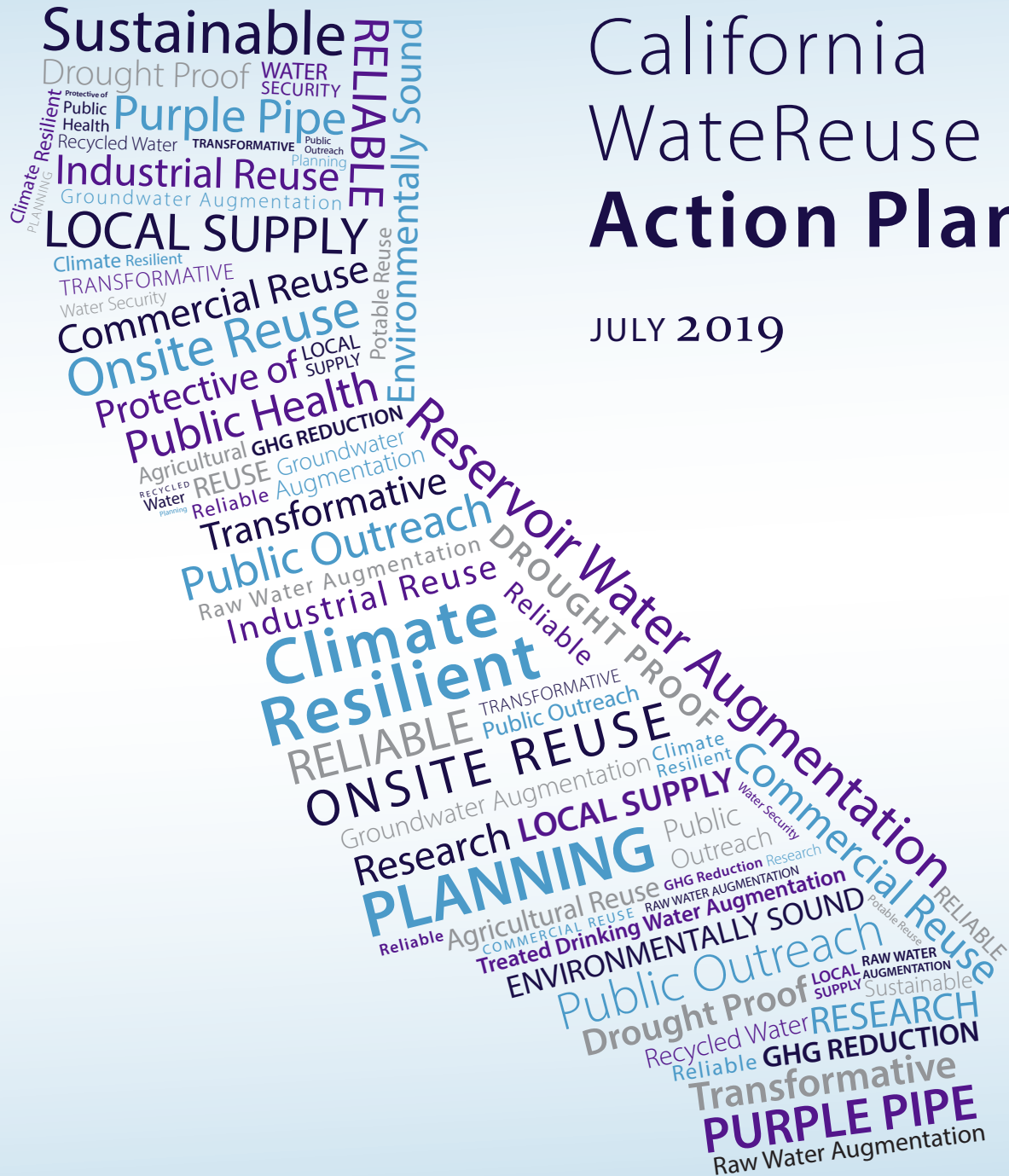


# California WaterReuse Action Plan

JULY 2019



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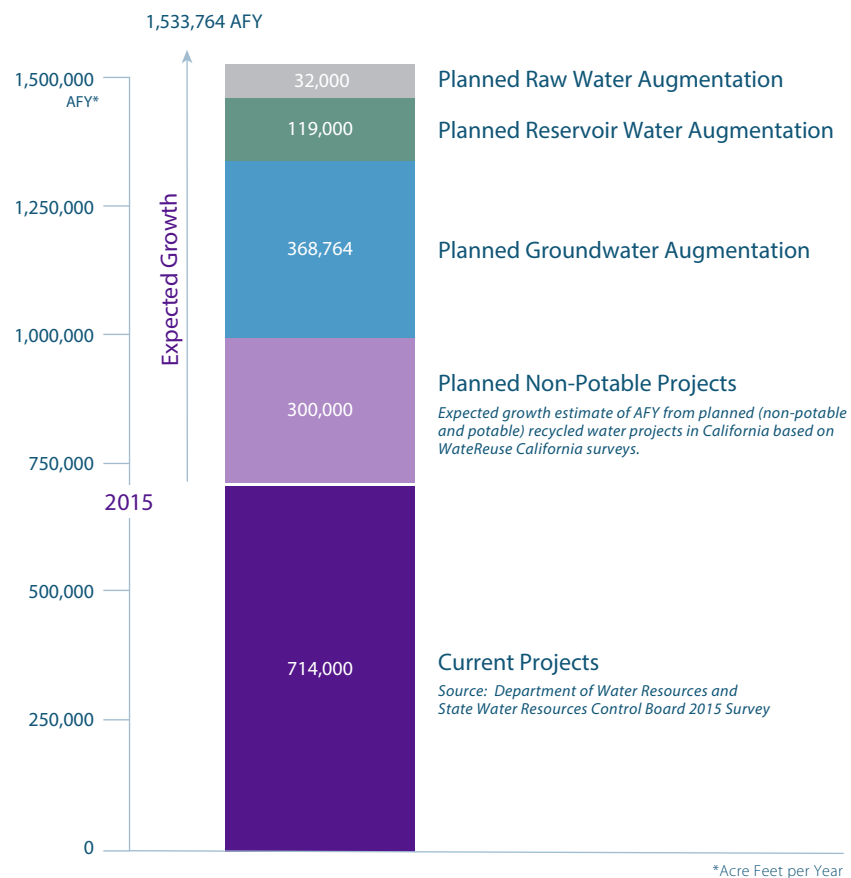
The mission of WaterReuse California is to promote responsible stewardship of California's water resources by maximizing the safe, practical and beneficial use of recycled water and by supporting the efforts of the WaterReuse Association.

## EXECUTIVE SUMMARY

### Introduction

California is widely recognized as a national and world leader in water recycling. Beginning with the first use of recycled water for landscape irrigation 100 years ago, agencies across California have continued to innovate and improve the process to treat and beneficially reuse their wastewater. In 1962, California pioneered potable reuse with the Montebello Forebay Groundwater Recharge Project, which uses recycled water to replenish local groundwater supplies. Today, recycled water supplies offset approximately 9% of the state's urban water demands and agricultural reuse provides reliable water supplies for farmers throughout the state.

### Water Recycling on the Rise in California



A Water Research Foundation project is seeking to identify the amount of wastewater available for water recycling in California. This project study, due in June 2020, will include environmental considerations such as minimum instream flow, water quality, and reduced flows from water conservation.

## Purpose of Action Plan

The California WaterReuse Action Plan provides a clear and concise strategy to advance water reuse in California over the next 30 years to help address the state's greatest water challenges as part of a comprehensive water resilience portfolio.

## Key Actions

California must expand reliable and sustainable water supplies to maintain our economic vitality, protect our environment, and maintain our quality of life. Climate change is profoundly impacting our natural environment and hydrologically dependent water supplies. More than ever, California needs to build a climate and seismic resilient water infrastructure to insulate our communities from increasing and more intense drought conditions. Increased use of recycled water provides long-term reliable water supply sources and is an important water resource strategy for increasing drought resiliency in regions throughout California. Water recycling is also a critically important environmental and water use efficient strategy for the state. By safely and effectively reusing water for potable and non-potable purposes, many areas of the state are able to reduce existing and future reliance on environmentally stressed imported water sources.

The State Water Resources Control Board (Water Board) recently updated California's Recycled Water Policy and added new ambitious recycled water goals for the state. To meet these goals and enhance the state's sustainable water supplies, WaterReuse California has prepared this plan to clearly identify state and local actions that must be completed over the coming decades. While the state has done a good job of promoting the use of recycled water, research, regulations, planning and funding have not matched the pace of new technology and uses. Steps must be taken to maximize the use of proven safe and reliable recycled water in communities statewide.

Proposed actions to be taken include:

- Determine How Much Water in California Can be Recycled
- Initiate and Complete Potable Reuse Research
- Develop Raw Water Augmentation Regulations and Onsite Reuse Regulations
- Plan for the Development of Treated Drinking Water Augmentation Regulations
- Update Existing Non-potable Recycled Water Regulations
- Streamline Permitting (e.g. wastewater change petition process) and Funding Process
- Enhance Regional Planning Between Water and Wastewater Agencies
- Pass a Sustainable Water Supply General Obligation Bond Measure
- Leverage More Funding for the Clean Water State Revolving Fund

## California Recycled Water Milestones in Agriculture

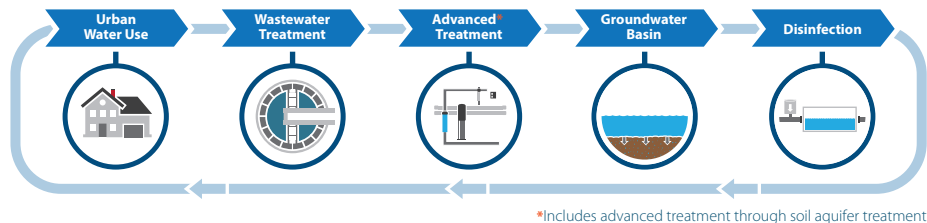


## SECTION I: COMPLETE RESEARCH TO ADVANCE WATER RECYCLING AND POTABLE REUSE

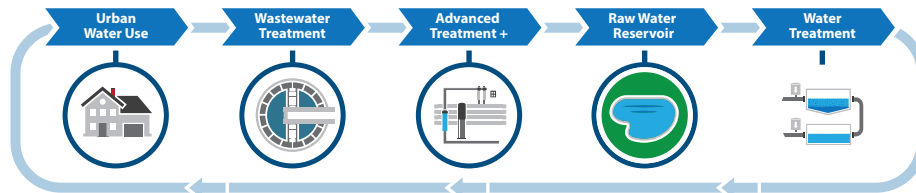
While recycled water and potable reuse projects have been successfully implemented throughout California and the nation for decades, additional research is needed to support expanded reuse in the state and to continue to ensure the paramount protection of public health as more advanced forms of reuse are implemented. Research drivers include the need to address: (1) the ability to measure and remove contaminants at increasingly lower regulated levels and monitoring/reporting limits, (2) additional or revised regulatory requirements and their application to recycled water end uses, (3) action needed to prepare and respond to climate change impacts including both flooding and drought, (4) potential application and effectiveness of alternative treatment trains for both water and wastewater treatment, and (5) the identification of new and increased uses for recycled water. On the following page are research projects that are of critical importance to the further advancement of water recycling in California.

### Potable Reuse - Newly Defined Types

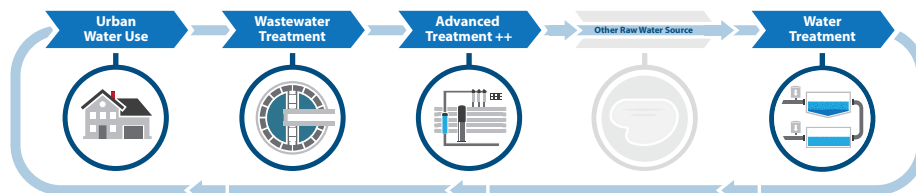
#### 1. Groundwater Augmentation



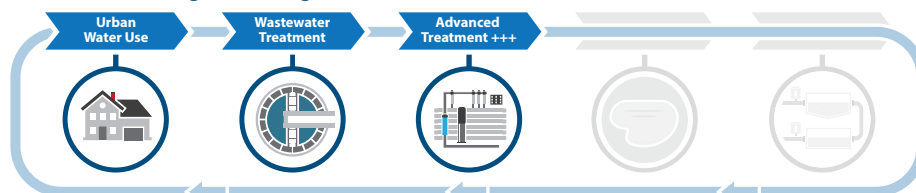
#### 2. Reservoir Water Augmentation



#### 3. Raw Water Augmentation



#### 4. Treated Drinking Water Augmentation



## SECTION I (CONTINUED)

### 1. Identify the Amount of Wastewater That is Available to Recycle in California

Water Research Foundation (WRF) project 4962 seeks to identify the amount of treated municipal wastewater available for recycled water production in California now, and projected into the future. It also seeks to identify how much treated municipal wastewater could feasibly be produced and reused in the state and the costs associated with that level of reuse, while considering required minimum instream flows, the effect of water conservation and water quality requirements. The State should use the results from this research to help establish more accurate and achievable numeric goals for water recycling in California. **Timing: June 2020**

### 2. Study the Impacts of Diminishing Wastewater Flows on Recycled Water Projects

The Water Board is developing new water use efficiency standards, as required by AB 1668–SB 606 (Friedman-Hertzberg 2018). As required by this legislation, the California Department of Water Resources (DWR) must study the full impacts of proposed indoor water use efficiency standards and the associated impacts of reduced wastewater flows on potable reuse, recycled water and related infrastructure. The Water Board should consider the impacts to recycled water and reuse when implementing AB 1668 and SB 606 and for establishing future long-term goals for water recycling. **Timing: January 2021 (Statutory Deadline)**

### 3. Monitor Contaminants of Emerging Concern (CEC): Develop Bioassay Monitoring Procedures for Potable Reuse

The National Water Research Institute, the Water Board and the water reuse community have implemented a Bioassay Implementation Advisory Group to ensure uniform procedures, repeatability, and data interpretation for CEC testing in potable reuse projects. The group will provide a forum to ensure ongoing bioassay monitoring is implemented effectively and appropriately regulated. **Timing: 2019-2025**

### 4. Finalize Research and Assemble an Expert Panel for Raw Water Augmentation (RWA) Regulations

In a 2016 report to the Legislature, “Evaluation of the Feasibility of Developing Uniform Water Recycling Criteria for Direct Potable Reuse (DPR)” the Water Board-initiated expert panel concluded that it was feasible to develop statewide regulations for DPR (including Raw Water Augmentation (RWA)). The report identifies six research areas that need to be addressed concurrently with the development of regulations. This important research has been initiated but not yet completed. As required by AB 574 (Quirk 2017), an expert panel for RWA must be assembled by the Water Board to help provide additional expertise to complete regulations that are protective of public health by the statutory deadline of December 2023. The Water Board must assemble this expert panel. **Timing: 2020 - 2023**

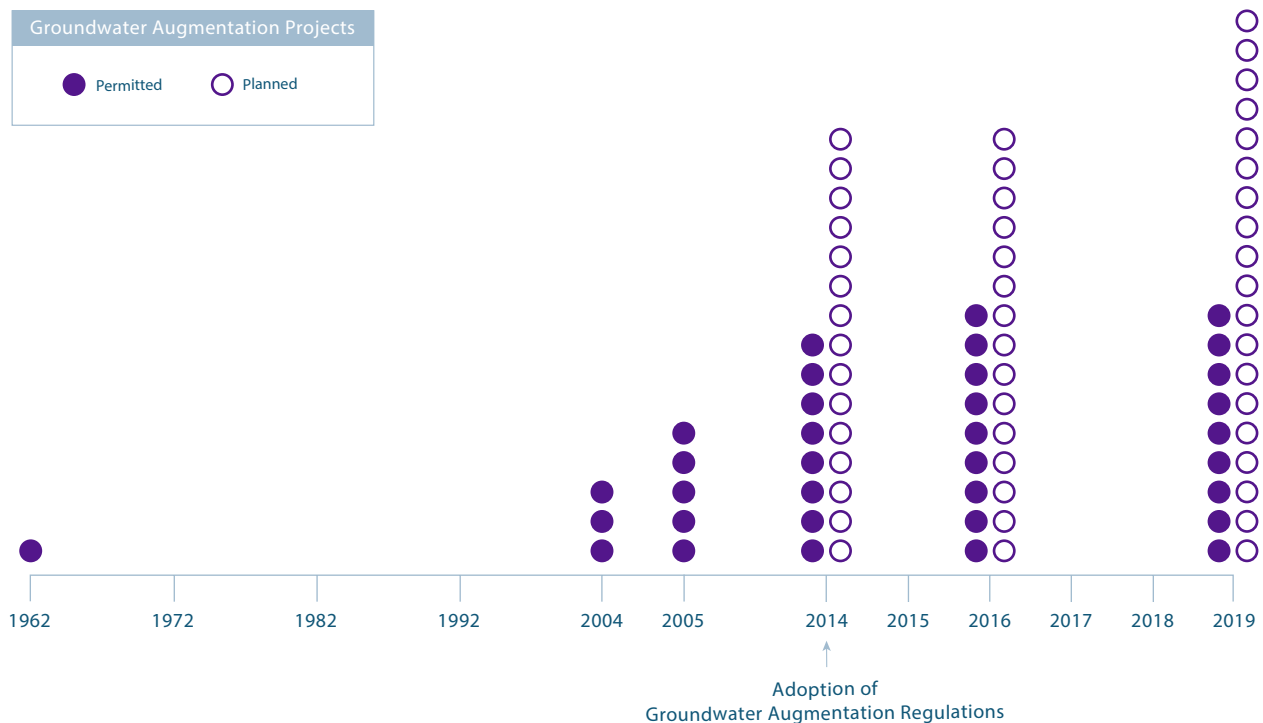
### 5. Assess Research Needed for Treated Drinking Water Augmentation Regulations

Based on the outcomes of the six research areas for DPR (see above), additional research may be necessary to determine what, if any, remaining information gaps exist before Treated Drinking Water Augmentation regulations can be advanced that are fully protective of public health. The Water Board should assess the research for DPR and determine what, if any additional research is needed for regulatory development for Treated Drinking Water Augmentation. **Timing: 2020**

## SECTION II: DEVELOP AND STREAMLINE RECYCLED WATER REGULATIONS AND PERMITTING

The development of statewide regulations is critical for the advancement of all types of recycled water projects in California. While the Water Board has the authority to permit other types of reuse projects on a case-by-case basis, the development of statewide regulations—whether it be for potable, non-potable or onsite reuse—ensures that local agencies understand the full scope of the regulatory requirements and possible financial implications of such requirements in advance of significant planning and project development investments. Statewide regulations for all types of reuse projects provide communities strong assurances that public health, local resources and the environment will be protected in a consistent manner throughout the state. These assurances broaden public acceptance of water recycling and help agencies garner crucial public and political support for recycled water investments.

### Adoption of Regulations as a Catalyst for Projects





## SECTION II (CONTINUED)

### 1. Develop Statewide Regulations for Raw Water Augmentation

AB 574 (Quirk 2017) established a 2023 legislative deadline for the development of statewide regulations for raw water augmentation. AB 574 requires that the Water Board develop the regulations with the advice of an expert panel. The Water Board should initiate the development of RWA regulations now to meet the legislative deadline.

**Timing: 2023 (Statutory Deadline)**

### 2. Develop Timeline for Treated Drinking Water Augmentation Regulations

There are communities in California where the most cost-effective approach for increasing reuse is to place purified recycled water directly into the drinking water distribution system. This type of potable reuse is known as Treated Drinking Water Augmentation. Potable reuse research is underway that should clarify what treatment trains, monitoring requirements and additional safety procedures may be necessary to support the Water Board's development of Treated Drinking Water Augmentation regulations. The Water Board should assess this research and create a timeline and needs assessment for the development of regulations, and confirm alignment with the Safe Drinking Water Act.

**Timing: 2020–2025**

### 3. Develop Regulations for Alternative Treatment Trains for Potable Reuse

Current California regulations are technology-based, requiring reverse osmosis (RO) as part of the treatment train for most types of potable reuse and lacking validation protocol for other alternatives and their potential applications for potable reuse. Because of the high cost of management and disposal of the RO concentrate waste stream (e.g. brine), potable reuse has been largely limited to coastal communities with access to ocean discharge facilities for RO concentrate disposal. Other technologies and treatment trains may provide similar levels of public health protection and should be considered to allow communities, which lack ocean discharge facilities, to leverage potable reuse as an option in water supply portfolios. The Water Board should: 1) update its 2014 Alternative Technology Report, 2) permit pilot projects with alternative treatment trains, and 3) update the potable reuse regulations to explicitly authorize these processes. **Timing: 2020–2025**

### 4. Develop Statewide Regulations for Onsite Reuse

Onsite non-potable reuse involves reusing a non-potable source of water (for example, graywater or rainwater) for a non-potable end purpose (for example, flushing toilets or irrigation) within a given site. By December 2022, SB 966 (Wiener 2018) requires the Water Board to adopt regulations for risk-based water quality standards for the onsite treatment and reuse for non-potable end uses in multifamily residential, commercial and mixed-use buildings. The Water Board has begun the development of regulations for onsite reuse.

**Timing: 2023 (Statutory Deadline)**

### 5. Update Existing Non-Potable Recycled Water Regulations

Title 22 (CCR, Title 22, Division 4, Chapter 3) contains the recycling criteria and use requirements for all non-potable recycled water projects in the state. These regulations, which have not been updated in nearly 20 years, contain a number of outdated and overly prescriptive requirements for non-potable recycled water use that are not needed for the protection of public health or the environment. Maintaining such unnecessary and outdated regulatory requirements deters the development of new non-potable recycled water uses and inordinately increases operating costs for existing recycled water projects. The Water Board should update these regulations through a public process that includes significant stakeholder engagement. **Timing: 2023**

### 6. Revise the Recycled Water Statewide Use Goals

One of the stated goals of the California Recycled Water Policy (Policy) is to increase the use of recycled water from 714,000 acre-feet per year (AFY) in 2015 to 1.5 million AFY by 2020 and to 2.5 million AFY by 2030. The 2018 update of the Policy contains new recycled water and wastewater reporting requirements that will accurately track the annual use of recycled water. After a few years of reporting, the Water Board should revise the statewide numeric goals for recycled water to set realistic and attainable targets. In setting these new goals the Water Board should use agency reporting information, the results of the research project WRF 4962 (see above) and local recycled water planning data. It should also incorporate estimates for Raw Water Augmentation



## SECTION II (CONTINUED)

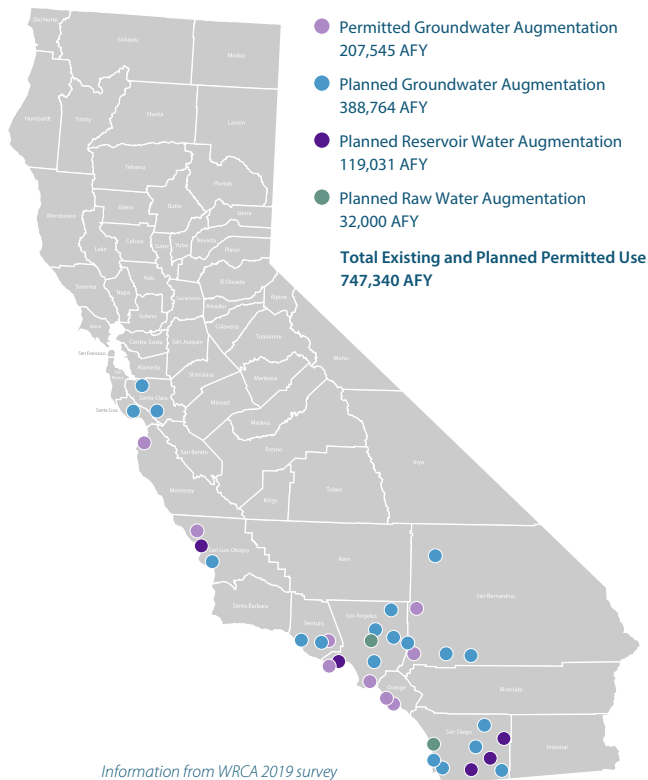
and Treated Drinking Water Augmentation projects (once regulations are developed), which that are critical for the state to meet its full water recycling potential. **Timing: 2023**

### 7. Clarify and Streamline Requirements for Wastewater Change Petition Process

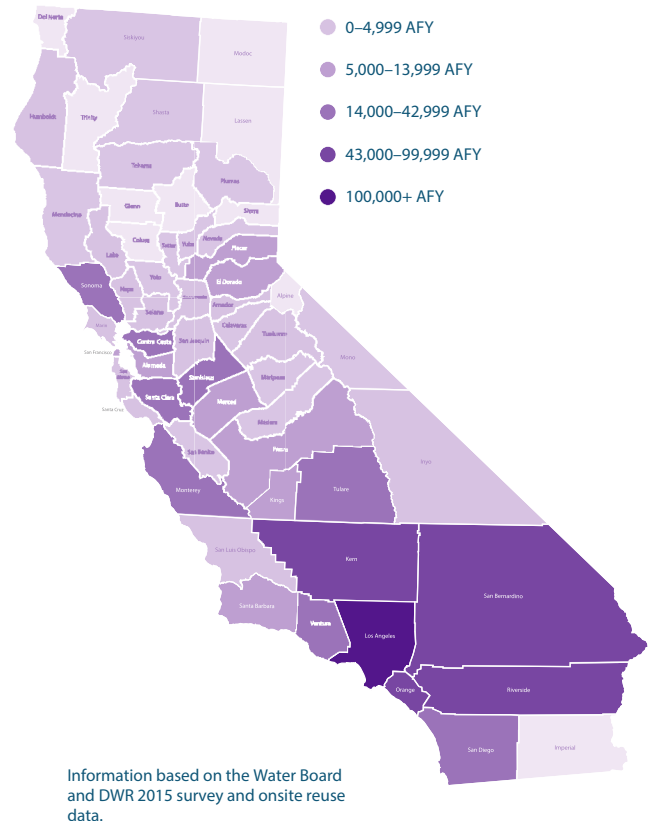
For many agencies, state approval of a wastewater change petition is necessary to redirect treated effluent currently being discharged into waterways for use in a potable or non-potable reuse project. Over the last five years, obtaining a wastewater change petition from the Water Board has

increasingly stalled or halted the permit process for many of these recycled water projects. Clear interagency standards between the Water Board and California Department of Fish and Wildlife must be established to promote inland recycled water projects—consistent with statewide recycling goals—while protecting the environment. The Water Board should work with the Department of Fish and Wildlife and other stakeholders to develop standards, checklist, and timeline for project applicants so that regulatory requirements and defined quantities of available treated effluent are clear from recycled water project development initiation through completion. **Timing: 2019–2020**

#### Existing and Planned Potable Reuse Projects



#### Non-Potable Use of Recycled Water



## SECTION III:

### PERFORM INTEGRATED REGIONAL PLANNING TO ADVANCE RECYCLED WATER USE

Implementing regional and local water projects that provide higher resilience to extreme climate and seismic events is critical for the future of California. Regional cooperation and collaborative planning between water (retail and wholesale), wastewater, recycled water, stormwater, flood control and land use agencies is necessary to develop diverse water supply portfolios and maximize reuse. Recycled water is unique in that it is derived from a year-round, hydrologically independent source: wastewater flows. Expanding recycled water surface storage and storage in groundwater aquifers while addressing regulatory barriers to storage and encouraging the commingling of waters (e.g. recycled water, surface water, groundwater and stormwater) creates a multi-source water supply buffer that helps minimize the impacts of extreme climate events. Regional planning and creative water exchanges leverage resources and enhances collaboration between all agencies, including water agencies, wastewater agencies, and stormwater agencies to more effectively integrate the management of all available water resources in a manner necessary to accomplish the goals of the State's Recycled Water Policy.

#### 1. Incentivize Innovative Water Exchange Arrangements

Water exchange arrangements between wastewater and water agencies represent a significant potential to cost-effectively help solve regional water supply shortages. It is recognized that water supply constraints are a regional and statewide problem that typically extend beyond the intersecting boundaries of individual water and wastewater agencies. To this extent, it is important that wastewater and water agencies collaborate to facilitate innovative water exchanges as part of the solution to regional water supply shortages. These exchanges envision creative arrangements between multiple agencies in order to achieve multiple benefits, leverage existing infrastructure and optimally treat and transport water to end users. **Timing: 2020–2030**

#### 2. Increase Local Collaboration to Maximize Recycled Water Use in Coastal Areas

The Water Board's 2018 update to the State Recycled Water Policy placed renewed emphasis on recycling wastewater that is currently being discharged to the ocean or bays. In areas where significant amounts of treated effluent is discharged to the ocean and bays, the local and regional water, wastewater and land use agencies should be encouraged to jointly (or individually if they provide water and wastewater services) develop local feasibility plans or recycled water master plans to identify additional economical recycled water projects in their service area(s). These plans should be recognized in regional plans addressing water supply, demands and other challenges, such as funding needs. State funding should be prioritized for multi-agency collaborative efforts.

**Timing: 2019–2025**

## SECTION III (CONTINUED)

### 3. Maximize Recycled Water Use Where Groundwater Basins are Overdrafted

Many groundwater basins in California are overdrafted or critically overdrafted. The Water Board's 2018 update to the State Recycled Water Policy encouraged the use of recycled water to enhance groundwater replenishment and yield in these basins. Groundwater Sustainability Plans (GSPs) being developed to meet the Sustainable Groundwater Management Act (SGMA) are the best way to identify local conditions, limitations and opportunities to maximize recycled water use. As appropriate, GSPs should include recycled water projects to help address groundwater overdraft in state-designated overdrafted basins. **Timing: 2020–2025**

### 4. Develop Regional Brine Disposal Solutions to Promote Reuse

In California, potable reuse projects that rely on the reverse osmosis (RO) process must have a means to dispose of the brine concentrate (e.g. the RO concentrate waste stream). In some areas, non-potable reuse projects similarly require the use of desalting technologies or blending techniques to irrigate salt sensitive crops, landscapes in groundwater basins with low salinity limits or for industrial uses with high water quality objectives. The lack of availability of an ocean outfall, or a regional brine conveyance facility connected to an ocean outfall, can result in an otherwise beneficial water project being infeasible. The state should offer incentives and regulatory support for: 1) regional efforts to develop and implement cross-jurisdictional brine conveyance and disposal facilities, and 2) research and development of cost-effective and commercially viable brine treatment and management technologies that maximize the recovery of recycled water from the brine stream and minimize or eliminate liquid brine discharges. **Timing: 2020–2030**

### 5. Incentivize Innovation in Water and Wastewater Treatment and Recycled Water Infrastructure

Water and wastewater treatment and conveyance infrastructure has become heavily segmented and is in need of new technology and means to assure an integrated and sustainable water future.

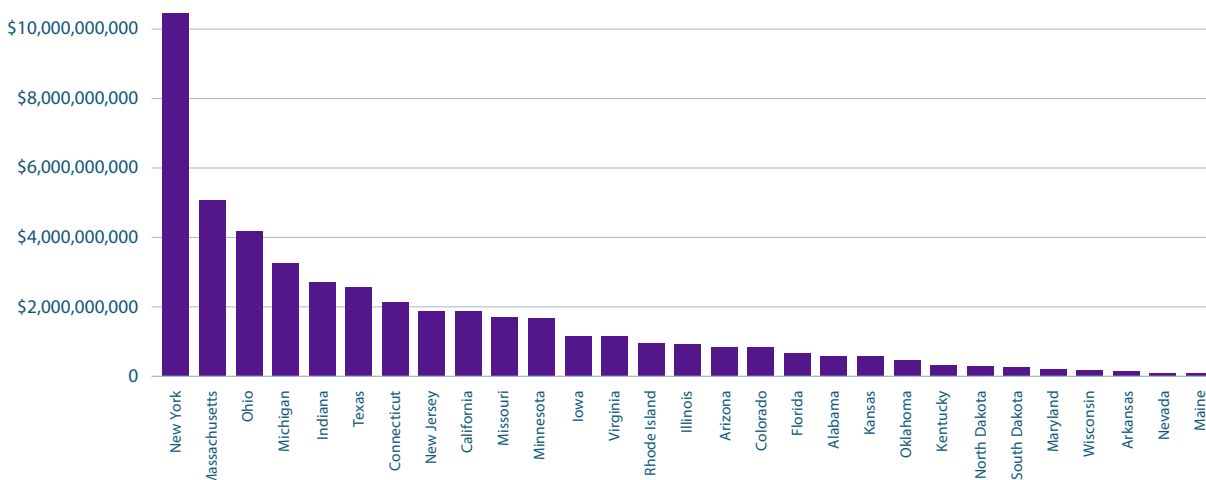
Regional projects often offer benefits of shared infrastructure, asset recovery, economies of scale, a more competitive strategy to pursue funding, and enhanced regional self-reliance. Integrated water management will allow agencies to make smart and flexible decisions to implement recycled water infrastructure investments, increase water deliveries and decrease unit costs. As part of regional reuse development efforts, the state should provide funding for multi-agency coordination infrastructure planning studies. These studies should identify opportunities for shared infrastructure development, including the reuse of abandoned assets (e.g. decommissioned pipelines) and multi-jurisdictional/cross-agency infrastructure (e.g. regional conveyance pipelines) and provide a local pathway for regionally coordinated approval. **Timing: 2020–2025**

## SECTION IV: INCREASE GRANT AND LOAN OPPORTUNITIES TO EXPAND RECYCLED WATER INFRASTRUCTURE

Communities are seeking funding for projects that address the impacts of climate change and to diversify their water portfolios to include sustainable sources of water such as recycled water. These are often complex projects that require significant investment. Most recycled water projects must secure at least 50 percent of project funding from local sources (e.g. rates, charges, taxes, local budgets, etc.), but typically require the remainder of project funding to be provided through outside sources – such as grants and/or low interest loans – to be economically viable.

The economic reality is that without local, state and federal low interest loans and grants, many recycled water projects would not be able to move forward. At the federal level, programs that fund recycled water projects in California include the U.S. Bureau of Reclamation's Title XVI-Water Reclamation and Reuse competitive grant program (Title XVI) and the Water Infrastructure Finance and Innovation Act (WIFIA) federal loan program. The Title XVI program is the only federal grant program available for recycled water projects and appropriations for this program and the WIFIA federal infrastructure loan program have not kept pace with current demands or inflation. Advocating for increased funding for these two programs, plus securing the reauthorization of EPA's Alternative Water Source grant program under Section 220 of the Clean Water Act to provide a second federal recycled water grant program, should be a high priority for the state. In California, there are more than \$7 billion in reuse and wastewater projects on the waiting list for loans from the Clean Water State Revolving Fund (CWSRF), and this does not include the majority of the potable reuse projects in the planning stages. The Water Board can authorize loans through the Drinking Water State Revolving Fund (DWSRF) for potable reuse projects on a case-by-case basis. However, with the grant funding from Proposition 1 for recycled water depleted, and the \$80 million for water recycling in Proposition 68 already allocated, the CWSRF is currently the primary source of financing for recycled water in California. To achieve the State Water Recycling Policy's ambitious goals for water recycling, California needs to be equally ambitious in securing funding to help finance these projects.

**Total Leveraged CWSRF Bonding By State**



Source: EPA CWSRF 2018 Report

### 1. Leverage More Funding for the CWSRF Through the Sale of Bonds

Under the status quo, the \$7 billion backlog of reuse and wastewater projects on the CWSRF cannot be fully addressed until 2057. But by adding \$300 million a year in loans, the backlog could be funded by 2035. To help close this significant funding gap, California should leverage additional funding for the CWSRF program through the issuance of revenue bonds. The sale of bonds is one of the easiest, fastest, and most cost effective ways that states raise capital for infrastructure of all types. Selling bonds can also give the CWSRF a cash infusion at interest rates, which are now at historically low levels. Many other states, with much smaller economies, have leveraged more funding than California for their SRF programs using this mechanism. **Timing: 2020**

### 2. Pass New Water Bond With Significant Grant Funding for Recycled Water

While loans through the SRF programs are an effective and necessary method to finance recycled water projects, in many cases the relatively high unit cost of projects require grant funding to be affordable at the local level. Grant funding can provide the needed incentive for a local agency to implement a recycled water project that might otherwise not go forward because a more cost effective surface water, groundwater or imported water source is available. California should pass a new statewide general obligation bond with a specific focus on developing hydrologically independent sustainable water supplies to help mitigate the impacts of climate change. This should include at least \$2 billion in grants for recycled water projects in order to provide funding assistance for the many recycled water projects that are planned to help meet the state's goals. **Timing: 2022**

### 3. Streamline Water Recycling Funding Program, CWSRF Application Process and Increase Staffing

Applicants for CWSRF loan funds have experienced substantially increased delays over the past few years in securing funding awards and agreements. These delays have resulted in uncertainty for local agencies that financing is secure and in place such that construction contracts can be awarded and projects commenced. The Water Board should look for opportunities to streamline this process and allocate the proper level of staff resources to this process. For example, the Water Board could allow applicants to use previously approved project application information and information submitted to different funding programs at the Water Board. It could also develop templates for small or standard projects and increase clarity of environmental and financial document submittal requirements. The Water Board could also increase staffing to accommodate a new funding infusion into the program as recommended above. **Timing: 2020**

## Conclusion

Recycled water is no longer a niche water supply in California. Unlike 30 years ago, recycled water is embraced in communities statewide as a reliable, sustainable option that is resistant to climate change and seismic impacts. But with our state's growing population and economy we must continue to enhance the state's investment to maximize the use of recycled water. See the list of critical reuse action items below:

Proposed Actions	Timing
<b>Section I: Complete Research to Advance Water Recycling and Potable Reuse</b>	
Identify the Amount of Wastewater That is Available to Recycle in California	2020
Study the Impacts of Diminishing Wastewater Flows on Recycled Water Projects	January 2021
Monitor Contaminants of Emerging Concern: Develop Bioassay Monitoring Procedures for Potable Reuse	2019–2025
Finalize Research and Assemble an Expert Panel for Raw Water Augmentation Regulations	2020–2023
Assess Research Needed for Treated Drinking Water Augmentation	2020
<b>Section II: Develop and Streamline Recycled Water Regulation and Permitting</b>	
Develop Statewide Regulations for Raw Water Augmentation	2023
Develop Timeline for Treated Drinking Water Augmentation Regulations	2020–2025
Develop Regulations for Alternative Treatment Trains for Potable Reuse	2020–2025
Develop Statewide Regulations for Onsite Reuse	2023
Update Existing Non-Potable Recycled Water Regulation	2023
Revise the Recycled Water Statewide Use Goals	2023
Clarify and Streamline Requirements for Wastewater Change Petition Process	2019–2020
<b>Section III: Perform Integrated Regional Planning to Advance Recycled Water Use</b>	
Incentivize Innovative Water Exchange Arrangements	2020–2030
Increase Local Collaboration to Maximize Recycled Water Use in Coastal Areas	2019–2025
Maximize Recycled Water Use Where Groundwater Basins are Overdrafted	2020–2025
Develop Regional Brine Disposal Solutions to Promote Reuse	2020–2030
Incentivize Innovation in Water and Wastewater Treatment and Recycled Water Infrastructure	2020–2025
<b>Section IV: Increase Grant and Loan Opportunities to Expand Recycled Water Infrastructure</b>	
Leverage More Funding for the CWSRF Through the Sale of Bonds	2020
Pass New Water Bond with Significant Grant Funding for Recycled Water	2022
Streamline Water Recycling Funding Program, CWSRF Application Process and Increase Staffing	2020

# WateReuse California

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*(July 2019)*

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