

Final Staff Report with Substitute Environmental Documentation

Amendment to the Water Quality Control Policy for Recycled Water

STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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DIVISION OF WATER QUALITY
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List of Acronyms and Abbreviations

Acronym or Term	Meaning
afy	Acre-feet per year
Amendment	Proposed amendment to the Recycled Water Policy
Antidegradation Policy	State Water Board Resolution No. 68-16
AhR	Aryl hydrocarbon receptor
CASGEM	California Statewide Groundwater Elevation Monitoring
CEC	Constituent of emerging concern
CEQA	California Environmental Quality Act
CV-SALTS	Central Valley Salinity Alternatives Long-Term Sustainability
DWR	California Department of Water Resources
ER- α	Estrogen receptor-alpha
GAMA	Groundwater Ambient Monitoring and Assessment
GSA	Groundwater sustainability agency
GSP	Groundwater sustainability plan
MOA	Memorandum of agreement
MTL	Monitoring Trigger Level
NDMA	N-nitrosodimethylamine
NPDES	National Pollutant Discharge Elimination System
Order WQ 2016-0068-DDW	Water Reclamation Requirements for Recycled Water Use
PFOS	Perfluorooctane sulfonate
PFOA	Perfluorooctanoic acid
Policy	2013 Policy for Water Quality Control for Recycled Water
Porter-Cologne	Porter-Cologne Water Quality Control Act
Regional water boards	Regional Water Quality Control Boards
SED	Substitute environmental documentation
SGMA	Sustainable Groundwater Management Act
SNMP	Salt and nutrient management plan
STORMS	State Water Board's Strategy to Optimize Resource Management for Stormwater or Storm Water Strategy
State Water Board	State Water Resources Control Board
TCDD	2,3,7,8- tetrachlorodibenzo-p-dioxin
TDS	Total dissolved solids
Uniform Statewide Recycling Criteria	See Cal. Code Regs., tit. 22, Div. 4, Ch. 3
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
Water Boards	State and regional water quality control boards
WDR	Waste discharge requirements
WQO	Water quality objective
WRR	Water recycling requirements

1 Executive Summary

The Policy for Water Quality Control for Recycled Water (Recycled Water Policy, or Policy) was developed by stakeholders and adopted by the State Water Resources Control Board (State Water Board) in 2009 to streamline permitting for recycled water projects. Recycled water is 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 (Wat. Code § 13050(n)). The Recycled Water Policy was amended in 2013 to specify monitoring requirements for constituents of emerging concern (CECs) in recycled water used for groundwater recharge¹ projects based on recommendations from a 2010 Science Advisory Panel on CECs in recycled water. The Recycled Water Policy includes a provision to reconvene a Science Advisory Panel every five years to update its recommendations for CEC monitoring in recycled water.

In December 2016, the State Water Board adopted Resolution No. 2016-0061, which directed staff to reconvene a Science Advisory Panel on CECs in recycled water and to propose an amendment to the Recycled Water Policy (Amendment) considering revised goals and mandates for statewide use of recycled water, clarification of recycled water monitoring and reporting requirements, recommendations for the development of representative, basin-wide groundwater monitoring networks, and an evaluation of the frequency of priority pollutant monitoring in recycled water. Resolution No. 2016-0061 also directed staff to consider a time schedule for regional water quality control boards (regional water boards) to review recycled water orders and permits and to evaluate the nexus between the Recycled Water Policy and the Sustainable Groundwater Management Act (SGMA), groundwater recharge regulations, and reservoir water augmentation² regulations.

In July 2017, the Science Advisory Panel for CECs in Recycled Water (Science Advisory Panel) reconvened to provide recommendations for monitoring CECs in recycled water. The Science Advisory Panel evaluated whether CEC monitoring was needed for all allowable non-potable uses of recycled water specified in California Code of Regulations, title 22, as well as for recycled water used for groundwater recharge and reservoir water augmentation. The Science Advisory Panel recommended adding monitoring for six chemicals (1,4-dioxane, N-nitrosomorpholine (NMOR), iohexol, sulfamethoxazole, perfluorooctanesulfonic acid (PFOS), and perfluorooctanoic acid (PFOA)) and removing five chemicals (17-beta-estradiol, caffeine, iopromide, N,N diethyl meta toluamide (DEET), and triclosan) from the list of CECs to monitor; and adding monitoring with two bioanalytical screening tools (estrogen receptor-alpha and aryl hydrocarbon receptor). The Science Advisory Panel also recommended several institutional

¹ Indirect potable reuse for groundwater recharge is defined in Water Code section 13561(c), as the planned use of recycled water for replenishment of a groundwater basin or an aquifer that has been designated as a source of water supply for a public water system. Groundwater recharge by surface application is the controlled application of water to a spreading area for infiltration resulting in the recharge of a groundwater basin. Subsurface application is the controlled application of water to a groundwater basin or aquifer by a means other than surface application, such as direct injection through a well.

² Reservoir water augmentation is also referred to as surface water augmentation. The planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system or into a constructed system conveying water to such a reservoir.

changes for the State and regional water quality control boards (Water Boards), including developing a more flexible and responsive program to update CEC monitoring recommendations in response to new information. The Science Advisory Panel's findings and recommendations were evaluated and used to update the Policy, including the CEC monitoring requirements in Attachment A.

This Staff Report with Substitute Environmental Documentation (SED) was prepared in support of the Amendment, which is intended to provide statewide consistency for permit requirements for recycled water projects. The goals for the Amendment are:

1. Support the increased development and use of recycled water in a manner that protects the environment and public health as one piece of a broader strategy to mitigate the effects of long-term drought, climate change, and water supply uncertainty.
2. Amend the Recycled Water Policy to reflect:
 - The changing regulatory aspects of recycled water production and use in California including changes to California Code of Regulations, title 22 and other applicable regulations
 - Findings from an evaluation of the challenges and benefits of salt and nutrient management plan (SNMP) development
 - Recommendations of the Science Advisory Panel on CECs in recycled water.
3. Clarify, streamline, and provide statewide consistency for permit requirements for recycled water.

The purpose of this Staff Report with SED is to provide the rationale and supporting documentation for the Amendment, in accordance with the California Water Code (Water Code) and the California Environmental Quality Act (CEQA). The Amendment would be implemented by the State Water Board and the regional water boards. If adopted, the Amendment would:

- Remove statewide mandates for the use of recycled water, but retain the goals;
- Add a narrative goal to minimize the direct discharge of treated wastewater to enclosed bays, estuaries and coastal lagoons, and ocean waters, except where necessary to maintain beneficial uses;
- Add a narrative goal to maximize the use of recycled water in areas where groundwater supplies are in a state of overdraft, to the extent that downstream water rights, instream flow objectives and public trust resources are protected;
- Require recycled water producers to report recycled water production and use data to the State Water Board;
- Require wastewater treatment plants to report influent, treatment level, and volume of treated wastewater discharged to land, inland surface waters, enclosed bays, estuaries and coastal lagoons, and ocean waters;
- Require proposed recycled water projects to receive 1) concurrence from the State Water Board Division of Water Rights that an approved wastewater change petition is not needed to implement the project, or 2) State Water Board approval for the change pursuant to Water Code section 1211;

- Require regional water boards to evaluate the basins in their regions and to identify groundwater basins where SNMPs have not yet been developed, but are still needed to achieve water quality objectives for salts and nutrients in the long-term;
- Clarify the process for regional water boards to approve stakeholder-developed SNMPs;
- Require regional water boards to periodically evaluate data from SNMPs to determine whether updates to SNMPs are warranted;
- Remove the requirement to monitor for priority pollutants in recycled water used for landscape irrigation;
- Clarify the permitting and antidegradation analysis required for non-potable recycled water projects, groundwater recharge projects, and reservoir water augmentation projects;
- Remove permitting criteria that, if met, could aid in compliance with State Water Board Resolution No. 68-16 (Antidegradation Policy) for eligible landscape irrigation recycled water projects;
- Restrict project-specific groundwater monitoring from being required for non-potable recycled water projects if certain criteria are met (e.g., appropriate use of fertilizer, application at rates that minimize percolation below the root zone), unless the regional water board determines unique site-specific conditions or unless project-specific groundwater monitoring is required by an applicable SNMP;
- Update the monitoring requirements for CECs in recycled water used for groundwater recharge and reservoir water augmentation, including adding bioanalytical screening using estrogen receptor-alpha and aryl hydrocarbon receptor;
- Require regional water boards to evaluate, and if necessary, update recycled water permits for consistency with applicable regulations, plans, and policies;
- Terminate regional water board general orders for non-potable uses of recycled water
- Incorporate other substantive and non-substantive changes.

State Water Board staff conducted informal targeted meetings with stakeholders and held several public meetings and workshops to obtain feedback that was used to develop the Amendment. Pursuant to CEQA, the State Water Board held early public consultation meetings on December 1, 2017 in Sacramento and December 5, 2017 in San Diego. The State Water Board held public stakeholder workshops on January 4, 2018 in Sacramento and January 11, 2018 in Fountain Valley and an additional workshop on CECs and bioanalytical screening tools on June 11, 2018 in Costa Mesa. The State Water Board held a hearing on June 19, 2018 to receive comments on the Amendment. The State Water Board released revised drafts of the Amendment and Staff Report with SED on November 13, 2018. The State Water Board will consider the Amendment and Staff Report for adoption on December 11, 2018.

Following this Executive Summary, Section 2 of the Staff Report with SED provides background information on recycled water production and use in California, regulations related to water recycling and the environmental setting where water recycling occurs in California. Section 3 provides background on the history of the existing Recycled Water Policy, as well as the major components of the Policy. The amendments to each section of the Policy and the rationale for the changes are described in Section 4. The State Water Board's environmental review of the Amendment is contained in this Staff Report with SED, including the project summary in Section 5 and the environmental checklist in 5.2. All references to sections in this document are

referring to sections within the Staff Report with SED. References to sections of the Amendment or Policy will reference “section ... of the Amendment” or, “section ... of the Policy.”

2 Background

This section provides background information on current recycled water production and use in California, regulations related to water recycling, and the environmental setting where water recycling occurs.

2.1 Summary of Current Recycled Water Production and Use in California

The use of recycled water in California is part of an integrated water management approach that includes water conservation, capture and use of stormwater, aquifer storage and recovery, and other strategies to achieve a sustainable and reliable long-term water supply.

Recycled water is defined in the Water Code 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 and is therefore considered a valuable resource.” (Wat. Code § 13050(n)). The Recycled Water Policy specifically applies to recycled water from wastewater sources that meets the Water Code definition. Many different sources of water are reused in California, such as graywater, oilfield produced water, agriculture return water, treated wastewater from non-domestic sources, and *de facto* or indirect reuse of treated wastewater; however, these types of water reuse are not covered by the Recycled Water Policy.

The Recycled Water Policy applies to the following non-potable and potable recycled water uses, which are defined as follows:

Non-potable recycled water is wastewater which, as a result of treatment, is suitable for uses other than potable use.

Indirect potable reuse for groundwater recharge is the planned use of recycled water for replenishment of a groundwater basin or an aquifer that has been designated as a source of water supply for a public water system, as defined in section 116275 of the Health and Safety Code (Wat. Code § 13561(c)). In 2014, the California Department of Public Health (now the State Water Board Division of Drinking Water) adopted requirements for groundwater replenishment using recycled water pursuant to Water Code section 13562.5. These requirements are enumerated in California Code of Regulations, title 22, division 4, chapter 3.

Reservoir water augmentation, also known as surface water augmentation, is the planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system or into a constructed system conveying water to such a reservoir. Assembly Bill 574, signed into law in 2017, amended Water Code section 13561 to change the term “surface water augmentation” to “reservoir water augmentation.” Concurrently and in accordance with Water Code section 13562, the State Water Board adopted uniform water recycling criteria for surface water augmentation on March 6, 2018. The regulations became effective October 1, 2018. Several recycled water projects are in development to use recycled water for reservoir water augmentation once the regulations are in effect.

In December 2016, the State Water Board released its report to the California Legislature on the feasibility of developing regulatory criteria for direct potable reuse in California. The State Water Board concluded that it is feasible to develop regulatory criteria for direct potable reuse, and that it would address outstanding research needs in parallel with criteria development. Following that report, Assembly Bill 574 was signed into law on October 6, 2017, which refined and expanded potable reuse definitions and requires the State Water Board to adopt uniform water recycling criteria for direct potable reuse through raw water augmentation by December 31, 2023. Raw water augmentation is the planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a drinking water treatment plant that provides water to a public water system, as defined by section 116275 of the Health and Safety Code. The Recycled Water Policy may be amended in future to include permitting provisions for raw water augmentation.

Over the years as the types of recycled water projects have diversified and new recycled water projects have been developed, the types and amount of recycled water used in California have increased. To track the use of recycled water, the State Water Board in collaboration with the California Department of Water Resources (DWR) periodically conducts wastewater recycling surveys that gather data on recycled water production and categories of recycled water use. The most recent survey is the [2015 Municipal Wastewater Recycling Survey](#) (State Water Resources Control Board and Department of Water Resources 2017). Recycled water uses included in past surveys have primarily been limited to those uses that comply with California Code of Regulations, title 22 (Cal. Code Regs., tit. 22, Div. 4, Ch. 3; also see 2.2.2).

Results of the 2015 survey indicate that a total of 714,000 acre-feet/year (afy) of recycled water was beneficially used in 2015, which was an increase of 45,000 afy since the last survey in 2009. The top uses of recycled water in 2015 were agriculture irrigation (31%), landscape irrigation (18%), and groundwater recharge (16%). Non-potable uses accounted for 76% of total recycled water use, including agriculture irrigation (31%), landscape irrigation (18%), industrial (9%), golf course irrigation (8%), recreational impoundments (4%), natural systems restoration, wetlands, and wildlife habitat (3%), geothermal energy production (3%), commercial (1%), and others. Potable uses accounted for 24% of total recycled water use, including groundwater recharge (16%) and seawater intrusion barrier (8%).

Most uses of recycled water increased from 2009 to 2015. The largest increase came from groundwater recharge, which increased 44% or 35,000 afy between 2009 and 2015. However, use of recycled water for agriculture irrigation decreased by 25,000 afy from 2009 to 2015. This decrease may have occurred because recycled water is used to supplement other water supplies used for agriculture irrigation, and those water supplies were curtailed in 2015 due to drought conditions. As reservoir water augmentation projects begin to come online and as the regulations for raw water augmentation are developed and implemented, the potable use of recycled water is expected to increase in the future. This increase may be compounded by the effects of increased state funding for recycled water projects through Proposition 1 and the Clean Water State Revolving Fund. However, the 2015 survey data indicate that we are not on track to meet the goals of increasing the use of recycled water to 1.5 million afy by 2020 and to 2.5 million afy by 2030. Additionally, the survey process elucidated a clear need to improve tracking the production and use of recycled water and estimate the potential to increase recycled water in California (see 4.5).

2.2 Regulatory Background

This section describes the regulatory authority of the Water Boards as well as the current regulations regarding recycled water and how recycled water projects are permitted by the Water Boards.

2.2.1 Clean Water Act and Porter-Cologne

The federal Water Pollution Control Act, known as the Clean Water Act, is the primary federal law for water quality protection. In California, the State Water Board and the nine regional water boards implement many of the provisions of the Clean Water Act. The Clean Water Act requires states to adopt water quality standards and to submit those standards for approval by the U.S. Environmental Protection Agency (USEPA). The Clean Water Act also created the basic structure for regulating point source discharges to surface waters, or the National Pollutant Discharge Elimination System (NPDES) program.

The Porter-Cologne Water Quality Control Act (Porter-Cologne) also known as the California Water Code, Division 7 is the principal law governing water quality regulation in California. It established a program to protect the water quality and the beneficial uses of waters of the state. The State Water Board and regional water boards are authorized to implement the Clean Water Act and Porter-Cologne. Sections 13140 and 13170 of Porter-Cologne authorize the State Water Board to adopt statewide water quality control policies and plans.

Porter-Cologne established nine regional water boards (based on hydrological watersheds) and the State Water Board. The regional water boards regulate discharges to surface waters and groundwater through the administration of waste discharge requirements (WDRs). All NPDES permits, which regulate point source discharges to surface waters, are also WDRs.

Porter-Cologne also requires the adoption of water quality control plans that contain the guiding policies of water pollution management in California. These plans identify the existing and potential beneficial uses of waters of the State and establish water quality objectives to protect these uses.

2.2.2 The Uniform Statewide Recycling Criteria

California Code of Regulations, title 22, division 4, chapter 3, which was last updated in 2014, describes what are referred to as the Uniform Statewide Recycling Criteria, which establish the water quality standards, level of treatment and use areas for recycled water. (Cal. Code Regs., tit. 22, Div. 4, Ch. 3). The Uniform Statewide Recycling Criteria define limitations for application of recycled water based on level of treatment and specified use, such as landscape and agricultural irrigation, landscape impoundments, industrial or commercial cooling, and golf course irrigation. The level of treatment required in the Uniform Statewide Recycling criteria for approved uses of recycled water depends on the potential for human contact with recycled water. The Uniform Statewide Recycling Criteria classify non-potable recycled water uses based on treatment levels into four categories:

- a. Undisinfected secondary recycled water, as defined in California Code of Regulations, title 22, §60301.900
- b. Disinfected secondary-23 recycled water, as defined in California Code of Regulations, title 22, §60301.225

- c. Disinfected secondary-2.2 recycled water, as defined in California Code of Regulations, title 22, §60301.220
- d. Disinfected tertiary recycled water, as defined in California Code of Regulations, title 22, §60301.230.

The Uniform Statewide Recycling Criteria also define the use areas for recycled water including specifications for irrigation and impoundment of recycled water near a domestic water supply well, and specifications for recycled water use for unrestricted public areas.

The Uniform Statewide Recycling Criteria include treatment levels for potable recycled water uses (i.e., groundwater recharge, reservoir water augmentation), which fall into two categories:

- a. Disinfected tertiary recycled water, as defined in California Code of Regulations, title 22, §60301.230
- b. Full advanced treatment, as defined in California Code of Regulations, title 22, §60320.201.

The currently defined allowable uses and required treatment levels for those uses in the Uniform Statewide Recycling Criteria are summarized in Table 2-1. Additional information on the treatment requirements and specific uses is available in the regulations.

2.2.3 Statewide General Orders

The State Water Board adopted a general permit for landscape irrigation uses of recycled water (Order WQ 2009-0006-DWQ) as required in Water Code section 13552.5, which was updated following approval of AB 1481 on October 12, 2007. The State Water Board also adopted Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW) in 2016 in accordance with the April 25, 2014 Proclamation of the Governor. The Water Reclamation Requirements for Recycled Water Use replaced the General Waste Discharge Requirements for Recycled Water Use (Order WQ 2014-0090-DWQ) and offers permit coverage for non-potable uses of recycled water.

Table 2-1 Summary of current uses and required treatment levels defined in the Uniform Statewide Recycling Criteria

Undisinfected secondary	Disinfected-23	Disinfected-2.2	Disinfected tertiary	Full advanced treatment (RO/AOP)
Non-food trees Non-milk pasture Ornamental nursery/sod (restricted) Flushing sewers	Cemeteries Freeway Golf course (restricted) Ornamental/sod (unrestricted) Pasture (milk) Non-edible vegetation Landscape impoundment Industrial cooling (no mist) Industrial boiler Fire Backfill consolidation Soil compaction Concrete Dust control Road/sidewalk cleaning	Food crop (no contact) Orchards (no contact) Vineyards (no contact) Restricted recreation	Food crops Parks/playground School yards Residential landscape Golf course (unrestricted) Irrigation Recreational impoundment Industrial cooling Toilet flushing Prime drains Industrial with contact Fire (structural) Decorative fountains Laundries (commercial) Backfill Snow making Car wash (commercial) Potable reuse: groundwater replenishment via surface application	Potable reuse: groundwater replenishment via subsurface application Potable reuse: Reservoir water augmentation

Order WQ 2016-0068-DDW establishes standard conditions for recycled water use and conditionally delegates authority to an administrator to manage a water recycling program and issue water recycling permits to recycled water users. Order WQ 2016-0068-DDW authorizes the use of recycled water statewide for non-potable uses including but not limited to landscape irrigation, irrigation of crops and pasture land, construction, firefighting, hydrostatic testing and other beneficial uses described in more detail in the Uniform Statewide Recycling criteria. By regulating the use of recycled water to those approved by the Uniform Statewide Recycling criteria, Order WQ 2016-0068-DDW ensures the protection of public health.

Order WQ 2016-0068-DDW authorizes and encourages the use of recycled water by producers, distributors, and users for non-potable uses consistent with the requirements of the Uniform Statewide Recycling criteria. In addition, Order WQ 2016-0068-DDW includes requirements for storage and application of recycled water to protect water quality and public health. Order WQ 2016-0068-DDW does not cover groundwater recharge activities, disposal of treated wastewater, or potable reuse for groundwater recharge or reservoir water augmentation. These activities are separately permitted by the applicable regional water board.

Recycled water available for reuse under Order WQ 2016-0068-DDW is required to be adequately treated by wastewater treatment processes to water quality levels that are in compliance with permits issued by the Water Boards. Order WQ 2016-0068-DDW does not include treatment specifications, so recycled water producers seeking coverage under this order would also need separate WDRs or an NPDES permit for the production of recycled water. However, Order WQ 2016-0068-DDW reduces the need for separate water recycling requirements (WRRs) for new recycled water use sites within a use area covered by an administrator. New use sites simply register with an administrator rather than seeking separate permit coverage from the regional water board for the use site. Order WQ 2016-0068-DDW also regulates discharges to groundwater basins to prevent degradation of high-quality waters, consistent with the Antidegradation Policy, from constituents such as salinity, nutrients such as nitrogen, pathogenic microorganisms, disinfection by-products, CECs, and endocrine disrupting chemicals.

2.2.4 Project-specific Orders

The regional water boards have the authority to issue and administer WDRs, WRRs, NPDES permits, and master recycling permits that include recycled water requirements found in the Uniform Statewide Recycling criteria. The San Diego Regional Water Board also adopted conditional waivers of WDRs for qualifying graywater and recycled water projects in the San Diego region.

The regional water boards issue WDRs for discharges from wastewater treatment facilities. If there is a discharge of a waste that could affect the receiving water quality, then a report of waste discharge must be submitted to the regional water boards. The WDRs must be consistent with water quality objectives adopted by the regional water board. The purpose of WDRs is to protect surface water quality and groundwater quality.

In accordance with Water Code section 13523, the regional water boards, after consulting and receiving the recommendations of the State Water Board, may prescribe WRRs for water that is used or proposed to be used as recycled water. The WRRs are in conformance with the Uniform Statewide Recycling Criteria and are necessary to protect public health, safety, or welfare.

In accordance with Water Code section 13377, the State Water Board or the regional water boards issue NPDES permits (hereafter collectively referred to as permits) to comply with the Clean Water Act. NPDES permits must be consistent with the requirements of the Clean Water Act as well as applicable water quality control plans, to ensure protection of beneficial uses.

Furthermore, the regional water boards are authorized to issue master recycling permits to a producer and/or distributor of recycled water instead of prescribing individual WRRs for a user of recycled water.

2.2.5 Region-specific Orders and Conditional Waivers

Prior to the adoption of statewide general orders for recycled water use, such as Order WQ 2009-0006-DWQ and Order WQ 2016-0068-DDW, some regional water boards developed general WDRs and waivers of WDRs for the use of recycled water. For example, the San Francisco Bay Regional Water Quality Control Board adopted Order 96-011, General Water Reuse Requirements for producers and distributors of recycled water, under which producers can authorize specific non-potable recycled water projects that meet the criteria of the order. Other examples of regional water board general orders or waivers are the Colorado River Regional Water Quality Control Board's Order 97-700, General WDRs for Discharge of Recycled Water for Golf Course and Landscape Irrigation and the San Diego Regional Water Quality Control Board's Order R9-2014-0041, Conditional Waivers of WDRs for Low-Threat Discharges in the San Diego Region. Order R9-2014-0041 includes Waiver 2: Discharges to Land of Recycled Water, which authorizes the use of recycled water for short-term recycled water projects of less than 365 days.

These regional water board orders and waivers for the use of recycled water were adopted prior to the adoption of Order WQ 2016-0068-DDW, and vary in permit conditions, protection of water quality, and consistency with the Policy and with California Code of Regulations, title 22. Order WQ 2016-0068-DDW was adopted to create statewide consistency in the permitting of recycled water projects and to better manage limited staff resources by reducing redundancy in permit development. In adopting Order WQ 2016-0068-DDW, the State Water Board stated its intention that regulatory coverage under existing regional water board general orders and conditional waivers for the non-potable use of recycled water be terminated within three years of adoption of the order (i.e., June 7, 2019), and that the regional water board transition those enrollees to be covered under Order WQ 2016-0068-DDW.

2.3 Environmental Setting

The Recycled Water Policy is a statewide policy; thus, the Amendment would apply to the entire State of California as the geographic boundary. The Policy was adopted to encourage the safe use of recycled water to help meet the state's growing water supply demand and sustain aquatic habitats and mitigation areas in times of drought and severe water shortage. When recycled water is used in accordance with the Policy and consistent with the Uniform Statewide Recycling criteria, the environmental impacts of recycled water use are limited. However, as more recycled water projects come online, there may be environmental effects related to constituents in the recycled water, including salts, nutrients, and CECs, or the discharge of waste streams associated with these facilities.

Recycled water may contain elevated concentrations of salts and nutrients, which may have a negative effect on groundwater quality. This is of particular concern in areas where salts and nutrient concentrations exceed or threaten to exceed water quality objectives established for the groundwater basin. To address this environmental concern, the Policy includes guidance on developing groundwater basin-wide or subbasin-wide SNMPs to ensure that water quality objectives are met and beneficial uses are protected as the number of recycled water projects increases. More information on SNMPs is provided in 3.4.

There are many potential sources of CECs to surface waters and groundwater, including wastewater, stormwater, and recycled water. The toxicological relevance for human health and

the environment is not known for many CECs; however, the amount of available information varies based on the individual CECs. The Water Boards have a number of activities related to monitoring for CECs but do not have a statewide management strategy to address CECs on a statewide level, although one is in development (see 4.14.6). The Policy requires monitoring for a subset of CECs in recycled water used for groundwater recharge to monitor for chemicals that are of toxicological relevance for human health as well as chemicals that can indicate the performance of recycled water treatment processes. This information is submitted to regional water board staff who review the data, but there is a need to better coordinate CEC monitoring and assessment in the state. More information on CECs and the Policy is provided in 3.7.

Provisions in the Policy do not directly impact the quality or quantity of surface water or groundwater conditions. The existing Uniform Statewide Recycling criteria regulations define the level of treatment required for recycled water used for different purposes. The required treatment levels were determined to be protective of public health by the California Department of Public Health, whose drinking water program was transferred to the State Water Board in 2014.

The Policy encourages the development and use of recycled water by providing streamlined permitting guidance and consistent statewide monitoring requirements, but these provisions do not override the ability of regional water boards to protect beneficial uses through permitting requirements. Each individual recycled water project is subject to permitting requirements, either by enrolling in a general order or an individual order through the State Water Board or the regional water boards. Requirements in general or individual orders ensure protection of the environment and public health and do not allow for significant adverse environmental impacts. In addition, recycled water projects that propose to divert surface water discharges must file wastewater change petitions with the State Water Board in accordance with Water Code section 1211³, which requires consultations with the Department of Fish and Wildlife to ensure that downstream aquatic habitat is protected when discharges to surface waters are decreased.

3 Recycled Water Policy Background

The Recycled Water Policy is an important element of the State Water Board's effort to encourage the safe use of recycled water in a manner that is protective of public health and the environment. Section 3.1 provides background information on the history of the Recycled Water Policy, and sections 3.2 through 3.7 describe the primary components of the Policy.

3 Water Code section 1211 states, "(a) Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater, the owner of any wastewater treatment plant shall obtain approval of the board for that change. The board shall review the changes pursuant to the provisions of Chapter 10 (commencing with section 1700) of Part 2 of Division 2. (b) Subdivision (a) does not apply to changes in the discharge or use of treated wastewater that do not result in decreasing the flow in any portion of a watercourse."

3.1 Policy History

The State Water Board has encouraged the safe use of recycled water in California to supplement surface and groundwater supplies since passage of the Porter-Cologne Act in 1969⁴. Since that time, the state has been active in developing legislation, adopting resolutions and policies, setting goals for recycled water use, and funding recycled water projects. A summary of the history of the Recycled Water Policy and associated regulations supporting the Policy is included in Table 3-1.

In 1977, the State Water Board adopted Resolution No. 77-1, the Policy with Respect to Water Reclamation in California, after convening a task force to develop the Policy and Action Plan for Water Reclamation in California, which was released in 1976 (State Water Resources Control Board 1976). The 1977 Policy encouraged the reclamation of water, approved the Action Plan, and directed the State Water Board to implement the Action Plan.

The State Water Board adopted the Policy on February 3, 2009. The 2009 Policy set goals for recycled water use, provided guidance for streamlined permitting of projects that use recycled water for landscape irrigation, and required the State Water Board to investigate CECs by convening a Science Advisory Panel to guide future actions. The 2009 Policy also included guidelines, deadlines, and a process that encouraged stakeholder collaboration with the regional water board staff to prepare SNMPs for groundwater basins and sub-basins throughout California. Salt and nutrient planning was incorporated into the Policy to address potential cumulative impacts to groundwater quality that may be associated with use of recycled water, considering all sources of salts and nutrients in groundwater basins throughout the state.

In accordance with the 2009 Policy, the State Water Board convened a Science Advisory Panel in 2009 to develop recommendations for monitoring CECs. These recommendations were included in a technical report provided to the State Water Board in 2010, and the Policy was amended in 2013 to incorporate recommendations from the Science Advisory Panel. The 2013 Recycled Water Policy includes a provision to reconvene a Science Advisory Panel every five years to update its recommendations for CEC monitoring in recycled water.

On December 6, 2016, the State Water Board adopted [Resolution No. 2016-0061](#), which directed staff to amend the Recycled Water Policy in light of regulatory developments since the Policy was amended in 2013. Some regulatory developments that have taken place since the Policy was amended in 2013 include:

- California Code of Regulations, title 22 was amended to include regulations regarding the use of recycled water for potable reuse for groundwater replenishment via surface or subsurface application in June 2014.
- The California legislature passed the Sustainable Groundwater Management Act in September 2014, which requires each groundwater basin in California to have a plan to sustainably manage groundwater supply.

⁴ Section 13512 of the Porter-Cologne Act states: "It is the intention of the Legislature that the state undertake all possible steps to encourage development of water recycling facilities so that recycled water may be made available to help meet the growing water requirements of the state".

- The State Water Board adopted Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW) for all allowable non-potable uses of recycled water consistent with the Uniform Statewide Recycling Criteria in June 2016.
- The State Water Board adopted regulations for reservoir water augmentation using recycled water on March 6, 2018.
- In December 2016, the State Water Board released its report to the California Legislature on the feasibility of developing uniform statewide recycling criteria for direct potable reuse in California.
- Assembly Bill 574 was approved in October 2017, requiring the State Water Board to adopt uniform statewide recycling criteria for direct potable reuse through raw water augmentation by 2023 provided an expert review panel adopts a finding that the proposed criteria would adequately protect public health.

Resolution No. 2016-0061 also directed staff to re-convene the Science Advisory Panel on CECs in recycled water as specified in the Policy to update the 2010 report titled, “Monitoring Strategies for Chemicals of Emerging Concern in Recycled Water – Recommendations of a Science Advisory Panel” to guide future actions relating to CECs. The Science Advisory Panel was convened in 2017 in parallel with the development of the Amendment (see 3.7 for more detail).

The following sections provide an overview of the primary components of the Policy, which include goals and mandates (3.2), state agency roles (3.3), SNMPs (3.4), landscape irrigation (3.5), groundwater recharge (3.6), and CECs (3.7).

3.2 Goals and Mandates

The Policy includes goals and mandates for the use of recycled water, goals for the use of stormwater, and statewide goals for increasing the amount of water conserved in urban and industrial uses.

3.2.1 Recycled Water Goals

The 1976 Policy and Action Plan for Water Reclamation in California (State Water Resources Control Board 1976) includes an estimated recycled water “potential” of 2.6 million afy by the year 2000, which was a projected estimate of municipal and industrial wastewater discharged to brackish or saline waters and available for reuse, not accounting for water rights, economic, or technical constraints.

In 1991, the Water Recycling Act established numeric goals of recycling 700,000 acre-feet of recycled water per year by 2000 and 1,000,000 acre-feet of recycled water per year by 2010. These are the recycled water goals referenced in Water Code section 13577⁵.

Numeric goals for recycled water use were included in the Policy to provide an incentive to further develop recycled water sources. The goals provide a statement of support for increased

⁵ Water Code section 13577 states, “This chapter establishes statewide goals to recycle a total of 700,000 acre-feet of recycled water per year by 2000 and 1,000,000 acre-feet of recycled water per year by the year 2010.”

production and use of recycled water from the State Water Board and provide a numeric means of assessing progress towards the overarching goal of increasing the resiliency of the state's water supply portfolio. The numeric goals provide a rationale for funding recycled water projects and are frequently cited by recycled water project proponents when applying for project funding. The Legislature has also cited the goals when proposing legislation to require development of new regulations regarding recycled water.

3.2.2 Recycled Water Mandates

The Policy includes recycled water use mandates that may have been derived by extending the goals referenced in Water Code section 13577 by 20 years, which was an increase over 2002 levels (500,000afy) of 200,000 afy by 2020 and an additional 300,000 afy in recycled water use by 2030.

The Policy does not include guidance on a method to enforce the mandates, the mandates indicate a stronger intent than the goals, and the Policy provides examples of how achieving the mandates will be supported. These include providing streamlined permitting, requesting that other state agencies use their authorities to assist the Water Boards in increasing recycled water use, and cooperating and collaborating with the environmental community and water industry to advocate for funding for recycled water projects.

3.2.3 Stormwater Goals

The Preamble of the Policy contains stormwater goals of increasing the use of stormwater over use in 2007 by at least 500,000 afy by 2020 and by at least one million afy by 2030. These goals were included in the Policy prior to the adoption of the State Water Board's Strategy to Optimize Resource Management for Stormwater (STORMS, or Storm Water Strategy). At the time the Policy was adopted, stormwater goals were included in the Policy to demonstrate a broad portfolio for meeting long-term water supply challenges.

3.2.4 Conservation Goal

The Preamble of the Policy also contains a conservation goal of increasing the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20 percent by 2020. This goal was included in the Policy prior to the existence of Senate Bill X7-7 and Executive Order B-37-16 Making Water Conservation a California Way of Life. Setting and meeting conservation goals could now be addressed by implementation of Senate Bill X7-7 and in the DWR California Water Action Plan ("Make Conservation a California Way of Life" is one of ten principals that define the California Water Action Plan). In addition, emergency drought regulations were adopted by the State Water Board between 2014 and 2017 to respond to the drought State of Emergency declared in 2014. The drought regulations were partially repealed, but remaining provisions prohibit wasteful water practices and require monthly reporting of water use. Furthermore, the State Water Board is conducting a rulemaking to prohibit wasteful water practices. At the time the Policy was adopted, conservation goals were used to demonstrate a broad portfolio for meeting long-term water supply challenges.

3.3 Agency Roles

The Policy includes a section describing the roles of the Water Boards, DWR, and California Department of Public Health in regulating recycled water. Prior to 2014, the California

Department of Public Health's Drinking Water Program was charged with the development of uniform statewide recycling criteria appropriate for particular uses of recycled water, to protect public health. Prior to the production or use of recycled water, California Code of Regulations, title 22 requires development of and California Department of Public Health approval of an engineering report that includes a description of the design of the proposed recycling system and a description of any applicable use area requirements for proposed uses of recycled water (hereafter referred to as a Title 22 Engineering Report). In 2014, the California Department of Public Health's Drinking Water Program was transferred to the State Water Board. The State Water Board's Division of Drinking Water is now charged with these responsibilities.

Table 3-1 Summary History of Recycled Water Policy in California

Date	Policy/Document	Comment
1969	Legislature Adopts Water Recycling Law	People of the state have a primary interest in the development of recycled water: Water Code sections 13500, 13501.
1976	Policy and Action Plan for Water Reclamation in California	Presented actions to encourage reclaimed water use.
1977	Resolution No. 77-1: Policy with Respect to Water Reclamation in California	Declares that State Water Board and regional water boards shall encourage reclamation of water, encourages DWR to assist in implementation.
1988	Resolution No. 88-119	Memorandum of Agreement (MOA) between State Water Board and Department of Health Services on use of reclaimed water.
1991	Water Recycling Act of 1991	Set goal of 700,000 afy by 2000 and 1 million afy by 2010.
1996	MOA: Department of Health Services and State Water Board on Use of Reclaimed Water	Establishes role of regional water boards (permitting), Department of Health Services (establish use criteria), and State Water Board (dispute resolution).
2000	Title 22 amendment	Set criteria for non-potable use of recycled water
2003	Water Recycling 2030 – Recommendations of California's Recycled Water Task Force	Projects increase in recycled water use of 1.5 million afy by 2030 (for 2.0 MAF) through investment of \$11B.
2009	Recycled Water Policy	Includes salt and nutrient management planning, as well as permitting requirements for landscape irrigation and groundwater recharge.
2009	Order WQ 2009-0006-DWQ	General Order for landscape irrigation using recycled water
2013	Recycled Water Policy	Update Policy to include monitoring for CECs for groundwater recharge projects
2014	Order WQ 2014-0090-DWQ	General Order includes permit requirements for non-potable use of recycled water.
2014	California Code of Regulations, title 22 amendment	Amended to include criteria for surface spreading and direct injection for groundwater recharge.
2014	Drinking Water Program migrated from Department of Public Health to State Water Board	
2016	Order WQ 2016-0068-DDW	General order for non-potable use of recycled water
2016	Draft Title 22 regulations for surface water augmentation	Draft amendments to Title 22 presenting criteria for use of recycled water for surface water augmentation
2016	Report to Legislature: Feasibility of Developing Water Recycling Criteria for Direct Potable Reuse	Presents findings of an Expert Panel re: feasibility of Direct Potable Reuse of recycled water. Recommends further research.
2016	Resolution No. 2016-0061	Resolves that State Water Board shall update the Recycled Water Policy.

In addition to these responsibilities, the State Water Board is responsible for developing and managing research grants and contracts to advance the use of recycled water statewide and evaluating progress towards achieving statewide goals for recycled water use by developing an online data entry system to track recycled water production and use statewide.

Among other responsibilities, regional water boards are responsible for issuing orders prescribing requirements for recycled water projects, including but not limited to WRRs, master recycling permits, waste discharge permits, and NPDES permits.

The California Department of Water Resources is charged with updating the California Water Plan every five years in accordance with Water Code section 10004(b) to include an evaluation of water storage facilities, water conservation, water recycling, desalination, conjunctive use, and water transfers that may be tools to meet the future water needs of the state.

The California Public Utilities Commission is charged with approving rates and terms of service for the use of recycled water by investor-owned utilities. The California Public Utilities Commission stated its intent to require the use of recycled water where practicable, and to develop rules to increase the use of recycled water and desalination (California Public Utilities Commission 2010)

3.4 Salt and Nutrient Management Plans

Salt and nutrient management plans are included in the Policy to help address the potential for recycled water use to impact groundwater quality and to promote basin-wide management of salts and nutrients in groundwater. This section provides an overview of the intent of the Policy with respect to SNMPs, followed by an assessment of the benefits and challenges of developing SNMPs since the Policy was adopted.

3.4.1 Scope of SNMPs in the Policy

The following five sections describe the scope of SNMPs in the 2013 Policy.

3.4.1.1 Policy Intent and Goals for SNMPs

The Policy recognizes that:

- Some groundwater basins in the state contain salts and nutrients that exceed or threaten to exceed water quality objectives established in basin plans,
- Due to the varied sources of salts and nutrients in a groundwater basin⁶, regulation of recycled water alone will not address these conditions,
- Not all basin plans include adequate implementation procedures for achieving or ensuring compliance with the water quality objectives for salt or nutrients; and
- The appropriate way to address salt and nutrient issues is through the development of regional or subregional SNMPs rather than through imposing requirements solely on individual recycled water projects.

⁶ The Policy lists the following sources of salts and nutrients: natural sources, waste discharge, irrigation using imported water, groundwater, or recycled water and groundwater recharge using surface water or recycled water.

Based on these findings, the Policy includes the intent that salts and nutrients from all sources be managed on a basin-wide or watershed-wide basis in a manner that ensures attainment of water quality objectives and protection of beneficial uses through development of SNMPs. The Policy states that SNMPs would be prepared by wastewater entities, together with salt and nutrient stakeholders, in locally driven and controlled collaborative processes open to all stakeholders.

3.4.1.2 Groundwater Basin Coverage and Deadlines

The Policy includes the intent that every groundwater basin/subbasin in California have an SNMP and set a deadline for these SNMPs of five years from the effective date of the 2009 Policy (i.e., 2014). The Policy includes language allowing regional water boards to extend this deadline up to two years (i.e., 2016). This intent was later clarified in a State Water Board memorandum dated August 2, 2009, which recommended that priority for developing SNMPs be given to basins identified as “priority basins” by the United States Geological Survey (USGS) Groundwater Ambient Monitoring and Assessment (GAMA) program (Belitz et al. 2003). The GAMA program identified 116 (of a total of 472) groundwater basins as priority basins based on a variety of criteria including basin area, number of water supply wells, municipal and agricultural groundwater use, pesticide use, and number of leaking underground storage tanks. Section 3.4.2.1 describes the development of SNMPs relative to coverage of those basins that have been categorized as a priority basin in accordance with the USGS GAMA system.

3.4.1.3 Salt and Nutrient Management Plan Components

The Policy states that each SNMP shall include the following components:

- A basin-wide monitoring program
- A provision for monitoring of CECs
- Goals for recycled water use and stormwater recharge
- Estimates of loading from identified sources of salts and nutrients and the assimilative capacity of the basin, and
- An antidegradation analysis of recycled water projects in the basin to satisfy the requirements of the Antidegradation Policy.

Antidegradation and assimilative capacity are discussed below.

3.4.1.4 Antidegradation Analysis and Assimilative Capacity

Some groundwater recharge projects using reverse osmosis in the treatment train have the potential to decrease the concentrations of salts and nutrients in a groundwater basin because the recharge water is lower in salts and nutrients than the existing groundwater. In other circumstances, however, the use of recycled water has the potential to increase the concentration of nutrients and salts in groundwater. Because of the potential for recycled water to increase groundwater concentrations of salts and nutrients, the use of recycled water is subject to compliance with the Antidegradation Policy. The Antidegradation Policy includes the following requirements:

“a. Higher quality water will be maintained until it has been demonstrated to the state that any change will be consistent with the maximum benefit to the people of the state, will not unreasonably affect present and anticipated beneficial use of the water, and will not result in water quality less than that prescribed in the policies.

b. Any activity that produces a waste or may produce waste or increased volume or concentration of waste and discharges to existing high quality waters will be required to meet waste discharge requirements that will result in the best practicable treatment or control (BPTC) of the discharge necessary to assure pollution or nuisance will not occur, and the highest water quality consistent with the maximum benefit to the people of the state will be maintained.”

The Policy states that use of recycled water consistent with the Policy is to the benefit to the people of the state. The Uniform Statewide Recycling Criteria impose limitations on the uses of recycled water, based on the level of treatment and the specific use of recycled water to protect public health. By restricting the use of recycled water to those meeting the Uniform Statewide Recycling Criteria, the Policy ensures that recycled water is used safely. To the extent that the use of recycled water may result in some waste constituents entering the environment after effective source control, treatment, and control measures are implemented, limiting the use of recycled water to agronomic rates is part of the suite of treatment, storage and application measures that comprise best practicable treatment or control for uses with frequent or routine application, such as landscape or agricultural irrigation. Other types of uses that may be approved, such as dust control, firefighting, hydrostatic testing, and other short term or infrequent application are unlikely to result in sufficient loading of waste constituents that impact water quality.

The remaining element to consider in an antidegradation evaluation for recycled water projects is whether any potential change to water quality associated with a recycled water project: “...will not unreasonably affect present and anticipated beneficial use of the water, and will not result in water quality less than that prescribed in the policies⁷.” The Policy states that SNMPs shall include an antidegradation analysis demonstrating that the recycled water projects in the SNMP will collectively satisfy the requirements of the Antidegradation Policy.

A key parameter to consider in evaluating whether a project may result in water quality less than water quality objectives included in regional water board basin plans is assimilative capacity⁸. When a receiving water (in this case groundwater) is able to absorb a pollutant load without exceeding the water quality objective, then assimilative capacity is said to exist. One of the goals of preparing an SNMP is to compare the total assimilative capacity for a groundwater basin with an estimate of the total of all loads of salts and nutrients into the basin. This comparison is then used to assess whether the available assimilative capacity is sufficient to absorb the existing loads of salts and nutrients in the basin (including loading anticipated from recycled water projects) such that groundwater quality objectives can be met into the future.

SNMPs developed for the Santa Ana region, the Central Valley region, and the Los Angeles region have been accepted by regional water boards with a CEQA analysis and basin plan amendment process. Many other SNMPs have been accepted by the respective regional board without CEQA analysis or associated basin plan amendment. These other SNMPs serve as technical documents that can be helpful to regional board staff in evaluating permits for water projects within the area covered by the SNMP. However, each recycled water project within the

⁷ In State Water Board Resolution No. 68-16, policies are referred to as “water quality control policies” and are taken to include basin plans.

⁸ Assimilative capacity is the ability of a water body to receive a water quality constituent without exceeding the applicable water quality objective for that constituent.

area of these SNMPs requires an antidegradation analysis because basin plan amendments were not completed. Regional water boards responsible for permitting recycled water projects must evaluate whether there is sufficient assimilative capacity in the underlying groundwater such that a project would not result in the underlying groundwater exceeding water quality objectives.

3.4.1.5 Regional Water Board Acceptance of SNMPs, Basin Plan Amendments, and the California Environmental Quality Act

The Policy states that, within one year of the receipt of a proposed SNMP, the regional water boards shall consider adoption of revised implementation plans “for those groundwater basins within their regions where water quality objectives for salts or nutrients are being, or are threatening to be, exceeded.” The Policy further states that the implementation plans shall be “based on” the salt and nutrient plans required by this Policy. The Policy does not include guidance regarding the approval process for SNMPs that do not indicate that salts and nutrients are exceeded or are threatened to be exceeded.

3.4.2 Benefits and Performance of SNMPs to Date

This section discusses the performance of SNMPs in terms of the number of SNMPs that have been developed and how many groundwater basins are covered by those SNMPs, followed by a more qualitative discussion of benefits of this program.

3.4.2.1 SNMP Statistics: Number of Salt and Nutrient Management Plans and Priority Basin Coverage

A summary of SNMP performance statistics is provided in Table 3-2, and illustrated in Figure 3-1. The first column in Table 3-2 of 116 USGS GAMA Priority Basins in California (“USGS priority basins,” Belitz et al. 2003). This USGS basin ranking study is further discussed along with other basin ranking criteria in 4.8.1.

Columns 3 – 6 include data related to the number of SNMPs that have been developed in the region as of November 2018, and the status of that SNMP. Column 3 is the number of stakeholder groups that have been formed in that region. Column 4 indicates the number of SNMPs that have been finalized. Column 5 includes the number of SNMPs that have been accepted by the regional water board through a resolution, letter, or other formal acceptance. Column 6 shows the number of SNMPs that have resulted in the regional water board adopting a basin plan amendment to add or update water quality objectives based on the SNMP.

Columns 7 – 10 put the number of SNMPs in context of the number of USGS priority basins that are covered in whole or in part by an SNMP. Column 7 shows the number of USGS priority basins for which a stakeholder group has been identified. Column 8 indicates the number USGS priority basins that are covered by an SNMP that has been finalized. Column 9 includes the number of USGS priority basins that are covered by an SNMP that has been accepted by the regional water board through a resolution, letter, or other formal acceptance. Column 10 shows the number of USGS priority basins that are covered with an SNMP that has resulted in the regional water board adopting a basin plan amendment to add or update water quality objectives based on the SNMP.

Columns 11 – 14 depict SNMPs in terms of the percentage of USGS priority basin area that is covered in whole or in part by an SNMP. Column 11 shows the percentage of USGS priority

basin area for which a stakeholder group has been identified. Column 12 indicates the percentage of USGS priority basin area that is covered by an SNMP that has been finalized. Column 13 includes percentage of USGS priority basin area that is covered by an SNMP that has been accepted by the regional water board through a resolution, letter, or other formal acceptance. Column 14 shows percentage of USGS priority basin area that is covered with an SNMP that has resulted in the regional water board adopting a basin plan amendment to add or update water quality objectives based on the SNMP.

As shown in Table 3-2, 49 stakeholder groups have been formed, resulting in development of approximately 29 SNMPS that have gone through various amounts of review by regional water board staff. Fourteen of these 29 SNMPS have been accepted by regional water boards with a regional water board resolution or other formal acknowledgement. The SNMP for the Santa Ana region was incorporated into the Water Quality Control Plan for the Santa Ana River Basin. The SNMP for the Central Valley Region was incorporated into basin plan amendments that were approved by the Central Valley Regional board on May 31, 2018.

Fifteen SNMPS have been finalized but not accepted by a regional water board. Of these 15 SNMPS:

- One was developed in the North Coast region. The North Coast Regional Water Board has conditionally approved this SNMP.
- Five were developed in the Central Coast region. The Central Coast Regional Water Board made a decision to not formally accept or adopt the SNMPS developed in their region (Harris 2014).
- Two were developed in the Colorado River region. The Colorado River Regional Water Board is in the process of reviewing these SNMPS.
- Seven were developed in the San Diego region. The San Diego Regional Water Board is in the process of developing a pathway for the Board to formally accept or adopt these SNMPS.

Each SNMP may cover multiple USGS GAMA basins, and each GAMA basin may represent a relatively large or small percentage of the total area of USGS GAMA priority basins in California. For example, the SNMP for the Central Valley region includes 36 priority basins, representing approximately 58% of the area of priority basins in California. Pending approval from the State Water Board, the SNMP for the Central Valley Region would increase the area of priority basins covered with a basin plan amendment in California from 4% to 62%. Thus, it is instructive to consider SNMP statistics in terms of both number of priority basins covered and percentage of priority basin area that is covered (see Table 3-2).

Approximately half (55 of 116) of priority basins are covered in whole or in part with an SNMP that has been accepted by a regional water board (Table 3-2). These basins represent approximately 70% of the area of priority basins in California.

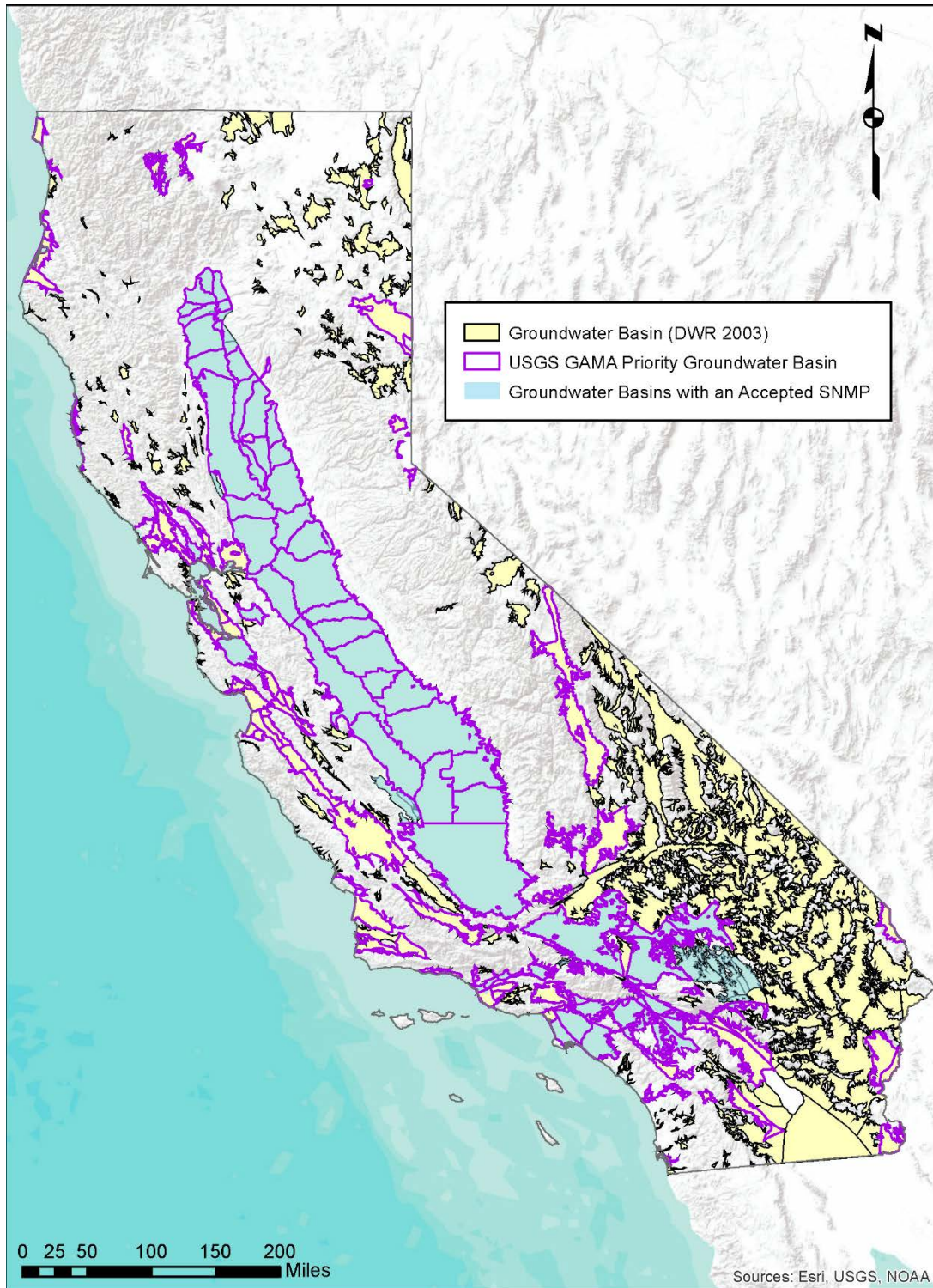
The San Diego Regional Water Board developed a region-specific prioritization system for groundwater basins within their region (see 4.8.1). SNMP coverage data for the San Diego region based on that region-specific basin prioritization is shown in row 11 of Table 3-2. According to that prioritization system, eight of the nine priority basins in the San Diego region (representing 98% of the area of the nine priority basins) have a final SNMP (Table 3-2).

Table 3-2 Summary of salt and nutrient management plan coverage

Regional Water Board	No. of Priority Basins ¹	Number of SNMPs Developed as of November 2018				Coverage of 116 USGS GAMA Priority Basins							
						Number of USGS GAMA Priority Basins				Percentage of Area of Priority Basins			
		# of Stakeholder Groups	Final SNMP	Regional Water Board Acceptance	BPA WQO	# of Stakeholder Groups	Final SNMP	Regional Water Board Acceptance	BPA WQO	Stakeholder Group	Final SNMP	Regional Water Board Acceptance	BPA WQO
North Coast	14	1	1	0	0	1	1	0	0	13%	13%	0%	0%
San Fran. Bay	8	5	3	3	0	3	3	3	0	37%	26%	26%	0%
Central Coast	16	10	5	0	0	6	5	0	0	55%	45%	0%	0%
Los Angeles	8	9	6	6	6	7	5	5	5	99%	77%	77%	77%
Central Valley	41	1	1	1	0	36	36	36	0	91%	91%	91%	0%
Lahontan	10	8	2	2	0	10	6	4	0	100%	58%	58%	0%
Colorado River	9	5	3	1	0	6	4	2	0	100%	45%	3%	0%
Santa Ana	5	1	1	1	1	5	5	5	5	100%	100%	100%	100%
San Diego	5	9	7	0	0	2	2	0	0	62%	62%	0%	0%
San Diego	9	9	7	0	0	9	8	0	0	100%	98%	0%	0%
Total	116	49	29	14	1	78	67	55	5	86%	76%	69%	4%

1 - Statistics on this line are for the high priority basins identified by the San Diego Regional Board rather than the USGS GAMA Priority Basins on the row above.

BPA: basin plan amendment; SNMP: salt and nutrient management plan; RB: regional water board; USGS GAMA: U.S. Geological Survey Groundwater Ambient Monitoring and Assessment program; WQO: water quality objective.



DWR: Department of Water Resources; GAMA: U.S. Geological Survey Groundwater Ambient Monitoring and Assessment.

Figure 3-1 Summary of Salt and Nutrient Management Plan Coverage

3.4.2.2 Qualitative Benefits from the SNMP Program

As presented in the previous section, the majority of the area of priority basins in California are characterized as either having formed a stakeholder group (86%), with a large percentage of those having prepared an SNMP that has been accepted by the regional water board (69%). The following sections provide a summary of the benefits of the SNMP program to date.

Informing Regional Water Board Permitting Staff Regarding Regional Salt and Nutrient Groundwater Quality

Even if an SNMP is not adopted as a basin plan amendment, the information in that SNMP can be very useful for permit writers for recycled water projects. Permitting individual projects that may impact groundwater quality for salts and nutrients (including recycled water projects) can be challenging in the absence of a more holistic view of the total salt and nutrient budget in the basin. The technical evaluations included in an SNMP provide a useful source of information for permit writers to assess whether groundwater monitoring should be considered as a permit condition, or other restrictions may be appropriate based on the surrounding groundwater quality conditions.

Basin-wide Groundwater Conceptual Models and Groundwater Sustainability Plans

Assessment of the long-term impacts from salt and nutrient loading into a groundwater basin requires developing basin-wide water budgets. The conceptual models that support development of these budgets are very similar to those that will be required for groundwater sustainability planning pursuant to SGMA. As a result, the conceptual models and water budgets developed for many of the basins with SNMPS will likely facilitate development of groundwater sustainability plans (GSPs) in the future.

3.4.3 Challenges

Challenges encountered since the SNMP program was started in 2009 can be categorized into administrative challenges (e.g., funding, staffing, regulatory authority), and challenges that are technical in nature (estimation of assimilative capacity). These different types of challenges are described below.

3.4.3.1 Administrative Challenges

3.4.3.1.1 Lack of Stakeholder Involvement from Key Stakeholders

In many basins, agriculture (both legacy conditions from past practices and current practices) represents a major source of salt and nutrient loading into the groundwater basin. Yet many regions have reported that stakeholder groups leading SNMP development (e.g., water districts, cities, publicly-owned treatment works) have had difficulties getting agricultural groups involved in the SNMP stakeholder group. This lack of involvement by agricultural groups and other parties contributing to salt and nutrient loading in a basin has significantly hindered development of effective SNMPS in some areas. For example, the Central Coast Regional Water Board did not approve several SNMPS that were developed in the that region because those SNMPS lacked stakeholder involvement from agriculture and were therefore not representative of the basin. The Central Coast Regional Board is using other regulatory tools to regulate groundwater quality with regards to salts and nutrients.

An exception to this overall trend is the Central Valley Salinity Alternatives for Long-Term Sustainability (CV-SALTS) program in the Central Valley region. CV-SALTS formed a stakeholder group that included major agricultural groups and has been working collaboratively with those agricultural groups for the past several years. The resulting SNMP (and anticipated basin plan amendments based on that SNMP) includes substantial implementation measures designed to improve long-term management of salts and nutrients.

3.4.3.1.2 Lack of Coverage of Groundwater Basins with Minor Use of Recycled Water

Because the SNMP program is housed within the Policy, incentives for stakeholder groups to form and prepare SNMPs are tied to permitting of recycled water projects. This incentive mechanism has been effective in those regions where use of recycled water is a large portion of the total water portfolio (e.g., the Los Angeles region, the Santa Ana region, and the San Diego region). For the other regions in California, recycled water is a relatively minor portion of the overall portfolio and it has been more challenging to successfully engage stakeholders to develop SNMPs.

3.4.3.1.3 Lack of Regulatory Authority on the Part of Stakeholder Groups

Often, stakeholder groups are led by water districts and publicly-owned treatment works. These entities lack the regulatory authority to implement many of the implementation measures that are frequently recommended in SNMPs. For example, many SNMPs include recommendations to reduce or eliminate the use of water softeners and/or to reduce the reliance on local septic systems as a means to reduce the salt and nutrient loading into a basin. However, these stakeholder groups do not have the ability to enforce or otherwise implement these measures.

3.4.3.2 Technical Challenges

The primary technical challenges encountered in developing SNMPs are the lack of readily available representative groundwater monitoring data and the methodology used to estimate the assimilative capacity of the basin.

Stakeholder groups that have led the effort to develop SNMPs have relied on water quality data available from existing domestic supply wells. This practice is consistent with the Policy, which states that use of existing wells is preferred. However, these domestic wells are typically screened in deeper portions of aquifers in groundwater basins. They frequently do not provide data that are representative of shallower portions of the aquifer, which are typically most impacted by salt and nutrient loading. Also, many individual or small domestic water supply systems are sourced from shallower aquifers that are not represented by data collected from deeper supply wells. Because individual or small systems are not required to report water quality data to the state, the data from these systems are not readily available. By excluding data from these shallow domestic systems, SNMPs frequently overestimate the total available assimilative capacity of the basin.

The other related technical challenge is the use of simple mass balance models to estimate the assimilative capacity of a groundwater basin. The Policy states that SNMPs shall include: “salt and nutrient source identification, basin/sub-basin assimilative capacity and loading estimates, together with fate and transport of salts and nutrients.” But no guidance is provided regarding the complexity of this analysis, and most SNMPs have relied upon a very simplistic mass-based approach that assumes complete mixing of salt and nutrient loads in the basin. However, salts and nutrients loaded into a basin from surface sources do not typically mix throughout the entire

depth of the basin. Rather, salts and nutrients loaded into a basin from the surface can concentrate in shallower aquifers where they can end up affecting domestic water supplies, without mixing with groundwater in the deepest portions of the aquifer. Salt and nutrient loads also can remain in relatively confined areas laterally as well, without mixing over the entire basin area. Like the effect of relying on water quality data from deep domestic wells, the simplified total mixing assumption can result in an overestimate of the assimilative capacity of a basin and does not consider potentially significant impacts to shallow groundwater supplies or isolated areas that may have significant impacts. Alternatively, if impacts that are laterally confined and vertically constrained within a basin are in areas or depths where the groundwater is not used, then the basin could be considered as being able to accept additional loading without impacting beneficial uses of groundwater.

3.4.4 Nexus with Other Programs

The SNMP program has a nexus with many other water quality protection programs in California including:

- SGMA
- The Irrigated Lands Regulatory Program
- Integrated Regional Water Management
- CV-SALTS
- General Orders, including Water Reclamation Requirements for Recycled Water Use (Order WQ 2016-0068-DDW)

A summary of the nexus of the objectives for the SNMP program with these other programs is summarized in Table 3-3. As indicated on Table 3-3, some of the objectives for the SNMP program can be addressed through other programs. It is important to note that the Policy recognizes this potential overlap by providing that the requirements for developing an SNMP shall not apply to areas that have completed a plan that is “functionally equivalent” to the requirements listed in the Policy for SNMPS.

The following section discusses the nexus between the SNMP and SGMA programs.

3.4.4.1 Nexus with Other Programs – Sustainable Groundwater Management Act

In 2014, the legislature passed a three-bill package⁹ collectively known as the Sustainable Groundwater Management Act. SGMA requires water and land-use agencies to work together to form groundwater sustainability agencies (GSAs) and to develop GSPs. DWR is responsible for reviewing GSPs, with the State Water Board intervening when DWR determines that the GSP is unlikely to achieve sustainability.

SGMA defines sustainable groundwater management as “management and use of groundwater in a manner that can be maintained during the planning and implementation horizon without causing undesirable results” (Water Code § 10721(u)). The legislation defines “undesirable results” as any of the following effects caused by groundwater conditions occurring throughout the basin (Water Code § 10721(w) (1-6)):

⁹ AB 1739 (Dickinson), SB 1168 (Pavley), and SB 1319 (Pavley)

- Chronic lowering of groundwater levels indicating a significant and unreasonable depletion of supply
- Significant and unreasonable reduction of groundwater storage
- Significant and unreasonable seawater intrusion
- Significant and unreasonable degraded water quality
- Significant and unreasonable land subsidence
- Surface water depletions that have significant and unreasonable adverse impacts on beneficial uses of the surface water.

3.4.4.2 Salt and Nutrient Management Planning and SGMA

There are certain overlaps in the objectives and desired outcomes of SGMA and salt and nutrient management planning in the Policy. Incorporating an SNMP into a GSP through application of the concepts discussed below may eliminate duplicative regulatory requirements and help encourage sustainable groundwater management. However, it is important to note that the objectives of SNMPs and GSPs are not identical and exist within different statutory frameworks. The concepts below do not suggest that DWR should approve or regulate SNMPs nor that the regional water boards are approving or overseeing GSPs. It is not feasible to remove the salt and nutrient management planning objectives from the Policy and simply rely on SGMA due to the separate regulatory authorities and responsibilities of DWR and the Water Boards.

The following sections include a discussion of the potential to achieve the salt and nutrient management planning objectives of the Policy through implementation of SGMA and provide recommendations for the interface between these programs going forward. The findings are broken into two subsections: 1) opportunities to coordinate between programs and 2) the distinctions between SNMPs and SGMA.

Opportunities for Coordinated Implementation

SGMA and salt and nutrient management planning share objectives such as:

- Managing of groundwater on a basin/subbasin-wide basis
- Encouraging involvement of a broad spectrum of stakeholders to develop plans
- Targeting long-term management goals (i.e., sustainable management)

In addition, the technical evaluations involved in preparing GSPs and SNMPs have common elements. The following outlines items in DWR's GSP regulation (DWR Regulation) that could be adapted by a GSA to meet both the requirements of the Regulation and the Policy.

Basin-Wide Monitoring: Both the SNMPs and SGMA require a basin-wide monitoring plan. The basin-wide monitoring required through the SNMPs could be incorporated into a basin's GSP. The DWR Regulation requires an analysis of the general water quality, which would likely include salt and nutrient conditions, in all principle aquifers to be presented in the basin's Hydrogeologic Conceptual Model (DWR Regulation §354.14 (d)). In addition, the DWR Regulation requires a description of current and historical groundwater conditions including groundwater quality issues that may affect the supply and beneficial uses of groundwater (DWR Regulation §354.16 (d)). Lastly, the DWR Regulation requires each GSA to develop a

groundwater monitoring network capable of collecting valuable spatial and temporal groundwater chemistry data in order to evaluate and determine degraded groundwater quality issues and trends (DWR Regulation §354.34 (4)).

Table 3-3 Summary nexus of the salt and nutrient management plan program with other programs

Dark Grey shading indicates a lack of nexus; Grey shading indicates a potential or partial nexus; White shading indicates a clear nexus

BMPs: best management practices; IRWMP: integrated regional water management plan; S&N: salts and nutrients; SGMA: Sustainable Groundwater Management Act; SNMP: salt and nutrient management plan; TDS: total dissolved solids; WDR: waste discharge requirements.

SNMP Program Objective	Nexus with Other Programs					
	Irrigated Lands Regulatory Program	SGMA	Order WQ 2016-0068-DDW	Other General Orders (Dairy, Winery, etc.)	Integrated Regional Water Management Planning	North Coast Region Groundwater Protection Strategy
Facilitate permitting of recycled water projects			Streamlined enrollment may facilitate permitting.			Basin-wide approach may facilitate permitting.
Manage salts and nutrients from all sources to attain water quality objectives and protect beneficial use.	Only agricultural sources of nitrate are covered (TDS is monitored but not emphasized). Potentially enforceable through WDRs. Nutrient content of recycled water used for irrigation may be included in nutrient balance, if required.	Significant and unreasonable degradation of water quality included as an "undesirable result" that must be avoided to achieve sustainability. Includes goal of sustainability within 20 years, but unclear if that includes attainment of water quality objectives.	Order requires compliance with any applicable SNMP and may include preparation of an SNMP or participation in an existing salt and nutrient management planning effort if directed by the State Water Board or the applicable regional water board.	Specific loads are managed through BMPs and monitoring.	Some salt and nutrient loading analysis can be incorporated into IRWMPs.	Yes

SNMP Program Objective	Nexus with Other Programs					
	Irrigated Lands Regulatory Program	SGMA	General Order 2016-0068	Other General Orders (Dairy, Winery, etc.)	Integrated Regional Water Management Planning	North Coast Region Groundwater Protection Strategy
Basin-Wide Monitoring Plan	Coalitions are large scale and consider basin-wide data, but program is limited to loading of nitrate from ag, sources.	Basin-wide scale of monitoring. Emphasis on proximity to recharge projects not included in SGMA.	Order requires compliance with any applicable SNMP.		Basin-wide approach is part of IRWMP.	Yes
CEC Monitoring			Order requires compliance with SNMP.			Pending findings of Region 1 analysis.
Recycled Water and Stormwater Use Goals		GSPs anticipated to include storm water goals for groundwater recharge.	Order requires compliance with SNMP.		May be part of IRWMP.	Pending findings of Region 1 analysis.
Basin-Wide Assimilative Capacity (Loading Estimates)			Order requires compliance with SNMP.		Possible part of IRWMP.	Yes
	Nexus with Other Programs					

SNMP Program Objective	Irrigated Lands Regulatory Program	SGMA	General Order 2016-0068	Other General Orders (Dairy, Winery, etc.)	Integrated Regional Water Management Planning	North Coast Region Groundwater Protection Strategy
Implementation Measures to Manage S&N on a sustainable basis	Some management of nutrient loading from ag. sources.	May be involved in impacted basins.	Order requires compliance with SNMP.		Possible component of IRWMP.	Possible, as determined by basin assessment.
Antidegradation Analysis			Order requires compliance with SNMP.	Partial (for specific discharge only)		Yes
Antidegradation Analysis (for recycled water projects)			Partial (non-potable only)			Possible, as determined by basin assessment.

Meeting these SGMA requirements would likely satisfy the monitoring requirements of an SNMP or could be incorporated by reference into an SNMP.

Minimum Thresholds and Undesirable Results: GSAs need to develop water quality minimum thresholds for their basin, as they deem appropriate. The minimum thresholds are part of a GSP's Sustainable Management Criteria. The Sustainable Management Criteria Best Management Practices document published by DWR provides considerations for developing water quality minimum thresholds. Some of the considerations identified in the document, such as what is the volume of impacted water in the basin, could be placed in terms of assimilative capacity if a GSA chose to do so. In addition, the Best Management Practices document suggests assessing which aquifers are utilized for public supply, and in turn, which aquifers or volumes of groundwater are not. The analysis of current and potential water quality degradation and development of water quality minimum thresholds are directly related to the undesirable result of significant and unreasonable degraded water quality (Water Code §10721(x)(4)). This framing of current and future water quality could be used by a GSA to meet SNMP objectives related to analyzing degradation and assimilative capacity, particularly given that a minimum threshold can be provided as a volume of water (DWR Regulation §354.28(c)(4)).

Water Budget: SGMA requires GSAs to develop a water budget for a basin. The water budget must incorporate information such as water supply, water demand, and land use (DWR Regulation §354.18 (c)(1)). SNMPs may be related to the water budget analysis in a GSP in that salt and nutrients, if not properly managed, can impair a water supply or limit supply for particular demands. By managing salts and nutrients, an agency could ensure their water supply is sustainably managed for their different beneficial uses and users, beyond just avoiding reduction of storage or lowering of water levels. In other words, an aquifer loaded with salts or nutrients beyond the aquifer's assimilative capacity is likely to be unsustainable over the planning and implementation horizon that must be addressed in SGMA. Incorporating the objectives of an SNMP will provide the opportunity to avoid a condition where a GSP cannot meet water demands due to water of insufficient quality, even though storage volumes and/or water levels remain desirable. Evaluating a water budget and storage in the context of assimilative capacity is likely to give a GSA a more robust understanding of water supply and use of SGMA's planning and implementation horizon.

Distinctions between SNMPs and SGMA

While there are certain opportunities to align the elements of a GSP with SNMP requirements, it is important to note the distinctions between SNMPs and SGMA. As mentioned above, the first distinction is the differing actors of each regulatory program. SGMA implementation is driven from the local level and provides GSAs a large amount of local flexibility. This deference for local flexibility means a GSA could use the SGMA process to meet the objectives of an SNMP and other regulatory programs, but it does not empower DWR to require GSAs to do so. Additionally, DWR's review and approval of a GSP under the authorities provided by SGMA would not supersede regional water board approval of the GSP as "functionally equivalent" to an SNMP. These are not hurdles but must be kept in mind by a GSA if they choose to take advantage of the opportunities to meet the needs of multiple regulatory processes using a GSP. Below are additional distinctions that will need to be considered for integration of SNMP objectives into SGMA.

Basin Prioritization: SGMA relies on DWR's California Statewide Groundwater Elevation Monitoring (CASGEM) prioritization system to identify which basins or subbasins are required to develop GSPs. SNMP prioritization relies on the USGS GAMA ranking or other basin prioritizations completed by individual regions. The criteria used by CASGEM to prioritize groundwater basins is slightly different than the USGS system and the systems developed by individual regions. As a result, several basins would be considered a "high" priority from an SNMP point of view that may be a low or very low priority for CASGEM. Basins identified as low or very low priority under CASGEM are not required to develop a GSP, but local agencies within these basins are empowered to form GSAs and develop GSPs if they choose to do so. Agencies in basins that are prioritized for SNMP development but prioritized as low or very low under CASGEM will need to evaluate whether to either: 1) pursue work that is specific to meeting SNMP requirements, or 2) form a GSA and integrate SNMP requirements with the optional process of developing a GSP.

Requirements Unique to an SNMP: There are certain SNMP requirements that do not overlap with current SGMA requirements as articulated by the statute or DWR's Regulation. These components, listed below, would need to be addressed for the GSP to be considered functionally equivalent to an SNMP. There is incentive for a GSA to include these components because it will become more feasible for GSPs to implement significant increases in managed aquifer recharge if the potential salt and nutrient impacts of increased recharge are considered. The SNMP requirements that a GSA will need to address are:

- **Basin-Wide Assimilative Capacity (Loading Estimates):** The DWR Regulation does not require this, however as described above, it does provide GSAs the opportunity to do so based on how the Sustainable Management Criteria for water quality degradation have been described.
- **Recycled Water and Storm Water Use Goals:** This is not explicitly required under SGMA but could be incorporated at the discretion of a GSA to support the description of the basin's water budget or as part of the projects and actions that a GSP must identify.
- **Antidegradation Analysis:** The necessary technical components of an antidegradation analysis are likely to become available through development of a GSP, but SGMA and the DWR Regulation do not require inclusion of an antidegradation analysis that meets the criteria laid out by the Antidegradation Policy.
- **Implementation Measures to Manage Salts and Nutrients on a Sustainable Basis:** SGMA does not provide responsibility or authority to the GSA to manage salt or nutrient loading. While loading associated with the projects and actions identified by a GSP must be addressed, a GSA will need to coordinate with regional water boards to achieve this SNMP objective. This coordination is certainly feasible but is unlikely to be mandated by DWR.

3.5 Landscape Irrigation

The Policy contains a section on landscape irrigation projects that describes the control of incidental runoff. When the Recycled Water Policy was adopted in 2009, landscape irrigation projects were a focus for streamlined permitting because of the high number of permits in development for landscape irrigation uses of recycled water.

3.5.1 Incidental Runoff

The Uniform Statewide Recycling Criteria, Cal. Code of Regs, tit. 22, Div. 4, Ch. 3, §60310 states that any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

There was a need to define incidental runoff because the concept is not defined in regulation or code. The Policy defines incidental runoff as “unintended small amounts (volume) of runoff from recycled water use areas, such as unintended, minimal over-spray from sprinklers that escapes the recycled water use area.” The Policy also includes several management practices that are required to be included in any type of permit that regulates incidental runoff. These management practices were intended to ensure that any runoff that occurs is no more than incidental. However, effective management practices may vary from site to site, and the practices prescribed in the Policy may not be the best practices for a given site.

3.5.2 Streamlined Permitting

Streamlined permitting for landscape irrigation recycled water projects was desired because there was no general order for these applications in 2009 when the Policy was adopted, which is the typical vehicle to provide streamlined permitting. This section of the Policy provided a basis for streamlined permitting while a general order was being developed. In 2009, the general WDRs for landscape irrigation uses of recycled water (Order WQ 2009-0006-DWQ) was adopted, in accordance with Water Code section 13552.5. In addition, WRRs for recycled water use (Order WQ 2016-0068-DDW) were adopted in 2016, and this general order also provides permit coverage for landscape irrigation uses of recycled water, as well as other non-potable uses of recycled water.

If streamlined permitting criteria are met (e.g., compliance with title 22, compliance with any applicable SNMP, application at agronomic rate and not when the soil is saturated, and appropriate use of fertilizer), the Policy requires regional water board to permit the landscape irrigation project within 60 or 120 days for a general order or an individual permit, respectively, unless the regional water board makes a finding of unusual circumstance through a public process. Projects meeting the streamlined permitting criteria are exempt from any receiving water or groundwater monitoring requirements unless project-specific monitoring is required under an applicable SNMP. In addition, projects meeting the streamlined permitting criteria are required to monitor for priority pollutants once per year for larger facilities (greater than one million gallons per day) or once every five years (less than or equal to one million gallons per day).

3.6 Groundwater Recharge

When the Policy was adopted in 2009, groundwater recharge projects were permitted on a case-by-case basis and uniform statewide regulations for groundwater recharge projects (Cal. Code Regs., tit. 22, § 60320) did not yet exist. The Policy section on groundwater recharge served to ensure there are uniform monitoring requirements for CECs and priority pollutants for groundwater recharge projects and clarify the roles of the State Water Board and the California Department of Public Health, which at the time was the regulatory authority for drinking water quality.

In 2014, uniform statewide regulations for groundwater recharge projects went into effect and the Drinking Water Program transferred from California Department of Public Health to the State Water Board. Under the current permitting process, the State Water Board Division of Drinking Water evaluates groundwater recharge project proposals on a case-by-case basis and then issues a recommendation for a project. If the project receives an affirmative recommendation from the Division of Drinking Water, the regional water board prepares an order that includes any conditions set forth by the Division of Drinking Water, as well as any other requirements to protect water quality. Recycled water used in groundwater recharge projects has the potential to degrade, improve, or have no effect on existing groundwater quality, thus the State Water Board acknowledges in the Policy that groundwater recharge projects must be reviewed on a case-by-case basis and have site-specific permits.

The groundwater recharge section of the Policy also includes monitoring requirements for CECs and priority pollutants. Groundwater recharge projects include more monitoring requirements for chemicals that may be a risk to human health compared to non-potable recycled water projects because the potential for exposure is increased in potable reuse projects, such as groundwater recharge.

Since the Policy was amended in 2013, the Uniform Statewide Recycling Criteria for groundwater replenishment via surface or subsurface application were adopted. These regulations include priority pollutant monitoring requirements for groundwater recharge projects that differ from the priority pollutant monitoring requirements given in the Policy (CCR, title 22, Div. 4, Ch. 3., §60320.12). The Uniform Statewide Recycling Criteria require quarterly monitoring for priority pollutants for the first two years of implementation of a groundwater recharge project. Subsequent monitoring may be reduced to annual with approval from the State Water Board. In contrast, the Policy requires priority pollutant monitoring twice per year. Now that Uniform Statewide Recycling Criteria for groundwater recharge specify priority pollutant monitoring, priority pollutant monitoring requirements for groundwater recharge are no longer needed in the Policy.

Monitoring requirements for CECs are included based on the recommendations of a Science Advisory Panel and are described in detail in Attachment A of the Policy. CEC monitoring requirements are updated periodically as occurrence of CECs changes and knowledge of CECs increases over time.

3.7 Constituents of Emerging Concern

Constituents of emerging concern are a large group of constituents that may or may not pose a risk to human health and aquatic species. There is no single definition of the term, but generally they are constituents that are typically not well-monitored and are not regulated from a water quality perspective, that is, chemicals for which there are no water quality standards or regulatory thresholds. CECs include many varied classes of constituents, such as chemicals in personal care products; pharmaceuticals; industrial, agricultural and household chemicals; hormones; antibiotic resistant bacteria, antibiotic resistance genes; and others. There are many potential sources of CECs to surface waters and groundwater, including wastewater, stormwater, and recycled water. The amount of information available on an individual CEC (e.g., environmental concentrations, fate and transport, pharmacokinetics, toxicity-particularly from long-term, low-level exposure) depends on how well it has been investigated. Consequently, we have a significant amount of information on some CECs (e.g., PFOS) and very little on others.

As more information becomes available, the individual CECs could be addressed through existing regulatory programs.

Since CECs may be present in recycled water, the Policy adopted in 2009 included direction to the State Water Board to convene a Science Advisory Panel to guide future actions relating to CECs. The Science Advisory Panel's findings and recommendations were documented in the 2010 report titled "[Monitoring Strategies for Chemicals of Emerging Concern \(CECs\) in Recycled Water](#)." The 2010 Science Advisory Panel developed a science-based framework to guide the prioritization of which CECs should be included in recycled water monitoring programs. This framework includes compiling environmental concentration data for CECs in recycled water, developing monitoring trigger levels for each compound based on toxicological relevance, comparing the available concentration data to the monitoring trigger levels to determine which compounds should be prioritized for monitoring, and screening the prioritized list to ensure that analytical methods are available for those compounds.

The 2010 Science Advisory Panel reviewed landscape irrigation and groundwater recharge uses of recycled water and made recommendations for monitoring CECs based on these use scenarios. Monitoring recommendations for CECs included health-based CECs, which have toxicological relevance to human health, and performance indicator CECs, which are used to indicate removal of broad classes of chemicals during treatment. Monitoring requirements for surrogate parameters were also included to measure effectiveness of treatment processes.

In December 2010, the State Water Board, in coordination with the California Department of Public Health, held a public hearing to hear a presentation on the 2010 Science Advisory Panel Report and to receive comments from stakeholders. The State Water Board considered the Panel Report and the comments received and adopted an amendment to the Policy in 2013 that established monitoring requirements for several CECs in recycled water used for groundwater recharge projects. These monitoring requirements are prescribed in Attachment A of the Policy. CEC monitoring was not recommended for recycled water used for landscape irrigation because this exposure scenario has a low human health exposure risk.

The Science Advisory Panel was reconvened in 2017-2018 to review the current state of scientific knowledge and monitoring data related to human health risks associated with exposure to CECs in recycled water, including antibiotic resistant bacteria and antibiotic resistance genes. The 2018 Science Advisory Panel had the same members as the 2010 Panel, with the addition of a human health pathologist member with expertise on antibiotic resistant bacteria and antibiotic resistance genes.

The 2018 Science Advisory Panel was charged with considering all allowable uses of recycled water specified in the Uniform Statewide Recycling Criteria, as well as reservoir water augmentation, for which regulations are currently in development. The 2018 Science Advisory Panel reviewed the conceptual framework developed in the 2010 Panel Report, evaluated relevant scientific literature, assessed potential health risks associated with CECs, and provided updated monitoring recommendations. The 2018 Science Advisory Panel released a draft report for public comment on January 30, 2018 and a final report in April 2018. The updated assessment and monitoring recommendations are available in the 2018 report titled "Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water."

4 Amendment to the Recycled Water Policy

This section describes the Amendment to the Recycled Water Policy and the rationale for the proposed changes. The Amendment includes non-substantive changes such as changing the numbering schematic and editorial changes, which are not described in this section, but can be seen in the track-change version of the Amendment. This section includes a description of proposed changes to each section of the Policy, which includes text that has been moved or revised for clarity, and language that has been added or removed from sections of the Policy.

4.1 Definitions

A Definitions section was added to the Policy for terms found throughout the Policy to improve clarity and readability of the Policy. The definitions are only intended to apply to their use within the Policy and may not be appropriate in other contexts. Definitions for recycled water, wastewater treatment plant, water recycling treatment plant, groundwater recharge, reservoir water augmentation, and treated drinking water augmentation are identical to those in the Water Code or have been previously adopted by the State Water Board. While raw water augmentation and treated drinking water augmentation are included in the Definitions section and in Section 3, uniform statewide regulations for raw water augmentation and treated drinking water augmentation do not yet exist and are included in the Amendment as a placeholder for future potential applications of this use of recycled water.

Definitions for desalination facility, enclosed bays, estuaries and coastal lagoons, and ocean waters are identical to those in the California Ocean Plan.

Definitions for permit and incidental runoff were moved from other sections of the Policy to the Definitions section for clarity.

Definitions related to bioanalytical screening tools (e.g., monitoring trigger level, bioanalytical equivalent concentration, surrogate) were generated using the information in the 2018 Science Advisory Panel Report and moved from Attachment A. The definition for reporting limit (RL) was derived from California Office of Information Management and Analysis (OIMA) documentation. A variety of slightly different RL definitions appear in federal law, including the Clean Water Act and Safe Drinking Water Act, as well as in documents published by state environmental protection agencies, federal laboratories, and accreditation programs. The State Water Board's Environmental Laboratory Accreditation Program has developed [guidelines](#) for conducting RL development. Reporting limits may vary depending on the sample matrix (e.g., deionized water, drinking water, wastewater), but are always above the minimum detection level (MDL) by a safety factor. MDL development criteria are also addressed in the ELAP guidelines.

No fair argument exists that adding a definitions section could result in any reasonably foreseeable significant adverse environmental impacts because adding a definitions section is not directly linked to direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

4.2 Preamble

In the Amendment, portions of the Preamble language were moved to other sections of the Policy to improve the organization of the Policy. Other language was removed because it is outdated or is now addressed by the State Water Board through other programs. This section provides a summary of the changes.

The Preamble language that lists many of the challenges for maintaining California's water supply and points out that these challenges also present an opportunity for California to move toward sustainable management of the water supply was removed. The issue is not specific to recycled water and the State Water Board has stated its support, through Resolution No. 2017-0012, Comprehensive Response to Climate Change, of the safe use of recycled water as one part of a long-term strategy to sustainably manage the water supply, rather than a response to short-term water supply challenges.

Similarly, the Policy includes recycled water goals, but also sustainable water management goals such as stormwater and conservation goals, which while critically important, are broader than recycled water and the scope of the Policy. The goals included in the Preamble of the Policy are intended to be aspirational goals to motivate increased development of recycled water in California and sustainable management of surface waters and groundwater. However, in the time since the Policy was last amended in 2013, the State Water Board has made significant developments towards developing the Storm Water Strategy and conservation regulations, which did not exist when the Policy was adopted.

The Storm Water Strategy identifies the goals, objectives, and actions needed for the State Water Board and regional water boards to improve the regulation, management, and utilization of California's stormwater resources. As part of the Storm Water Strategy, a project has been initiated to promote stormwater capture and use and eliminate barriers to capture and reuse. In addition, several other projects have been initiated that work towards the long-term goals for stormwater use. These projects will increase resilience to climate impacts by increasing the proportion of precipitation runoff that is stored as groundwater.

Through Executive Order B-37-16 ("Making Water Conservation a California Way of Life") the State Water Board and other agencies developed a long-term framework to make water conservation a California way of life, which was issued in a [Final Report](#) in April 2017. This framework includes adopting a new urban water use target methodology, monthly reporting of urban water usage, and other elements that will move California towards meeting water conservation goals for urban and industrial uses. In May 2018, the California State Legislature passed SB 606 (Hertzberg) and AB 1668 (Friedman), which, among other requirements, require the State Water Board to adopt regulations for urban water efficiency standards for indoor use, outdoor use, and water lost to leaks by 2022. The legislation also requires urban retail water agencies to calculate and meet their own urban water use objectives by 2023. These regulations are a more appropriate vehicle for conservation targets and reflect current state policy with regard to conservation.

With the development of STORMS and the requirement to develop urban water use efficiency standards pursuant to SB 606 and AB 1668, the State Water Board now has more focused programs and pathways to develop and oversee stormwater and conservation goals. Because of this, the stormwater and conservation goals were removed.

The remaining goals for recycled water use of the Policy were moved from the Preamble to a new section titled "Goals and Tracking Use of Recycled Water" in order to link the concept of setting a goal and annual reporting of the use of recycled water to track progress towards meeting the goal (see 4.5).

The discussion of SNMPs in the Preamble was moved to the Salt and Nutrient Management Plan section of the Policy to improve the organization of the Policy.

There is a statement in the Preamble stating that the purpose of the Policy is to increase the use of recycled water from wastewater sources that meets the definition in Water Code section 13050(n). This statement was moved to section 2 of the Amendment titled “Purpose of the Policy.”

As a result of the Amendment, there would no longer be a Preamble in the Policy.

Removing goals addressed by other means, revising text for clarity, and moving text to other sections of the Policy will not result in significant adverse impacts to the environment because these are aspirational goals and non-substantial changes that are not directly linked to direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment. No fair argument exists that removing stormwater and conservation goals and other text in the Preamble, revising the text, or moving text to other sections of the Policy could result in any reasonably foreseeable significant adverse environmental impacts.

4.3 Purpose of the Policy

The purpose statement that was in the Preamble of the Policy was moved to the “Purpose of the Policy” section. This is now the first purpose statement in the section and states, “The purpose of the Policy is to encourage the safe use of recycled water from wastewater sources that meets the definition in Water Code section 13050(n), in a manner that implements state and federal water quality laws and protects public health and the environment.” The final clause of this sentence was added to emphasize the importance of protecting public health and the environment.

The sentence, “The State Water Board will establish additional policies that are intended to assist the State of California in meeting the goals established in the preamble to this Policy for water conservation and the use of stormwater” was removed from the Policy. This sentence was removed because, as described above in the Preamble section, the State Water Board strongly supports conservation and the beneficial use of stormwater, but it has established the Storm Water Strategy and implementation measures associated with Executive Order B-37-16 (“Making Water Conservation a California Way of Life”), which are better suited to address stormwater and conservation.

The subsection regarding permitting was clarified by adding references to Order WQ 2016-0068-DDW and master recycling permits, which are two streamlined permitting options. Order WQ 2016-0068-DDW is a statewide general order for non-potable recycled water uses that did not exist when the Policy was adopted. Master recycling permits are a permitting option for both treatment and use of recycled water, which can facilitate enrollment for new recycled water users within a use area.

The definition of “permit” was moved from the Purpose of the Policy section to the Definitions section to improve clarity and readability.

No fair argument exists that revising the text of the Purpose of the Policy could result in any reasonably foreseeable significant adverse environmental impacts because clarifying the purpose of the Policy is not directly linked to direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

4.4 Benefits of Recycled Water

One sentence was moved from the Preamble section of the Policy to the Benefits of Recycled Water section. The statement reads, “when used in compliance with this Policy, California Code of Regulations, title 22 and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses.” This sentence was moved to improve readability of the Amendment and was expanded to include fresh as well as potable water.

One sentence was added to state that “the State Water Board supports the use of recycled water to diversify community water supplies and mitigate for the impacts of climate change.” These are benefits of recycled water use that may assist in environmental analyses of recycled water projects that are required by CEQA.

The remaining Policy language in the Benefits of Recycled Water section was edited for clarity but otherwise remains as a statement intended for use in environmental analyses of recycled water projects that are required by CEQA.

No fair argument exists that moving the text from the Preamble section of the Policy to the Benefits of Recycled Water section or revising the text of the Benefits of Recycled Water for clarity could result in any reasonably foreseeable significant adverse environmental impacts.

4.5 Goals and Reporting Requirements to Track Recycled Water

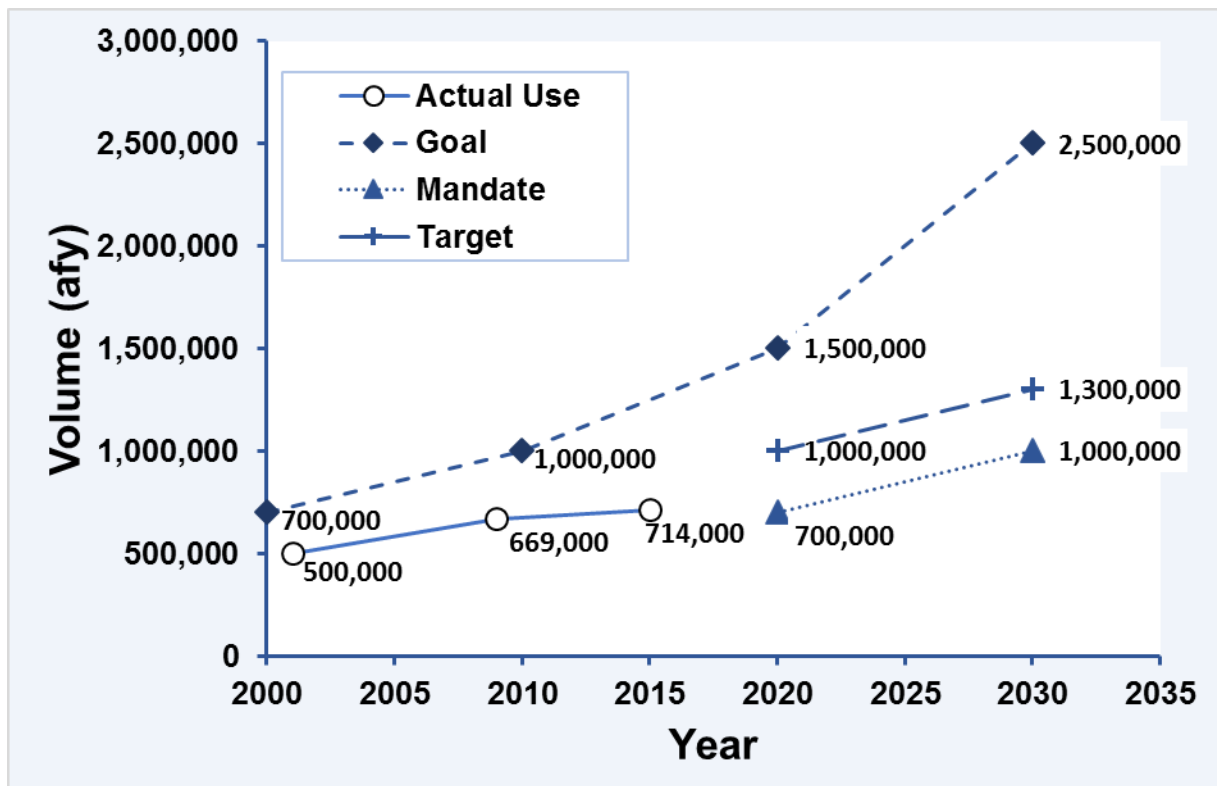
The Policy includes statewide goals and mandates for recycled water use, goals for stormwater use, and goals for water conservation. Collecting reliable and timely data regarding recycled water use is an integral part of developing realistic goals for recycled water use. This section includes a discussion regarding the goals and reporting requirement to track recycled water in the Amendment.

4.5.1 Goals and Mandates for Use of Recycled Water

The goal for recycled water use as stated in the Policy is to “increase the use of recycled water over 2002 levels by at least one million afy by 2020 and by at least two million afy by 2030.” The Policy also includes a mandate to “increase the use of recycled water in California by 200,000 afy by 2020 and by an additional 300,000 afy by 2030.” The Policy does not include guidance on a method to enforce the mandates. Furthermore, the mandates do not account for the potential reasonability of increasing the beneficial use of recycled water over other beneficial uses of water, such as maintaining streamflow to support in-stream beneficial uses. Also, without having accurate tracking of recycled water use and an estimate of the amount of wastewater that is available to recycle, it is challenging to see if the recycled water mandates are realistic and should be made enforceable.

In addition, DWR established statewide water recycling targets as required by Water Code section 10608.50(b) and published in the 2013 California Water Plan Update (DWR 2014). These targets are based on estimates from 2010 Urban Water Management Plans and the 2009 Recycled Water Survey.

A summary of goals, mandates, and targets for recycled water use, as well as actual use reported in the Recycled Water Surveys is presented in Figure 4-1.



Source: California Water Plan (DWR 2014) and Recycled Water Policy
 Baseline: 2001 Survey, 2009 Survey, 2015 Survey
 1 Acre-foot= 1233.48 m³; the volume of water to cover one acre one foot deep

Figure 4-1 Recycled water goals and mandates from the Recycled Water Policy, targets from the 2013 California Water Plan Action Update, and actual statewide recycled water use from the 2001, 2009, and 2015 Recycled Water Surveys

4.5.1.1 Recycled Water Use Mandates

In the Amendment, the mandates were removed. Currently, there is lack of a comprehensive tracking and reporting system for recycled water use that would be needed to accurately understand whether or not mandates are being achieved. Not all regions of the state can reasonably meet mandates for the production and use of recycled water because of a lack of demand and an abundance of clean, potable water. Once tracking recycled water use improves and there is a better understanding of how much wastewater is available and feasible to recycle, mandates could be implemented and made enforceable through a future Policy amendment. The State Water Board strongly supports the use of recycled water in California, and mandates may be a tool in the future to promote recycled water in the state. However, at this time, the goals for recycled water use serve a similar function of providing direction and aspiration to increase recycled water use without the ambiguity of mandating recycled water use in a manner that is not enforceable. Furthermore, at this time, other tools are more appropriate to advance the use of recycled water statewide, such as creating a framework for streamlined permitting of recycled water projects, supporting recycled water research, establishing policies and regulations, and partnering with the recycled water industry in public outreach and education efforts.

No fair argument exists that removing the recycled water use mandates could result in any reasonably foreseeable significant adverse environmental impacts because the mandates are currently not being enforced.

4.5.1.2 Recycled Water Use Goals

The Policy includes the following recycled water goal, “Increase the use of recycled water over 2002 levels by at least one million afy by 2020 and by at least two million afy by 2030,” and “Included in these goals is the substitution of as much recycled water for potable water as possible by 2030.”

The following options were considered for modifying recycled water use goals in the Amendment:

- a. Maintain the current recycled water goals for the Amendment. Continue to engage members of the recycled water community to track and analyze recycled water use data (see 4.5.2 regarding improving recycled water tracking). Conduct an analysis of the volume of wastewater available for reuse and use these data to update the goals in a future Policy amendment.
- b. Replace the current goals with recycled water targets established by DWR. DWR uses information based on Urban Water Management Plans to update estimates for recycled water use.
- c. In addition to (a) or (b), include a narrative goal of minimizing wastewater discharges to enclosed bays, estuaries and coastal lagoons, and ocean waters, except where necessary to maintain beneficial uses.
- d. In addition to (a) or (b) or (c), include a narrative goal to maximize the use of recycled water in areas where water supplies are in a state of overdraft, to the extent that downstream water rights, instream flow requirements, and public trust resources are protected.
- e. Replace the existing goals with numeric goals for reducing a percentage of treated wastewater discharged to enclosed bays, estuaries and coastal lagoons, and ocean waters.
- f. Remove all numeric goals and replace with narrative goals.

The Amendment would result in a combination of options “a,” “c,” and “d”. The Amendment would not substantively change the recycled water goals in the Policy, but would make the actual goal clear by adding one million afy to the 2002 levels of recycled water use (500,000 afy) for the 2020 goals and two million afy for the 2030 goals, and also referencing the level of recycled water use in 2015, which was based on data from the 2015 Recycled Water Survey (State Water Resources Control Board and Department of Water Resources 2017). The Amendment goal is now:

“Increase the use of recycled water from the use of 714,000 acre-feet per year (afy) to 1.5 million afy by 2020 and to 2.5 million afy by 2030.”

Considering that the 2015 Recycled Water Survey indicated 714,000 afy of recycled water is currently being used, an additional 786,000 afy of recycled water production and use would be needed to reach the 2020 goal and 1,786,000 afy to reach the 2030 goal (State Water Resources Control Board and Department of Water Resources 2017). The rationale for this

recommendation is that the numeric goals are aspirational and provide a quantitative benchmark for future recycled water use. While this goal may seem unrealistic, the data needed to determine a more realistic, but still aspirational, goal for recycled water use is not currently available. The reporting requirements in the Amendment (see 4.5.2) will serve to fill in this data gap. As more data become available on new uses of recycled water, such as reservoir water augmentation, and as more recycled water projects are implemented as a result of funding from Proposition 1, the recycled water goals may be revised in a future Amendment.

In addition to the recycled water use goals, the Amendment includes a narrative goal to minimize direct discharge of treated wastewater to enclosed bays, estuaries and coastal lagoons, and ocean waters, except where necessary to maintain beneficial uses and excluding brine discharge from recycled water or desalination facilities.

In its 1977 Policy for Water Reclamation in California ([Resolution No. 77-001](#)), the State Water Board adopted a Principle to encourage water reclamation projects where beneficial use will be made of wastewaters that would otherwise be discharged to marine or brackish receiving waters or evaporation ponds and which do not adversely impact vested water rights or unreasonably impair instream beneficial uses or place an unreasonable burden on present water supply systems. This Principle is still in effect, and the narrative goal reflects this concept.

In 2015, an estimated 1.28 million afy of treated wastewater was discharged directly to the Pacific Ocean and coastal bays (Heal the Ocean 2018). Minimizing direct discharges to enclosed bays, estuaries and coastal lagoons, and ocean waters will have statewide benefits, such as increasing regional self-sufficiency and decreasing reliance on imported water. The narrative goal is consistent with Action Item 2 of the Governor's California Water Action Plan, to increase regional self-reliance and integrated water management across all levels of government, as well as the Climate Change Draft Scoping Plan developed pursuant to the California Global Warming Solutions Act of 2006 (AB 32).

In coastal areas, it is more energy efficient to treat and use recycled water than to treat wastewater, discharge it to the ocean, and then desalinate seawater to meet water supply needs. Seawater desalination requires approximately 12,000 – 18,000 kilowatt-hours per million gallons (kWh/MG) of energy (Pacific Institute 2013). In comparison, recycled water using membrane treatment to produce potable water requires approximately 3,300 – 8,300 kWh/MG, and producing disinfected tertiary recycled water for groundwater recharge via surface spreading requires approximately 1,000 – 1,800 kWh/MG. The intent of the narrative goal is to promote the increased use of recycled water by encouraging utilities to consider recycling treated wastewater for beneficial use, rather than disposing of it. Factors such as infrastructure, cost, funding, market availability, seasonality, existing water rights, public support, and other site-specific conditions may impact the practicability of recycling treated wastewater instead of discharging it. Coastal dischargers should evaluate each of these factors and explore solutions to possible impediments when determining whether to recycle treated wastewater instead of discharging it directly to saline waters. The responsibility of making progress towards the narrative goal is not solely placed on producers of treated wastewater. Rather, achieving the goal will require wastewater producers, water suppliers, recycled water distributors, and users to collaborate to implement multi-benefit projects.

To encourage continued emphasis on the use of recycled water in groundwater basins facing water supply challenges, the Amendment includes a narrative goal to maximize the use of

recycled water in areas where groundwater supplies are in a state of overdraft, to the extent that downstream water rights, instream flow objectives and public trust resources are protected. This goal promotes the maximum use of recycled water to augment water supplies in inland areas with limited surface water supplies and/or where groundwater basins are in a state of overdraft. In addition, this goal aligns the use of recycled water directly with GSP efforts under SGMA, such as overdraft mitigation and basin recharge, and is consistent with the Governor's California Water Action Plan. The State Water Board intends to establish a recycled water reporting system to collect data on an annual basis to accurately track recycled water use and the amount of water being discharged to enclosed bays, estuaries and coastal lagoons, and ocean waters. As these data become available, the State Water Board will have accurate information to conduct an annual assessment of recycled water use and potential for reuse to thereby track progress towards these goals. This information could also be used to update the goals for a future Policy amendment.

No fair argument exists that adding a narrative goal to minimize the direct discharge of treated wastewater to enclosed bays, estuaries and coastal lagoons, and ocean waters could result in any reasonably foreseeable significant adverse environmental impacts because it does not involve a change to the physical environment.

4.5.2 Reporting Requirements to Track Recycled Water

The State Water Board does not currently have an efficient, streamlined statewide reporting system to track the production, use, and potential for use of recycled water. Historically, the State Water Board has collaborated with DWR to conduct statewide surveys to quantify recycled water use statewide. The State Water Board and DWR completed a survey for 2009, and recently completed a survey for 2015 (State Water Resources Control Board and Department of Water Resources 2017). These surveys provide valuable information regarding the production and use of recycled water in California. However, these surveys do not include an estimate of how much wastewater is available to recycle (potential) and they are infrequent, labor intensive and time consuming, and challenging for both permittees and staff.

In addition to completing the Recycled Water Survey, permittees currently report recycled water production and use to the regional water boards through compliance with NPDES permits, WDRs, master recycling permits, and WRRs. The reporting requirements in these permits are varied and may be redundant with other reporting requirements, which are not reported to a centralized data repository. As a result, recycled water production and use data are not readily available in an electronic format for compilation and analysis.

State Water Board Resolution No. 2016-0061 directs staff to “develop a proposal for an efficient, statewide reporting program and data management system that will allow online reporting of the volume, quality, and use(s) of recycled water on an annual basis, or more frequently, including consideration of adding requirements to recycled water producer, distributor, and/or user monitoring and reporting programs.”

To address this directive, the Amendment has several goals:

- Streamline the tracking and reporting of recycled water production, use, and potential so that there is one statewide repository for the data that can be accessed by anyone who wants or needs the data
- Increase frequency and accuracy of the data

- Reduce the time, labor, and cost required for both permittees and staff to conduct the information gathering and analysis
- Assist the State Water Board in assessing progress towards the recycled water goals
- Provide the State Water Board with the information needed to make decisions, such as reassessing the goals, determining the need for mandates, assessing region- and basin-wide recycling trends, and tracking the benefits of recycled water funding.

The Amendment would require permittees to report to the State Water Board the amount of recycled water produced, the amount used, and how much water is potentially available to recycle (details below).

Wastewater treatment plants and recycled water producers would be required to report the data electronically to a database, possibly through an electronic web-based portal. It is likely that an existing database (e.g., CIWQS, Geotracker) would be modified or expanded to house these data, and these data would be made publicly accessible. A wastewater treatment plant is defined, consistent with Water Code section 13625(d), as (A) any facility owned by a state, local, or federal agency and used in the treatment or reclamation of sewage and industrial wastes, (B) any privately-owned facility used in the treatment or reclamation of sewage and industrial wastes, and regulated by the Public Utilities Commission pursuant to Sections 216 and 230.6 of, and Chapter 4 (commencing with Section 701) of Part 1 of Division 1, of the Public Utilities Code, or (C) any privately owned facility used primarily in the treatment or reclamation of sewage for which the state board or a regional board has issued waste discharge requirements.. Some wastewater treatment plants may also be water recycling treatment plants, which are defined as wastewater treatment plants that further treat secondary or tertiary effluent, or both, for the purpose of meeting the uniform statewide recycling criteria established pursuant to Water code section 13521 for the use of recycled water (Water Code section 13625(g)). A recycled water producer is defined as an entity that is permitted to produce recycled water, consistent with California Code of Regulations, title 22, at a wastewater treatment plant or water recycling treatment plant. Where applicable, recycled water producers would work with distributors and users to collect recycled water use data, but producers would have ultimate responsibility for reporting recycled water use categories to the State Water Board.

There are various levels of detail and granularity of data that could be collected and reported to track recycled production, use, and potential. While collecting detailed information can be beneficial, that benefit must be weighed against the additional resources required, additional burden on the regulated community, and potential increase in reporting errors when collecting that information.

To address the question of how much treated wastewater is being produced to California Code of Regulations, title 22 standards, the Amendment would require wastewater treatment plants and recycled water producers to report the volume of wastewater treated and to specify the level of treatment..

This information will capture the total volume and level of treatment of effluent from wastewater treatment plants and the total volume and level of treatment of recycled water produced. Specific categories of treatment will be provided in the reporting system and will cover all levels of wastewater treatment for all wastewater treatment plants and recycled water applications

allowed under Title 22. Since level of treatment is a key element for determining the current and future potential for recycled water use, this level of detail is appropriate. The amendment requires these data to be collected monthly and reported annually to provide information that can be used to evaluate potential impediments to recycled water use.

The next issue the Amendment addresses is requiring consistent reporting categories for recycled water that is used for direct beneficial uses. The Amendment requires that recycled water producers and, where applicable, wastewater treatment plants to annually report the volume of all treated wastewater (recycled water) used for each of the following categories:

- Agricultural irrigation: pasture or crop irrigation
- Landscape irrigation: irrigation of parks, greenbelts, and playgrounds; school yards; athletic fields; cemeteries; residential landscaping, common areas; commercial landscaping; industrial landscaping; and freeway, highway, and street landscaping
- Golf course irrigation: irrigation of golf courses, including water used to maintain aesthetic impoundments within golf courses
- Commercial application: commercial facilities, business use (such as laundries and office buildings), car washes, retail nurseries, and appurtenant landscaping that is not separately metered
- Industrial application: manufacturing facilities, cooling towers, process water, and appurtenant landscaping that is not separately metered
- Geothermal energy production: augmentation of geothermal fields
- Other non-potable uses: including but not limited to dust control, flushing sewers, fire protection, fill stations, snow making, recreational impoundments, etc.
- Groundwater recharge: the planned use of recycled water for replenishment of a groundwater basin or an aquifer that has been designated as a source of water supply for a public water system, as defined in section 116275 of the Health and Safety Code, per Water Code section 13561. Includes surface or subsurface application, except for seawater intrusion barrier use
- Seawater intrusion barrier: groundwater recharge via subsurface application intended to reduce seawater intrusion into a coastal aquifer with a seawater interface
- Reservoir water augmentation: the planned placement of recycled water into a raw surface water reservoir used as a source of domestic drinking water supply for a public water system, as defined in section 116275 of the Health and Safety Code, per Water Code section 13561
- Raw water augmentation: the planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a drinking water treatment plan that provides water to a public water system, as defined in section 116275 of the Health and Safety Code, per Water Code section 13561
- Other potable uses: both direct and indirect potable reuse other than for groundwater recharge, seawater intrusion barrier, reservoir augmentation, or raw water augmentation.

Some of the categories could be subdivided further to increase the specificity of the use data. However, by splitting these categories further, there is an increased probability that the accuracy of the data will decrease because of potential confusion over the use category to which the data should be reported. Alternatively, some of the categories could be combined, such as the potable reuse categories (see However, since the regulatory frameworks for potable reuse are being developed, (e.g., raw water augmentation), it will be important to track the

amount of water that is being generated from these projects. These data could help the State Water Board make decisions about the allocation of financing or regulatory improvements needed to facilitate the expansion of the various types of recycled water use.

The third piece of information the Amendment addresses is requiring annual reporting of monthly volume of treated wastewater discharged to the environment, which will be used to estimate the amount of wastewater that may be available to recycle (potential). Studies that have characterized the potential for water recycling in California have varied widely in their estimates of recycled water potential. Cooley et al. estimated 2014 potential by characterizing it to be equivalent to the total amount of indoor water use in California minus existing recycled water use, resulting in 1.2 million to 1.8 million acre-feet in recycled water potential for 2015 (Cooley et al. 2014). WRRF estimated 2020 potential by subtracting estimated 2020 recycling amounts from estimated 2020 wastewater influent (WRRF 2014). WRRF (2014) estimated 2,305 million gallons per day or 2.6 million afy of treated municipal wastewater available for recycling in 2020. These studies have provided useful summary information regarding the potential for water recycling in California; however, they do not take into consideration factors such as storage availability, cost of treatment and distribution, customer availability, existing water rights, and capacity for expansion.

While there are location-specific factors that make it difficult to understand the total potential for recycled water use, reporting requirements for all wastewater treatment plants and water recycling treatment plants are included in the Amendment to begin to gather more accurate data on the potential. For a given location, the availability of water, demand for recycled water, proximity of potential use areas, funding, and other factors that are subject to interpretation may mean that while there may be potential for recycled water use, it may not be practicable for that location. The reporting requirements for wastewater treatment plants will not illuminate these location-specific factors, but would gather data on the total volume of influent entering wastewater treatment plants and the volume of discharges of treated wastewater not used for any direct beneficial use to:

- Inland surface waters, specifying volume required to maintain minimum instream flow
- Enclosed bays, estuaries and coastal lagoons, and ocean waters

Natural systems, such as wetlands, wildlife habitats, and duck clubs, where augmentation or restoration has occurred, and that are not part of a wastewater treatment plant.

- Underground injection wells, such as those classified by U.S. EPA's Underground Injection Control Program, excluding groundwater recharge via subsurface application intended to reduce seawater intrusion into a coastal aquifer with a seawater interface
- Land, where beneficial use is not taking place, including evaporation or percolation ponds, overland flow, or spray irrigation disposal, excluding pasture or fields with harvested crops.

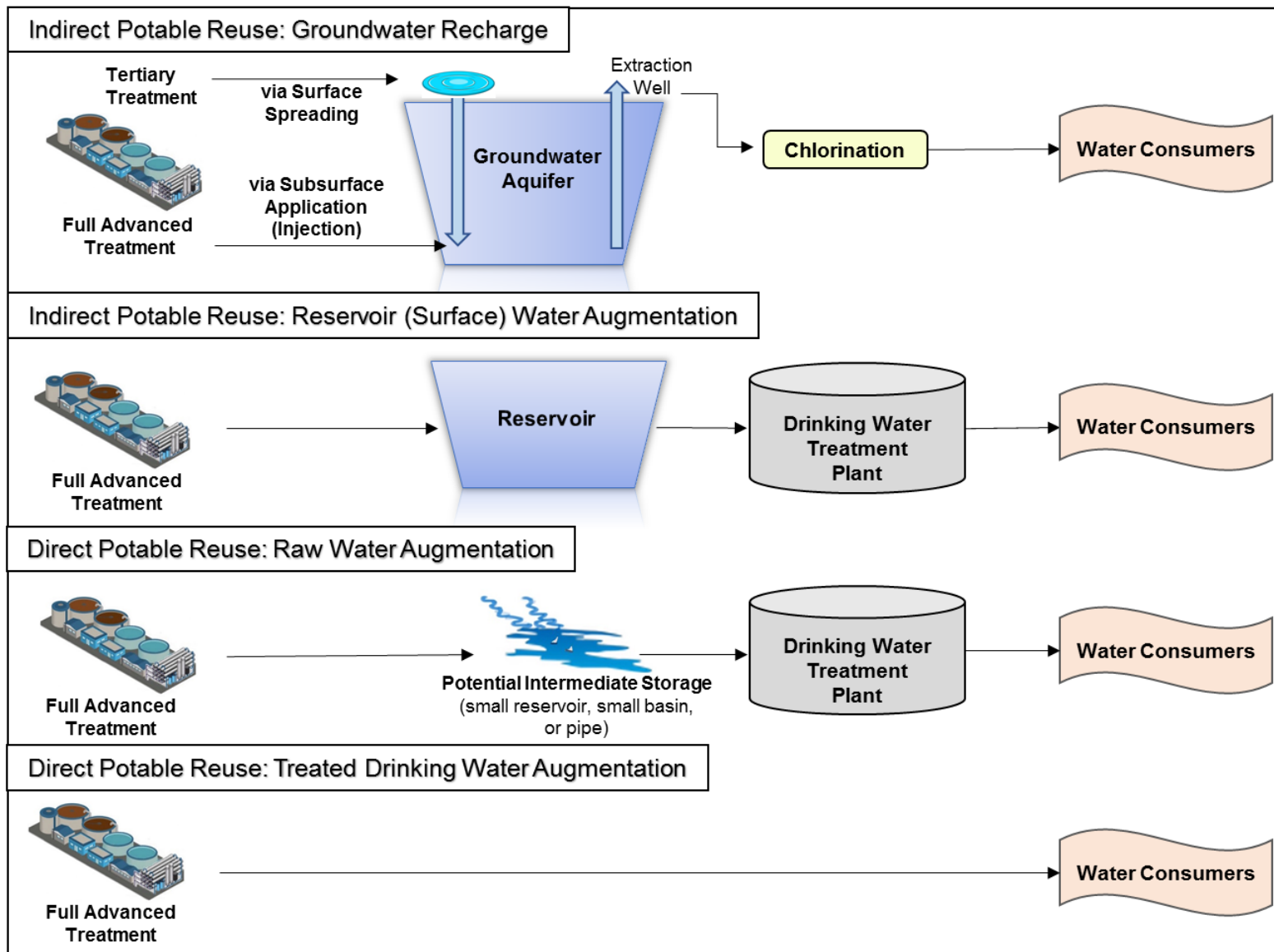


Figure 4-2 Recycled water applications for potable reuse

While there may be some wastewater being discharged to inland surface water that could be reused, many of the inland waterways rely on wastewater flows to support fish and wildlife. In some watersheds in southern California, water that would otherwise be recycled is required to be discharged to surface water bodies to maintain instream flows in the summer months. This metric is important to track to better understand how much wastewater could potentially be recycled out of the volume being discharged to inland surface waters. Conversely, any volume of treated wastewater discharged to enclosed bays, estuaries and coastal lagoons, and ocean waters, or land is wastewater that could be recycled and beneficially used. These categories will also assist the state in tracking progress towards the recycled water goals in the Amendment.

The Amendment requires monthly collection and annual reporting of the volumes of influent, treated wastewater produced, and treated wastewater discharged, and requires at least annual reporting of the volume of recycled water used. This frequency of data collection and reporting for influent, production, and discharge is intended to capture volumetric trends that will delineate the potential of recycled water in California in terms of treatment, use, and potential. In addition, more frequent data for these volumes may provide useful information for the State Water Board and others to answer management questions (e.g., how influent volume changes during drought conditions). Monthly data collection is not expected to be burdensome since these should be volumetric data that facilities can easily report based on flow. The reason for allowing annual collection and reporting for recycled water use is that determining the different use categories for recycled water may not be a simple task for some facilities that distribute treated wastewater to other distributors or retailers, as they may need to work with those other entities to track and report the volumes of recycled water use for the various categories outlined above. Annual reports of the volumes of influent and treated wastewater produced, discharged, and recycled are anticipated to be submitted between January and March of each year.

The recycled water tracking requirements may have costs associated with them for the staff time required to compile and submit the data, and the cost estimates are given below, pursuant to Water Code section 13267. Several regional water boards already require similar reporting for recycled water producers, and the tracking requirements in the Amendment would replace the regional water board requirements rather than be duplicative. The costs associated with the tracking requirements for recycled water and wastewater in the Amendment are estimated to be solely associated with staff time to compile the required information and submit it to the State Water Board. These costs are estimated to be \$5,375 per year based on the assumption that annual reporting would require 0.5 person-month at \$10,750 per person-month. These costs would apply to all wastewater treatment plants and recycled water producers in California.

The information that will be acquired from these reporting requirements will be used at a minimum by the Water Boards to evaluate progress towards the recycled water goals in the Amendment and potentially update the recycled water goals in the future based on more accurate data. Several regional water boards already track some of this information and will continue to be used to inform Board decisions. The information would also likely be used by DWR to update Urban Water Management Plans.

While the Amendment will assist the State Water Board in achieving the goals outlined above, the Recycled Water Policy is not self-implementing. The Water Boards will need to take action to modify orders and permits and/or their monitoring and reporting programs to include the recycled water tracking requirements. To expedite the implementation of the reporting requirements in the Amendment and increase the Water Boards' ability to collect this much-

needed recycled water data, the Amendment includes language acknowledging the State Water Board Executive Director will issue an order consistent with Water Code section 13267 and Water Code section 13383 to identified recycled water producers and wastewater treatment plants to update the monitoring and reporting requirements of each recycled water permit to specify recycled water reporting requirements, frequency, and vehicle. The Amendment includes language allowing the State Water Board Executive Director to adjust the reporting requirements as necessary to effectively evaluate progress toward the goals.

No fair argument exists that requiring tracking and annual reporting of recycled water use and recycled water potential could result in any reasonably foreseeable significant adverse environmental impacts because it does not involve a change to the physical environment.

4.6 State Agency Roles

On July 1, 2014, administration of the Drinking Water Program transferred from the California Department of Public Health to the State Water Board. The Amendment includes revisions to reflect this change. The State Water Board roles were also clarified to include processing wastewater change petitions and implementation of SGMA. The Department of Water Resources roles were clarified in the Amendment to state that they may rely on annual recycled water production and use data that would be required by the Amendment, rather than collecting a duplicative data set. The Department of Water Resources roles were also expanded to include additional statutory authorities the Department has for recycled water, such as the authority to update statewide recycled water targets pursuant to Water Code section 10608.50(b), its requirement to adopt regulations for dual plumbing of recycled water and potable water systems pursuant to Water Code section 13577, and its statutory authorities under SGMA. In addition, Department of Food and Agriculture was also added to include their role in food safety related to the use of recycled water for agricultural irrigation.

Within the State Water Board, several divisions play a role in the permitting and funding of recycled water projects. The following are descriptions of the roles of each division, solely regarding permitting and funding recycled water projects:

- Division of Drinking Water
 - o Reviews Title 22 Engineering Reports, which are required for a recycled water project to produce or supply recycled water. In approving Title 22 Engineering Reports, Division of Drinking Water provides recommendations for recycled water project permits and on sites proposed for recycled water use.
 - o Develops and updates regulations regarding the safe use of recycled water, including the Uniform Statewide Recycling Criteria and the recent reservoir water augmentation regulations, among others.
 - o Develops statewide general orders, including Order WQ 2016-0068-DDW, which covers non-potable uses of recycled water.
 - o Issues notices of applicability to recycled water projects proposing to enroll under statewide general orders and whose project area crosses regional water board boundaries.
- Division of Water Quality
 - o Develops statewide policies governing recycled water project permitting, including the Recycled Water Policy.

- o Develops statewide general orders, some of which cover water recycling, such as Order WQ 2014-0153-DWQ, which covers small domestic wastewater treatment systems, including potential recycling of domestic wastewater for systems that treat less than 100,000 gallons per day.
 - o Evaluates progress towards the recycled water goals set forth in the Recycled Water Policy.
 - o Develops grants and contracts for research to advance the use of recycled water statewide.
- Division of Financial Assistance
 - o Allocates and disburses funding for recycled water projects with funding from the Clean Water State Revolving Fund, Costa-Machado Water Act of 2000 (Proposition 13) and the Water Quality, Supply, and Infrastructure Improvement Act of 2014 (Proposition 1) among other funding sources.
- Division of Water Rights
 - o Reviews wastewater change petitions filed by wastewater treatment plant owners for recycled water projects that have the potential to change the point of use, place of use, or purpose of use of treated wastewater, in accordance with Water Code section 1211.
- Office of Research, Planning & Performance
 - o Implements portions of the Sustainable Groundwater Management Act, specifically state intervention to manage a basin's groundwater resources if local efforts fail.

While developing regulations and policies, issuing approved wastewater change petitions and permits, and allocating and dispersing funding for recycled water projects all demonstrate the State Water Board's commitment to advancing the production and use of recycled water statewide, the State Water Board develops priorities on an ongoing basis to meet water resource challenges. It is therefore not appropriate to require the State Water Board to prioritize recycled water projects above other priorities at this time.

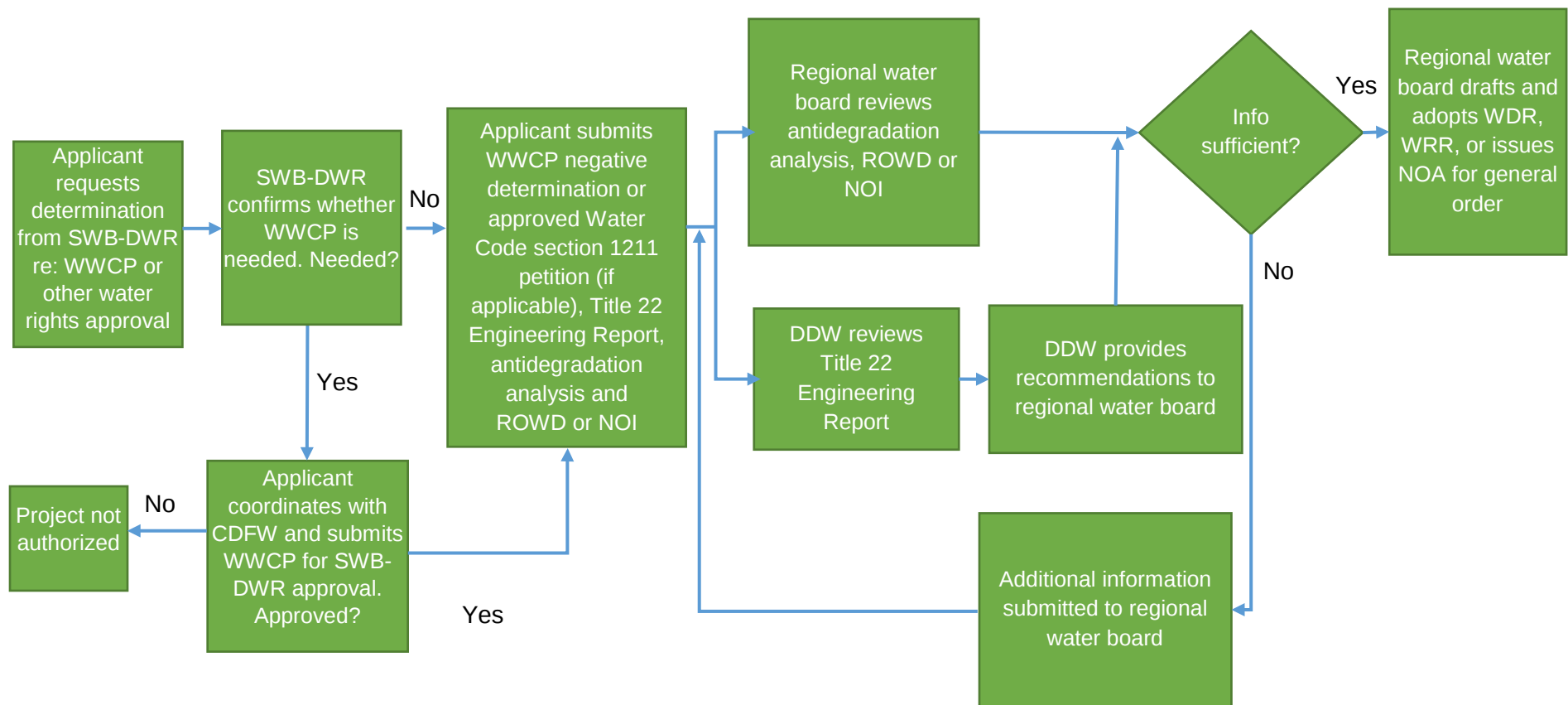
Regional water boards issue and enforce permits for recycled water projects with input from the State Water Board Division of Drinking Water. The permitting process is illustrated in Figure 4-3. For applicants that discharge to inland surface waters, the first step of the permitting process is to request a determination from the State Water Board Division of Water Rights regarding with a wastewater change petition is needed. Following this, or for applicants that do not require a wastewater change petition, an applicant submits a complete application to the regional water board. A complete permit application to be submitted to the regional water board must include the following information:

- Complete Title 22 Engineering Report (and once approved, the approval letter from the Division of Drinking Water)
- Determination by the Division of Water Rights that a wastewater change petition is not needed or approved wastewater change petition, if applicable (see 4.7 for more information on when this is required)
- Report of waste discharge (ROWD) for a site-specific order OR a notice of intent (NOI) for a general order

- Information to support an antidegradation analysis.

Following submittal of a complete permit application, the Division of Drinking Water and regional water board review the documents. In both cases, there may be back and forth between the Water Board and the project proponent before the documents are considered complete. The Division of Drinking Water reviews the Title 22 Engineering Report and when approved, the Division of Drinking Water provides an approval letter that includes recommendations to the regional water board for the project. The regional water board reviews the antidegradation analysis and ROWD or NOI, as well as the Title 22 Engineering Report and recommendations from Division of Drinking Water and the wastewater change petition determination and/or approval. If the regional water board determines that the information is insufficient, additional information would be requested from the applicant. If the regional water board determines that the information is sufficient, then the regional water board drafts and adopts a WDR or WRR, or issues a notification of applicability for the general order.

No fair argument exists that revising the description of state agency roles could result in any reasonably foreseeable significant adverse environmental impacts because this section of the Amendment reflects the status quo of agency roles and does not involve a change to the physical environment.



SWB-DWR: State Water Board Division of Water Rights; WWCP: wastewater change petition (Water Code Section 1211 petition); CDFW: California Department of Fish and Wildlife ROWD: report of waste discharge; NOI: notice of intent; DDW: State Water Board Division of Drinking Water; WDR: waste discharge requirements; WRR: Water Recycling Requirements; NOA: notice of applicability.

Figure 4-3 Flow chart illustrating the recycled water project permitting process

4.7 Wastewater Change Petitions

Stakeholders expressed concern about the mechanism for verifying compliance with Water Code section 1211¹⁰ and any additional applicable water rights requirements during the recycled water permitting process, which has sometimes resulted in delays in permitting and issues with project funding. Additionally, the California Department of Fish and Wildlife requested improved interagency coordination on this issue during the recycled water permitting process.

The Amendment language clarifies the role, authority, and responsibility of the State Water Board in approving wastewater change petitions. A recycled water project proponent should seek early coordination and consultation with the State Water Board Division of Water Rights and with Department of Fish and Wildlife prior to requesting funding or permit approval for a recycled water project. This would minimize delays in project approval and ensure any required Water Code section 1211 approval and CEQA analysis conducted by the recycled water project proponent includes an evaluation of impacts resulting from the reduction to stream flows. For this reason, the State Water Board will develop a checklist and submittal process for determining whether a Water Code section 1211 approval or other water right is required, or confirmation of previous approval, for every recycled water project or program. The process will be designed as a “self-certification”, where the recycled water project proponent completes a screening checklist, and then submits the results to the State Water Board Division of Water Rights for review and confirmation. Figure 4-3 above includes a flow chart illustrating the general recycled water project permitting process and when it is advised to initiate consultation with State Water Board Division of Water Rights and with Department of Fish and Wildlife. Figures 4-4 and 4-5, below, show the processes for submitting and reviewing a wastewater change petition, respectively.

The Amendment language also includes the statement that the State Water Board may consider cumulative impacts to the environment and public trust resources caused by the proposed project. This language is included in recognition that, although impacts caused by the incremental decrease in streamflow resulting from the approval of a single wastewater change petition may be insignificant, impacts to the environment may be cumulatively considerable when viewed together with impacts from past, present, and probable future projects with the potential to decrease the streamflow. This is particularly true for streams where discharges from wastewater treatment facilities comprise the majority of streamflow for a portion of the year, such as the dry summer months. The process of evaluating of wastewater change petitions and other water right requirements touches on larger beneficial use issues, including balancing of benefits of instream use versus local recycled water projects, competing demand for water from a variety of potentially affected parties, and other related water resource issues. The Amendment is intended to clarify the process of obtaining a wastewater change petition as part of permitting a recycled water project and the role of the State Water Board in that process.

¹⁰Water Code section 1211 states, “(a) Prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater, the owner of any wastewater treatment plant shall obtain approval of the board for that change. The board shall review the changes pursuant to the provisions of Chapter 10 (commencing with section 1700) of Part 2 of Division 2. (b) Subdivision (a) does not apply to changes in the discharge or use of treated wastewater that do not result in decreasing the flow in any portion of a watercourse.”

More information on the wastewater change petition process can be found here:

https://www.waterboards.ca.gov/waterrights/water_issues/programs/applications/wastewaterchange/.

No fair argument exists that adding a section to the Amendment that clarifies the role, authority, and responsibility of the State Water Board in approving wastewater change petitions could result in any reasonably foreseeable significant adverse environmental impacts because this section reflects the status quo of agency roles, and the consideration of cumulative impacts to the environment and public trust resources is included in order to prevent adverse environmental impacts

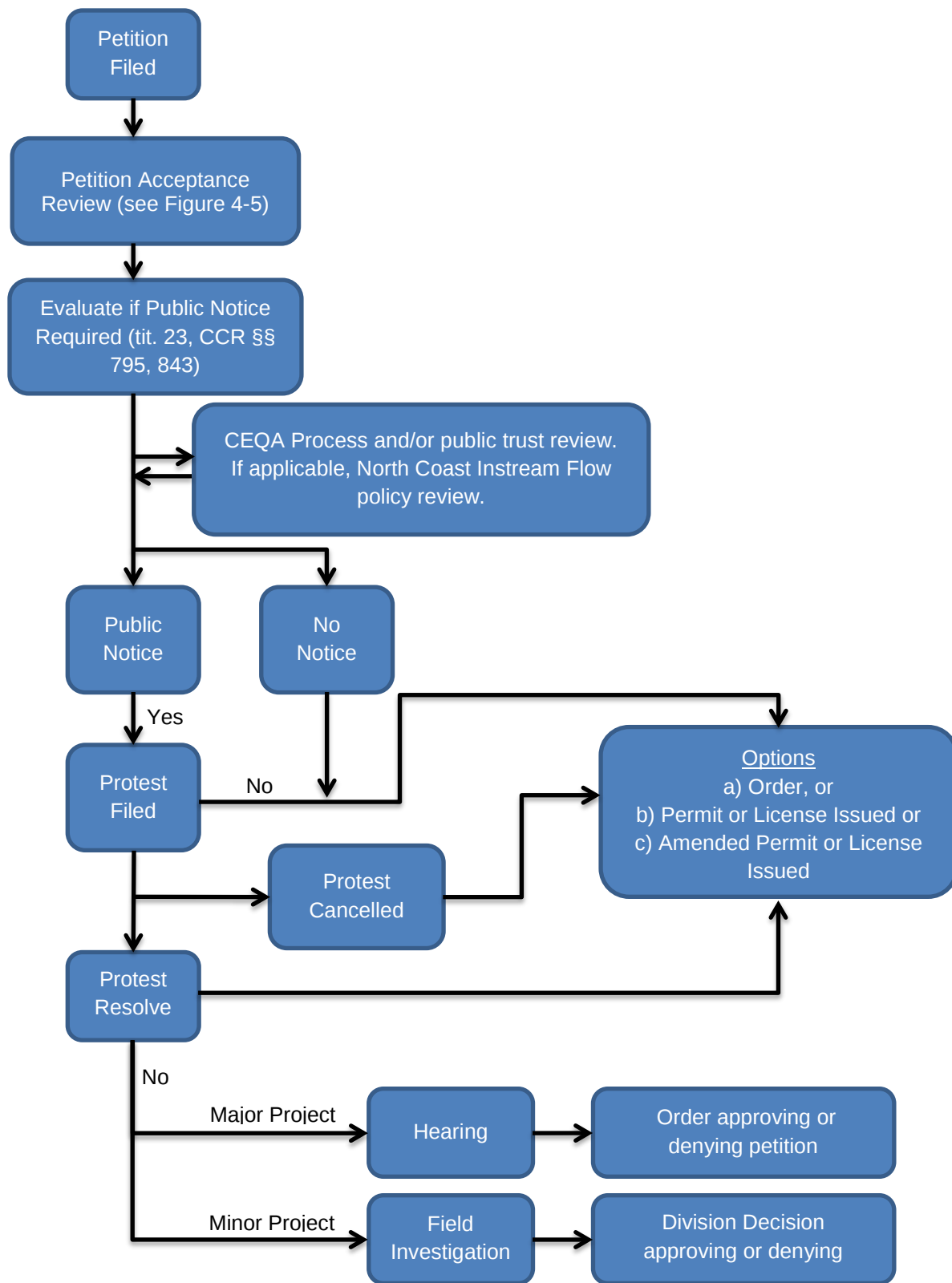


Figure 4-4: Flow chart illustrating the wastewater change petition process

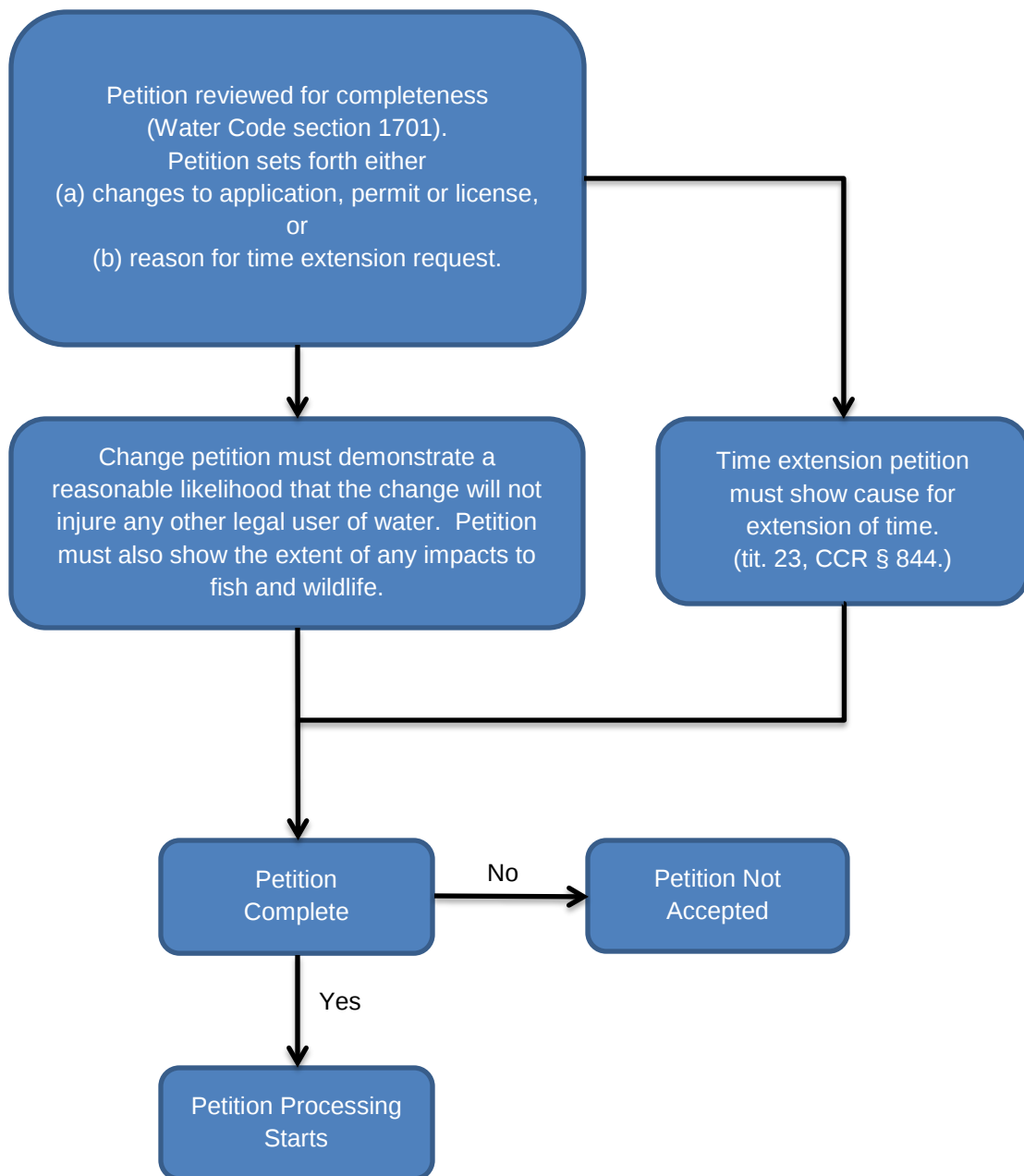


Figure 4-5: Wastewater change petition review process

4.8 Salt and Nutrient Management Plans

SNMPs are included in the Policy to address the potential salt and nutrient loading from recycled water projects, for recycled water use to impact groundwater quality, to promote basin-wide management of salts and nutrients in groundwater, and to facilitate permitting of recycled water projects. Section 3.4 provides background information regarding SNMPs in the Policy.

The following four sections (4.8.1– 4.8.4) describe the Amendment as it pertains to the SNMP section of the Policy.

4.8.1 Basin Evaluation

The Policy states that the Board's intention is that every groundwater basin in California have a consistent SNMP. The State Water Board later clarified this intent in a memorandum dated August 2, 2009 to recommend that SNMPs be developed first in basins identified as "priority basins" by USGS, GAMA program (Rice 2009). The GAMA program identified 116 (of a total of 472) groundwater basins as priority basins based on a variety of criteria including basin area, number of water supply wells, municipal and agricultural groundwater use, pesticide use, and number of leaking underground storage tanks (Belitz et al. 2003).

DWR also developed a basin prioritization system based on data collected from the CASGEM program (DWR 2015). The prioritization criteria of the CASGEM system is similar to that of the GAMA system and is based on the following factors in a groundwater basin: population (including projected growth), number of public supply wells, number of irrigated acres, reliance on groundwater, known impacts (e.g., subsidence, sea water intrusion), and other factors. Using this system, 127 (of a total of 512) groundwater basins have been prioritized as "high" or "medium" priority. The prioritization of basins from CASGEM is being used to implement SGMA.

The Central Valley Water Board and the San Diego Water Board developed their own systems for prioritizing groundwater basins, using different criteria. The Central Valley regional priority system was developed as part of the Salt and Nitrate Management Plan prepared by CV-SALTS. CV-SALTS is a partnership between Central Valley Regional Water Board staff and stakeholder groups that formed in 2006 to address salinity and nitrate problems in California's Central Valley. In 2017, CV-SALTS submitted a Salt and Nitrate Management Plan for the Central Valley region that prioritized basins in the Central Valley primarily by the magnitude of concentration of nitrate in shallow groundwater in the basin.

The San Diego Regional Water Board developed its own basin prioritization system to implement the SNMP provision in the Policy. The San Diego Regional Water Board priority criteria included factors such as storage volume, yield, water quality, salt and nutrient loading, and availability of information.

A summary of the various groundwater basin ranking criteria used by the GAMA system, the CASGEM system, CV-SALTS, and the San Diego Regional Water Board is provided in

Table 4-1. Each of these prioritization systems use different ranking criteria. As a result, the basin ranking resulting from these prioritization schemes differ, and basins with a high priority ranking in one system may have a low priority ranking in another system.

A region-specific evaluation of basins for potential threats to water quality from salt and nutrients will result in a more accurate assessment water quality threats from salts and nutrients compared to the statewide systems (GAMA or CASGEM). The criteria included in these statewide systems focus on groundwater use and population, rather than on water quality, which is the most important consideration for evaluating the threat from salts and nutrients. Evaluating basins on a regional basis allows for more accurate assessment of the drivers for salt and nutrient threats in each region (e.g., quality of imported water, density and type of agricultural land use, depth to groundwater). A regional evaluation can also incorporate important hydrogeologic factors that may play a role in salt and nutrient threats in a region, such as regional aquitards, depth to water, natural formations, and other region-specific factors. Finally, a regional evaluation can allow for a more detailed assessment of current groundwater

conditions, including existing groundwater quality and trends in the concentrations of salts and nutrients in the basin.

The Amendment includes language to require the regional water boards to evaluate the groundwater basins within their region with respect to the potential threat from salts and nutrients to groundwater quality. Based on that evaluation, the regional water boards would be required to categorize those basins that are at highest risk from salts and nutrients and in need of an SNMP. Regional water boards would also use this evaluation to categorize those basins that have a relatively low threat from salts and nutrients and thus would not benefit from salt and nutrient management planning. The Amendment includes basin characteristics to consider in this evaluation, along with a requirement that the basins be re-evaluated periodically. To satisfy this requirement, the regional water boards may determine that use the existing GAMA or CASGEM prioritization programs is appropriate for their region. However, in many cases, regional water boards may prefer to use more region-specific factors in basin evaluation that better represent conditions of the region.

This evaluation is designed to encourage development of SNMPS in those basins that are most at risk with respect to salts and nutrients. Regional water boards could also use this evaluation to facilitate permitting of recycled water projects. Recycled water projects in basins where salts and nutrients do not represent a threat to groundwater quality objectives would require less evaluation and potentially fewer permit requirements, while permit requirements for groundwater monitoring, participation in an SNMP, etc. could be focused only on those basins in which salts and nutrients pose a relatively high threat to groundwater quality. In addition, regional water boards could use this evaluation to develop basin plan amendments for the control and management of salts and nutrients in their region if salt and nutrient management planning efforts have proven to be ineffective in controlling salt and nutrient impacts to a basin (for example, in the Central Coast region).

One option would be to require regional water boards to prioritize groundwater basins for SNMP development based on the GAMA or CASGEM system and continue to encourage focusing of SNMP efforts on high priority basins in accordance with these systems. While this option would improve statewide consistency, this is not recommended based on the discussion above regarding the improved accuracy of regional evaluations.

No fair argument exists that requiring regional water boards to evaluate and categorize their basins could result in any reasonably foreseeable significant adverse environmental impacts because the categorization is for informational purposes and such action has no potential to result in a direct physical change to the environment or a reasonably foreseeable indirect physical change to the environment.

4.8.2 Regional Water Board Review and Acceptance of SNMPS

The Amendment states that the regional water boards “shall consider for adoption a basin plan amendment when implementation of a salt and nutrient management plan involves adoption and/or modification of water quality objectives, beneficial uses, or programs of implementation consistent with Water Code sections 13240, 13241, and 13242.” In other words, in basins where water quality objectives for salts or nutrients are being or threaten to be exceeded, the regional water boards shall consider for adoption basin plan amendments based on the basin’s SNMP. This language clarifies the process for regional water boards to review and accept SNMPS that require a basin plan amendment.

However, several SNMPs that have been prepared conclude that water quality objectives for salts or nutrients are not exceeded or threatened to be exceeded in the basin, and, as a result, no basin plan amendments are required. The Policy does not include guidance regarding the approval process for SNMPs that do not require a basin plan amendment. Some regional water boards have used board resolutions as a means to accept these SNMPs, and other regions have not formally approved these SNMPs.

The Amendment includes a description of the process for regional water boards to review and accept SNMPs. Under the proposed process, the regional water board would review the SNMP for completeness and to determine whether it adequately addresses the required components of SNMPs (as described in section 6.2.4 of the Amendment). If the regional water board determines the SNMP is adequate, the regional water board would accept the SNMP through a regional water board resolution accepting the SNMP. Next, the regional water board would determine whether a basin plan amendment is necessary. An SNMP may be a technical document that is created to support individual board actions if implementation would not require modification water quality objectives, beneficial uses, or programs of implementation. In those cases, a basin plan amendment would not be required as part of the approval process. An example would be an SNMP that provides technical justification for salt or nitrogen loading metrics that can be incorporated into permits on a case-by-case basis. In some basins with limited salt and nutrient concerns, this type of SNMP may be sufficient to adequately ensure that salt and nutrient discharges do not create water quality problems.

Alternatively, the implementation of an SNMP may require a regional water board to establish new or modified water quality objectives, beneficial uses, or programs of implementation. The implementation of these SNMPs would require the regional water board to amend its basin plan(s). Examples of SNMP elements that would require a basin plan amendment include: provisions that establish new water quality objectives, the establishment of a standardized process for interpreting narrative salinity and nutrient water quality objectives, and the creation of an implementation plan that relies on new methods to determine compliance with the Antidegradation Policy in Board-issued permits.

The Policy states that SNMPs include compliance with CEQA. Compliance with CEQA may be required if the regional water boards choose to consider basin plan amendments that are based on the SNMPs, including establishment of new or modified water quality objectives or new rules for regulating salt and nutrient discharges. Compliance with CEQA may also be required if the regional water board accepts an SNMP through a resolution because the SNMP may include future recycled water projects that have not yet gone through the CEQA process. A resolution accepting an SNMP could, in certain limited circumstances, be considered an implicit approval of these future projects, which could constitute an action subject to CEQA.

Table 4-1 Basin ranking criteria used for GAMA, CASGEM, CV-SALTS, and the San Diego Regional Water Board

USGS/GAMA Study 2003	CASGEM	San Diego Regional Water Board ¹	CV-SALTS (Nitrate Control) ²
Criteria for Basin Prioritization			
Area Number of Public Supply Wells Municipal Groundwater Use Agricultural Groundwater Use Number of Leaking underground storage tanks Pesticide Use	Overlying population Projected growth of overlying population Public supply wells Total wells Overlying irrigated agriculture Reliance on groundwater as primary source Groundwater impacts (overdraft, subsidence, saline intrusion)	Storage Volume Yield Water Quality Use/potential of municipal water supply wells Availability of information Salinity/Nutrient load issues	Average nitrate concentration in Upper Zone, 2000 - 2016
Basin Ranking System			
Primary Factor: Number of Public Wells 1 >260 2 100 - 259 3 25-99 (+ high rank for 2 secondary factors) 4 25-99 (no high rank in secondary) 12-24 (high rank in 1 secondary factor) 5 Outside of a Basin 6 Low Use	High Medium Low Very Low Overall Basin Ranking Score = Population + Population Growth + public supply wells + (Total Wells x .75) + Irrigated Acreage + (Groundwater Use + Groundwater %)/2 + Impacts + Other	A > 60K AF, significant municipal use, WQ decrease downgradient Extensively studied basin, models B 50K AF or less, urban/ag use 500 < TDS < 1,000 mg/L Some non-compliance C < 20K AF, urban or ag. 500 < TDS < 1,100 mg/L Few studies, limited storage capacity D1 Large/moderate urban coastal basins Elevated TDS; WQO TDS > 1,200 mg/L No compliance issues Municipal supply by demineralization D2 Same as D1, but no municipal supply E Rural and outside of recycled water service area.	Priority 1 Priority 2 Not Priority

¹ Proposed Guidelines, Salinity/Nutrient Management Planning in the San Diego Region. September 2010.

² CV SALTS final SNMP. Appendix D-4. <https://www.cvsalinity.org/docs/committee-document/technical-advisory-docs/conceptual-model-development/3655-d-4-prioritization-methodology/file.html>

AF: acre-feet; Secondary factors: municipal pumping, agricultural pumping, leaking underground storage tanks, pesticide applications; TDS: total dissolved solids; WQ: water quality; WQO: water quality objective.

Furthermore, if there is sufficient assimilative capacity for existing and proposed future recycled water projects, under the Policy it is not clear whether (1) those future recycled water projects would need regional water board approval on a project-by-project basis to utilize that assimilative capacity, or (2) the regional water board would allocate that assimilative capacity by accepting the SNMP, which could require compliance with CEQA. To clarify this issue, the Amendment states that SNMPs that are accepted by the regional water board without a basin plan amendment are to be used as technical documents that can assist in the permitting of recycled water projects. Compliance with CEQA will not likely be required since assimilative capacity is not allocated in these cases; however, the regional water board must make a determination regarding whether compliance with CEQA is required for each action accepting an SNMP.

No fair argument exists that clarifying the regional water board process to accept salt and nutrient management plans could result in any reasonably foreseeable significant adverse environmental impacts because this revision clarifies the existing CEQA requirements and does not change CEQA requirements and such action has no potential to result in a direct physical change to the environment or a reasonably foreseeable indirect physical change to the environment.

4.8.3 Data Assessment and Periodic Updates to SNMPs

The Policy states that stakeholders shall provide monitoring data collected from SNMPs every three years to the regional water board, but does not include any language regarding the type or frequency of assessment to be done with that data. The Amendment changes the frequency of data reporting from every three years to annually to facilitate regional water board review of monitoring data and requires data be reported to a GAMA information system. This will centralize data generated from SNMPs and create consistency across regional water boards to allow for further analysis of monitoring data.

The Policy does not include any language regarding whether and how frequently SNMPs should be updated. Furthermore, the Policy includes language that assimilative capacity assessments for groundwater recharge projects should project potential impacts for a period of at least 10 years. There is no language in the Policy regarding if or how to confirm these 10+ year projections against data that is collected pursuant to the SNMPs.

As data are collected and assessed, there may be a need to update various aspects of SNMPs based on the new information acquired. To ensure that data collected is assessed and used to update SNMPs when warranted, the Amendment includes a requirement for regional water boards, in consultation with stakeholders, to assess and review monitoring data generated from SNMPs every 5 years, unless an alternate timeline has been established in a basin plan amendment that is based on an accepted SNMP. This timeframe ensures that data are evaluated on a basin/subbasin-wide scale, which is appropriate for this type of trend analysis.

Data assessment is required in the Amendment, but whether or not updates to SNMPs are needed based on the data assessment is left to the discretion of the regional water boards, in consultation with stakeholders. The following list of items should be included in the data assessment:

- observed trends in water quality data as compared with trends predicted in the SNMP

- the ability of the monitoring network to adequately characterize groundwater quality in the basin
- potential new data gaps
- groundwater quality impacts predicted in the SNMP based on most recent trends and any relied-upon models, including an evaluation of the ability of the model to simulate groundwater quality
- available assimilative capacity based on observed trends and most recent water quality data
- projects that are reasonably foreseeable at the time of this data assessment but may not have been when the salt and nutrient management was prepared or last updated.

The SNMP review should include an assessment of the validity of the estimate of assimilative capacity, and the conceptual model of the groundwater basin that supports that estimate, as described below.

Required components of an SNMP include “salt and nutrient source identification, basin or subbasin assimilative capacity and loading estimates, together with fate and transport of salts and nutrients.” (Section 6.2.4.3). The assimilative capacity of a groundwater basin is a quantitative estimate of the ability of that basin to accept loads of salts and nutrients without exceeding water quality objectives. Estimation of assimilative capacity of a groundwater basin or subbasin requires a quantitative assessment of loading of salts and nutrients and the fate and transport of those salts and nutrients. Because assimilative capacity is a quantity, estimation of assimilative capacity requires use of a mathematical model of the basin. As discussed in Section 3.4, this mathematical model may be relatively simple (e.g. a simple mixing cell). The mathematical model of the basin is in turn based on a conceptual model of the basin. The conceptual model is a more qualitative representation of the groundwater basin that supports the development of the mathematical model that can then be used to quantify the fate and transport of nutrients and to estimate the assimilative capacity of the basin.

If the results of this assessment indicate that observed trends are generally in agreement with predicted trends in the SNMP, and that the key assumptions of the conceptual model in the SNMP are still valid, then further updates to the SNMP would not be needed. Alternatively, if the results of this assessment indicate that the conceptual model components in the SNMP are no longer valid, and/or that observed trends are significantly different from those predicted in the SNMP, then the SNMP would need to be revised to address those changes. Furthermore, pursuant to section 6.2.7 of the Amendment, updates to the SNMP may be necessary to ensure the SNMP is consistent with the provisions of the Amendment.

No fair argument exists that including a recommendation to periodically assess monitoring data and consider updating SNMPs could result in any reasonably foreseeable significant adverse environmental impacts because (1) an SNMP is a planning document, (2) updating SNMPs is not required, and (3) such action has no potential to result in a direct physical change to the environment or a reasonably foreseeable indirect physical change to the environment. Updated SNMPs would only require environmental analysis if they were going to be used as the basis for a basin plan amendment, which is a discretionary action.

4.8.4 SNMPs and the Policy

While some recycled water projects have measurable contributions to the total salt and nutrient loading in a given groundwater basin, many recycled water projects have negligible contributions to the total salt and nutrient loading in a given groundwater basin. More often, it is other entities or activities such as agriculture, industry, wastewater treatment plant operations, or water agencies importing high-salinity water that result in significant contributions of salts and/or nutrients to a groundwater basin. In these cases, entities other than recycled water producers or users may be more appropriate to lead stakeholder efforts for developing SNMPs. As discussed in 3.4.3, one of the major challenges of developing SNMPs has been the lack of participation by other entities such as agriculture in recycled water producer-led stakeholder groups.

An evaluation of SNMP development and recycled water use by region illustrates this point. SNMP coverage by region was compared with the percentage of the total water portfolio that is provided by recycled water in that region. In this analysis, basin coverage was calculated as the percentage of USGS GAMA priority basin area that has an accepted SNMP. This statistic was compared against the total volume of recycled water used for irrigation and groundwater recharge¹¹ divided by the total volumes of water used for those purposes as reported by DWR in the California Water Plan.¹² Results of this analysis are summarized on Figure 4-6. The percentages calculated from this analysis should be considered approximate, given the different sources of data, and uncertainties within each source of data. However, these data can provide a useful generalization of the SNMP experience in different regions.

As shown on Figure 4-6, in general, the SNMP program has been most successful (i.e., resulted in the most coverage of basins with stakeholder led SNMPs) in those regions where recycled water use represents the highest percentage of total water use in the region. Relatively high percentages of recycled water use in the Los Angeles, Santa Ana, and San Diego regions correspond to high SNMP basin coverage in those regions. Conversely, comparatively lower recycled water use in the North Coast, Central Coast, San Francisco Bay, and Colorado River regions corresponds to lower SNMP coverage. The high SNMP coverage in the Central Valley despite low recycled water use is due to the [CV-SALTS program](#), which was formed in 2006 with a focus on agricultural stakeholders. Also, relatively high coverage in the Lahontan region despite low recycled water use is largely explained by the participation of two water agencies that prepared SNMPs for two very large groups of groundwater basins that constitute the majority of GAMA priority basins in that region.

Consistent with Resolution No. 2016-0061, staff evaluated the challenges and benefits of SNMP development, and considered the following two options: (1) make the SNMP program a “stand-alone” program; and (2) migrate the SNMP program to fit within the SGMA program framework. These options are not recommended because of a lack of key stakeholder support and a lack of

¹¹ Recycled water use data from State Water Resources Control Board and Department of Water Resources (2017).

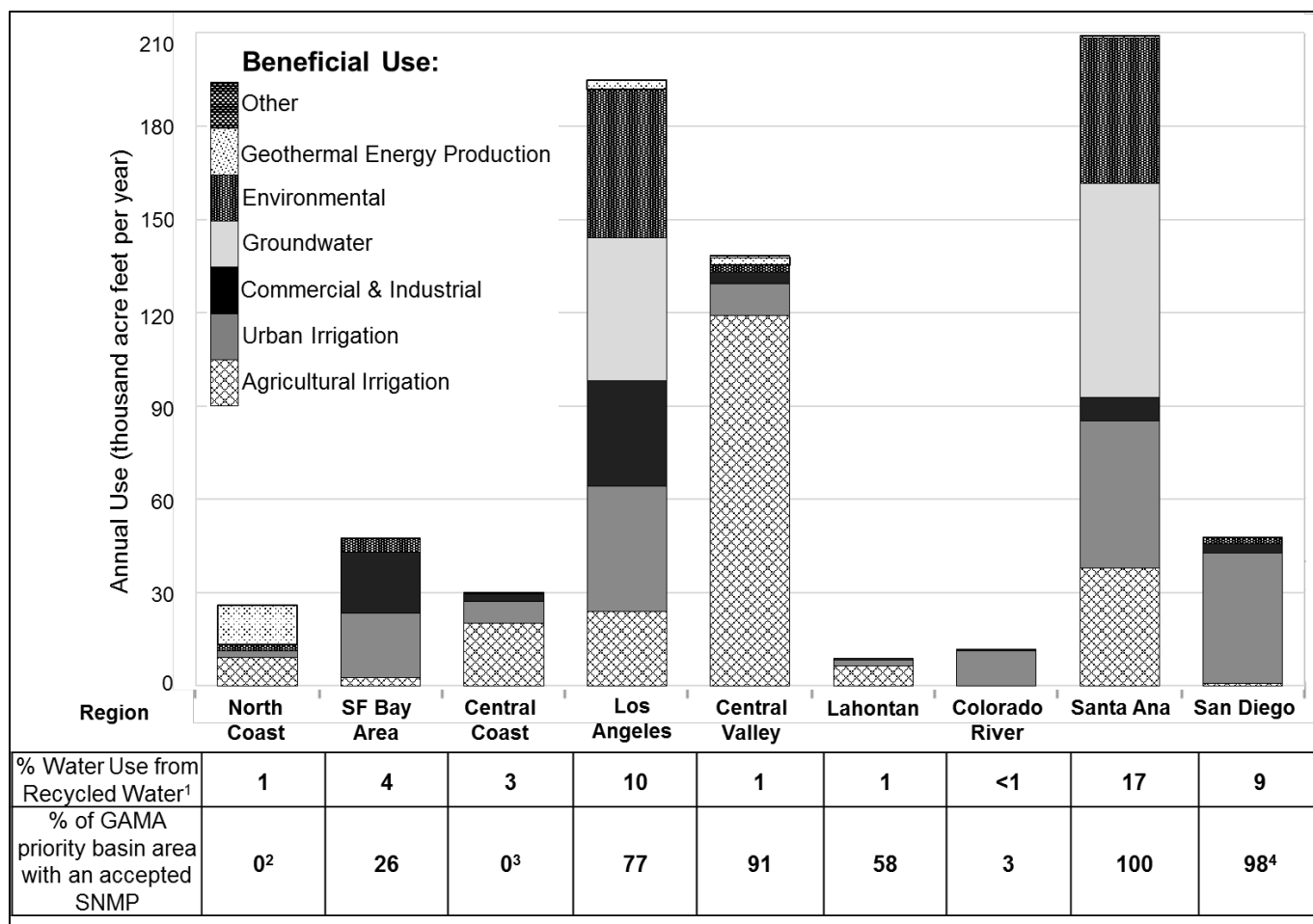
¹² Sum of recycled water use for irrigation and groundwater recharge divided by total irrigation and groundwater recharge based on DWR water budgets (approximate) (DWR 2014).

statutory authority by DWR to evaluate SNMPs for consistency with the Policy and applicable basin plans. These options are discussed below.

4.8.4.1 Stand-Alone SNMP Option

Pulling the SNMP program out of the Policy could give it more flexibility to interface with and cover more salt and nutrient sources and associated programs including the Irrigated Lands Regulatory Program, SGMA, Onsite Wastewater Treatment Systems programs, and other relevant salt and nutrient management programs. It also could allow regional water boards to direct SNMP efforts to dischargers and stakeholders that often represent the largest contributors of salts and nutrients in the basin (e.g., water agencies importing highly saline water, dairies, agriculture).

Removing the salt and nutrient management planning component from the Policy is not recommended because of a lack of stakeholder support for salt and nutrient management planning outside of the context of recycled water. It is unclear by what mechanism the regional water boards could require key stakeholders to participate in salt and nutrient management planning efforts. Furthermore, removing SNMPs from the Policy could undermine existing stakeholder efforts to develop SNMPs in some areas of the state.



Recycled water use data from the 2015 recycled water use survey.

1 – Sum of recycled water use for irrigation and groundwater recharge divided by total irrigation and groundwater recharge based on approximate DWR water budgets (California Water Plan, Update 2013, Vol. 5, #10)

2 – The North Coast Region is developing a programmatic approach designed to cover all basins

3 – The Central Coast Region is focusing on the Irrigated Lands Regulatory Program for management of nutrients and salts

4 – Based on the San Diego Region basin prioritization – this statistic applies to SNMPs that have been accepted as final by staff according to that system.

Figure 4-6 Recycled water use and salt and nutrient management plan development by region

4.8.4.2 Migration of the SNMP Program into SGMA

The nexus between the SNMP program included in the Policy with SGMA is discussed in 3.4.4. Based on the factors discussed in 3.4.4, moving the salt and nutrient management planning component out of the Policy and into SGMA is not included in the Amendment. However, integration of each programs' objectives is possible if a GSA chooses to take advantage of the opportunity to do so. As such, the Amendment includes language that:

- Articulates the common elements between GSPs and SNMPs and encourages GSAs to incorporate salt and nutrient management planning into their GSPs; and
- Clarifies the essential elements of an SNMP and states that, if those SNMP elements are included in a GSP, the regional water board shall not require an additional SNMP for the basin.

In the longer term, the State Water Board plans to work in coordination with regional water boards and DWR to develop guidance for GSAs on how to incorporate the essential elements of an SNMP into their GSP and continue to work to find ways to harmonize these two programs.

4.9 Landscape Irrigation Projects

The Policy has a section focused on landscape irrigation projects and in the Amendment, this section has largely been removed. Instead, the Amendment includes a new section to clarify permitting for all non-potable recycled water projects and provide guidance on antidegradation analysis (see 4.10 and section 7 of the Amendment).

The Landscape Irrigation Projects section of the Policy included a definition of incidental runoff, and this was moved to the "Definitions" section of the Amendment. The Policy also included required management practices associated with controlling and limiting incidental runoff, which were removed because the best management practices will vary from site to site and regional water boards should have discretion to choose the best management practices to include in a given order or permit.

For all non-potable recycled water projects, a sentence was added to the Amendment to state, "the incidental runoff of recycled water shall not result in water quality less than that prescribed in water quality control plans or policies, unless authorized through time schedule provisions in WDRs, waivers of WDRs, or conditional prohibitions (e.g., agricultural discharges from irrigated lands)." This statement recognizes that incidental runoff may occur and provides limitations for its allowance, i.e., that recycled water projects must comply with water quality control plans.

No fair argument exists that moving text to other sections of the Policy or repeating regulations listed in the California Code of Regulations could result in any reasonably foreseeable significant adverse environmental impacts. Moving text to other sections of the Policy and stating the requirement to comply with existing plans and policies will not result in significant adverse impacts to the environment because these are non-substantial changes that are not directly linked to direct physical change in the environment or a reasonably foreseeable indirect physical change in the environment.

4.9.1 Priority Pollutant Monitoring Requirements

Priority pollutants are a set of 126 toxic pollutants including heavy metals, pesticides, and organic compounds for which numeric criteria were established by the USEPA in a rule known as the California Toxics Rule (40 CFR Part 131). Priority pollutant monitoring is required under NPDES permits for the discharge of treated wastewater to waters of the United States.

For landscape irrigation projects, the Policy requires priority pollutant monitoring once per year for recycled water facilities that have design production flows of more than one million gallons per day. For recycled water facilities with design production flows of one million gallons per day or less, priority pollutant monitoring is required once every five years.

These monitoring requirements were included in the Policy due to a concern over the potential risk to aquatic life from incidental runoff to surface water bodies of recycled water applied for landscape irrigation. However, incidental runoff is not allowed according to the Uniform Statewide Recycling criteria, and this prohibition is included in WDRs and permits for landscape irrigation use of recycled water. The expectation is that permittees are in compliance with their permits, and therefore incidental runoff is not occurring at a magnitude or frequency that would cause harm to aquatic life. Furthermore, noncompliance of some permittees (i.e., with the Uniform Statewide Recycling criteria) is not enough justification to maintain requirements for priority pollutant monitoring for all landscape irrigation projects. This rationale provides the basis for removing the priority pollutant monitoring requirements for landscape irrigation projects from the Policy. In addition, a subset of priority pollutant monitoring data was analyzed (Table 4-2) and the data analysis supports the determination that the risk to aquatic life from any potential incidental runoff of recycled water is very low.

An evaluation of monitoring data of priority pollutants at 192 NPDES-permitted wastewater treatment plants over the past five years showed 81 treatment plants produced treated wastewater disinfected tertiary standards per California Code of Regulations, title 22 (Table 4-2). The Uniform Statewide Recycling criteria required level of treatment for recycled water used for landscape irrigation is disinfected tertiary treatment, so data for the 81 treatment plants that produced tertiary treated wastewater was analyzed to be approximately representative of recycled water used for landscape irrigation throughout California. Based on the information collected, exceedances of priority pollutant levels of concern do not occur with a magnitude or frequency to warrant monitoring requirements for landscape irrigation recycled water projects.

For 95 of the 126 priority pollutants (75% of priority pollutants), concentrations never exceeded the limitations in the 5-year timeframe. For the remaining 31 priority pollutants, on one or more occasion, the concentration exceeded the limitation in the 5-year data set for 81 tertiary treatment plants. Of the 81 tertiary treatment plants, 32 tertiary treatment plants had a priority pollutant exceedance in the 5-year timeframe. Of the 32 tertiary treatment plants that had a priority pollutant exceedance, 20 treatment plants had five or fewer exceedances, indicating that the exceedances were likely due to intermittent issues that were resolved, rather than a persistent issue with a treatment plant. For tertiary treatment plants that had exceedances, the majority (27 of 32 treatment plants or 84%) exceeded limitations for three or fewer priority pollutants. This indicates that only a small percentage of priority pollutants exceed their limitations at most tertiary treatment plants.

The six priority pollutants that had exceedances at four or more out of the 81 tertiary treatment plants are copper (10 facilities), di[2-ethylhexyl]phthalate (7), zinc (5), dichlorobromomethane (4), cyanide (4), and dibromochloromethane (4). However, these six pollutants are monitored more frequently than others; these pollutants make up six of the ten most frequently monitored of the 126 priority pollutants (ranging from n=2,032 for dibromochloromethane to n=8,078 for copper). When looking at the data set for the 81 tertiary treatment plants, the exceedance frequency for all of these pollutants is less than 1% (calculated as the number of exceedances divided by the number of monitoring events; Table 4-2).

Table 4-2 Priority pollutant monitoring summary

Total Amount	Fractional Amount	Equation Used/ Percentage
USEPA lists 126 contaminants as “priority pollutants” that require monitoring	31 priority pollutants exceeded limitations in CA	$\frac{31 \text{ Exceeded PPs}}{126 \text{ Total PPs}} = 25\%$
The data set includes data from 192 wastewater treatment plants with NPDES permits	81 treatment plants produce tertiary treated wastewater	$\frac{81 \text{ Facilities with Tertiary Treatment}}{192 \text{ Total Facilities}} = 42\%$
Within the 81 tertiary treatment plants, monitoring was recorded 38,304 times for the 31 priority pollutants that exceeded limitations	There were 244 instances when a priority pollutant exceeded its limitation	$\frac{244 \text{ Exceedances}}{38,304 \text{ Total Monitoring Events}} = 0.64\%$

Data is from October 2012-October 2016.

The priority pollutants with the highest exceedance frequencies are NDMA at 6% (8 exceedances of 145 monitoring events), aldrin at 4% (5 exceedances of 121 monitoring events), dieldrin at 4% (8 exceedances of 215 monitoring events) and DDT at 3% (6 exceedances of 174 monitoring events), and 3,3'-dichlorobenzidine at 3% (2 exceedances of 67 monitoring events). These exceedance frequencies are still relatively low, and the exceedance frequencies are based on relatively small numbers of monitoring events. The NDMA exceedances occurred at a single treatment plant, the aldrin exceedances occurred at two treatment plants, the dieldrin exceedances occurred at two treatment plants, the DDT exceedances occurred at two treatment plants, and the 3,3'-dichlorobenzidine exceedances occurred at one treatment plant, indicating that these are not widespread issues. More frequent monitoring of a particular priority pollutant indicates that there had been a detection or exceedance of that pollutant in the past for a given treatment plant that demonstrated there was reasonable potential for an exceedance to occur. If

there is no reasonable potential for an exceedance based on past monitoring data, then less frequent monitoring is required at a given wastewater treatment plant.

The above data set indicates there are low levels of exceedances of all priority pollutants at NPDES-permitted water recycling treatment plants in California. Priority pollutant monitoring data will remain available for recycled water that originates from an NPDES-permitted treatment plant because priority pollutant monitoring remains a requirement for all NPDES-permitted wastewater treatment plants. However, the low levels of exceedances of priority pollutants indicates that the risk to aquatic life from potential incidental runoff of recycled water is very low.

The Amendment removes priority pollutant monitoring requirements for landscape irrigation projects. In addition, the Amendment removes the requirement for groundwater recharge projects to monitor for priority pollutants twice a year because it conflicts with the priority pollutant monitoring requirements for groundwater recharge projects given in the California Code of Regulations, which was amended to include these requirements in 2014 (see 4.11 for more detail). To make permits consistent with the Policy following adoption of the Amendment, the monitoring and reporting programs for permits that include priority pollutant monitoring requirements for landscape irrigation recycled water projects will need to be updated to remove these requirements. The resolution adopting the Amendment will direct the State Water Board's Executive Director to issue an order pursuant to Water Code section 13267 and Water Code section 13383 to update the monitoring and reporting programs of applicable recycled water permits to be consistent with the updated monitoring requirements of the Amendment.

Removing priority pollutant monitoring requirements will not result in significant adverse environmental impacts because reduced monitoring does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment.

4.10 Permitting and Antidegradation Analysis for Non-Potable Recycled Water Projects

The Amendment includes a new section to clarify permitting for all non-potable recycled water projects and provide guidance on antidegradation analysis. There are two main permitting options, each of which is mentioned in the Amendment and is described in greater detail below. The two permitting options are: (1) use of a statewide general order, such as Order WQ 2016-0068-DDW, and (2) site-specific permitting for projects ineligible for a statewide order or for which a statewide general order is not appropriate¹³.

In the Amendment, the Antidegradation section of the Policy is no longer its own section but is integrated into several sections to which it relates, including the section now titled "Permitting and Antidegradation Analysis for Non-Potable Recycled Water Projects." An antidegradation analysis is required to comply with the Antidegradation Policy when a permit is issued for a

¹³ A recycled water project may be eligible to enroll under the statewide General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems (Order WQ 2014-0153-DWQ), which covers treatment, disposal, and recycling of domestic wastewater for systems that treat less than 100,000 gallons per day.

recycled water project. There is additional antidegradation information for each of the permitting options in each permitting subsection.

4.10.1 Antidegradation Analysis for Non-Potable Recycled Water Projects

The subsection on antidegradation analysis for non-potable recycled water projects in the Amendment includes general statements that apply to all types of non-potable recycled water projects. The first statement is that all non-potable uses of recycled water in accordance with the Policy is to the benefit of the people of California to emphasize the State Water Board's support for the safe use of recycled water.

This subsection of the Amendment also clarifies how to demonstrate compliance with the Antidegradation Policy depending on whether an SNMP has been developed for the basin. The Amendment clarifies compliance with the Antidegradation Policy in basins with a basin plan amendment based on an SNMP. The Amendment states that compliance with the Antidegradation Policy may consist of an analysis demonstrating that the project is consistent with the adopted basin plan amendment. If a project is not consistent with the adopted basin plan amendment as determined by the regional water board, compliance with the Antidegradation Policy may be based, in part, on the technical findings of the salt and nutrient management plan or basin plan amendment, as applicable. A project may be inconsistent with the adopted basin plan amendment if it does not fit within a class of projects that were reasonably foreseeable at the time the antidegradation analysis for the accepted salt and nutrient management plan was prepared. The Amendment also clarifies compliance with the Antidegradation Policy for projects in those basins where a basin plan amendment was not adopted but an SNMP was accepted by the regional water board. In this case, the antidegradation analysis may be based, in part, on the technical findings of the accepted salt and nutrient management plan. This section also clarifies that if an SNMP has not been developed and accepted by the regional water board or if an SNMP is not required by the regional water board pursuant to section 6.1.3 of the Amendment, then compliance with the Antidegradation Policy will depend on the permitting mechanism used for the project. In addition, this section re-states the existing authority of the regional water boards, pursuant to Water Code section 13267, to require a project proponent to develop or participate in developing an SNMP as a condition of the permit.

In the Antidegradation section of the Policy, there is a provision that allows a landscape irrigation project that meets the streamlined permitting criteria and that is in a basin in which an SNMP is being prepared to be permitted by a regional water board if it can demonstrate that it uses less than 10 percent of the available assimilative capacity in a basin (or multiple projects use less than 20 percent of the available assimilative capacity). This provision is not included in the Amendment because a blanket allowance for a landscape irrigation project to be permitted if it uses less than 10 percent of the available assimilative capacity of a basin is no longer needed now that the State Water Board has adopted a statewide general order for all non-potable uses of recycled water, including landscape irrigation. If a project meets the conditions of the order, it may be permitted without further antidegradation analysis (see 4.10.2).

Describing the status quo requirements for antidegradation analysis for recycled water projects for the purpose of clarification in the Amendment and removing the blanket 10 and 20 percent assimilative capacity allowance for landscape irrigation recycled water projects will not result in

significant adverse environmental impacts and does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment.

4.10.2 Use of statewide water reclamation requirements

The primary streamlined permitting mechanism for non-potable recycled water projects that meet the eligibility requirements is to use the statewide general order, Order WQ 2016-0068-DDW. Pursuant to Water Code section 13263(i), the State Water Board or a regional water board may prescribe general WDRs for a category of discharges if the discharges involve similar operations, types of waste, treatment standards, or are more appropriately regulated under general WDRs than individual WDRs. Additionally, Water Code section 13528.5 gives the State Water Board the authority to carry out the authority and duties of the regional water board, including the authority to prescribe WRRs pursuant to Water Code section 13523.

Use of statewide general orders provides consistent regulation of non-potable recycled water uses statewide and encourages recycled water projects by providing a streamlined approach in permitting. Permittees benefit through clear direction in preparing a Notice of Intent and reduced time required to obtain permit coverage. Regional water boards benefit through reduced application review time, fewer requests for additional information, and less staff time spent on sites that are generally considered a low threat to water quality. To provide a more efficient permitting process that requires less processing time and resources for eligible permittees, the State Water Board strongly encourages regional water boards to enroll eligible projects under Order WQ 2016-0068-DDW. Enrollment under this order does not require action by the regional water board, but rather can be accomplished by an action by the regional water board executive officer, resulting in a significant reduction in staff time. The regional water board executive officer issues a notice of applicability and monitoring and reporting program.

The Amendment requires all appropriate and eligible projects with the capability of taking on the responsibility of administering water recycling programs to enroll under Order WQ 2016-0068-DDW. This language is consistent with Finding 34 of Order WQ 2016-0068-DDW, in which the State Water Board recognized the need for streamlined permitting of non-potable recycled water projects.

This subsection also includes information on antidegradation analysis for projects permitted under Order WQ 2016-0068-DDW. If the project can demonstrate that it complies with the conditions of that Order, it is also in compliance with the Antidegradation Policy.

The Amendment removes streamlined permitting guidance and criteria for landscape irrigation projects. In the Policy, if a project meets the criteria, the regional water board is required to permit the project within 60 or 120 days absent unique, site-specific conditions and the regional water board cannot impose project-specific receiving water and groundwater monitoring requirements unless such project-specific monitoring is required under a SNMP. Order 2016-0068-DDW provides a more streamlined permitting mechanism than the streamlined permitting section of the Policy. Finding 33 of Order WQ 2016-0068-DDW contains similar provisions to the Policy in requiring the regional water board executive officer to make findings in a Notice of Intent response letter that a proposed project has the potential to degrade water quality and may require a site-specific order. Given the limited scope of the streamlined permitting guidance in the Policy (i.e., landscape irrigation projects meeting specific criteria) and given its redundancy with Order WQ 2016-0068-DDW, it is appropriate to remove the streamlined permit

guidance and criteria from the Policy. See 4.10.4. for project-specific groundwater monitoring requirements.

Removing streamlined permitting guidance and criteria and instead, encouraging the use of Order WQ 2016-0068-DDW will not result in significant adverse environmental impacts and does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment because to enroll a recycled water project under the Order, the regional water board must determine the recycled water use will not adversely impact water quality. Specifically, recycled water used under the Order is prohibited from causing unacceptable groundwater and surface water degradation, creating nuisance conditions, and must be in compliance with all existing plans, policies, and regulations for the protection of water quality and public health.

4.10.3 Site-specific Permitting for Non-Potable Recycled Water Projects

There may be cases where a project is not eligible to enroll in Order WQ 2016-0068-DDW, or where the regional water board has selected a more efficient permitting option for the project, such as a master recycling permit. Master recycling permits provide coverage for treatment or production of recycled water as well as application of recycled water and can streamline enrollment for new users within the use area. Site-specific individual permits are most resource-intensive for the permittees and regional water boards and are appropriate only for cases where the projects are not eligible for the statewide general order or a master recycling permit. These projects require site-specific evaluations and require a more detailed antidegradation analysis to demonstrate they do not pose a threat to water quality.

The Amendment re-states the existing permitting authorities of the regional water boards under Water Code sections 13263, 13267, 13523, and 13523.1, among others, in order to describe the suite of potential permitting options for non-potable recycled water projects.

Describing the status quo permitting requirements for recycled water projects in the Amendment will not result in significant adverse environmental impacts and does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment.

4.10.4 Project-specific Groundwater Monitoring for Non-Potable Recycled Water Projects

The final subsection under the section on permitting and antidegradation analysis for non-potable recycled water projects regards site-specific groundwater monitoring. The Amendment states that project-specific groundwater monitoring shall not be required for non-potable recycled water projects if two criteria are met, unless the regional water board determines there are unique site-specific conditions, or unless such project-specific monitoring is required under the accepted SNMP or applicable basin plan. The two criteria are 1) for irrigation projects, application of recycled water at rates to minimize percolation of recycled water below the plant's root zone, and 2) appropriate use of fertilizer that takes into account nutrient levels in recycled water and nutrient demand by plants. This statement expands on existing language in the Policy limiting project-specific groundwater monitoring for landscape irrigation projects that meet the streamlined permitting criteria. The two criteria included here are critical to justify the restriction of groundwater monitoring and for the application of recycled water in a manner that

protects water quality. These criteria are included as streamlined permitting criteria in the Policy. “Application in amounts and at rates needed for the landscape” was changed to “application...at rates to minimize percolation of recycled water below the plant’s root zone” to better describe appropriate application of recycled water for irrigation. Streamlined permitting criteria in the Policy that are not included in the Amendment are 1) application of recycled water in compliance with California Code of Regulations, title 22, and 2) compliance with any applicable SNMP. As these are requirements of all permitted recycled water projects, these criteria are no longer needed. The restriction is consistent with the purpose of the Policy, to promote and encourage the use of recycled water.

Limiting groundwater monitoring unless there are unique site-specific conditions or monitoring is required under another plan in the Amendment will not result in significant adverse environmental impacts and does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment.

4.11 Permitting and Antidegradation Analysis for Groundwater Recharge Projects

In the Amendment, the section discussing groundwater recharge projects is updated to reference and include the uniform statewide regulations for these projects, which had not yet been adopted at the time the Policy was last amended in 2013. References to the specific sections of the California Code of Regulations were added to the relevant regulations for these projects. In addition, the requirement for groundwater recharge projects to monitor for priority pollutants twice a year was removed because it conflicts with the priority pollutant monitoring requirements for groundwater recharge projects given in the California Code of Regulations, which was amended to include these requirements in 2014. Instead, the Amendment refers to the priority pollutant monitoring requirements in California Code of Regulations, title 22, including subsequent revisions.

In the Amendment, the Antidegradation section of the Policy is no longer its own section but is integrated into several sections to which it relates, including the section now titled “Permitting and Antidegradation Analysis for Groundwater Recharge Projects.” Antidegradation analysis is required to comply with the Antidegradation Policy when a permit is issued for a groundwater recharge project.

The subsection titled “Antidegradation analysis for groundwater recharge projects” clarifies how to demonstrate compliance with the Antidegradation Policy when an SNMP has been developed for the basin, when an SNMP has not been developed for the basin, and when an SNMP is in development. The Amendment clarifies compliance with the Antidegradation Policy in basins where a basin plan amendment based on the SNMP has been adopted and in those basins where a basin plan amendment was not adopted, but an SNMP was accepted by the regional water board. Where an SNMP has not been developed for the basin or where the regional water board has determined no SNMP is required pursuant to section 6.1.3 of the Amendment, the Amendment clarifies that a site-specific antidegradation analysis is required for the project.

The Antidegradation section of the Policy includes a provision that allows a groundwater recharge project in a basin in which an SNMP is not yet in effect to demonstrate compliance with the Antidegradation Policy by demonstrating that it uses less than 10 percent of the available assimilative capacity in a basin (or multiple projects use less than 20 percent of the available assimilative capacity). Some regional water boards have extended the use of these 10

percent and 20 percent assimilative capacity criteria to facilitate permitting projects in the absence of an SNMP. These interim criteria were intended to assist with permitting of recycled water projects while SNMPs were being developed. The deadlines for SNMP development in the Policy have passed, and there is a need to clarify how these interim criteria are to be used going forward.

The following options were considered to address the use of the 10 percent and 20 percent assimilative capacity criteria in the Policy:

- a. Extend use of the 10 percent and 20 percent assimilative capacity for groundwater recharge projects. This would maintain the incentive provided by the 10 percent and 20 percent assimilative capacity to potentially encourage development of more SNMPs and continue to provide a streamlined path for permitting groundwater recharge projects.
- b. Extend the use of the 10 percent and 20 percent assimilative capacity for groundwater recharge projects in basins where SNMPs are in development. This would maintain the incentive provided by the 10 percent and 20 percent assimilative capacity to encourage development of more SNMPs while establishing that the 10 percent and 20 percent assimilative capacity allowance is an interim guideline that may not be used for groundwater recharge projects in basins where no SNMP is in development.
- c. Do not extend the use of these 10 percent and 20 percent assimilative capacity criteria. The deadlines for developing SNMPs using these 10 percent and 20 percent assimilative criteria have passed, including the option for two-year extensions.

The Amendment allows groundwater recharge projects to use the 10 percent and 20 percent criteria in basins where an SNMP is in development (option B). Maintaining the 10 percent and 20 percent criteria may encourage permitting of recycled water for groundwater recharge, which is recognized in the Policy as a benefit to the people of the State of California when done in accordance with the Policy and state and federal water quality laws. Allowing the use of the 10 percent and 20 percent criteria for groundwater recharge projects may also encourage development of SNMPs in basins that include groundwater recharge projects, which is important because groundwater recharge projects have the potential to effect water quality in a basin. In order to use the 10 percent and 20 percent criteria, the regional water board must determine that the groundwater recharge project proponent is satisfactorily participating in the development of an SNMP. The 10 percent and 20 percent criteria are not intended to provide coverage for the groundwater recharge project indefinitely, and if a regional water board is not satisfied with the project proponent's participation in development of the SNMP, it can require site-specific antidegradation analysis for the project.

Extending the use of the 10 percent and 20 percent assimilative capacity criteria for groundwater recharge projects will not result in direct or indirect impacts to the environment because extending the use of these criteria maintains that for a given groundwater recharge project, they will only be applicable for short-term use while an SNMP is being developed, which is consistent with the status quo conditions of how these criteria have been used.

4.12 Reservoir Water Augmentation

A section describing permitting for reservoir water augmentation projects is included in the Amendment in recognition that uniform statewide regulations were adopted by State Water

Board on March 6, 2018 and went into effect October 1, 2018 for this use of recycled water. The Amendment includes references to the specific sections of the California Code of Regulations relevant for these projects. It is anticipated that reservoir water augmentation projects will be proposed and permitted in the near future. Reservoir water augmentation projects will assist the state in meeting the recycled water goals included in the Amendment and may be a cost-effective water supply for recycled water producers in lieu of installing comparatively expensive non-potable recycled water distribution systems. In addition, the 2018 Science Advisory Panel recommended CEC monitoring for reservoir water augmentation projects, similar to the recommendations for groundwater recharge using subsurface application (see 4.14).

Adding a section in the Amendment describing permitting for reservoir water augmentation projects would not result in a significant adverse environmental impact because it does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment. Individual reservoir water augmentation projects must be permitted consistent with all applicable federal and state water quality laws and regulations and would undergo a separate analysis pursuant to CEQA.

4.13 Raw Water and Treated Drinking Water Augmentation

The State Water Board is required to develop uniform statewide regulations by 2023 for raw water augmentation, which is the planned placement of recycled water into a system of pipelines or aqueducts that deliver raw water to a drinking water treatment plant that provides water to a public water system, as defined in section 116275 of the Health and Safety Code. (Wat. Code § 13561).

The Amendment does not include discussion of permitting for raw water augmentation projects because the adoption of regulations for these projects is likely several years in the future. Permitting guidance would be premature until more information is known about how these projects will be regulated. However, once regulations are developed for raw water augmentation and projects are implemented, the volumes of recycled water used for raw water augmentation will be required to be reported to the State Water Board. This use is included in the tracking and reporting requirements in the Amendment to avoid the need for updating the reporting categories in the near future. Once regulations are developed and raw water augmentation projects begin to be permitted, they will assist the State in meeting the recycled water goals included in the Amendment.

Treated drinking water augmentation is the planned placement of recycled water into the water distribution system of a public water system, as defined in section 116275 of the Health and Safety Code. (Wat. Code § 13561). There is no defined timeline for developing uniform statewide regulations for treated drinking water augmentation projects, thus permitting guidance and tracking and reporting requirements were not included for this application in the Amendment.

Currently there is recycled water research in progress to support the development of uniform statewide regulations for raw water and treated drinking water augmentation. This research includes a \$1 million grant agreement with The Water Research Foundation titled “Research to Support the Development of Methods for Quantitative Microbial Risk Assessment (QMRA), Pathogen Monitoring, and Identification and Treatment of Unknown Constituents for Potable

Reuse Projects.” These research projects were recommended by the 2016 Direct Potable Reuse Expert Panel (Olivieri et al. 2016) and the research is expected to be complete in 2021.

Once regulations for raw water and treated drinking water augmentation are closer to adoption, it will be important to reconvene the Science Advisory Panel on CECs in Recycled Water to receive recommendations on CEC monitoring for these new recycled water uses, particularly because these are both potable uses.

4.14 Constituents of Emerging Concern

The Amendment includes several revisions in the section titled “Constituents of Emerging Concern” in the Policy. Overall, the revisions to this section reflect the State Water Board’s increased understanding of the nature of CEC research, including the need for a continuing research program due to the variable occurrence and concentrations of CECs over time.

The subsection titled “Research Program” includes revisions to reflect the ongoing research program for CECs that will continue to be implemented by the State Water Board, rather than describing past research activities. The past CEC research activities are summarized in 3.7.

The Policy refers to a “blue ribbon” advisory panel, and the Amendment changes the term to a Science Advisory Panel. The Amendment would update the areas of expertise that should be represented on the Science Advisory Panel to include a human health pathologist with expertise on antibiotic resistant bacteria and antibiotic resistance genes, which is an important area of knowledge that has been identified by staff and stakeholders. In addition, the topics that the Science Advisory Panel should address were updated to be consistent with the scope of work for the 2018 Science Advisory Panel, which was expanded to include all non-potable uses of recycled water and reservoir water augmentation, rather than just landscape irrigation and groundwater recharge.

The 2018 Science Advisory Panel presented their CEC monitoring recommendations in a report titled “Monitoring Strategies for Constituents of Emerging Concern (CECs) in Recycled Water” (Drewes et al. 2018). The recommendations were used as the basis for the changes to the CEC monitoring requirements in Attachment A of the Amendment. The 2018 Science Advisory Panel recommended monitoring for CECs in recycled water used for groundwater recharge projects and reservoir water augmentation projects. Thus, the monitoring requirements described in Attachment A of the Amendment would apply to the eight existing groundwater recharge facilities in California, and any future groundwater recharge or reservoir water augmentation projects.

Recycled water project proponents seeking permitting for groundwater recharge projects implementing treatment processes that provide control of CECs by processes other than soil aquifer treatment or reverse osmosis/advanced oxidation processes (RO/AOPs) and reservoir water augmentation projects implementing treatment processes that provide control of CECs by processes other than RO/AOPs would need to contact the State Water Board and have them determine the CEC monitoring requirements for their water recycling treatment plant as these scenarios were not contemplated by the Panel. The State Water Board Division of Drinking Water may also require monitoring for certain constituents upon review of the Title 22 Engineering Report.

The 2018 Science Advisory Panel evaluated the potential exposures and potential human health risks associated with non-potable recycled water applications and determined that CEC monitoring is not needed for non-potable recycled water uses. The Panel also was asked to provide recommendations for additional research regarding antibiotic resistant bacteria and antibiotic resistance genes related to the use of recycled water for surface water augmentation and other uses allowed under Title 22 to further understand potential human exposure and potential impacts to human health. This assessment will serve to supplement recommendations from a previous expert panel that provided an in-depth review of antibiotic resistant bacteria and antibiotic resistance genes relative to direct potable reuse (Olivieri et al. 2016).

State Water board staff received numerous comments from the public and regional water boards on the structure and organization of Attachment A. Staff considered these comments and re-organized the content in Attachment A for clarity as well as making the substantive revisions described below.

The changes to Attachment A in the Amendment include:

- Clarifying monitoring in Attachment A is only required for recycled water used for groundwater recharge and reservoir water augmentation applications. CEC monitoring is not required for non-potable recycled water applications.
- Removing five chemicals (17 β -estradiol, caffeine, iopromide, N-N Diethyl-meta-toluamide (DEET), and triclosan) from the list of targeted chemistry monitoring requirements in Table 1 of Attachment A;
- Adding six chemicals (1,4-dioxane, N-nitrosomorpholine (NMOR), PFOS, PFOA, iohexol, sulfamethoxazole) to the list of targeted chemistry monitoring requirements in Table 1 of Attachment A;
- Adding CEC monitoring requirements for reservoir water augmentation projects;
- Adding requirements to use two bioanalytical screening tools for CEC monitoring (estrogen receptor- α (ER- α) and aryl hydrocarbon receptor (AhR));
- Adding a section requiring recycled water producers to develop a quality assurance project plan and submit to the regional water board;
- Organizing the "Monitoring Locations" subsection by type of recycled water project rather than by type of CEC or surrogate;
- Clarifying the requirements (e.g., analytes, duration, surrogate assessment) of the three-phased monitoring approach (initial assessment, baseline, and standard operation monitoring phases);
- Adding guidance on the evaluation of the results from bioanalytical screening tools and requiring response actions after the initial assessment phase;
- Requiring that all CEC monitoring data be reported electronically so the data are easily accessible and can be retrieved by Water Boards staff and the public for analyzing trends and compiling data for the next Science Advisory Panel.

The above changes to Attachment A of the Amendment are consistent with the 2018 Science Advisory Panel's recommendations in their Final Report. Staff has also included guidance on the evaluation of bioanalytical screening tool results, which was not included in the 2018 Science Advisory Panel's recommendations. This guidance is intended to provide follow-up investigatory actions when monitoring trigger levels are exceeded, and the response actions

increase as the magnitude of the monitoring trigger level exceedance increases, and is discussed further in 4.14.2 below.

Targeted chemistry, bioanalytical screening tools, and non-targeted analyses are broad terms that encompass a suite of analytical techniques that are currently available to detect and measure CECs. Each of these CEC screening tools is discussed in further detail below, as well as a discussion of if or how they were incorporated into the Amendment. Attachment A requires phased monitoring for health-based and performance indicator CECs (See Table 1 of Attachment A), surrogates for CECs (Table 2 of Attachment A), and bioanalytical screening tools (Table 3 of Attachment A), collectively referred to as the CEC Monitoring Parameters.

Currently, CEC monitoring is intended to be investigatory and not for regulatory compliance with a specific limit such as a maximum contaminant level or water quality objective. For both targeted chemistry and bioanalytical screening tools, the response actions for exceeding the monitoring trigger levels are to further investigate the exceedance if the magnitude of the exceedance is greater than a factor of 10 higher than the monitoring trigger level. The Amendment does not require any response actions if the magnitude of an exceedance is less than a factor of 10 greater than the monitoring trigger limits because the purpose of the CEC monitoring requirements is to investigate the occurrence and magnitude of CECs in recycled water and the monitoring trigger levels are relatively conservative values.

4.14.1 Targeted Analyses for CECs

Targeted analytical chemistry is when you know what chemicals you are looking for and have a fairly well established analytical method to detect the chemicals of interest. Targeted analytical chemistry is used for detecting and quantifying known CECs. The Panel's recommendations regarding targeted CEC monitoring were incorporated into Attachment A of the Amendment because the basis for the recommendations was scientifically sound and supported by scientific evidence. The updates to the list of targeted chemistry monitoring were based on comparing the 90th percentile concentrations from facilities in California (a relatively conservative level) to the monitoring trigger levels. The risk-based framework has several layers of conservatism, such as using concentration data from the point of compliance rather than the point of exposure. There would likely be additional removal or dilution of CECs between the point of compliance and the point of exposure where humans contact the recycled water.

Following the release of the 2018 Science Advisory Panel's recommendations in their Final Report (Drewes et al. 2018), the State Water Board released notification levels for the chemicals PFOS and PFOA. The notification levels for these two compounds were lower than the monitoring trigger levels previously recommended by the Panel. According to the Panel's risk-based framework, California notification levels are the preferred monitoring trigger levels if they are available. Upon release of the notification levels for PFOS and PFOA, the Science Advisory Panel reviewed available measured environmental concentrations (MECs) for these compounds and found additional data to consider. The notification levels were compared to the MECs for PFOS and PFOA, and the MECs exceeded the notification levels for both PFOS and PFOA. Thus, the Panel recommended adding both compounds to the targeted chemistry list in the Amendment. The reporting levels and monitoring trigger levels for PFOS and PFOA given in Attachment A of the Amendment were recommended by the Science Advisory Panel in a memorandum dated August 7, 2018 (Drewes 2018).

Analytical methods are available for all of the CECs included on the targeted chemistry monitoring list (Table 4-3). The 2018 Science Advisory Panel did not recommend specific methods for each CEC, but Table 4-3 is included here to provide information on potential methods that may be used for the analyses. Additional PFOS and PFOA analytical methodology information can be found in the USEPA Technical Fact Sheet (USEPA, 2017). Some of the listed methods do not include the CEC of interest in their targeted analytes, but the method was included in Table 4-3 if a laboratory has demonstrated it can be reliably detected with this method. The selection of methods and demonstrating that the method can meet the required reporting limits is discussed further in the Quality Assurance Project Plan section of Attachment A (also see discussion in 4.14.4 below).

Cost estimates for the targeted CEC analyses are given in Table 4-4, pursuant to Water Code section 13267. Costs for analyzing the complete set of analytes in Table 4-3 would be approximately ~~\$1,450-2,075~~ ~~1,250-\$1,600~~ per sample, which would apply to surface application groundwater recharge projects. For reservoir water augmentation and subsurface application groundwater recharge projects, the analyte list does not include gemfibrozil and iohexol, thus the cost of analysis may be lower for laboratories that run these separately from other CECs. For the shorter list of analytes, the cost would be approximately ~~\$1,050-1,325~~ ~~850~~ per sample. The estimated costs for the targeted chemical analyses for the first four years of monitoring and thereafter are given in Table 4-4. There are multiple commercial laboratories in California that can provide these analyses, as well as multiple laboratories outside of California.

Table 4-3 Available analytical chemistry methods for CECs

CEC	Available methods
1,4-dioxane	EPA 522 ^a
Gemfibrozil	EPA 1694 ^b , EPA 542 ^c , Standard Methods 6810 ^d
Iohexol	EPA 1694 ^b
NDMA	EPA 521 ^e , EPA 607 ^f , EPA 1625 ^g
NMOR	EPA 521 ^e , EPA 607 ^f , EPA 1625 ^g
PFOS	EPA 537 ^h ASTM D7979 ⁱ
PFOA	EPA 537 ^h ASTM D7979 ⁱ
Sucralose	EPA 1694 ^b
Sulfamethoxazole	EPA 1694 ^b , EPA 542 ^c , Standard Methods 6810 ^d

^a Munch and Grimmer 2008, ^b USEPA 2007, ^c USEPA 2016, ^d Standard Methods 2017, ^e Munch and Bassett 2004, ^f USEPA 1984a, ^g USEPA 1984b, ^h Shoemaker et al. 2009, ⁱ ASTM 2017.

Table 4--4 Cost estimates for targeted chemical analyses

Monitoring phase	Year	Number of samples per year	Groundwater recharge – surface application (9 7 CECs) Cost per sample: \$2,075 1600	Reservoir water augmentation and Groundwater recharge – subsurface application (7 5 CECs) Cost per sample: \$1,325 850
Initial assessment	1	4	\$8,300 6,400	\$5,300 3,400
Baseline	2	2	\$4,150 3,200	\$2,650 1,700
	3	2	\$4,150 3,200	\$2,650 1,700
	4	2	\$4,150 3,200	\$2,650 1,700
Subtotal for years 1-4		10	\$20,750 16,000	\$13,250 8,500
Standard operating	5 and thereafter	2	\$4,150 3,200-per year	\$2,650 1,700-per year

4.14.2 Bioanalytical Screening Tools

Bioanalytical screening tools is a term that encompasses a variety of biomolecular techniques. *In vitro* cell bioassays are receptor-based bioassays that can integrate unknown compounds and mixture interactions that affect the bioassay receptor and can be used to assess the potential effects of certain CECs on wildlife or human health. Bioanalytical screening tools can be used to identify unknown CECs and narrow down the type of CECs that are present in the water or indicate if the CECs in the water will cause a physiological response in organisms.

For example, the ER- α bioassay screens for estrogenic compounds. When any estrogenic compound binds to the cells of an ER- α bioassay, a reporter gene is activated, and the wells light up. The amount of light can be measured and correlated to a concentration of estrogenic compounds. *In vitro* cell bioassays cannot indicate which specific compounds are present, but they do indicate whether there are estrogenic compounds present and also take into account mixture effects from multiple CECs and effects of CECs present at low concentrations.

Monitoring with bioanalytical screening tools is intended to capture a wider array of CECs than is possible with targeted analytical chemistry monitoring. The nature of CECs is that there are many possible unknown constituents that are not included in targeted chemical analyses or were not included in the evaluation of CECs to determine the targeted chemical monitoring recommendations. Monitoring with bioanalytical screening tools provides an opportunity to monitor for potential unknown CECs.

To begin to fill the data gaps regarding unknown CECs, the 2010 Science Advisory Panel recommended developing the capacity to monitor with bioanalytical screening tools. The 2018 Science Advisory Panel identified ten *in vitro* bioassays that screen for different biological modes of action that may be appropriate for use in screening recycled water. Each *in vitro* bioassay would indicate that different physiological endpoints are activated, and different types of CECs are present in a sample (e.g., estrogenic CECs, carcinogenic CECs, etc.).

The 2018 Science Advisory Panel recommended monitoring with ER- α and AhR and the Amendment requires monitoring with ER- α and AhR because these two *in vitro* bioassays can provide information about removal of CECs through recycled water treatment systems as well

as bioactivity of any CECs that do make it through the treatment systems. Additionally, the Panel recommended ER- α and AhR and not other available bioassays because they are at a stage of development that can provide robust and reliable results for recycled water and the adverse outcome pathways have been identified and linked to activation of these two receptors. For example, the ER- α can be activated by CECs that impair physiological systems including the reproductive, cardiovascular, and central nervous systems. Monitoring with ER- α and AhR will provide information regarding potential unknown CECs that affect these receptors, including responses to low concentrations and mixtures of CECs and whether there may be estrogenic effects for ER- α or carcinogenic or reproductive effects for AhR.

Bioanalytical Methods

Standardized extraction procedures are available for ER- α and AhR bioassays (Table 4-5). The methods cited in Table 4-5 include both extraction and analysis methods, but only the extraction and concentration methods are relevant for preparing samples for the bioassays. Several choices are also available for commercial kits to perform the bioassays in-house or commercial laboratories that can perform the bioassays with recycled water samples and the 2018 Science Advisory Panel provided examples of available commercial laboratories and kits in their Final Report (Drewes et al. 2018).

At present, the ER- α and AhR bioanalytical screening tools both have reporting limits of 0.5 ng/L which is the measured value that can be reliably detected and quantified within acceptable limits of precision and bias for these analytical methods (see Table 3 in Attachment A). The reporting limit can be further defined as no lower than the lowest calibration standard performed within the calibration process. Reporting limits are the minimum value below which data are documented as non-detects.

Table 4-5 Available extraction and concentration methods for bioanalytical screening tools

Bioassay	Available extraction/concentration method
ER- α	EPA 539 ^a
AhR	EPA 1613 ^b

^a Smith et al. 2010, ^b USEPA 1994.

Phased Monitoring and Data Evaluation

The Amendment also includes a provision that bioanalytical monitoring will commence one year from the effective date of the amended Policy. This is to allow time for utilities to budget and plan for the bioanalytical monitoring and for additional laboratories to develop the ability to provide these analytical services.

Section 7.4 of the Panel's report states,

"The Panel recommends a phased approach for implementation of bioanalytical monitoring of recycled water. Phase I is a data collection exercise to determine the range of responses for IVBs standardized for water quality monitoring (i.e. Stage 3 of higher in Table 7.2) and that represent endpoints relevant to human health in designated samples from recycled water facilities across the state. Phase II is a pilot evaluation of the interpretive framework for bioanalytical monitoring results (described in section 7.3),

with initial MTLs established to further guide appropriate response actions geared toward ensuring a high quality of recycled water. Phase III would constitute full implementation of bioanalytical monitoring, where validated and certified bioanalytical methods would be an integral component of routine screening/monitoring of recycled water quality.”

The Amendment mirrors this phased implementation approach for bioanalytical monitoring in recycled water. Monitoring with ER- α and AhR will be required in the initial assessment and baseline monitoring phases to ensure that there is a robust data set to evaluate to then determine appropriate monitoring requirements for bioanalytical screening tools for the standard operating monitoring phase. The initial assessment monitoring phase has a 3-year duration with quarterly monitoring to collect data on the range of bioactivity responses for the recycled water treatment plant and evaluate treatment system performance. As stated in the Amendment, the purpose of the initial assessment phase for bioanalytical screening tools is for the recycled water producer to gather bioactivity data for ER- α and AhR to determine the range of responses for the bioassays at the recycled water facility so they can begin to develop a sense of appropriate bioanalytical monitoring for standardized water quality monitoring. No response actions would be required in the initial assessment phase.

The Panel indicated the next appropriate step would be to pilot an interpretive framework. Section 4.2.2 of Attachment A includes the baseline monitoring phase requirements, followed by 1-year of quarterly monitoring. The baseline monitoring phase is to pilot test the bioanalytical interpretive framework in Section 5.3 of Attachment A to compare the monitoring trigger levels to the results from the bioassays and then work with the regional water board to identify appropriate response actions for the various bioassay outcomes. Quarterly monitoring in the baseline phase will ensure the recycled water producer has at least four data points to evaluate the interpretive framework (described below).

Following the first two phases, the bioanalytical monitoring results would be evaluated to determine whether monitoring with ER- α and AhR should continue for the standard operating monitoring phase, and if so, at what frequency. As Table 10 indicates, if the BEQ/MTL ratio is consistently lower than 0.1 for ER- α and 1.0 for AhR, then the regional water board can consider reducing the monitoring frequency or removing the endpoint from the monitoring program. Furthermore, the framework and response actions may need to be refined after the baseline monitoring phase and implemented in the standard operation monitoring phase, especially if more information becomes available regarding the monitoring trigger level for AhR (see discussion below).

In a Memorandum to the State Water Board on Bioanalytical Monitoring Trigger Levels, the Panel stated, “At this time, the Panel also stresses that their recommendations for bioscreening should not be misconstrued as suitable for incorporation into the [Recycled Water Policy] as a regulatory limit for compliance but rather, as noted above, for screening level analysis only.” Attachment A is consistent with this strong recommendation from the Panel. The inclusion of bioanalytical screening in Attachment A and the monitoring trigger levels and response actions in section 5.3 of Attachment A are intended as *investigatory screening tools* at this time. The bioassay monitoring should be implemented to provide additional information about potentially bioactive CECs in recycled water for groundwater recharge and reservoir water augmentation.

The monitoring trigger level of 3.5 nanograms/liter for ER- α is based on a threshold of concern for human health effects. The Panel further elaborates on the use of this threshold in the response to peer review comments document,

“The Panel identified a concentration of 3.5 ng/L of EE2 in drinking water (the most potent estrogen typically considered) that is assumed to be without adverse effect in humans. The Panel was able to equate that concentration with a level of response in the ER- α assay and proposed to use that associated ER- α assay response level as a MTL to determine whether an effluent requires additional evaluation. In-vitro to in-vivo extrapolation is not necessary to use the 3.5 ng/L drinking water concentration given it was derived directly from the mammalian toxicity data. The Panel is simply recommending use the ER- α assay response to measure the concentration of estrogen-active CECs in an effluent and determine whether that concentration is greater than or less than the MTL and believes the approach to be scientifically sound.”

While the Panel did not include a monitoring trigger level for AhR, the Amendment includes a monitoring trigger level of 0.5 nanograms/liter. The Panel did not recommend a health-based monitoring trigger level for AhR in part because there was not consensus for an appropriate health-based trigger level since there are numerous constituents that can activate AhR and may have varied effects depending on the composition of the mixture. The State Water Board agrees there is still uncertainty around identifying an appropriate health-based trigger level for AhR. However, the Table 9 of Attachment A includes a monitoring trigger level of 0.5 ng/L as a matter of Policy, which should be used as an interim trigger level to evaluate the AhR bioassay data until a health-based monitoring trigger level can be established.

The State Water Board acknowledges that the monitoring trigger level for AhR is the same as the reporting limit for the bioassay, which is not ideal if the biological equivalent concentration is at the reporting limit. But after the initial assessment monitoring phase, it is appropriate to continue to monitor or investigate any bioactivity detected by AhR for the reasons outlined below.

Some agonists of the AhR receptor, such as 2,3,7,8- tetrachlorodibenzo-p-dioxin (TCDD), a known human carcinogen, can elicit an effect on the receptor at concentrations far below the reporting limit for the AhR assay, which is currently 0.5 ng/l. This means low concentrations of AhR agonists such as TCDD may be present, but not be reliably detected by the AhR assay.

Dr. Chan highlights in her peer review comments that,

“The MTL is higher than the health risk-based thresholds used in the US. The US EPA advises that children should not have more than 1 nanogram 2,3,7,8-TCDD per liter of water (ng/L) in 1 day or more than 0.01 ng/L per day for long-term exposure. For long-term exposure in adults, EPA recommends that there should not be more than 0.04 ng/L in drinking water. Therefore, the USEPA set the maximum contaminant level goal for dioxin at 0.00000003 mg/L or 0.03 ng/L in drinking water. ATSDR uses health guidance value for chronic oral exposure to TCDD, i.e. Minimal Risk Levels of 0.000001 μ g/day (1×10^{-6} μ g/kg/day). Therefore, someone drinking 4 L of recycled water at the recommended monitoring trigger level of 0.5 ng/L will have a daily TCDD dose exceeding these health-based guidelines.”

It is not the intent of the Amendment to have the AhR bioassay replace monitoring requirements for TCDD or other known constituents with existing health-based guidelines. But the Amendment includes the use of AhR to detect bioactivity from the various agonists of the AhR receptor. While the source of the bioactivity may be an unknown constituent, in some cases bioactivity above the reporting limit could be indicative of an impact to human health. But the potential to impact human health will be dependent on the amount of bioactivity (i.e., bioanalytical equivalent concentration) and the chemical or chemicals that is causing the activity.

Many of the agonists for ER- α and AhR (e.g., TCDD) are large, hydrophobic molecules that will primarily be associated with the particulate matter in the wastewater and removed through primary and secondary treatment. The water will then undergo further treatment processes such as microfiltration, ultrafiltration, nanofiltration, reverse osmosis, UV, AOP, and/or soil aquifer treatment to generate the recycled water for groundwater recharge or reservoir water augmentation. These treatment processes reliably result in significant reductions in total organic carbon and consequently the contaminant concentrations, resulting in the reduction or elimination of many of the ER- α and AhR agonists. There may be some bioactivity in advanced tertiary treated water prior to soil aquifer treatment, but bioactivity in the finished recycled water would be highly unexpected.

If the bioassays have bioanalytical equivalent concentrations of 10-1000 times higher than the monitoring trigger level, this would mean biological equivalent concentrations of estrogenic CECs would be 35-3,500 ng/l and biological equivalent concentrations of AhR-activating CECs could be 5-500 ng/l, in which case it would be important for a recycled water producer to follow up with additional actions to ensure adequate protection of public health.

The use of the monitoring trigger level for AhR is consistent with a conservative and precautionary approach that should be implemented to protect public health, and the monitoring trigger level of 0.5 ng/l should be used until the sensitivity of the AhR assay improves (i.e., a lower reporting limit) or there is more consensus on a health-based monitoring trigger level, at which time the monitoring trigger level in Table 9 could be updated.

Table 10 of Attachment A includes a list of response actions, but not a prescriptive framework. This allows adequate flexibility for the recycled water producer to work with the State and regional water board to identify appropriate response actions on a case-by-case basis. The response actions are intended to be investigatory follow-up to identify the source of the bioactivity. Additional actions include following up with more monitoring, conducting targeted analytical chemistry, or conducting additional diagnostics to identify the source of estrogenicity or AhR activation. Since the ER- α assay has a health-based trigger level, the response actions should appropriately investigate the source as they may be indicative of estrogenic CECs present above concentrations known to cause impacts to human health.

Cost Estimates and the Need for Monitoring Using Bioanalytical Screening Tools

The Water Boards are obligated to ensure that the burden of monitoring and reporting bears a reasonable relationship to the need for the report and the benefits obtained from it. (Wat. Code, 13267 (b)(1)). The need for monitoring with bioanalytical screening tools and the benefits obtained from this monitoring were identified by the Science Advisory Panels (Anderson et al. 2010, Drewes et al. 2018). As discussed above, the monitoring results have the potential to

provide information on unknown CECs, which is an important data gap in determining the effects of CECs in recycled water (Anderson et al. 2010, Drewes et al. 2018).

Cost estimates for the bioanalytical screening tools are given in Table 4-6, pursuant to Water Code section 13267. For commercial kits that can be purchased to perform the bioassays in-house, the fluorometer or luminometer, incubator and other equipment needed to get results from the bioassays may cost approximately \$50,000. Following the purchase of those equipment, the commercial kits cost approximately \$700-1,000 and are capable of running 5-10 samples. Commercial laboratories can perform the bioassays for approximately \$3,300-4,500 per 96-well plate, and 5-10 samples can be run per plate with calibration standards and replicates. In addition, sample extraction costs are approximately \$150-250 per sample, assuming solid-phase extraction techniques are used. The estimated costs for the first four years of monitoring and thereafter are given in Table 4-6 using the high end of the estimated ranges. There may be opportunities to decrease costs if recycled water producers are able to bundle their samples together to maximize the number of samples run on a plate or in a batch. In addition to the costs mentioned above, there may be additional costs associated with personnel training and the time to conduct the monitoring and implement the quality assurance measures. However, these costs will vary depending on the current capabilities of the laboratory. There are existing laboratories available that are currently trained to conduct the bioassays and the costs of grabbing an additional sample are minimal. Whereas if a laboratory has no experience in conducting these analyses, then the costs for establishing the lab and training personnel may be more substantial. Consequently, cost estimates for these factors were not included in Table 4-6.

Table 4-6 Cost estimates for bioanalytical screening tools

Monitoring phase	Year	Number of samples per year	Kits <i>Startup equipment cost: \$50,000</i> <i>Cost per kit: \$1,000</i> <i>Extraction cost per sample: \$250</i>	Laboratory services <i>Cost per 96-well plate: \$4,500</i> <i>Extraction cost per sample: \$250</i>
Initial assessment	1	4	\$3,000 (2 kits + 4 extractions)	\$19,000 (4 plates + 4 extractions)
	2	4	\$3,000 (2 kits + 4 extractions)	\$19,000 (4 plates + 4 extractions)
	3	4	\$3,000 (2 kits + 4 extractions)	\$19,000 (4 plates + 4 extractions)
Baseline	4	4	\$3,000 (2 kits + 4 extractions)	\$19,000 (4 plates + 4 extractions)
Subtotal for years 1-		16	\$68,000 (including startup equipment)	\$76,000
Standard operating	5 and thereafter	2	\$1,500 per year (1 kit + 2 extractions)	\$9,500 per year (2 plates + 2 extractions)

Bioanalytical Advisory Group and Next Steps

Because of the novelty of the use of bioanalytical tools as required monitoring in recycled water used for groundwater recharge or reservoir water augmentation, the Panel recommended the

State Water Board convene a Bioanalytical Advisory Group to guide permittees in implementing the bioanalytical monitoring requirements in the Amendment. The Bioanalytical Advisory Group would, “define goals for bioanalytical monitoring, specify protocols for sampling, extraction, measurement and data reporting, and provide guidance for interpretation of bioanalytical monitoring results, including QA/QC data” (Drewes et al. 2018). The State Water Board is coordinating with stakeholder groups such as WaterReuse California and California Association of Sanitation Agencies to support the development of the Bioanalytical Advisory Group. This stakeholder-driven effort will convene stakeholders, State Water Board staff, and subject-matter experts to develop consensus on a Standard Operating Procedure for the ER-α and AhR bioassays and provide other guidance on the implementation of the bioanalytical screening tools for monitoring recycled water.

The 2018 Science Advisory Panel stated that future research on bioanalytical screening tools would include developing a broader suite of *in vitro* bioassays to be used as screening indicators of a wider array of potential impacts to humans and wildlife (Drewes et al. 2018). The State Water Board is planning to fund additional research on bioanalytical screening tools to; identify a suite of additional *in vitro* bioassay candidates that could be used to screen for CECs that affect other physiological endpoints (e.g., thyroid, glucocorticoid); further develop standardized methods for multiple *in vitro* bioassays; build consensus on optimized methods, build capacity for more laboratories to conduct these analyses; and develop guidance on data interpretation for potential effects on both human health and wildlife.

4.14.3 Non-targeted Analytical Chemistry Tools

Non-targeted analytical chemistry tools include a variety of analytical techniques used to identify unknown chemicals in a sample. The most common non-targeted analytical technique is to operate mass spectrometers in a scan mode and then use databases of mass spectra and retention times to identify unknown chemicals in a given sample. Truly unknown chemicals are not in databases or mass spectral libraries, and identification of unknown chemicals would typically require additional analyses to elucidate the structure. Non-targeted analytical chemistry tools are particularly beneficial for identifying transformation products that may be generated in the recycled water treatment process that targeted chemistry is unable to detect.

Non-targeted chemical analyses do not have the ability to identify every potential chemical in a sample because the sample handling, extraction technique, analytical instrumentation, matrix effects, instrument condition (e.g., contamination), and data analysis software will all play a role in which chemicals will be detected and potentially identified. Each of these pieces may limit which chemicals are detected based on their physical-chemical properties. For example, an extraction technique can target non-polar or polar compounds, or non-volatile, semi-volatile or volatile compounds, thus limiting which compounds will be in an extract that is analyzed. Non-targeted analytical techniques are typically less sensitive than targeted analytical techniques because the extraction procedure and analytical method are not optimized for any particular chemicals. For example, a targeted chemical analysis may detect several compounds in a sample that would not be detected if the same sample was analyzed with a non-targeted analysis because the non-targeted method was not optimized and sensitive enough to detect those particular compounds at the concentrations they occurred.

Non-targeted chemical analyses can also be costly because to capture the wide array of chemicals that may occur in a sample, multiple instrumental techniques would need to be

employed, such as gas chromatography, liquid chromatography, ion chromatography, and inductively-coupled plasma mass spectrometers, and the mass spectrometers would each need to be operated in multiple modes. Non-targeted chemical analyses cannot replace targeted analytical chemistry, but they can be useful tools for exploratory research and in limited circumstances where some information is known to help narrow the range of the unknown CECs of interest.

The 2018 Science Advisory Panel discussed non-targeted analytical chemistry tools as promising tools that with further development may be useful in analyzing recycled water but did not recommend routine monitoring with non-targeted techniques. The 2018 Science Advisory Panel suggested that non-targeted analytical chemistry tools could be used on a voluntary basis as a follow-up action for *in vitro* bioassay detections. Because this recommendation is for voluntary use of non-targeted analyses, it was not included in the Amendment. However, a first step in identifying bioactive CECs in a sample would likely be to do targeted chemical analysis for known CECs that bind to the receptor of the bioassay, and then if there are still unknown chemicals after that, to follow-up with non-targeted analyses. When there is detection of bioactivity in an *in vitro* bioassay, there is some knowledge of what types of chemicals may be causing the bioactivity, which then limits the types of non-targeted analyses that would need to be employed to potentially identify the CECs in a sample. Thus, some permittees may voluntarily choose to use non-targeted analyses as follow-up to bioactivity detections if they are interested in identifying unknown CECs causing the bioactivity.

4.14.4 Quality Assurance Project Plan

One of the significant amendments to Attachment A was the emphasis on ensuring data quality associated with CEC Monitoring to ensure data are of known, consistent, and documented quality and to verify that the laboratory can meet the required reporting limits for the targeted CECs and bioanalytical results. Quality assurance should start at a program level and be implemented at a project level. Attachment A now includes a requirement for a recycled water producer to develop a quality assurance project plan (QAPP) for a recycled water treatment plant generating recycled water for groundwater recharge or reservoir water augmentation and submit it to the regional water board. The regional water board may consult with State Water Board staff in the Office of Information Management and Analysis (OIMA) or the Division of Drinking Water on the various components in the QAPP and the State Water Board or regional water board could approve the QAPP.

A QAPP is a 24-element document describing in comprehensive detail the necessary Quality Assurance, Quality Control, and other technical activities that must be implemented by the recycled water producer to ensure that the results of the CEC monitoring will satisfy the stated performance criteria, including the reporting limits in Tables 1 and 3 of Attachment A. The Amendment requires a recycled water producer to develop a QAPP using the Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-2/009, 2002) found here:

<https://www.epa.gov/sites/production/files/2015-06/documents/g5-final.pdf>

For additional guidance and direction on developing a QAPP, the recycled water producer can contact the State Water Board's Quality Assurance Officer or navigate to the State Water Board's QAPP webpage:

https://www.waterboards.ca.gov/water_issues/programs/quality_assurance/qapp.html.

The Principal Data Users and Decision Makers include the State Water Board, regional water boards, the recycled water facilities, and possibly others. Depending on the recycled water facility, others may be involved and will be identified in each QAPP. The State Water Board will work with the regional water boards and stakeholders to develop data quality objectives, data quality indicators, and other relevant portions of the QAPP for the CEC Monitoring Parameter in Attachment A.

Selection of Analytical Methods

Attachment A provides specific direction on three specific sections under the QAPP section, Selection of Analytical Methods, Laboratory Selection and Demonstrations of Competency, and Data Submission, which was in response to requests from stakeholders to provide additional direction in these areas. For the Selection of Analytical methods, sections 4.14.1 and 4.15.2 of the Staff Report and the Panel's final report include additional guidance and discussion on method selection. In the Amendment, the section on selection of analytical methods only applies to the CEC monitoring parameters included in Attachment A. If the State Water Board requires monitoring for other CECs or other constituents than those listed in Attachment A, it will provide additional guidance on selection of analytical methods.

The QAPP will need to include minimum method validation requirements developed by the regional water board in consultation with the State Water Board if proposing to (1) use a method that has not been approved and validated, (2) use an approved and validated method that has been modified, or (3) use a method for an application that is outside the intended use of the method (e.g., different matrix, new analyte). Additional method validation guidance, see [Standard Methods 1040 B,C](#) or the [Clean Water Act Alternative Test Procedure \(ATP\) protocols](#).

The State does not currently have the resources to develop analytical methods for CECs or conduct interlaboratory calibration studies to approve the analytical methods for statewide use. However, the State Water Board can use the data from the method validation studies from multiple laboratories to approve the method for statewide use.

Laboratory Selection and Demonstrations of Competency

Another key component of data quality is ensuring the analytical laboratories conducting the testing can demonstrate competency in conducting the analyses. ELAP can accredit laboratories to analyze the CEC Monitoring Parameters using any method that has been validated and approved for use by the regional water board, State agency partners, U.S. EPA, or a consensus standard body such as the Standards Methods Committee or the American Society for Testing and Materials International. As the constituents in Table 1 and 3 of Attachment A are emerging, some of the methods have not been validated or approved for the analytes in the applicable matrix. Consequently, ELAP does not currently accredit laboratories for analyzing the constituents in Table 1 or 3.

Even though ELAP does not currently accredit for the constituents in Tables 1 and 3, it is still important to monitor for the CEC Monitoring Parameters as the Panel recommended monitoring them based on the fact there are analytical methods available, quality assurance measures can be implemented to generate quality data, and because of the fundamental importance of

screening potable recycled water CECs with known risks to human health. Furthermore, absence of availability of ELAP accreditation does not preclude a program or laboratory from being able to successfully monitor and generate quality data that are reliable, repeatable, accurate, and precise. The provisions in section 1.2 of Attachment A are intended to highlight specific components that should be included in the QAPP to ensure the laboratories selected to conduct the analyses can meet the reporting limits and generate quality data. A recycled water program should also implement a Quality Management Program.

CEC monitoring should be done by laboratories with ELAP accreditation for a similar analytical method, instrumentation or analyte until ELAP accreditation becomes available. As ELAP accreditation becomes available for methods or analytes, the recycled water should use an ELAP accredited lab that has a certificate for the fields of testing in Tables 1 and 3. The Amendment provides flexibility for recycled water producers to use labs that do not have ELAP accreditation for the CEC monitoring parameters in Table 1 and Table 3, while still holding the laboratories to achieve the data quality objectives that will ensure good data quality.

As more methods are validated and approved for use as described in the Analytical Method selection above, ELAP can evaluate if moving down the accreditation path is appropriate for the CEC Monitoring Parameters. As we re-evaluate the list of CECs in future assessments, some of the CECs will no longer be found in the environment (e.g., product bans, replacement pharmaceuticals), other CECs will persist. As we saw in the time since the Panel was last convened in 2010, five chemicals (17-beta estradiol, caffeine, iopromide, N-N diethyl-meta-toluidine (DEET), and triclosan) were removed from the list of targeted chemistry monitoring. CEC monitoring programs need to include adequate flexibility for adding and removing CECs from the list of testing parameters. The State will need to focus their efforts to validate and approve analytical methods and go through the process to offer ELAP accreditation for CECs that are expected to persist and certainly for those that have notification levels (e.g., PFOS, PFOA, NDMA), maximum contaminant levels, or water quality objectives. This is an appropriate approach considering the transient nature of CECs and the State's resource limitations.

Data Submission

Prior to this Amendment, data from the groundwater recharge projects was submitted to the regional water boards in pdf reports. The pdf reports are publicly available through the Water Boards' data systems. However, the CEC monitoring data are not easily accessible or analyzed. On July 10, 2018, the State Water Board adopted [Resolution No. 2018-0032](#) "Adopting Principles of Open Data as a Core Value and Directing Programs and Activities to Implement Strategic Actions to Improve Data Accessibility and Associated Innovation," The resolution emphasizes the importance of open data principles commits the Water Boards to provide broader access to the data used to make local, regional and statewide water management and regulatory decisions in California. Consistent with Resolution 2018-0032, the Amendment includes a requirement to electronically report the CEC monitoring data to a database identified by the State Water Board.

4.14.5 Antibiotic Resistant Bacteria and Antibiotic Resistance Genes

Antibiotic resistant bacteria (ARB) and antibiotic resistance genes (ARGs) are a concern for public health that is not limited to recycled water. Bacteria exposed to antibiotics can develop resistance, and their resistance genes may also be disseminated in the environment after the

bacteria die. There are many sources of ARB and ARGs in the environment and recycled water is one potential source. The 2016 Direct Potable Reuse Expert Panel conducted a literature review on ARB and ARGs and concluded that recycled water was not a significant disseminator of ARB and ARGs relative to other sources (Olivieri et al. 2016). Similarly, the 2018 Science Advisory Panel concluded that the limited information available on ARB and ARGs in recycled water does not indicate that recycled water applications that comply with existing regulations cause antibiotic resistance transmission. The 2018 Science Advisory Panel emphasized the need for additional research and included specific recommendations for further studies that would improve risk assessment of ARB and ARGs in recycled water in California. The Panel did not recommend monitoring for ARB/ARGs in recycled water due to the uncertainty in this field of research and how to apply the results. Standard monitoring protocols and guidance on data interpretation would need further development before being implemented in routine monitoring at recycled water treatment facilities. This field of science is progressing, and the World Health Organization has an analytical method for monitoring ARB/ARGs in water and wastewater, but there is not a risk assessment framework for ARB/ARGs, and the Panel did not make recommendations for monitoring ARB or ARGs in recycled water.

The Amendment does not include monitoring requirements for ARB/ARGs in recycled water. The State Water Board will continue to track research in this area through the Recycled Water Research Program. For example, the State Water Board is funding recycled water research in collaboration with The Water Research Foundation, including addressing "The Use of Next Generation Sequencing (NGS) and Metagenomics Approaches to Evaluate Anti-Microbial Resistance, Plant Challenge, and Biological Removal Processes" (Reuse PD 18-10). The State Water Board encourages utilities to start collecting ARB/ARG data and for the scientific community to make further progress towards establishing the risk assessment framework for ARB/ARGs. Additionally, the State Water Board could collaborate with utilities to fund a pilot study to begin monitoring for ARB/ARGs to establish a baseline and to make progress towards the recommendations of Olivieri et al. 2016 and Drewes et al. 2018. After further progress is made in this field, the State Water Board could require monitoring for ARB/ARGs under its existing authorities (e.g., Water Code section 13267), reconvene the Panel to make recommendations for ARB/ARGs monitoring, and then consider including monitoring requirements for ARB/ARGs in recycled water.

4.14.6 Programmatic Changes to Address CECs and the CEC Initiative

The 2018 Science Advisory Panel also made recommendations for institutional changes within the Water Boards, which are summarized below:

- Develop a more flexible and responsive program to update CEC monitoring recommendations in response to rapidly emerging science, technology advances, and monitoring data collected.
- Develop internal protocols for State Water Board Division of Drinking Water staff review and response to CEC and bioanalytical data, source control data, and high-frequency operation monitoring data.
- Develop internal protocols for State Water Board staff to:
 - o Collect CEC monitoring data from within California and from other jurisdictions;
 - o Refine and update monitoring trigger levels (health-based levels of concern);

- o Compare monitoring data to trigger levels to provide recommendations on CECs that should be removed or added from monitoring requirements;
 - o Collect and review data from treatment process and special studies;
 - o Review high production volume chemical data to potentially identify new CECs to evaluate with the framework.
- Consider requiring broader screening of CECs in recycled water to better inform the framework for providing monitoring recommendations.
- The State Water Board Division of Drinking Water (rather than the regional water boards) should issue permits for potable reuse of recycled water.
- Issue drinking water permits for potable reuse projects that include enhanced source control measures.
- Develop a data management system for potable water facility monitoring data and require consistent permittee electronic reporting requirements.
- Develop internal staff and external utility communication protocols.
- Provide an annual report summarizing performance of potable reuse projects.
- Reconvene a Science Advisory Panel every 3 years to review proposed changes to CEC monitoring, make further recommendations for the use of the framework, and review the potable reuse program implementation.
- Convene a Bioanalytical Advisory Group.

CEC Initiative and Next Steps

The State Water Board and regional water boards have been conducting work associated with CECs for a number of years. The State Water Board and regional water boards have been developing a CEC Initiative to coordinate CEC monitoring activities across the state and develop and implement a program that can address CEC issues in response to the evolving science. One of the primary goals of the CEC Initiative is to develop a statewide management strategy to address CECs that includes both recycled water as well as ambient waters. Several regional water boards have performed or required CEC monitoring studies in wastewater effluents and surface waters, and several other regions are currently planning to conduct CEC monitoring studies in surface waters.

The Water Boards can implement the programmatic recommendations of the 2018 Science Advisory Panel and future Panels through the CEC Initiative, the Recycled Water Research Program, and eventually, the CEC Program. The Science Advisory Panel recommended reconvening the Panel every 3 years, however the Amendment includes a provision to reconvene the Panel every 5 years. The State Water Board can currently commit to reconvening the Panel every five years based on the current resources allocated to the CEC Program. However, if additional resources become available, the State Water Board could convene the Panel more frequently.

The State Water Board is currently partnering with the Ocean Protection Counsel to reconvene a Science Advisory Panel in 2019 to make CEC monitoring recommendations for aquatic ecosystems including enclosed bays, estuaries, inland surface water, and ocean waters. The State Water Board can use the recommendations in this report to make decisions regarding the developing a marine and inland surface waters CEC monitoring protocol that is protective of aquatic health.

In addition to these recommendations, the State Water Board could collaborate with utilities on a pilot study to screen for ARB/ARGs in recycled water. The goal of the pilot study would be to pilot the ARB/ARG analytical methods, establish baseline ARB/ARG conditions, and work towards developing a risk assessment framework for evaluating the monitoring data. However, much of this work is already occurring and it is likely a better use of the State Water Board's limited research resources to wait until more data is available, further progress is made towards the risk assessment framework, and the Panel makes ARB/ARG monitoring recommendations before amending the Policy to include ARB/ARG monitoring requirements.

No fair argument exists that updating CEC monitoring requirements and the resulting sample collection and analysis that would occur could result in any reasonably foreseeable significant adverse environmental impacts. The CEC monitoring requirements require sampling of recycled water and analytical and bioanalytical analyses on these samples, which are not expected to result in any direct or indirect impacts to the physical environment.

4.15 Maximizing Consistency in the Permitting of Recycled Water Projects

A new section is included in the Amendment titled "Maximizing Consistency in the Permitting of Recycled Water Projects." This section contains two subsections, one regarding CEC permit provisions and the other regarding reviewing and updating recycled water permits.

4.15.1 CEC Permit Provisions

This section of the Policy was moved from the CECs section of the Policy because it pertains to permitting consistency for CEC monitoring requirements. This section states that permits for recycled water projects be consistent with any monitoring requirements established in Attachment A. Monitoring requirements for CECs will need to be updated in applicable existing groundwater recharge permits. The resolution adopting the Amendment will direct the State Water Board's Executive Director to issue an order pursuant to Water Code section 13267 and Water Code section 13383 to update the monitoring and reporting programs of applicable groundwater recharge permits to be consistent with the requirements for CEC monitoring in the Amendment.

4.15.2 Regional Water Board General Orders

In order to maximize statewide consistency in permitting recycled water projects, the Amendment terminates coverage under regional water board general orders for non-potable uses of recycled water by three years from the effective date of the Amendment. Where an enrollee under an existing regional water board general order for non-potable recycled water use has a Title 22 Engineering Report approved after January 1, 2001 by the State Water Board Division of Drinking Water (formerly the Department of Public Health, Drinking Water Program), the Amendment requires the applicable regional water board to transition the enrollee to Order WQ 2016-0068-DDW or another order as appropriate, within one year of the effective date of the Amendment.

Prior to the adoption of statewide general orders for recycled water use, such as Order WQ 2009-0006-DWQ and Order WQ 2016-0068-DDW, some regional water boards developed general WDRs for the use of recycled water. For example, the San Francisco Bay Regional Water Quality Control Board adopted Order 96-011, General Water Reuse Requirements for producers and distributors of recycled water, under which producers can authorize specific non-

potable recycled water projects that meet the criteria of the order. Another regional water board general order is the Colorado River Regional Water Quality Control Board's Order 97-700, General WDRs for Discharge of Recycled Water for Golf Course and Landscape Irrigation.

These regional water board orders for the use of recycled water were adopted prior to the adoption of Order WQ 2016-0068-DDW and vary in permit conditions, protection of water quality, and consistency with the Policy and with California Code of Regulations, title 22. Order WQ 2016-0068-DDW was adopted to create statewide consistency in the permitting of recycled water projects and to better manage limited staff resources and improve efficiency for permittees by reducing redundancy in permit development. In adopting Order WQ 2016-0068-DDW, the State Water Board stated its intention that regulatory coverage under existing regional water board general orders for the non-potable use of recycled water be terminated within three years of adoption of the order (i.e., June 7, 2019), and that, if appropriate, the regional water board transition those enrollees to be covered under Order WQ 2016-0068-DDW. It is generally expected that enrollees of regional water board general orders are eligible to transition to Order WQ 2016-0068-DDW. However, regional water boards maintain their authority to choose the most appropriate permitting mechanism for each recycled water project. A tiered timeline for when enrollees of regional water board general orders must be transitioned prioritizes permits so that regional water boards are not tasked to transition all enrollees at once. Regional water boards will work with enrollees to ensure timely transition from regional water board general orders occurs prior to the deadlines established in the Amendment. Language in the Amendment to terminate coverage under regional water board general orders for non-potable recycled water uses will make the Policy consistent with the State Water Board's intent and with the purpose of the Policy to provide direction to the regional water boards and recycled water project proponents on appropriate permitting of recycled water projects.

The Amendment does not terminate the San Diego Regional Water Quality Control Board's Order R9-2014-0041, Conditional Waivers of WDRs for Low-Threat Discharges in the San Diego Region. Order R9-2014-0041 includes Waiver 2: Discharges to Land of Recycled Water, which authorizes the use of recycled water for short-term recycled water projects of less than 365 days. Terminating this conditional waiver was not included in the Amendment because it covers both treatment and use of recycled water, unlike Order WQ 2016-0068-DDW, which only authorizes use of recycled water. Thus, enrollees of the conditional waiver would not be eligible to enroll in Order WQ 2016-0068-DDW. Order R9-2014-0041 serves the purpose of allowing permittees to operate their recycled water facility for up to 365 days while the regional water board is in the process of developing a master recycling permit.

Rescinding regional water board general orders and conditional waivers for non-potable uses will not result in significant adverse environmental impacts and does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment because recycled water projects enrolled under the general orders and conditional waivers will be transitioned to different orders or permits. Changing the permitting of a recycled water project will not result in adverse environmental impacts because all orders and permits issued by the Water Boards are designed to protect water quality and each order or permit also goes through an environmental analysis in compliance with CEQA.

4.15.3 Permit Review

Regional water boards have historically permitted recycled water projects under site-specific WDRs, waivers of WDRs, WRRs, master recycling permits, and/or amendments to NPDES permits (hereafter collectively termed “permits”) in lieu of enrolling permittees under regional or statewide general orders. Since many of these permits are not frequently updated, some recycled water facilities have permit requirements that may not be consistent with the requirements of the Uniform Statewide Recycling Criteria or the Policy. For example, the Uniform Statewide Recycling Criteria found in California Code of Regulations, title 22 were last updated effective January 1, 2001. Therefore, monitoring and reporting programs and/or permit requirements for recycled water projects issued prior to that date may not be consistent with the Uniform Statewide Recycling Criteria.

State Water Board Resolution No. 2016-0061 directs staff to update the Policy considering: “a recommendation for a time schedule for regional water boards to review orders and permits issued to recycled water projects prior to the adoption of Order WQ 2016-0068-DDW to ensure compliance with the Policy and to make a determination on whether they should be renewed and if appropriate enroll them under the statewide general order.”

To address this directive, the Amendment would require that by three years from the effective date of the Amendment:

- (1) The State Water Board review all Title 22 Engineering Reports for recycled water permits issued prior to January 1, 2001 for consistency with the Uniform Statewide Recycling Criteria and other applicable regulations
- (2) Regional water boards review all recycled water permits and update any recycled water permits and/or monitoring and reporting programs that are inconsistent with (1) the Policy (details below), (2) an approved Title 22 Engineering Report per the State Water Board's Division of Drinking Water or (3) the applicable Basin Plan. The regional water boards shall enroll permittees in Order WQ 2016-0068-DDW or its successor if appropriate.
- (3) The regional water boards prioritize updating orders, permits and/or monitoring and reporting programs that were issued prior to January 1, 2001 or are located in basins identified as needing a SNMP.

Completing a review of all existing permits for recycled water projects represents a potentially significant effort on the part of State Water Board and regional water board staff. However, the process can be streamlined by identifying the highest priority permits that are most likely out of compliance with the Policy and existing regulations. To accomplish this, State Water Board Division of Drinking Water staff would review Title 22 Engineering Reports for recycled water permits issued prior to January 1, 2001 for consistency with California Code of Regulations, title 22. Title 22 Engineering Reports approved prior to January 1, 2001 may not be consistent with current monitoring requirements, such as for daily total coliform monitoring of disinfected secondary-23, disinfected secondary-2.2, and disinfected tertiary recycled water, which could present a risk to public health. If a Title 22 Engineering Report is inconsistent with current regulations or was never written for an existing recycled water permit (which may be the case for some pre-2001 permits), the permittee would be required to submit an updated Title 22 Engineering Report.

Once the Title 22 Engineering Report has been reviewed, updated if needed, and approved by Division of Drinking Water, then Division of Drinking Water would notify the applicable regional water board, which would then review the applicable permit and/or monitoring and reporting requirements and enroll the recycled water project under Order WQ 2016-0068-DDW, if applicable. For facilities that are not eligible to enroll under the statewide general order, the regional water board would review the permit requirements for consistency with the (1) approved Title 22 Engineering Report, (2) Policy, and (3) applicable Basin Plan. To evaluate consistency with the Policy, the regional water board would assess whether each recycled water permit is consistent with the following elements of the Amendment:

1. The CEC monitoring requirements in Attachment A, i.e., monitoring for targeted CECs and using bioanalytical screening tools for groundwater recharge projects and reservoir water augmentation projects
2. A prohibition of the escape of surface runoff into surface water bodies unless authorized by WDRs, waivers of WDRs, or conditional prohibitions (e.g., those regulating agricultural discharges from irrigated lands)
3. Removal of priority pollutant monitoring requirements for landscape irrigation and groundwater recharge projects
4. Removal of recycled water production, use, and potential reporting requirements that conflict with the requirements set forth in the Amendment
5. Direction to develop or participate in developing an SNMP if the recycled water project is in a basin the regional water board has identified as needing an SNMP.

The regional water boards would update any permits to include all requirements needed to be consistent with the Amendment, the applicable Basin Plan, and any applicable permit conditions or monitoring and reporting requirements recommended by Division of Drinking Water in its approval of the Title 22 Engineering Report.

The regional water boards would also identify all permittees enrolled under regional water board general orders or conditional waivers for non-potable uses of recycled water and will transition those permittees to Order WQ 2016-0068-DDW where applicable. Further discussion on transitioning coverage from existing regional water board general orders and conditional waivers to Order WQ 2016-0068-DDW or other applicable statewide general order is in 4.15.2.

Establishing a time schedule to review existing recycled water permits and orders would not result in a significant adverse environmental impact because it does not involve a change to the physical environment or a reasonably foreseeable indirect physical change in the environment. The actions that may result from this provision include additional permittees enrolling in the statewide general order, which would not require additional environmental analysis, or updating individual site-specific orders, which would require environmental analysis prior to being adopted by regional water boards.

4.16 Incentives for the Use of Recycled Water

The Amendment does not include the section titled “Incentives for the Use of Recycled Water” that is in the Policy. This reasons for removing this section are described below for each subsection.

The “Funding” subsection was removed because funding for projects from DWR is already included in the “State Agency Roles” section, funding for stormwater recharge projects is deferred to the Storm Water Strategy, and the point regarding use of the State Revolving Fund is simply stating the status quo and does not need to be re-stated in the Policy.

The subsection titled “Stormwater” was removed to maintain a focus on recycled water in the Policy and defer stormwater management to the Storm Water Strategy, which focuses on improving the regulation, management, and utilization of California’s stormwater resources.

The “TMDLs” subsection was removed because developing a total maximum daily load includes identifying sources and assigning wasteload allocations in a manner that is consistent with their flow and loading, and must be consistent with the Clean Water Act provisions regarding TMDLs. If a wastewater source was planning to reduce their discharge due to recycling in the future, they participate in the public process to adopt a TMDL and work with the regional water board to include that potential change in the wasteload allocations.

No fair argument exists that removing the “Incentives for the Use of Recycled Water” section from the Policy could result in any reasonably foreseeable significant adverse environmental impacts because removing this section is not expected to result in any direct or indirect impacts to the physical environment.

5 Analysis of Potential Adverse Environmental Effects

Project Summary

5.1.1 Project Title

Amendment to the Policy for Water Quality Control for Recycled Water

5.1.2 Lead Agency Name and Address

State Water Resources Control Board – Division of Water Quality

1001 I Street Sacramento California 95814

5.1.3 Contact Person and Phone Number

Ms. Laura McLellan, Environmental Scientist

Email Laura.McLellan@Waterboards.ca.gov

Phone (916) 319-8288

5.1.4 Project Location

The Amendment would apply to the entire State of California.

5.1.5 Project Description

The Amendment to the Policy for Water Quality Control for Recycled Water will update monitoring requirements for CECs, reflect recent regulatory developments and advancements in the field of recycled water, and update or clarify guidance on SNMPs. A detailed discussion of the project description is given in Section 4. The specific section of the Amendment that is the focus of the environmental analysis is section 7.3.2 Criteria for streamlined permitting. Section 7.3.2 of the Amendment provides criteria that, if met, would allow for a non-potable recycled

water project to be permitted without further antidegradation analysis. Streamlined permitting and antidegradation analysis for non-potable recycled water projects are further described in 1.1.1.1.

5.1.6 Project Goals

The goals for the Amendment are:

1. Support the increased development and use of recycled water in a manner that protects the environment and public health as one piece of a broader strategy to mitigate the effects of long-term drought, climate change, and water supply uncertainty.
2. Amend the Recycled Water Policy to reflect:
 - a. The changing regulatory aspects of recycled water production and use in California including changes to California Code of Regulations, title 22 and other applicable regulations
 - b. Findings from an evaluation of the challenges and benefits of SNMP development
 - c. Recommendations of the second CEC Science Advisory Panel.
3. Clarify, streamline, and provide statewide consistency for permit requirements for recycled water.

5.1.7 Project Necessity

Streamlined permitting for non-potable recycled water projects is included in the Amendment because it supports the achievement of project goal 3, “clarify, streamline, and provide statewide consistency for permit requirements for recycled water.” This section of the Amendment recognizes that regional water boards may select other regulatory mechanisms besides Order WQ 2016-0068-DDW, and provides streamlined permitting by allowing a project to be permitted without further antidegradation analysis.

5.1.8 Native American Tribal Consultation

Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code section 21080.3.1? If so, has consultation begun?

Executive Order B-10-11 provides that it is the policy of the administration of the Governor of the State of California that every state agency encourage consultation and communication with California Tribes and permit tribal governments to provide meaningful input in the development of regulations, rules, and policies that may affect tribes.

California State Assembly Bill (AB) 52 (Gatto 2014) established a new category of resources in CEQA called Tribal Cultural Resources:

“Tribal Cultural Resources are either of the following: (1) Sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are either of the following: (A) Included or determined to be eligible for inclusion in the California Register of Historical Resources. (B) Included in a local register of historical resources as defined in subdivision (k) of Section 5020.1. (2) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Section 5024.1. In applying the criteria set

forth in subdivision (c) of Section 5024.1 for the purposes of this paragraph, the lead agency shall consider the significance of the resource to a California Native American tribe. (Pub. Resources Code, § 21074)”

The Public Resource Code includes a consultation process with California Native American tribes. Consultation with a California Native American tribe that has requested such consultation may assist a lead agency in determining whether the project may adversely affect tribal cultural resources, and if so, how such effects may be avoided or mitigated. The Public Resources Code requires formal notice to California tribes of an opportunity to consult with the lead agency prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report if the tribe is traditionally and culturally affiliated with the geographic area of the proposed project.

The requirements to consider tribal cultural resources and to consult with California tribes apply to CEQA projects for which the lead agency issues a notice of preparation or a notice of intent to adopt a negative declaration or mitigated negative declaration, or EIR on or after July 1, 2015. The Board considers AB 52’s requirements as also applying to an SED.

In addition to the focused public outreach described above, letters were to California Native American Tribes on March 15, 2018, including all of the California tribes who, at the time, requested to receive AB 52 notices. Formal consultation was requested by four tribes, the San Manuel Band of Mission Indians, the Federated Indians of Graton Rancheria, the Ohlone/Costanoan-Esselen Nation, and the United Auburn Indian Community of the Auburn Rancheria. Board staff subsequently responded with letters describing specific impacts of the Amendment. None of the tribes requested any changes to the Amendment.

5.2 Environmental Checklist

5.2.1 Evaluation of the Environmental Impacts in the Checklist

1. The board must complete an environmental checklist prior to the adoption of plans or policies for the Basin/208 Planning program as certified by the Secretary for Natural Resources. The checklist becomes a part of the SED.
2. For each environmental category in the checklist, the board must determine whether the project will cause any adverse impact. If there are potential impacts that are not included in the sample checklist, those impacts should be added to the checklist.
3. If the board determines that a particular adverse impact may occur as a result of the project, then the checklist boxes must indicate whether the impact is “Potentially Significant,” “Less than Significant with Mitigation Incorporated,” or “Less than Significant.”
 - a. “Potentially Significant Impact” applies if there is substantial evidence that an impact may be significant. If there are one or more “Potentially Significant Impact” entries on the checklist, the SED must include an examination of feasible alternatives and mitigation measures for each such impact, similar to the requirements for preparing an EIR.
 - b. “Less than Significant with Mitigation Incorporated” applies if the board or another agency incorporates mitigation measures into the SED that will reduce an impact that is “Potentially Significant” to a “Less than Significant Impact.” If the board

does not require the specific mitigation measures itself, then the board must be certain that the other agency will in fact incorporate those measures.

- c. "Less than Significant" applies if the impact will not be significant, and mitigation is therefore not required.
 - d. If there will be no impact, check the box under "No Impact."
4. The board must provide a brief explanation for each "Potentially Significant," "Less than Significant with Mitigation Incorporated," "Less than Significant," or "No Impact" determination in the checklist. The explanation may be included in the written report described in section 3777, subdivision (a)(1) or in the checklist itself. The explanation of each issue should identify: (a) the significance criteria or threshold, if any, used to evaluate each question; and (b) the specific mitigation measure(s) identified, if any, to reduce the impact to less than significant. The board may determine the significance of the impact by considering factual evidence, agency standards, or thresholds. If the "No Impact" box is checked, the board should briefly provide the basis for that answer. If there are types of impacts that are not listed in the checklist, those impacts should be added to the checklist.
 5. The board must include mandatory findings of significance if required by CEQA Guidelines section 15065.
 6. The board should provide references used to identify potential impacts, including a list of information sources and individuals contacted.
 7. Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.
 8. This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected. Association of Environmental Professionals 2017 CEQA Guidelines Appendices 284.
 9. The explanation of each issue should identify:
 - a) the significance criteria or threshold, if any, used to evaluate each question; and
 - b) the mitigation measure identified, if any, to reduce the impact to less than significance.

5.2.2 Explanation of Checklist

The checklist identifies those impacts representing the Amendment to the Policy for Water Quality Control for Recycled Water project and does not provide a detailed evaluation of a particular water recycling facility. The Amendment does not change the recycled water goals from the existing Policy, and thus is not expected to result in increased development of recycled water facilities, thus potential environmental impacts of particular water recycling facilities is not included in the environmental checklist.

5.2.3 Environmental Checklist for the Amendment to the Policy

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS				
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

- a. The Amendment is not expected to result in the development of more recycled water projects than the status quo conditions. The construction of any new facility with the potential to affect aesthetics would be subject to CEQA on an individual case-by-case basis, and potential impacts to scenic vistas would be evaluated at that time.
- b. Recycled water may be used for landscape irrigation, including irrigation of landscape within a state scenic highway. Irrigation of a salt-sensitive tree with certain recycled water could damage the tree. This potential would be evaluated before initiating the irrigation, as specified in the Amendment, which requires consideration of unusual circumstances. In addition, the Amendment would require irrigators to use fertilizers appropriately, after taking into account nutrient levels in the recycled water. The potential impact to scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway is less than significant.
- c. The Amendment is not expected to result in the development of more recycled water projects than the status quo conditions. New recycled water facilities could affect the existing visual character or quality of a site and its surroundings. Any potential effect is speculative but would be subject to CEQA on an individual case-by-case basis, and potential impacts to scenic vistas would be evaluated at that time.
- d. The Amendment is not expected to result in the development of more recycled water projects than the status quo conditions and would not create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

II. AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Boards. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

The Amendment will not result in the loss or conversion of farmland or conflict with existing timber or forest zoning because the Amendment does not by itself permit recycled water facilities and is not expected to result in the development of more recycled water projects than the status quo conditions. As determined on a case-by-case basis, water recycling facilities in general may adversely impact agriculture or forest resources, however, these impacts would not be caused directly or indirectly by the Amendment. The construction and operation of water recycling facilities could cause impacts to agriculture or forest resources that are unrelated to the Amendment.

- The Amendment is not expected result in converting farmland to non-agricultural uses.
- The Amendment is not expected to conflict with existing zoning for agricultural use or a Williamson Act contract.
- The Amendment is not expected to conflict with existing zoning for or cause rezoning of forest land or timberland.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
d. The Amendment is not expected to result in the loss of forest land or conversion of forest land to non-forest use.				
e. The Amendment is not expected to result in changes in the existing environment that could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.				

III. AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

The Amendment will not result in significant impacts to air quality.

- Recycled water projects implemented in accordance with the Amendment are not expected to conflict with or obstruct implementation of the applicable air quality plan.
- Recycled water projects implemented in accordance with the Amendment are not expected to violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Recycled water projects implemented in accordance with the Amendment are generally not expected to result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard.
- Recycled water projects implemented in accordance with the Amendment are generally not expected to expose sensitive receptors to substantial pollutant concentrations compared to the status quo conditions.
- Recycled water projects implemented in accordance with the Amendment are generally not expected create objectionable odors compared to the status quo conditions.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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IV. BIOLOGICAL RESOURCES

Would the project:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

The Amendment will not result in significant impacts to biological resources.

- a. Recycled water could potentially be used to develop land that is habitat for candidate, sensitive, or special status species. Predicting any potential impacts from such development would be speculative. However, any development would be analyzed under CEQA and subject to regional plans, policies, and regulations.
- b. Recycled water could be used to develop land within a riparian habitat. However, predicting any potential impacts from such development would be speculative. Any development would be analyzed under CEQA and subject to regional plans, policies, and regulations.
- c. The Amendment is not expected to result in direct removal, filling, hydrological interruption, or other adverse effects on wetlands.
- d. A recycled water irrigation site could be proposed to be located within a migratory corridor. See IV.a. above for discussion of potential impacts.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Recycled water projects implemented in accordance with the Amendment are not expected to conflict with local policies or ordinances.				
f. The Amendment does not conflict with any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or any other local, regional, or state habitat conservation plan.				

V. CULTURAL RESOURCES

Would the project:

a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

The Amendment will not affect historical, archeological, or paleontological, geologic features or human remains because the Amendment will not directly result in construction or earth-moving activities. As determined on a case-by-case basis, water recycling facilities may adversely impact cultural resources. However, these impacts would not be caused directly or indirectly by the Amendment.

VI. GEOLOGY AND SOILS

Would the project:

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

- a. The Amendment does not result in increased risk associated with geologic hazards such as ground shaking, ground failure or increased potential for soil erosion because the Amendment will not directly result in any construction or earth-moving activities. As determined on a case-by-case basis, the siting, design and location of individual water recycling facilities will need to consider these factors to address and minimize the potential risks associated with soils and geologic conditions onsite. However, these impacts would not be caused directly or indirectly by the Amendment.
- b. See (a) above.
- c. See (a) above.
- d. See (a) above.
- e. The Amendment is not expected to result in soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available..

VII. GREENHOUSE GAS EMISSIONS

Would the project:

a) Generate Greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒

The Amendment will not result in significant greenhouse gas emissions.

- a. The operation of wastewater treatment facilities and the infrastructure necessary to convey recycled water (e.g., pumps, back-up systems, etc.) may generate greenhouse gasses, including carbon dioxide and methane. While recycled water production, distribution and use contributes a small amount of emissions, the Amendment would not affect the volume of existing production, most of which occurs

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
at the wastewater treatment facilities, not the point of use.				
b. The Amendment will not conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. As determined on a case-by-case basis, the siting, design and location of individual water recycling facilities will need to consider any applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases. However, these impacts would not be caused directly or indirectly by the Amendment.				

VIII. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

The Amendment will not directly or indirectly create a significant hazard to the public, result in increased emissions or cause a project to be located on a hazardous waste site. As

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
determined on a case-by-case basis, the siting, design and location of individual water recycling facilities will need to consider these factors to address and minimize the potential hazards and the use of, or exposure to hazardous materials by onsite workers and the public working and residing in the area. However, these impacts would not be caused directly or indirectly by the Amendment.				
a. The Amendment is not expected to create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials because the Amendment is not expected to result in additional recycled water facilities compared to the status quo conditions. In the status quo conditions, water recycling facilities may use chlorine gas or sodium hypochlorite for disinfection, which are hazardous materials. Use of these materials, however, is subject to hazardous material regulations and inspection by local regulatory agencies.				
b. The Amendment is not expected to directly impact hazards and hazardous materials.				
c. See (b) above.				
d. See (b) above.				
e. See (b) above.				
f. See (b) above.				
g. See (b) above.				
h. See (b) above.				

IX. HYDROLOGY AND WATER QUALITY

Would the project:

a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
water drainage systems or provide substantial additional sources of polluted runoff?				
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒

- a. The Amendment is not expected to result in violations of water quality standards or waste discharge requirements. The goal of the Amendment is to support the development and use of recycled water in a manner that protects the environment and public health. Protection of the environment includes ensuring that recycled water is used in a manner that does not violate water quality standards. Because basin plans include all water quality standards applicable to a basin, if the regional water board finds that a recycled water project may violate the water quality standards, then it would not be permitted.
- b. Use of recycled water may be a substitute for groundwater use and groundwater recharge reuse projects directly augment groundwater supplies. Hence, the Amendment may help prevent the reduction of groundwater supplies.
- c. It is possible that a golf course or other landscape area whose construction is facilitated by the availability of recycled water could alter drainage patterns. Turf, however, is relatively permeable. Hence, it is unlikely that this type of facility would greatly increase runoff from the previous condition. Such a facility would be evaluated under CEQA at the time it is proposed.
- d. See response to (c) above.
- e. See response to (c) above.
- f. See response to (a) above.
- g. It is unlikely that the adoption of the Amendment would promote the construction of structures within areas that could be flooded.
- h. It is unlikely that the adoption of the Amendment would promote the construction of structures that could impede or redirect flood flows.
- i. It is unlikely that the adoption of the Amendment would create a flood risk.
- j. The Amendment does not alter the likelihood of inundation by seiche, tsunami, or mudflow compared to the status quo. The failure of recycled water distribution pipe could potentially saturate a hillside and create a mudflow. This potential, however, exists with any potable water pipe and would be considered in the engineering design and review process.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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X. LAND USE AND PLANNING

Would the project:

a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

The Amendment will not physically divide a community, or conflict with land use plans policies or habitat conservation plans. As determined on a case-by-case basis, the siting, design, and location of water recycling facilities in general could impact land use and planning; however, these impacts would not be caused directly or indirectly by the Amendment. The siting, location and design of each individual facility would need to consider local land use plans policies and conservation plans.

XI. MINERAL RESOURCES

Would the project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

The Amendment is not expected to affect mineral resources. Potential impacts to mineral resources due to construction of water recycling facilities will be analyzed on a case-by-case basis because any such construction would be subject to CEQA.

XII. NOISE

Would the project result in:

a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

The Amendment would not directly or indirectly cause exposure to harmful noise, excessive groundborne vibration or increase ambient noise above existing levels. As determined on a case-by-case basis, the construction and operation of individual water recycling facilities will need to address and minimize noise impacts; however, these impacts would not be caused directly or indirectly by the Amendment because the infrastructure required by the Amendment would be, from the perspective of noise generation, equivalent to infrastructure that would be needed for any water recycling facility.

- a. The Amendment is not expected to result in the exposure of people to or generation of noise levels in excess of established standards compared to the status quo conditions. In some circumstances, recycled water projects could generate noises typical of irrigation systems (sprinkler heads, pumps, valves, water hammer) and expose some individuals in the immediate vicinity of the point of use to elevated noise levels, however, projects are generally expected to be subject to local noise ordinance restrictions and the noise generated would not be caused directly or indirectly by the Amendment.
- b. See (a) above.
- c. The implementation of the Amendment is not expected to result in a substantial permanent increase in ambient noise levels in the vicinity of a recycled water project.
- d. The implementation of the Amendment is not expected to result in a substantial temporary or periodic increase in ambient noise levels in the vicinity of a recycled water project.
- e. For a recycled water project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the implementation of the Amendment is not expected to expose people residing in or working in a recycled water project area to excessive noise levels.
- f. For a recycled water project within the vicinity of a private airstrip, the implementation of the Amendment is not expected to expose people residing in or working in the project area to excessive noise levels.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
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XIII. POPULATION AND HOUSING

Would the project:

a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

- a. The Amendment is not expected to result in increased development of water recycling facilities compared to the status quo conditions, however, the addition of recycled water to a community's water portfolio may allow for population growth. Using recycled water can be a strategy to obtain water resources necessary for growth, however, this strategy has been used prior to the Amendment. While the Amendment may streamline permitting for some recycled water projects, it is not expected that it would result in growth substantially beyond what would occur in the absence of the Amendment.
- b. The Amendment will not directly or indirectly displace housing or residents. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to address population, growth and housing; however, these impacts would not be caused directly or indirectly by the Amendment.
- c. See (b) above.

XIV. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

i) Fire protection?	☐	☐	☐	☒
ii) Police protection?	☐	☐	☐	☒
iii) Schools?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
iv) Parks?	☐	☐	☐	☒
v) Fire protection?	☐	☐	☐	☒
vi) Other public facilities?	☐	☐	☐	☒

The Amendment will not directly or indirectly cause impacts to fire services, police protection or the need for new schools, parks or other public facilities. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to take into account any potential impacts to public services. However, these impacts would not be caused directly or indirectly by the Amendment.

XV. RECREATION

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

The Amendment will not directly or indirectly cause increased use of regional parks or recreational facilities or require construction or expansion of new recreational facilities. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to consider any potential impacts to recreation; however, these impacts would not be caused directly or indirectly by the Amendment.

XVI. TRANSPORTATION/TRAFFIC

Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

The Amendment will not directly or indirectly cause conflicts with applicable traffic plans, policies, or ordinances nor would it conflict with traffic management plans, or increase traffic and associated hazards. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to account for potential impacts to traffic; however, these impacts would not be caused directly or indirectly by the Amendment.

XVII. TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or

b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.

☐	☐	☐	☒
☐	☐	☐	☒

The Amendment will not result in significant impacts to tribal cultural resources. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to analyze the potential impacts to tribal cultural resources; however, these potential impacts would not be caused directly or indirectly by the

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Amendment.				

XVIII. UTILITIES AND SERVICE SYSTEMS

Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

The Amendment will not result in significant impacts to utilities and service systems.

- The implementation of the Amendment is not expected to result in exceedances of wastewater treatment requirements of the applicable regional water board.
- The Amendment would streamline permitting of some recycled water projects, but is not expected to result in construction of water recycling facilities or expansion of wastewater treatment facilities beyond what would occur under the status quo conditions. As determined on a case-by-case basis, the siting, construction and operation of individual water recycling facilities will need to analyze the potential impacts to utilities and service systems; however, these potential impacts would not be caused directly or indirectly by the Amendment.
- It is unlikely that implementation of the Amendment would create a need for significant construction of additional stormwater drainage facilities.
- The implementation of the Amendment is not expected to affect water supplies available to serve the project from existing entitlements and resources, or otherwise require new or expanded entitlements.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e. Implementation of the Amendment is not expected to result in more wastewater being generated. Hence, it does not require a determination by a wastewater treatment provider regarding the availability of adequate treatment capacity.				
f. Implementation of the Amendment is not expected to require a determination of sufficient landfill capacity.				
g. The implementation of the Amendment is expected to comply with federal, state, and local statutes and regulations related to solid waste.				

XVIV. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

No adverse environmental impacts associated with the Amendment were identified. The portions of the Amendment that were the focus of the environmental analysis were related to streamlined permitting for non-potable recycled water projects and antidegradation analysis information provided for non-potable and groundwater recharge projects. The Amendment is designed to be protective of water quality and in general is not expected to alter the status quo conditions. The goals of streamlined permitting and associated antidegradation analysis section of the Amendment do not serve to increase the development of recycled water, but rather to increase efficient use of resources and time for Water Boards staff and project proponents, which does not result in adverse environmental impacts.

PRELIMINARY DETERMINATION

Based on the above analysis, the Amendment COULD NOT have a significant effect on the environment, and, therefore, no project alternatives, reasonably foreseeable alternative methods of compliance, nor mitigation measures are proposed (CCR, title 23, § 3777 (e-f)).

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