

Summary of Water Quality contained in the California Water Plan, Update 2009

A central feature of this update is the oversight of a 21-member State agency Steering Committee, which included active participation from the State Water Resources Control Board as well as the California Department of Public Health. These two agencies provided significant staff resources in preparing content which is integrated throughout this Update. The following table provides an abridging document to provide a guide to where aspects of water quality are discussed in this document.

Summary of Water Quality in the California Water Plan, Update 2009

This table is intended to provide the reader with the locations in the California Water Plan, Update 2009 where discussion or tie to water quality has been included. The page number, general subject and where appropriate a description of the discussion is included. Hyperlinks are also provided to navigate the reader to the pertinent portion of the document.

Volume 1 Strategic Plan

Water quality is included throughout the strategic plan which is outlined in this chapter. It is included within each of the Strategic Plan Elements: Vision, Mission, Goals, Guiding Principles, and Objectives

Chapter 1 Introduction

Introduction outlines the process for preparing California Water Plan Update 2009: Integrated Water Managements and its new features. It also explains the organization of all five volumes of Update 2009 and its Highlights brochure.

<i>Page</i>	<i>General Subject and Description</i>
Page 1-7	Inclusive Water Planning

Chapter 2 Imperative to Act

Imperative to Act lays out the urgent course California must take to ensure enough safe and clean water through year 2050 for California's cities and towns, farms and businesses, and plants and animals when and where they need it.

<i>Page</i>	<i>General Subject and Description</i>
Page 2-6	Impaired Water Bodies
Page 2-7	Paramount Challenges
Page 2-10	Fundamental Lessons
Page 2-12	Box 2-3 Update 2009 Strategic Plan Elements Vision, Mission, Goals, Guiding Principles, and Objectives
Page 2-15	Key Initiatives
Page 2-17	Box 2-5 Strategic Growth Council
Page 2-18	Box 2-6 Integrated Regional Management
Page 2-22	Reducing Uncertainty and Risk
Page 2-24	Multiple Future Scenarios
Page 2-26	Conclusion
Page 2-27	Recommendations Each of the nine recommendations in this chapter includes a water quality component.

Chapter 3 Companion State Plans

The Steering Committee of 21 state agencies helped identify companion State plans that have a direct connection with this water plan. Of the companion state plans listed are 2 which have direct bearing on water quality.

<i>Page</i>	<i>General Subject and Description</i>
Page 3-8	California Government Describes the California Water Board and Regional Water Boards
Page 3-10	Federal Government Describes the role of the United States Geologic Survey in conducting research for water quality.
Page 3-11	State Agency Steering Committee Included members were the State Water Board and the Department of Public Health.
Page 3-19	Regional Water Quality Control Plans
Page 3-19	Water Boards Strategic Plan Update
Page 3-21	Resource Management Strategies Describes the connections between the Resource Management Strategies and the Companion State Plans

Chapter 4 California Water Today

Challenges of managing California’s extreme and variable resources are outlined in this chapter

<i>Page</i>	<i>General Subject and Description</i>
Page 4-15	Water Supplies and Uses
Page 4-19	Ground Water Quality
Page 4-26	Water Conditions - Water Quality
Page 4-27	Water Governance
Page 4-29	Critical Challenges
Page 4-31	Floods and Flooding
Page 4-37	Sea Level Rise
Page 4-40	Contamination of Surface and Groundwater
Page 4-40	Delta Vulnerabilities
Page 4-41	Deferred Maintenance and Aging Infrastructure
Page 4-43	Data Gathering and Sharing

Chapter 5 Managing an Uncertain Future

Managing our resources such that our investments account for and reduce uncertainty and risk in our water management systems, flood protection systems, and ecosystems more sustainable.

<i>Page</i>	<i>General Subject and Description</i>
Page 5-5	Planning Approach
Page 5-6	Traditional Planning Approach
Page 5-7	New Planning Approach
Page 5- 11	Box 5-3 Sources of Future Change and Uncertainty
Page 5-18	Sustainability Indicators
Page 5- 19	Box 5-5 Sustainable Water Resources Roundtable Sustainability Indicators
Page 5-20	Examples of Managing for Sustainability
Page 5-20	Strategic Growth Council
Page 5-21	ACWA - Sustainability Principals

Chapter 6 Integrated Data and Analysis

The need for the water community to have improved water resources information and analysis is detailed in this chapter.

<i>Page</i>	<i>General Subject and Description</i>
Page 6-5	Improving Technical Support for Integrated Regional Water Management
Page 6-7	Specific Water Management Information and Analytical Needs
Page 6-7	Information Gaps and Limitations
Page 6-8	Technical Challenges of Integrated Water Management
Page 6-14	Develop Strategic Plan to Improve Water Management
Page 6-16	Develop Common Schematic of the Water Management System

Chapter 7 Implementation Plan

The implementation plan for California Water Plan Update 2009 presents 13 objectives and their 110 related actions. Water quality is specifically mentioned in 11 of the 13 objectives with Objective 4 being specific to Water Quality and Objectives 2 and 9 having significant bearing on Water Quality due to the inclusion of Water Recycling related actions.

<i>Page</i>	<i>General Subject and Description</i>
Page 7-8	Objective 1- Promote, improve, and expand integrated regional water management to create and build on partnerships that are essential for California water resources planning, sustainable watershed and floodplain management, and increasing regional self-sufficiency.
Page 7-11	Objective 2 - Use water more efficiently with significantly greater water conservation, recycling, and reuse to help meet future water demands and adapt to climate change. This objective with its water recycling component makes for a large nexus with water quality. See related action #4.

Page 7-14	Objective 3 - Advance and expand conjunctive management of multiple water supply sources with surface and groundwater storage to prepare for future droughts, floods, and climate change.
Page 7-18	Objective 4 - Protect and restore surface water and groundwater quality to safeguard public and environmental health and secure California’s water supplies for beneficial uses. This objective is the main water quality objective.
Page 7-21	Objective 5 - Practice, promote, improve, and expand environmental stewardship to protect and enhance the environment by improving watershed, floodplain, and instream functions and to sustain water and flood management systems.
Page 7-23	Objective 6 - Promote and practice integrated flood management to provide multiple benefits including better emergency preparedness and response, improve flood protection, more sustainable flood and water management systems, and enhanced floodplain ecosystems.
Page 7-33	Objective 9 - Reduce the energy consumption of water and wastewater management systems to mitigate greenhouse gas emissions. By its very nature, this objective has a large nexus with water quality.
Page 7-35	Objective 10 - Improve and expand monitoring, data management, and analysis to support decision-making in light of uncertainties that support integrated regional water management and flood and water resources management systems
Page 7-39	Objective 11 - Identify and fund applied research on new water technology to help carry out water programs and better manage water systems.
Page 7-41	Objective 13 - Provide safe drinking water and wastewater treatment to all California communities. Increase the participation of small and disadvantaged communities in State processes and programs to achieve fair and equitable distribution of benefits, to consider mitigation of impacts from the implementation of State government programs and policies, and to ensure that these programs and policies address the most critical public health threats in disadvantaged communities.

Volume 2 Resource Management Strategies

Volume 2 describes 27 resource management strategies that can help meet various water plan objectives including seven which are directly aimed at improving water quality, and eighteen which have described benefits to improving water quality. Of the 27 resource management strategies 7 are strategies which have a primary goal of improving water quality and 18 have included discussion of identified water quality improvements which could result from implementation of the strategy even though the primary goal is something other than water quality. New for Water Plan 2009 is the Salt and Salinity Management Resource Management Strategy.

Seven RMS Strategies have primary goal of improving water quality:

- Chapter 14 Drinking Water Treatment and Distribution
- Chapter 15 Groundwater/Aquifer Remediation
- Chapter 16 Matching Quality to Use
- Chapter 17 Pollution Prevention
- Chapter 18 Salt and Salinity Management
- Chapter 19 Urban Runoff Management

Eighteen RMS Strategies which have identified and discussed water quality benefits:

Chapter 2 Agricultural Water Use Efficiency

<i>Page</i>	<i>General Subject and Description</i>
Page 2-5	Introduction
Page 2-6	Ag WUE in California
Page 2-21	Implementation
Page 2-23	Measurements and Evaluation
Page 2-27	Recommendations: 1,6,7

Chapter 3 Urban Water Use Efficiency

<i>Page</i>	<i>General Subject and Description</i>
Page 3-5	Introduction
Page 3-8	Water Quality
Page 3-22	Sustainability
Page 3-24	Environmental Benefits
Page 3-25	Recommendation 14 - Grey Water & Rain Water Capture
Page 3-39	Recommendation 37 - DWR Near Term Core Programs

Chapter 4 Conveyance Delta

<i>Page</i>	<i>General Subject and Description</i>
Page 4-5	Introduction
Page 4-8	Potential Benefits of Delta Conveyance
Page 4-10	Major Issues and Considerations Facing Conveyance
Page 4-10	Major Issues - Science and Planning
Page 4-13	Major Issues - Climate Change
Page 4-13	Major Issues - Water Supply Reliability
Page 4-15	Recommendation Number 3

Chapter 5 Conveyance Regional/Local

<i>Page</i>	<i>General Subject and Description</i>
Page 5-7	Potential Benefits of Reg/Local Conveyance
Page 5-10	Major Issues - Science and Planning
Page 5-11	Major Issues - Regulatory Compliance
Page 5-12	Major Issues - Climate Change
Page 5-12	Recommendation Number 2

Chapter 6 System Reoperation

<i>Page</i>	<i>General Subject and Description</i>
Page 6-6	Reoperation to Address Specific Needs Discusses the Delta Cross Channel Reoperation
Page 6-7	Reoperation to Improve Efficiency and Water Supply Reliability Focus Based Operations
Page 6-8	Reoperation in Anticipation of Future Change
Page 6-13	Institutional Constraints
Page 6-14	Recommendations

Chapter 8 Conjunctive Management and Groundwater Storage

<i>Page</i>	<i>General Subject and Description</i>
Page 8-5	Introduction
Page 8-10	Box 8-1 Importance of GW to California Water Supply
Page 8-14	Current Status of RMS
Page 8-18	Potential Benefits
Page 8-21	Table 8-1 Potential Benefits
Page 8-23	Cost of Conjunctive Management and Groundwater Storage
Page 8-24	Major Issue - Effects of Land Use
Page 8-24	Major Issue - Commingling of Different Quality Water
Page 8-25	Major Issue - Lack of Data and Tools
Page 8-26	Major Issue - Infrastructure and Operational Criteria

Page 8-27	Major Issue - Surface and Groundwater Management
Page 8-29	Major Issue - Water Quality (Section)
Page 8-29	Major Issue - Environmental Concerns
Page 8-29	Major Issue - Climate Change
Page 8-30	Recommendations 1,2, & 3

Chapter 9 Desalination - Brackish and Seawater

<i>Page</i>	<i>General Subject and Description</i>
Page 9-5	Desalination in California
Page 9-9	Potential Benefits of Desalination

Chapter 11 Recycled Municipal Water

<i>Page</i>	<i>General Subject and Description</i>
Page 11-5	Introduction
Page 11-8	Box 11-2 - Definitions
Page 11-10	Benefits of Water Recycling
Page 11-10	Potential Costs of Water Recycling
Page 11-11	Major Issue Facing More Recycled Water Use
Page 11-15	Recycled Water Use Policies
Page 11-16	Recycled Water Use Regulations
Page 11-18	Status of Recycled Water Task Force Recommendations

Chapter 12 Surface Storage - CALFED

<i>Page</i>	<i>General Subject and Description</i>
Page 12-5	Introduction
Page 12-8	Table 12-1 CALFED surface storage initial alternatives' benefit summary
Page 12-9	Potential Benefits of CALFED Surface Storage
Page 12-13	Major Issues - Effects
Page 12-16	Linkages to Other Strategies

Chapter 13 Surface Storage - Regional /Local

<i>Page</i>	<i>General Subject and Description</i>
Page 13-7	Potential Benefits of Surface Storage
Page 13-7	Potential Costs of Surface Storage
Page 13-8	Major Issues - Impacts

Chapter 20 Agricultural Lands Stewardship

<i>Page</i>	<i>General Subject and Description</i>
Page 20-5	Introduction
Page 20-13	Potential Benefits of Ag Land Stewardship
Page 20-15	Table 20-1 Annotated List of Ag Land Stewardship BMP's
Page 20-16	Potential Economic Costs of Ag Land Stewardship
Page 20-18	Major Issues - Landowner Confidentiality and Privacy Protection
Page 20-20	Major Issues - Outreach and Information
Page 20-23	Major Issues - Lack of Information
Page 20-23	Major Issues - Complex Regulations and Programs
Page 20-24	Major Issues - Regional Cooperation
Page 20-25	Regulatory Process Recommendations
Page 20-27	Data and Research Recommendations
Page 20-29	Education and Outreach Recommendations

Chapter 21 Economic Incentives (Loans, Grants, Water Pricing)

<i>Page</i>	<i>General Subject and Description</i>
Page 21-7	Financial Assistance - Incentives
Page 21-8	Potential Benefits of Economic Incentives
Page 21-11	Funding for Loans and Grants

Chapter 22 Ecosystem Restoration

<i>Page</i>	<i>General Subject and Description</i>
Page 22-5	Overview
Page 22-8	Water Quality (Section)
Page 22-15	Major Issues - Mercury Contamination

Chapter 23 Forest Management

<i>Page</i>	<i>General Subject and Description</i>
Page 23-5	Introduction
Page 23-5	Forest Management in California
Page 23-9	Potential Benefits of Forest Management
Page 23-11	Meadow Groundwater Storage
Page 23-14	Riparian Forests
Page 23-17	Fuels and Fire Management
Page 23-19	Road Management
Page 23-20	Urban Forestry
Page 23-22	Major Issues - Information Needs
Page 23-23	Major Issues - Coordination Needs
Page 23-24	Major Issues - Regulatory Requirements
Page 23-25	Monitoring and Research Recommendation
Page 23-26	Coordination Recommendation

Chapter 24 Land Use Planning and Management

<i>Page</i>	<i>General Subject and Description</i>
Page 24-5	Introduction
Page 24-7	Box 24-2 Key RMS Crosscutting Links
Page 24-7	Land Use Planning and Management in California
Page 24-7	Local Planning and Land Use Regulations
Page 24-8	State and Local Land Use Planning and Regulations
Page 24-9	Need for Compact & Sustainable Design
Page 24-12	Key State Legislation
Page 24-14	Coordinating Land Use and Climate Change
Page 24-16	Coordinating Land Use and Water Supply
Page 24-17	Box 24-6 LEED for Neighborhood Development
Page 24-19	Coordinating Land Use and Water Quality
Page 24-20	Potential Benefits of Compact and Sustainable Development
Page 24-22	Comprehensive Land Use Planning
Page 24-26	Recommendation- Integrate Regional Water Management and Local Land Use Plans
Page 24-27	Recommendation - Provide Funding Incentives and Technical Assistance
Page 24-28	Recommendation - Enhance Research and Data Gathering.

Chapter 25 Recharge Area Protection

<i>Page</i>	<i>General Subject and Description</i>
Page 25-5	Introduction
Page 25-5	Managed Recharge Areas in California
Page 25-9	Other Methods of Enhancing Recharge
Page 25-10	Potential Benefits of Recharge Area Protection
Page 25-11	Major Issues Facing Recharge Area Protection
Page 25-12	Recommendations 1, 2
Page 25-13	Recommendation 12

Chapter 27 Watershed Management

<i>Page</i>	<i>General Subject and Description</i>
Page 27-6	State Watershed Management Chronology – Key Dates
Page 27-9	Potential Costs of Watershed Management
Page 27-10	Potential Benefits - Table 27-1 Typical List of Watershed Products, Goods, and Services
Page 27-13	Major Issues – Land Use Alters Nutrient Cycle
Page 27-14	Major Issues - Fire and Water

Chapter 28 Flood Risk Management

<i>Page</i>	<i>General Subject and Description</i>
Page 28-5	Background
Page 28-6	Structural Approaches - Channel Modification
Page 28-11	Connections with other Resource Management Strategies - Urban Runoff Management
Page 28-12	Potential Benefits of Flood Risk Management
Page 28-14	Major Issues - Issues Common to all Flood Risk Approaches

Volume 3 Regional Reports

The 12 Regional Reports each include a section discussing water quality relative to the region with some regions having more information included in an appendix where noted below.

Chapter 2 North Coast

<i>Page</i>	<i>General Subject and Description</i>
NC-19	Section on Water Quality
Appendix NCB	Appendix on Water Quality.

Chapter 3 San Francisco

<i>Page</i>	<i>General Subject and Description</i>
SF-17	Section on Water Quality
Appendix SFB	Appendix on Water Quality.

Chapter 4 Central Coast

<i>Page</i>	<i>General Subject and Description</i>
CC-20	Section on Water Quality
Appendix CCB	Appendix on Water Quality.

Chapter 5 South Coast

<i>Page</i>	<i>General Subject and Description</i>
SC-26	Section on Water Quality
Appendix SCB	Appendix on Water Quality.

Chapter 6 Sacramento River

<i>Page</i>	<i>General Subject and Description</i>
SR-17	Section on Water Quality
Appendix SRB	Appendix on Water Quality.

Chapter 7 San Joaquin River

<i>Page</i>	<i>General Subject and Description</i>
SJR-15	Section on Water Quality
Appendix SJB	Appendix on Water Quality.

Chapter 8 Tulare Lake

<i>Page</i>	<i>General Subject and Description</i>
TL-22	Section on Water Quality
Appendix TLB	Appendix on Water Quality.

Chapter 9 North Lahontan

<i>Page</i>	<i>General Subject and Description</i>
NL-19	Section on Water Quality

Chapter 10 South Lahontan

<i>Page</i>	<i>General Subject and Description</i>
SL-19	Section on Water Quality

Chapter 11 Colorado River

<i>Page</i>	<i>General Subject and Description</i>
CR-23	Section on Water Quality

Chapter 12 Delta

<i>Page</i>	<i>General Subject and Description</i>
D-17	Section on Water Quality

Chapter 13 Mountain Counties

<i>Page</i>	<i>General Subject and Description</i>
MC-19	Section on Water Quality