Section D
WATER MANAGEMENT STRATEGIES

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D. WATER MANAGEMENT STRATEGIES

Section D Summary *– Criteria for selecting water management strategies used within this IRWM Plan include (1) the strategy is addressed within one or more of the Region's existing water, wastewater, land use, habitat, land conservation, watershed, stormwater, recreation, erosion control, and flood management plans, and (2) the strategy directly supports attainment of one or more IRWM Plan objectives. Thirty water management strategies are selected for inclusion in this IRWM Plan. Many of the selected strategies support multiple IRWM Plan objectives. The selected strategies incorporate all eleven strategies mandated by IRWM Program Guidelines. More than 160 water management projects are considered within this Plan. Each of the projects incorporates one or more of the selected water management strategies.*

D.1 Overview

Potential strategies for managing water resources are identified in the *California Water Plan Update 2005* (DWR, 2005) and in the IRWM Program Guidelines (DWR and Regional Board, 2004 and 2007). This chapter:

- describes potential strategies for managing water resources,
- identifies which of the potential strategies are considered within this IRWM Plan,
- documents how the water management strategies considered within this IRWM Plan comply with IRWM Program Guidelines,
- identifies the IRWM Plan objectives supported by the proposed water management strategies, and
- identifies water management projects that implement the water management strategies.

The *California Water Plan Update 2005* and the IRWM Program Guidelines use two different means of naming and organizing water management strategies, but each document addresses the same basic set of water management strategies.

Water Management Strategies in California Water Plan. Division 43, Chapter 2, Section 75206(a) of the California Water Code authorizes funding (pursuant to Proposition 84) for long-term water needs of the state, and requires that eligible projects implement IRWM Plans that address the water management strategies identified within the *California Water Plan*:

> *Eligible projects must implement regional water management plans that meet the requirements of this section. Integrated regional water management plans shall identify and address the major water related objectives and conflicts within the region, consider all of the resource management strategies identified in the California Water Plan, and shall use an integrated, multi-benefit approach to project selection and design.*

Table D-1 (pages D-3 and D-4) presents water management strategies addressed within the *California Water Plan Update 2005*.

Strategies Mandated by IRWM Program Guidelines. IRWM Program Guidelines (DWR and State Board, 2004 and 2007) establish criteria for Proposition 50 funding eligibility, and identify eleven water management strategies that must be addressed within IRWM Plans, including:

- water supply reliability,
- groundwater management,
- water quality protection and improvement,
- water recycling,
- water conservation,
- stormwater capture and management,
- flood management,
- recreation and public access,
- ecosystem restoration,
- wetlands enhancement and creation, and
- environmental and habitat protection and improvement.

Table D-2 (page D-5) summarizes how the eleven IRWM strategies mandated by the IRWM Program Guidelines correlate to the water management strategies identified within the *California Water Plan Update 2005*.

Table D-1
Water Management Strategies Addressed in *California Water Plan Update 2005*

California Water Plan Update 2005 Volume 2 Chapter Number[1]	Water Management Strategy within *California Water Plan Update 2005*[1]	Strategy Overview
2	Agricultural Land Stewardship	Includes strategies for promoting continued agricultural use of lands (e.g. agricultural preserves), strategies to reduce pollutants from agricultural lands, and strategies to maintain and create wetlands and wildlife habitat within agricultural lands. Stewardship strategies for agricultural lands include wetlands creation, land preserves, erosion reduction measures, invasive species removal, conservation tillage, riparian buffers, and tailwater management.
3	Agricultural Water Use Efficiency	Increasing water use efficiency and achieving reductions in the amount of water used for agricultural irrigation. Includes incentives, public education, and other efficiency-enhancing programs.
4	Groundwater Management	Using and managing groundwater supplies to ensure sustainable groundwater yields while maintaining groundwater-dependent beneficial uses, including coordinating management of groundwater and surface water supplies (conjunctive use)
5	Conveyance	Maintaining, optimizing use of, and increasing the reliability of regional treated and untreated water conveyance facilities. Included within this strategy is maintaining the ability to obtain and convey imported water supplies into the Region.
6	Seawater Desalination	Developing potable water supplies through desalination of seawater. Includes disposal of waste brine.
7	Potable Water Treatment and Distribution	Includes improving the quality of the potable supply delivered to potable water customers by increasing the degree of potable water treatment. Strategy also may include conveyance system improvements that improve the quality of supply delivered to treatment facilities.
8	Economic Incentives	Includes economic incentives (e.g. loans, grants, water pricing) to promote resource preservation or enhancement.
9	Ecosystem Restoration	Strategies that restore impacted or impaired ecosystems, and may include invasive species removal, land acquisition, water quality protection, revegetation, wetlands creation and enhancement, and habitat protection and improvement, habitat management and species monitoring.
10	Floodplain Management	Strategies that decreasing the potential for flood-related damage to property or life including control or management of floodplain lands or physical projects to control runoff.
11	Groundwater Aquifer Remediation	Includes strategies that remove pollutants from contaminated groundwater aquifers through pumping and treatment, *in situ* treatment, or other means.
12	Matching Quality to Use	Optimizing existing resources by matching the quality of water supplies to the required quality associated with use.
13	Pollution Prevention	Strategies that prevent pollution, including public education, efforts to identify and control pollutant contributing activities, and regulation of pollution-causing activities. Includes identifying, reducing, controlling, and managing pollutant loads from non-point sources.

1 Water management strategies addressed within Chapters 2 through 25 of Volume 2 of the *California Water Plan Update 2005* (DWR, 2005). (Note: Chapter 1 of Volume 2 is an introductory section.)

Note: Table D-1 is continued on the following page.

Table D-1 (Continued)
Water Management Strategies Addressed in *California Water Plan Update 2005*

California Water Plan Update 2005 Volume 2 Chapter Number[1]	Water Management Strategy within *California Water Plan Update 2005*[1]	Strategy Overview
14	Precipitation Enhancement	Strategy involves increasing precipitation yields through cloud seeding or other precipitation enhancing measures.
15	Recharge Area Protection	Includes land use planning, land conservation, and physical strategies to protect areas that are important sources of groundwater recharge.
16	Recycled Water	Developing usable water supplies from treated municipal wastewater. Includes recycled water treatment, distribution, storage, and retrofitting of existing uses.
17	CALFED Surface Storage	Strategy involves developing additional CALFED storage capacity or more efficiently using existing CALFED storage capacity.
18	Regional Surface Storage	Developing additional yield through construction or modification (enlargement) of local or regional surface reservoirs or developing surface storage capabilities in out-of-region reservoirs.
19	Reoperation and Reservoir Management	Managing surface storage facilities to optimize the availability and quality of stored water supplies and to protect/enhance beneficial uses. Includes balancing supply and delivery forecasts, coordinating and interconnecting reservoir storage, and optimizing depth and timing of withdrawals.
20	Urban Land Use Management	Includes land use controls to manage, minimize, or control activities that may negatively affect the quality and availability of groundwater and surface waters, natural resources, or endangered or threatened species.
21	Urban Runoff Management	Includes strategies for managing or controlling urban runoff, including intercepting, diverting, controlling, or managing stormwater runoff or dry season runoff.
22	Urban Water Use Efficiency	Increasing water use efficiency by achieving reductions in the amount of water used for municipal, commercial, industrial, irrigation, and aesthetic purposes. Includes incentives, public education, and other efficiency-enhancing programs.
23	Water Transfers	Contracting to provide additional outside sources of imported water to the Region over and above contracted State Water Project and Colorado River supplies
24	Water-Dependent Recreation and Public Access	Enhancing and protecting water-dependent recreational opportunities and public access to recreational lands.
25	Watershed Management and Planning	Comprehensive management, protection, and enhancement of groundwater and surface waters, natural resources, and habitat

1 Water management strategies addressed within Chapters 2 through 25 of Volume 2 of the *California Water Plan Update 2005* (DWR, 2005). (Note: Chapter 1 of Volume 2 is an introductory section.)

Table D-2
Correlation of Water Management Strategies in *California Water Plan Update 2005* to Water Management Strategies Mandated by IRWM Guidelines

Management Strategies Addressed in *California Water Plan Update 2005*		Water Management Strategies Required by IRWM Program Guidelines to be Addressed in IRWM Plans[2]										
California Water Plan Update 2005 Volume 2 Chapter Number [1]	Water Management Strategy within *California Water Plan Update 2005*[1]	Ecosystem Restoration	Environmental and Habitat Protection and Improvement	Water Supply Reliability	Flood Management	Groundwater Management	Recreation and Public Access	Storm Water Capture and Management	Water Conservation	Water Quality Protection and Improvement	Water Recycling	Wetlands Enhancement and Creation
2	Agricultural Lands Stewardship	●	●		●			●	●	●		●
3	Agricultural Water Use Efficiency			●					●			
4	Groundwater Management		●	●		●				●		
5	Conveyance			●								
6	Seawater Desalination			●								
7	Potable Water Treatment and Distribution			●						●		
8	Economic Incentives	●	●	●	●	●	●	●	●	●	●	●
9	Ecosystem Restoration	●	●				●					●
10	Floodplain Management				●							
11	Groundwater Aquifer Remediation			●		●				●		
12	Matching Quality to Use			●							●	
13	Pollution Prevention		●	●		●	●	●		●		
14	Precipitation Enhancement			●								
15	Recharge Area Protection		●			●				●		
16	Recycled Water			●							●	
17	CALFED Surface Storage			●								
18	Regional Surface Storage			●								
19	Reoperation and Reservoir Management			●								
20	Urban Land Use Management	●	●	●	●	●	●	●	●	●		●
21	Urban Runoff Management						●	●		●		
22	Urban Water Use Efficiency			●					●			
23	Water Transfers			●								
24	Water-Dependent Recreation and Public Access	●	●				●	●		●		●
25	Watershed Management and Planning	●	●	●	●	●	●	●	●	●	●	●

● Indicates that the California Water Plan Strategy may include elements of the corresponding IRWM Program Guidelines strategy

1 Water management strategies addressed within Chapters 2 through 25 of Volume 2 of the *California Water Plan Update 2005* (DWR, 2005). (Note: Chapter 1 of Volume 2 is an introductory section.)

2 Water management strategy that must be addressed in IRWM Plans per the 2004 and 2007 versions of the IRWM Program Guidelines (DWR and State Board, 2004 and 2007).

D.2 Water Management Strategies Considered within IRWM Plan

Use of California Water Plan Convention. For purposes of presenting and discussing water management strategies, this IRWM Plan utilizes the water management strategy organizational structure and convention set forth in the *California Water Plan Update 2005*.

For reference, water management strategies addressed in this IRWM Plan are numbered in accordance with the chapter in which they are described in Volume 2 of the *California Water Plan Update 2005*. As an example, agricultural land stewardship as a water management strategy is described in Chapter 2 of the *California Water Plan Update 2005*; agricultural land stewardship is addressed as water management strategy #2 in this IRWM Plan. Recycled water as a water management strategy is described in Chapter 16 of the *California Water Plan Update 2005*, and is addressed herein as water management strategy #16.

As documented in Table D-2 (page D-5), all eleven water management strategies mandated by the 2004 and 2007 versions of the IRWM Program Guidelines are incorporated within the water management strategies identified within the *California Water Plan Update 2005*. As a result, the water management strategies considered within this IRWM Plan conform to both Proposition 50 and Proposition 84 water management strategy requirements.

Strategies Addressed in Local Plans. This IRWM Plan is intended to be an umbrella document for all of the Region's water management plans. Many of the Region's major water management plans have been reviewed and incorporated into this Plan, and specific water management strategies proposed within these plans have been identified. As noted, however, additional work is required identify all of the Region's pertinent water-related management plans and incorporate specifics from these local plans into the IRWM Plan. (See Section M for a description of the Region's water management plans. Also see Table G-9 on page G-23 for the proposed action plan for completing an assessment of the local water plans.)

While all the Region's local plans have not yet been identified and reviewed, many plans by their very nature (e.g. flood control plan, land use plan, habitat protection plan, etc.) are associated with certain types of water management strategies (e.g. flood management, land use management, habitat protection, etc.) As a result, it is possible to identify the types of strategies applied in the Region's local plans, even though all of the local plans have not yet been reviewed. Table D-3 (page D-7) summarizes the general types of water management strategies addressed in the Region's local water management plans. As shown in Table D-3, all but two of the *California Water Plan Update 2005* water management strategies are addressed in local water management plans.

Table D-3
Summary of *California Water Plan Update 2005* Strategies Addressed in Local Plans[1]

California Water Plan Update 2005 Volume 2 Chapter No.[2]	Water Management Strategy within *California Water Plan Update 2005*[2]	Water Management Strategies Addressed in the Region's Water Management Plans[1]									
		Water Supply Plans[3]	Wastewater and Recycled Water Plans[4]	Groundwater Plans	Land Use Plans	Habitat Enhancement and Conservation Plans	Land Conservation Plans	Recreation Plans	Watershed Plans	Stormwater Runoff Plans	Flood Management Plans
2	Agricultural Land Stewardship				●		●		●	●	
3	Agricultural Water Use Efficiency	●									
4	Groundwater Management[5]	●	●	●					●		
5	Conveyance	●	●	●							
6	Seawater Desalination	●	●	●							
7	Potable Water Treatment and Distribution	●									
8	Economic Incentives	●			●		●				
9	Ecosystem Restoration[6]				●	●	●	●	●	●	
10	Floodplain Management				●				●		●
11	Groundwater Aquifer Remediation	●		●	●				●		
12	Matching Quality to Use	●	●	●					●		
13	Pollution Prevention[7]	●	●	●	●	●	●		●	●	
14	Precipitation Enhancement										
15	Recharge Area Protection			●					●		
16	Recycled Water	●	●						●		
17	CALFED Surface Storage										
18	Regional Surface Storage	●	●						●		
19	Reoperation and Reservoir Management	●							●		
20	Urban Land Use Management				●	●		●	●	●	
21	Urban Runoff Management		●		●	●	●		●	●	
22	Urban Water Use Efficiency	●			●						
23	Water Transfers	●									
24	Water-Dependent Recreation & Public Access	●			●	●	●	●	●		
25	Watershed Management and Planning	●	●	●	●	●	●	●	●	●	●

1 While not all local water management plans have been identified and reviewed to date, the above water management strategies are known to be addressed in one or more of the local plans within the designated category.
2 Water management strategies addressed within Chapters 2 through 25 of Volume 2 of the *California Water Plan Update 2005* (DWR, 2005). (Note: Chapter 1 of Volume 2 is an introductory section.)
3 Includes urban water management, water supply, agricultural water management, sanitary surveys, water quality protection, and capital improvement plans of the Region's water agencies.
4 Includes wastewater, recycled water, and capital improvement plans of Region's wastewater agencies, recycled water agencies, and water agencies that purvey recycled water.
5 Includes conjunctive use. This Plan considers groundwater management and conjunctive as separate strategies in evaluating and prioritizing the Region's water management projects. (See Section F.)
6 Includes the following three strategies identified by IRWM Program Guidelines: ecosystem restoration, environmental and habitat protection and improvement, and wetlands enhancement and creation. This Plan considers these three ecosystem strategies separately in evaluating and prioritizing the Region's water management projects. (See Section F.)
7 Includes wastewater collection and treatment. This Plan considers wastewater treatment and pollution prevention as separate strategies for purposes of evaluating and prioritizing the Region's water management projects. (See Section F.)

Water management strategies directed toward improving water quality are addressed in the Region's water resources management plans, including:

- urban water management, water supply, sanitary survey, water quality protection, capital improvement, groundwater, and recycled water plans, and
- land use, habitat enhancement and conservation, land conservation, watershed management, and stormwater management plans.

As shown in Table D-3, natural resource stewardship strategies are addressed in the Region's land use, habitat enhancement and conservation, land conservation, recreation, watershed management, and stormwater management plans, and flood management plans.

Strategies for improving water system efficiency and transfers are addressed in the Region's urban water management, water supply, capital improvement, groundwater, and recycled water plans. Urban water management, agricultural water management, water supply, and land use plans address strategies to reduce demand (conservation). Strategies to increase water supply are addressed in urban water management, water supply, capital improvement, groundwater, recycled water plans, and watershed management plans.

Current Application of Water Management Strategies in the Region. In addition to incorporating strategies addressed in existing water management plans, this IRWM Plan builds on existing and ongoing water management efforts within the Region. Existing water management efforts within the Region are summarized below for each water management strategy addressed in the *California Water Plan Update 2005*.

Agricultural Land Stewardship (#2). While agricultural lands represent only approximately three percent of San Diego County (see Table B-6 on page B-10), agricultural activities represent an important element affecting the Region's water resources. Land preservation represents a key agricultural land stewardship activity implemented within the Region. The County and several municipalities maintain agricultural land preserve programs in which owners agree to set aside lands for agriculture or open space in return for reduced property taxes. Agricultural land stewardship practices implemented by private landowners include erosion control, habitat conservation, and pollution-reduction. Agencies that have programs that assist and advise in agricultural land stewardship practices within the Region, in part, include:

- U.S. Natural Resource Conservation Service,
- County of San Diego Department of Agriculture Weights and Measures, and
- University of California Agricultural Extension.

The Regional Board is also involved in assisting in agricultural land stewardship through regulation (including issuance of discharge permits or conditional waivers) of animal confinement, agricultural and nursery operations, and silviculture operations.

Agricultural Water Use Efficiency (#3). Agricultural water use efficiency is practiced both by private agricultural businesses and by local water agencies. The Water Authority and local agencies maintain programs to encourage agricultural water conservation and increase efficiency of use. Water costs represent a significant portion of the overall operating costs for many growers within the Region, and economic factors have lead to significant improvements in agricultural water use efficiency within the Region during the past 30 years. The Water Authority's Agricultural Water Management Program provides free irrigation system evaluations for agricultural operations of two acres or more. Additional irrigation efficiency expertise, technology, and advice is available to the Region's agribusinesses through the University of California Agricultural Extension, U.S. Natural Resource Conservation Service, and local growers' organizations.

Groundwater Management (#4). As shown in Table B-20 (page B-56), approximately ten of the region's major water agencies incorporate groundwater as part of their water supply portfolio. Groundwater supplies are projected to comprise 28,580 AFY of supply for Water Authority member agencies by 2010 (see Table B-30 on page B-72). The Region's water agencies have prepared groundwater resources development and management plans for most of the Region's groundwater basins, including plans for conjunctive management of groundwater basins. Much of the groundwater management infrastructure proposed in these plans awaits implementation.

Groundwater represents the sole source of supply throughout much of the less developed eastern portion of the Region outside the Water Authority service area. The County has developed land use policies and is developing groundwater plans to address water supply issues in these areas of the Region. Because no backup supply exists in areas outside the Water Authority service area, management of groundwater is critical to insuring continued water availability to this portion of the Region's population.

Conjunctive use represents an important form of groundwater management. Accordingly, this Plan considers groundwater management and conjunctive use as separate strategies for purposes of evaluating and prioritizing the Region's water management projects. (See Section F and Appendix 5.)

Conveyance (#5). As described in Section B.9, the Water Authority aqueduct system delivers both treated and untreated water to the Region. Conveyance facilities for flood flows include

lined or armored flood channels, culverts, natural stream courses, and storm drains. Member agency operations for conveying local reservoir supplies include:

- pipelines (e.g. Hodges, Olivenhain, San Vicente, El Capitan, Sweetwater, and Otay Reservoirs),
- releases to natural stream channels (e.g. Sutherland, Loveland, Morena, and Cuyamaca Reservoirs),
- canals, surface channels and flumes (e.g., Wohlford, Barrett and Henshaw).

Seawater Desalination (#6). The Water Authority's *Updated 2005 Urban Water Management Plan* establishes a target of 34,700 AFY of seawater desalination within the Region by 2015. (See Tables B-30 and B-31 on pages B-72 and B-73.) This desalination capacity would be provided through a privately financed desalination facility proposed at the Encina Power Station adjacent to Agua Hedionda Lagoon, within the Carlsbad HU.

Potable Water Treatment and Distribution (#7). Water Authority treated water supplies are derived from a Metropolitan-operated treatment facility at Lake Skinner in Riverside County. In addition, the Region includes over 800 mgd of potable water treatment capacity (see Table B-23 on page B-59) that allows for treatment of locally derived supplies and untreated supplies delivered via the Water Authority aqueducts. Expansion of the Region's water treatment capacity will allow for greater flexibility in managing water sources and enhancing system reliability. Each water agency maintains its own distribution network, and the agency systems are interconnected to create a potable water delivery system that extends throughout the Water Authority service area.

Small water systems and community wells are an important source of supply in the portion of Region outside the Water Authority service area. A lack of backup facilities and interconnections among these small community systems render them vulnerable to supply interruption or water quality problems. Upgrades in treatment and conveyance to these small water systems would enhance both water quality and system reliability among the Region's rural populations.

Economic Incentives (#8). The Water Authority maintains several economic incentive programs to encourage water conservation, including rebate programs for water conservation toilets and washing machines. As detailed in Section K.3, additional regional financial incentive programs include the Water Authority's Reclaimed Water Development Fund (RWDF) and Metropolitan Water District of Southern California's Local Resources Program (LRP).

Ecosystem Restoration (#9). The ecosystem restoration strategy identified in the *California Water Plan Update 2005* incorporates a broad range of strategies directed toward conserving, protecting, enhancing, and creating habitat, ecosystems, and wetlands. The IRWM Program Guidelines identify and mandate consideration of the three specific ecosystem restoration strategies, including:

- ecosystem restoration,
- environmental and habitat protection and improvement, and
- wetlands enhancement and creation.

This plan considers each of the above three IRWM Program Guidelines ecosystem strategies in evaluating and prioritizing the Region's water management projects. (See Section F.) Ecosystem restoration, environmental and habitat protection and improvement, and wetlands enhancement and creation projects and programs have been implemented by government and non-government organizations within the Region. Ongoing efforts within the Region include multiple species conservation programs; land conservation; invasive species control; land contouring; rehabilitation and revegetation; wetlands preservation, conservation and creation; and addressing flow hydraulics and preserving natural flow hydrology. DFG and USFWS are active in several of the Region's restoration programs. As detailed in Section B.4, three multiple species conservation and preservation plans are being implemented within the Region. In addition to government ecosystem restoration efforts, private foundations and conservancies have been established within the Region to preserve lands, restore ecosystems, and to provide environmental management of conserved lands.

Floodplain Management (#10). Flood management facilities within the Region include armored and lined channels, levees, natural channels and natural floodplain management, retention basins, culverts, and an extensive regional storm drain system. As described in Section B.4, the Flood Control District coordinates region-wide flood control projects among the County's municipalities to: (1) engineer, maintain, and improve storm conveyance facilities, (2) perform stream restoration and maintenance, (3) update flood mapping, (4) provide for vegetation and debris removal, and (5) maintain streamflow and flood alert systems.

Groundwater Aquifer Remediation (#11). As described in Section B.6, toxic organic contaminants have been documented in several of the Region's groundwater aquifers. The Regional Board and San Diego County oversee investigation and remediation within the Region at more than 100 cleanup/remediation sites within the Region. Regional Board also maintains a program for investigating, monitoring, and enforcing clean up/remediation of soil and groundwater pollution from (1) Department of Defense sites, and (2) pollution sources other than underground tanks.

Matching Quality to Use (#12). Many of the Region's water agencies have adopted regulations requiring the use of recycled water in place of potable supplies for certain non-potable irrigation uses. Additional instances where quality is matched to use within the Region includes (1) using untreated water for dust control, (2) using poor quality groundwater for non-potable uses such as irrigation, and (3) the use of gray water for toilet flushing and non-potable uses.

Pollution Prevention (#13). As summarized in Tables B-14 and B-15 (pages B-36 and B-37), approximately 40 inland surface waters and 35 coastal waters or beach segments are listed as 303(d) impaired. The Regional Board is currently implementing TMDLs for several of the affected waters (see Section B.5) and has prioritized TMDLs for remaining impaired waters. As described in Sections B.4, the County and MS4 copermittees implement a regional storm runoff program. Ongoing pollution prevention efforts associated with this program include:

- conducting pollutant monitoring,
- planning and implementing stormwater capture and treatment,
- developing and implementing non-point source controls including BMPs,
- planning and implementing dry season diversion of surface flows and storm drain flows to the sewer system,
- implementing wastewater collection system maintenance, rehabilitation, and sewer spill prevention programs, and
- performing storm drain maintenance and community cleanup events.

The pollution prevention strategy identified in the *California Water Plan Update 2005* incorporates a range of water quality protection strategies, including the following two strategies addressed in the IRWM Program Guidelines:

- water quality protection and improvement, and
- wastewater collection and treatment.

Recognizing the importance of water quality protection and wastewater treatment in attaining the Region's water quality standards, this Plan considers these strategies as pollution prevention separate strategies in evaluating and prioritizing the Region's water management projects. (See Section F and Appendix 5.)

Precipitation Enhancement (#14). Local water plans do not focus on precipitation enhancement as an important water management strategy in the Region as a result of (1) the highly seasonal nature of precipitation in the region, (2) the potential for flash flooding, and (3) the virtually nonexistent role of snow pack in storing water within the Region. While precipitation enhancement is not an important strategy within the Region, the City of San

Diego has periodically experimented with precipitation enhancement as a means of increasing runoff to local reservoirs.

Recharge Area Protection (#15). Land use or land conservation measures to protect important groundwater recharge areas have been addressed in several of the Region's watershed management plans. Local water agencies using groundwater as a source of supply have identified key recharge area issues through sanitary surveys and within groundwater plans. Agencies that own and conserve significant land holdings to protect important groundwater recharge areas within the Region, in part, include:

- Camp Pendleton (lower portion of Santa Margarita River Watershed),
- Vista Irrigation District (upper portion of San Luis Rey Watershed), and
- City of San Diego (San Pasqual Valley in the San Dieguito River Watershed).

Recycled Water (#16). As shown in Table B-26 (page B-62) recycled water use is currently produced and distributed by many of the Region's water and recycled water agencies. Tertiary treatment capacity within the Region is currently approximately 80 mgd, and the Region's water supply plans propose to increase recycled water use within the Region from 33,670 AFY in year 2010 to over 47,580 AFY by year 2030. (See Table B-30 on page B-72) Attaining this recycled water use target will involve expansion of existing recycled water distribution systems, increasing the number of users, and increasing the variety of recycled water uses.

CALFED Water Storage (#17). CALFED water storage is critical to the reliability of the State Water Project and in turn the reliability of Metropolitan's supplies delivered to the Region. The Region's local water supply plans, however, do not include constructing or optimizing additional CALFED storage. The plans and programs of the state agencies and Metropolitan are more likely to incorporate this strategy. Instead, the Region's existing plans (see Tables B-30 and B-31) focus on water resources actions to improve conservation, increase water storage within the Region, and increase the diversity of the Region's supplies.

Regional Water Storage (#18). Regional surface storage is critical in balancing seasonal and other temporal differences between supply availability and demand. Table B-22 (page B-58) summarizes existing regional surface water storage. The Emergency Storage Program (see Table B-25 on page B-61) represents an important part of the Region's effort to increase regional water storage.

Reoperation and Reservoir Management (#19). All local reservoir-operating agencies (see Table B-22 on page B-58) employ some form of system operation and reservoir management. Key reservoir reoperation/management programs within the Region include the following reservoirs that capture local runoff, serve large water treatment facilities, are connected to the imported water system, and are interconnected with other local reservoirs:

- San Vicente Reservoir (City of San Diego),
- Sweetwater Reservoir (Sweetwater Authority), and
- Otay Reservoir (City of San Diego).

Urban Land Use Management (#20). The County and the Region's municipalities utilize urban land use management as a means of influencing the management of water through the Region's storm runoff program, zoning regulations, building codes, landscape ordinances, septic tank, and agricultural preserve/land conservation programs. As part of its land use plans, the County limits development in areas dependent on groundwater supply so that water needs do not exceed available supplies.

Urban Runoff Management (#21). Urban runoff management within the Region has occurred both through activities related to flood management (see above strategy #10) and runoff management actions implemented by the MS4 copermittees. Ongoing urban runoff management strategies implemented by MS4 copermittees within the Region have been directed toward

- regulatory controls such as BMPs and public education to limit runoff flows, and
- physical means of control such as flow and pollutant reduction through minimizing impervious areas, capture and retention, diversion to the sewer, or treatment.

Urban Water Use Efficiency (#22). The Water Authority and local water agencies currently implement programs to enhance urban water use efficiency within the Region. As shown in Table B-29 (page B-70), existing Water Authority conservation measures include residential surveys, retrofits, a landscape efficiency program, voucher programs to encourage flow-efficient toilets and washing machines, and a commercial/industrial/institutional water efficiency program.

Local water agencies assist the Water Authority in implementing urban water use efficiency programs. Water conservation savings resulting from these urban water use efficiency programs are projected to increase from 53,930 AFY to 108,400 AFY by 2030. (See Table

B-29 on page B-70.) The County and local municipalities encourage conservation through land use regulations, building codes, and incentive programs.

Water Transfers (#23). As discussed in Section B.10, the Water Authority has implemented water transfer agreements to take delivery of conserved agricultural water from the Imperial Irrigation District and water conserved through lining the All-American and Coachella Canals in Imperial County. Local water agencies have implemented agreements and facilities to allow for transfer of supplies among agencies.

Water-Dependent Recreation and Public Access (#24). Section B.8 describes water-dependent recreational opportunities within the Region. Recreational uses (either non-contact or body-contact uses) are supported in virtually all of the Region's inland surface waters, reservoirs, lagoons, estuaries, bays, and coastal waters.

Watershed Management and Planning (#25). As shown in Table M-3 (page M-8), watershed management plans have been prepared within ten of the Region's eleven hydrologic units. The management plans address watershed-specific water management issues outside the limitations of jurisdictional boundaries. The Region's watershed planning efforts also include non-government stakeholders in water management planning decisions.

Other Water Management Strategies. In addition to the water management strategies addressed in the *California Water Plan Update 2005* and IRWM Program Guidelines, this Plan also addresses the following three additional strategies:

- stakeholder/community involvement,
- water resources data collection, management, and assessment, and
- scientific and technical water quality management knowledge enhancement.

These three strategies respectively specifically address Objective A (stakeholder/community involvement), Objective B (data management), and Objective C (scientific/technical understanding.

D.3 Strategies Selected for Inclusion in IRWM Plan

Framework for Considering Strategies. As noted, this IRWM plan builds upon existing plans developed by local agencies or organizations (see Section M) for managing water resources within the Region. The IRWM Plan incorporates water management strategies proposed by regional agencies and groups that are directed toward achieving conformance with the designated IRWM Plan goals and objectives.

The Region's water management strategies must be considered within the regulatory framework (and applicable water quality standards) established by the Regional Board, State Board, and EPA. This regulatory framework addresses water quality protection issues through:

- establishing and enforcing Basin Plan water quality objectives,
- establishing and enforcing Ocean Plan water quality standards,
- the 303(d) impaired water quality listing process, and
- the TMDL process.

Basis for Selecting IRWM Plan Strategies. In accordance within this framework, the RWMG employed the following criteria in selecting water management strategies for inclusion within the IRWM Plan:

- The strategy must be addressed within one or more of the Region's existing water, wastewater, land use, habitat, land conservation, watershed, stormwater, recreation, erosion control, or flood management plans. (See Section M for a description of applicable local water management plans within the Region.)
- The strategy must directly support attainment of one or more of the IRWM Plan objectives.

Selected IRWM Plan Strategies. As noted, many of the Region's major water management plans have been reviewed and specific water management strategies proposed within the plans have been identified. It is possible to identify other strategies within the Region's local plans by the general nature of the plan itself. (For instance, the Region's flood management plans address flood management strategies, and the Region's land use plans address land use.) Other yet-to-be-reviewed plans are known by reference to address specific water management strategies. As a result, while not all of the Region's local plans have been identified and reviewed, it is possible to confirm that all but two of the *California Water Plan 2005 Update* strategies are addressed in the Region's local water management plans.

Table D-4 (page D-17) identifies strategies that are known to be implemented in the Region, addressed in one or more of the Region's water management plans, and addressed by one or more submitted IRWM projects. Table D-5 (page D-18) summarizes the strategies selected for inclusion in this Plan and identifies which of the thirty selected strategies help attain each of the nine IRWM Plan objectives.

Table D-4
Water Management Strategies Selected for Inclusion within IRWM Plan

No.[1]	Water Management Strategy	Strategy Addressed in Local Water Management Plans[2]	Ongoing Implementation of Strategy in Region[3]	Strategy Directly Addressed by IRWM Projects[4]	Strategy Selected for Inclusion within the IRWM Plan[5]
2	Agricultural land stewardship	●	●	●	●
3	Agricultural water use efficiency	●	●	●	●
4	Groundwater management	●	●	●	●
	Conjunctive use[6]	●	●	●	●
5	Conveyance	●	●	●	●
6	Seawater desalination	●	●	●	●
7	Potable water treatment and distribution	●	●	●	●
8	Economic incentives	●	●	●	●
9	Ecosystem restoration	●	●	●	●
	Ecosystem preservation[6]	●	●	●	●
	Env. and habitat protection and improvement[6]	●	●	●	●
	Wetlands enhancement and creation[6]	●	●	●	●
10	Floodplain management	●	●	●	●
11	Groundwater aquifer remediation	●	●	●	●
12	Matching quality to use	●	●	●	●
13	Pollution prevention	●	●	●	●
	Water quality protection and improvement[6]	●	●	●	●
	Wastewater treatment[6]	●	●	●	●
14	Precipitation enhancement		●		
15	Recharge area protection	●	●	●	●
16	Recycled municipal wastewater	●	●	●	●
17	Surface storage – CALFED				
18	Regional surface storage	●	●	●	●
19	System reoperation and reservoir mgt.	●	●	●	●
20	Urban land use management	●	●	●	●
21	Urban runoff management	●	●	●	●
22	Urban water use efficiency	●	●	●	●
23	Water transfers	●	●	●	●
24	Water-dependent rec. and public access	●	●	●	●
25	Watershed management and planning	●	●	●	●
Other	Stakeholder/Community Involvement	●	●	●	●
	Water resources data collection and mgt.	●	●	●	●
	Enhance scientific and technical knowledge	●	●	●	●

1 Strategy numbers per water management strategies addressed within Chapters 2 through 25 of Volume 2 of the *California Water Plan Update 2005* (DWR, 2005). (Note: Chapter 1 of Volume 2 is an introductory section.)

2 See Table D-3 on page D-7 for a breakdown of *California Water Plan Update 2005* strategies considered or addressed in regional water management plans. While not all local plans have been identified and reviewed to date, the above water management strategies are known to be addressed in one or more of the local plans within designated by a bullet.

3 See text on pages D-8 through D-12 for a brief summary of examples of ongoing water management actions within the Region.

4 See Appendix 5 for a list of the water management projects considered within this IRWM Plan and a summary of the primary and secondary water management strategies implemented by the projects.

5 The water management strategies considered within this IRWM Plan incorporate the eleven water management strategies mandated by the IRWM Guidelines (DWR and State Board, 2004 and 2007). See Table D-2 on page D-5.

6 Strategy addressed IRWM Program Guidelines considered a separate strategy for purposes of project prioritization. (See Section F).

Table D-5
IRWM Plan Objectives Supported by the Selected Water Management Strategies

Number	Water Management Strategy Selected for Inclusion in the IRWM Plan	IRWM Plan Objectives Supported by the Water Management Strategy								
		A. Maximize Stakeholder/ Community Involvement and Stewardship	B. Effectively Obtain, Manage and Assess Water Resources Data	C. Further Technical and Scientific Foundation for Water Management	D. Develop, Operate, and Maintain a Diverse Mix of Water Resources	E. Construct, Operate, and Maintain Reliable Water Infrastructure	F. Reduce Negative Effects of Hydromodification $ Flooding	G. Reduce Pollutant Sources and Environmental Stressors	H. Protect, Restore and Maintain Habitat and Open Space	I. Optimize Recreational Opportunities
2	Agricultural lands stewardship			○			●	●	●	
3	Agricultural water use efficiency	○		○	●	○		○		
4	Groundwater management		○	○	●	○			●	
	Conjunctive use		○	○	○	○				
5	Conveyance				●	●				
6	Seawater desalination		○	○	●	○				
7	Potable water treatment and distribution				●	●				
8	Economic incentives	○	○		○	○	○	○	●	○
9	Ecosystem restoration	○	○	○			○	○	○	○
	Ecosystem preservation	○	○	○			○	○	○	○
	Env. and habitat protection and improvement	○	○	○			○	○	○	○
	Wetlands enhancement and creation	○	○	○			○	○	○	○
10	Floodplain management	○	○	○			●		○	○
11	Groundwater aquifer remediation	○	○	○	●					
12	Matching quality to use		○	○	○					
13	Pollution Prevention	○	○	○				●	○	●
	Water quality protection and improvement	○	○	○				○	○	○
	Wastewater treatment\	○	○	○				○	○	
15	Recharge area protection			○					●	
16	Recycled water		○	○	●	○				
18	Regional surface storage				○	●				○
19	Reoperation and reservoir management		○	○	○	●				○
20	Urban land use management	○	○	○			●	●	●	○
21	Urban runoff management	○	○	○			●	●	○	●
22	Urban water use efficiency	○		○	●	○		○		
23	Water transfers				●					
24	Water-dependent recreation and public access	○	○	○				○	○	●
25	Watershed management and planning	●	●	●	○		●	●	○	○
Other	Stakeholder/community involvement	●	●	●	○	○	○	○	○	○
	Water resources data collection and mgt.	●	●	●	○	○	○	○	○	○
	Enhance scientific and technical knowledge	●	●	●	○	○	○	○	○	○

● Water management strategy primarily and directly supports attainment of the IRWM Plan objective

○ Water management helps achieve the IRWM Plan objective

As shown in Table D-5, each of the selected water management strategies directly supports attainment of two or more IRWM Plan objectives. Further, two or more of the selected strategies support each of the IRWM Plan objectives. The eleven water management strategies mandated by the IRWM Program Guidelines are included within the selected strategies. (See Table D-2 on page D-5 for a correlation between strategies listed in the *California Water Plan Update 2005* and the IRWM Program Guidelines.)

D.4 Water Management Projects

Types of Projects and Programs to Be Considered in Plan. This Plan considers a wide range of potential means of implementing the selected water management strategies.

Table D-6 (pages D-20 through D-24) identifies specific actions or types of projects that implement the selected water management strategies. Potential water management actions or projects listed in Table D-6 were selected by the RWMG on the basis of:

(1) the Region's water management needs,

(2) existing or ongoing water management activities within the Region, and

(3) conformance with existing local plans for managing water resources (see Section M).

Submitted IRWM Water Management Projects. Through a stakeholder outreach process (see Section N), the RWMG and RAC solicited water management projects from IRWM Plan stakeholders. A list of projects submitted by the Region's government and non-government agencies and organizations is presented in Appendix 5.

Appendix 5 also presents the primary and secondary water management strategies addressed by each of the candidate IRWM projects. As shown in Appendix 5, candidate water management projects directly or indirectly implement each of the water management strategies selected for inclusion in this Plan.

Table D-6
Water Management Strategies and Corresponding Types of Projects Considered in IRWM Plan

California Water Plan Chapter No.[1]	Water Management Strategy Selected for Inclusion within this IRWM Plan[1]	Types of Water Management Projects to be Considered within this IRWM Plan[2]
2	Agricultural Lands Stewardship	• maintain agricultural land preserves • encourage wetlands and habitat restoration on agricultural lands • encourage riparian buffers • encourage erosion control measures such as windbreaks, conservation tillage, and contour buffer strips • invasive species control • investigate and implement tailwater recovery or management • implement regional public education and outreach programs to promote environmentally sound agricultural pollution prevention controls
3	Agricultural Water Use Efficiency	• implement agricultural audit programs and determine savings • implement agricultural water budgets • conduct research on agricultural water use efficiency • fund projects to develop innovative irrigation methods to decrease water use, runoff, and disease • explore alternative crop varieties • implement efficient water management practices of the Agricultural Water Management Council • assess irrigated agricultural acreage using remote sensing technology • continue cooperation between water agencies, the Farm Bureau, and local agriculture to increase understanding of water issues and emergency response measures, and to increase availability and variety of low water use vegetation.
4	Groundwater Management	• perform studies to map and evaluate current groundwater tables, water quality, and recharge rates • develop groundwater management plans • enable opportunities for conjunctive use • promote use of groundwater basins for seasonal or carryover storage and emergency storage • implement land use and development methods that reduce the impacts of impermeable pavement on groundwater recharge and promote the use of permeable surfaces • protect and conserve open space that affects recharge areas or recharge water quality • evaluate the potential impacts of stormwater BMPs (including LID) on groundwater quality • remediate contaminated groundwater supplies and install seawater intrusion barriers • implement source control strategies • implement groundwater modeling, monitoring, or studies, • manage groundwater to optimize sustained or seasonal yield • recharge groundwater basins using raw water, impounded local surface runoff, released flows from surface impoundments, or recycled water • protect groundwater-dependent habitat and water quality • implement and enhance brine management and disposal plans and methods • evaluate, study, and select sites for groundwater demineralization facilities • improve and maintain groundwater-related infrastructure • determine appropriate uses and water quality requirements.

1 Water management strategy considered within this IRWM Plan. See Table D-1 (pages D-3 and D-4) for a summary of the strategies.
2 Types of water management projects considered within this IRWM Plan to implement the listed strategy.

(Table D-6 is continued on the following page)

Table D-6 (Continued)
Water Management Strategies and Corresponding Types of Projects Considered in IRWM Plan

California Water Plan Chapter No.[1]	Water Management Strategy Selected for Inclusion within this IRWM Plan[1]	Types of Water Management Projects to be Considered within this IRWM Plan[2]
5	Conveyance	• monitor the integrity of the aqueduct system and key conveyance pipelines to detect and prevent pipeline failure • maintain and upgrade existing raw water and treated water conveyance infrastructure (pipelines, pump stations, flumes, treated water storage, and appurtenances) • construct new conveyance infrastructure (pipelines, pump stations, and appurtenances) to increase the capacity and flexibility of (1) raw water delivery to the Region's water treatment facilities and reservoirs, and (2) transfer of potable (treated) water among the Region's water agencies • construct new treated water storage infrastructure (particularly in portions of the Region that are dependent on the uninterrupted availability of imported water) • improve cooperation and coordination for interagency water transfers • identify emergency backup plans and procedures for reacting to system failures or supply deficiencies
6	Seawater Desalination	• seawater desalination planning, siting, feasibility, and marketing studies • seawater desalination brine impacts and brine management studies • site acquisition • construct seawater desalination facilities/site improvements
7	Potable Water Treatment and Distribution	• upgrade water treatment processes • improve the reliability of existing treatment processes • evaluate water quality and additives • evaluate reservoir management options for improving water quality and treatability • implement water quality protection strategies or reservoir management programs that minimize source contamination or improve the treatability of water supplies • provide improvements to conveyance that may result in improved water quality and decreased potential for water supply contamination
8	Economic Incentives	• loans, grants, rebates, water pricing, and tax incentives • investigate regulatory relief
9	Ecosystem Restoration	• study and monitor ecosystem needs/impacts • identify opportunities for land acquisition and existing corridors needing further linkages/protection • perform land siting and acquisition studies • acquire acreage and develop site designs • restore/rehabilitate ecosystems and revegetate sites • enhance, protect, and restore wetlands • modify landforms to mimic natural conditions • improve stream hydraulics • monitor, protect, and improve water quality • augment groundwater tables through recharge or streamflow • control land use and public access • remove and control invasive species and re-vegetate with native species • monitor and prevent recurrence of invasive species • monitor, manage, and maintain ecosystem health • incorporate interpretive centers and trails • perform outreach and education

1 Water management strategy considered within this IRWM Plan. See Table D-1 (pages D-3 and D-4) for a summary of the strategies.

Table D-6 is continued on the following page

Table D-6 (Continued)
Water Management Strategies and Corresponding Types of Projects Considered in IRWM Plan

California Water Plan Chapter No.[1]	Water Management Strategy Selected for Inclusion within this IRWM Plan[1]	Types of Water Management Projects to be Considered within this IRWM Plan[2]
10	Floodplain Management	• stream restoration and maintenance • utilize or enhance natural floodways with buffer zones • engineer flood control facilities, retention basins, or levees • improve drainage systems including culverts, storm drains, and dissipation structures • install and improve streamflow and flood alert monitoring systems • maintain storm drains and conveyances • implement grade, flow, velocity, or other hydraulic control measures • clear or remove vegetation and sediment • control erosion, and stabilize slopes and streambeds • emergency planning • revising and updating flood mapping systems
11	Groundwater Aquifer Remediation	• monitor, identify, and assess the extent of contamination and flux rates • remediate contamination through groundwater pumping and treatment, excavation, soil vapor extraction, hydraulic containment or physical barriers, *in situ* treatment (natural, chemical, or biological means), or other means
12	Matching Quality to Use	• assessing the water quality needs of users, evaluating the quality of available supplies, evaluating conveyance means, and optimizing supplies to use • constructing infrastructure to deliver water supplies to appropriate uses
13	Pollution Prevention	• determine and evaluate naturally occurring background levels • enhance water quality monitoring programs to include chemistry, toxicity, and periphyton and benthic community evaluations • perform pollutant source identification studies • implement, test, and monitor non-point source controls such as stormwater capture and treatment devices • research and evaluate the effectiveness of non-point source controls including BMPs, onsite retention, or treatment • research and evaluate effectiveness of non-structural controls (e.g. bioswales) • enhance and manage surface reservoirs through in-reservoir techniques, such as oxygenation, circulation, and selective withdrawals • implement land use planning and management controls • implement treatment and diversion strategies for surface streams or storm drains • implement wastewater collection system maintenance, rehabilitation, and sewer spill prevention programs • promote environmentally sound wastewater disposal practices, including water recycling, groundwater recharge, and regional land and ocean outfall systems • perform ambient monitoring • coordinate community cleanup events • establish and implement regional public education and outreach programs
14	Precipitation Enhancement	[Strategy is not selected for inclusion within this IRWM Plan]
15	Recharge Area Protection	• assess groundwater recharge protection needs • perform siting studies and acquire acreage • develop recharge protection/recharge enhancement plans and designs • monitor groundwater quality • assess groundwater recharge potential • augment groundwater tables through recharge or streamflow • control land use and public access

1 Water management strategy considered within this IRWM Plan. See Table D-1 (pages D-3 and D-4) for a summary of the strategies.

Table D-6 is continued on the following page

Table D-6 (Continued)
Water Management Strategies and Corresponding Types of Projects Considered in IRWM Plan

California Water Plan Chapter No.[1]	Water Management Strategy Selected for Inclusion within this IRWM Plan[1]	Types of Water Management Projects to be Considered within this IRWM Plan[2]
16	Recycled Water	• perform cost benefit analysis of recycled water use • research and evaluate potential new recycled water use markets • install and maintain recycled water treatment, storage, and conveyance facilities • monitor recycled water quality • mandate recycled water use where appropriate • provide operator certification training and assistance • conduct studies to identify sources of brine and brine disposal options • construct dedicated brine collection facilities for collecting concentrated saline wastewater from industrial sources, groundwater demineralization facilities, or recycled water demineralization facilities • provide assistance for site retrofits • assess water quality considerations of recycled water markets • implement and enhance community outreach and education • aggressively promote recycled water use (including social marketing strategies)
17	CALFED Surface Storage	[Strategy is not selected for inclusion within this IRWM Plan]
18	Regional Surface Storage	• construct new storage reservoirs • increase the storage capacity of the Region's existing reservoirs • remove sediment from existing reservoirs • seismic upgrades • increase the number of reservoirs capable of storing imported water • interconnect existing reservoirs
19	Reoperation and Reservoir Management	• expand reservoir capacities to provide seasonal, carry-over, or emergency storage • balance the capture and impounding of local runoff with the timing of imported water purchases and reservoir withdrawals • manage reservoirs to minimize evaporation losses • reservoir management programs improve storage efficiency • aeration or recirculation programs to minimize stratification-related water quality or treatability effects and to expand the vertical depth ranges from which water supplies may be withdrawn • manage reservoirs to sustain or preserve habitat • operate reservoirs to provide recreational opportunities
20	Urban Land Use Management	• protect/conserve endangered species, habitat, open spaces, and wildlife corridors • match development in groundwater-dependent areas to supply availability • promote low impact development and strategies that reduce urban sprawl • manage growth and promote conservation and higher density development • encourage non-structural BMPs and use of natural landscape features to control flooding and filter runoff • educate the development community on alternate development strategies • maintain and enhance parks and recreation within new and re-development areas • implement stormwater and flood control protection requirements and measures • monitor, manage, and control storm runoff and non-point sources • regulate and manage septic tank wastes and wastewater
21	Urban Runoff Management	• implement regulatory controls (e.g. best management practices) • monitor, control, and identify pollutant sources • install treatment devices and detention basins • utilize green roofs and rain barrel systems • treat stormwater for reuse (e.g., irrigation, agriculture, fire fighting) • divert dry-weather/urban runoff to the sanitary sewer system

1 Water management strategy considered within this IRWM Plan. See Table D-1 (pages D-3 and D-4) for a summary of the strategies.

Table D-6 is continued on the following page

Table D-6 (Continued)
Water Management Strategies and Corresponding Types of Projects Considered in IRWM Plan

Management Strategy Category	Water Management Strategy Selected for Inclusion in this IRWM Plan[1]	Specific Management Strategies Addressed within this IRWM Plan[1]
22	Urban Water Use Efficiency	• continue residential surveys, retrofits, and incentive programs • provide incentives for water conserving appliances • conduct commercial, industrial, and institutional water/energy efficiency audits and programs • improve marketing and incentives for water use efficiency through partnerships and resource sharing among water agencies and San Diego Gas & Electric • implement regional water budget program for all irrigated landscape sites in excess of one-quarter acre in size • conduct landscape irrigation audits for sites over budget • implement measured water savings incentive programs • develop and promote programs for landscaper training and certification, xeriscape and native vegetation • promote use of efficient irrigation methods and vegetation • implement best management practices of the California Urban Water Conservation Council • create a comprehensive regionally-supported water use efficiency effort for all Water Authority member agencies • create partnerships among water agencies, business and industry, environmental groups, and land use planning agencies through a Local Conservation Action Committee that promotes a regional approach for water use efficiency • provide experience-based education for landscape water use efficiency • implement water use efficiency programs for new development
23	Water Transfers	• transfer of conserved water from the Imperial Irrigation District • transfer of conserved water through Imperial Valley canal lining projects • transfer of conserved water via exchange programs with MWD • contracts to provide additional sources of imported water to the Region • interagency coordination and agreements for facilitate inter-regional transfers • conveyance infrastructure improvements to facilitate inter-regional water transfers
24	Water-Dependent Recreation and Public Access	• design and implement physical facilities that support water-related recreational opportunities and public access • acquire land to enhance access to recreational areas • restore, protect, and enhance wetlands • identify new areas of interest and prepare plans for recreational use • implement strategies to improve local fresh water and marine fisheries • implement strategies to monitor and improve water quality to support recreation • identify and mitigate the impacts of recreational use on water quality and habitat • revegetation and erosion control along trails and streams • construct, maintain, and staff visitor centers and park facilities • incorporate educational components to recreational areas • maintain and enhance recreational facilities and public access to include features such as trails, waste facilities, restrooms, and pet stations
25	Watershed Management and Planning	• create and implement Special Area Management Plans throughout the region • develop and implement Watershed Management Plans • assemble a Low Impact Development (LID) guidance manual • implement and encourage LID and "Smart Growth" strategies that reduce urban sprawl and facilitate mixed use • promote high density development or other methods to decrease sprawl • draft new ordinances or regulations to implement or require LID • update General Plans to require/promote LID, BMPs, higher-density development • adhere to General Plan land use designations and development protocols • educate the planning community on LID concepts and strategies

1 Water management strategy considered within this IRWM Plan. See Table D-1 (pages D-3 and D-4) for a summary of the strategies.

D.5 Applicability to the Region's Hydrologic Units

As described in Section B, the Region's eleven hydrologic units share many region-wide water quality management problems and needs. Key water management similarities among the Region's hydrologic units include:

- water quality impairment associated with bacteriological, nutrient, and sediment loads,
- ecosystem protection and restoration needs and the need for invasive species control,
- water supply diversity and water infrastructure reliability needs, and
- hydromodification and flood control issues.

While the Region's watersheds face many similar water management needs, not all of the water management strategies are applicable to each of the Region's hydrologic units:

- Agricultural land stewardship (#2) and agricultural water use efficiency (#3) strategies are not applicable within the Pueblo HU, as that hydrologic unit does not support any significant commercial agriculture.
- The San Juan and Pueblo HUs do not feature any existing or planned surface storage reservoirs. Regional surface storage (#18) and reoperation and reservoir management (#19) are thus not applicable within these hydrologic units.
- While the Pueblo HU may possess significant manageable deep-aquifer groundwater resources (San Diego Formation), no usable near-surface groundwater exists within the hydrologic unit. As a result, groundwater aquifer remediation (#11) and recharge area protection (#15) are not applicable within the Pueblo HU.
- Groundwater resources exist in the upper reaches of the Peñasquitos HU (private wells in the Poway area), but aquifer storage capacities and yields are not sufficient to warrant implementation of groundwater aquifer management (#4) or recharge area protection (#15) within the HU.

Only one seawater desalination site (within the Carlsbad HU) has been identified within the Region's water plans. Seawater desalination may be feasible in other locations, but a lack of availability of facility sites and brine disposal issues may prevent this strategy from being implemented in all but a few select locations within the Region.

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