of public health code standards (as defined in Title 22). In addition, agency has provided funding for local projects.
Department of Water Resources	Funding, Promotion	Provides planning assistance in regional studies and facilitates water recycling projects (primarily through technical assistance, coordination and promotion of feasible projects). In addition, the agency includes recycled water in its statewide supply planning documents (e.g., the California Water Plan Update).
Wholesale Water Agencies (e.g. MWD)	Funding	Provide financial assistance to retail agencies for recycled water projects.
Department of Housing and Community Development	Regulation	Adopt provisions for recycled water plumbing regulations for multi- and single-family residential units in the California Plumbing Code.

<b>Local/Regional Agencies and Authorities</b>		
<b>Agency/ Authority</b>	<b>Primary Role</b>	<b>Activities</b>
Regional Water Quality Control Boards	Regulation	Enforces water quality and public health regulations defined in Title 22 through the permitting process.
Local Health Departments	Regulation	Enforce policies defined by the Department of Health Services over cross connection prevention standards.
Utilities and Water Sanitation Districts	Promotion	Develop and implement Urban Water Management Plans, which identify future anticipated recycled water use.