

Incorporating Water Reuse into the State Revolving Fund Programs



2020 CIFA SRF Workshop Online Edition

November 12, 2020

National Water Reuse Action Plan

Improving the Security, Sustainability, and Resilience of Our Nation's Water Resources



The Vision



Launch of the draft WRAP at the WaterReuse Symposium in San Diego on September 10, 2019 with federal representatives. Pictured, top row, left to right: Paul Jones (WaterReuse Association Representative), Aubrey Bettencourt (DoI), Tim Petty (DoI), Brenda Burman (BoR), Pat Sinicropi (WaterReuse Association). Pictured, bottom row, left to right: Ryan Fisher (ACoE), David Ross (EPA), Mary Neumayr (CEQ), William Northey (USDA), Daniel Simmons (DoE).

“ Our goal is to issue a[n]...Action Plan that includes clear commitments and accountability for actions that will further water reuse and help [ensure] the sustainability, security, and resilience of the nation’s water resources. Water quantity, supply, and quality decision-makers have historically worked through independent management regimes. Addressing future water resource challenges will require more holistic thinking that embraces the ‘convergence of water’ through more integrated action.”

–David Ross, Assistant Administrator for Water,
U.S. EPA

Opportunities and Key Terms

Water Reuse Objectives:

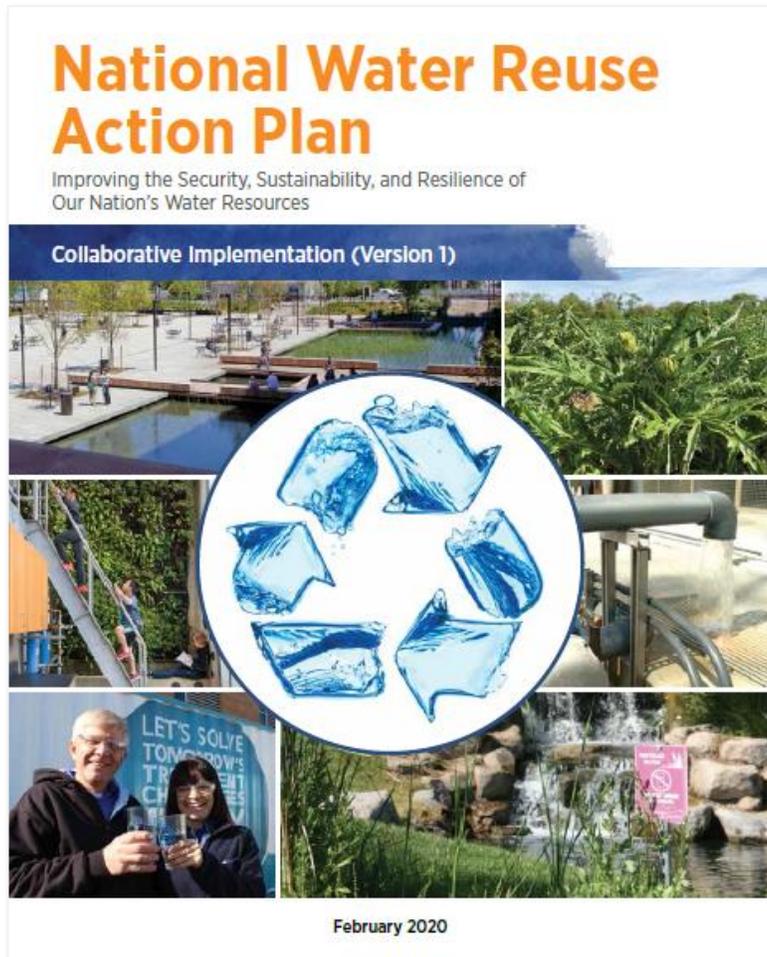
- **Water security:** The capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being, and socioeconomic development.
- **Water sustainability:** Ensuring an adequate, reliable, and continual supply of clean water for human uses and ecosystems.
- **Water resilience:** The ability of a water supply (e.g., a community water system or an asset of a community water system) to adapt to or withstand the effects of rapid hydrologic change or a natural disaster.

WRAP Guiding Principles

1. Protect public health
2. Protect the environment and ecosystem health
3. Promote action based on leadership, partnership, and collaboration
4. Build on past experiences
5. Identify the most impactful actions
6. Recognize distinct challenges posed by water reuse
7. Consider water reuse in an integrated water resources management framework
8. Defer to state (cooperative federalism) and local issues and considerations
9. Commit to implementation through transparency and shared accountability
10. Communicate effectively
11. Apply adaptive management and governance



Water Reuse Collaborative Action Implementation



The WRAP features 11 strategic themes

- 2.1 - Integrated Watershed Action
- 2.2 - Policy Coordination
- 2.3 - Science and Specifications
- 2.4 - Technology Development and Validation
- 2.5 - Water Information Availability
- 2.6 - Finance Support
- 2.7 - Integrated Research
- 2.8 - Outreach and Communications
- 2.9 - Workforce Development
- 2.10 - Metrics for Success
- 2.11 - International Collaboration

Communicating Progress

Water Reuse

[Water Reuse Home](#)

[Basic Information](#)

[Water Reuse Action Plan](#)

[WRAP Online Platform](#)

[Latest Quarterly Update](#)

[WRAP Activities and Highlights](#)

[Water Reuse Activities and Resources](#)

[State Resources](#)

[Federal and Non-governmental Resources](#)

- **Action Implementation**
 - 121 implementation milestones out of 270 completed
 - More than 30 new milestones added since February
- **Online Platform**
 - Weekly updates on implementation progress
 - Nearly 700 total updates across 35 actions
- **Regular Outreach and Engagement**
 - Quarterly updates – next release: January
 - Action leader meetings
 - Ongoing discussions with federal, state, tribal, and local stakeholders
 - WRAP Action Activities and Highlights web page

WRAP Online Platform

- Repository for all actions (developed and undeveloped)
- Provides background and opportunities to be gained
- Identifies leaders, partners, interested collaborators
- Captures milestones and progress
- Helps form the pipeline of new actions and collaboration

The screenshot displays the 'National Water Reuse Action Plan: Online Platform' interface. It features a search bar for 'Strategic Theme Area' and a list of actions. The detailed view for the action 'Enhance State Collaboration on Water Reuse' is shown, including its status, action leaders, and implementation milestones.

National Water Reuse Action Plan: Online Platform

Instructions: Click on an action in the table to display detailed information.

Strategic Theme Area:

Show 10 entries

Strategic Theme Area	
Integrated Watershed Action	Develop a Federal Policy State Consideration of Water Reuse
Integrated Watershed Action	Prepare Case Studies of Successful Integrated Water Resources Management
Integrated Action	Incorporate Water Reuse and Planning Efforts at the Local Level
Integrated Watershed Action	Leverage EPA's Water Partners Program in the Context of Integrated Watershed Scale
Policy Coordination	Complete Existing State Policies
Policy Coordination	Enhance State Collaboration on Water Reuse
Policy Coordination	Complete the EPA Study of Oil Management
Policy Coordination	Enhance Wastewater Source Control Programs to Support Water Reuse
Policy Coordination	Compile and Develop Potential Waters for Potential Reuse
Policy Coordination	Develop Informational Materials to Facilitate Water Reuse/Capture

Showing 1 to 10 of 58 entries

Enhance State Collaboration on Water Reuse

Enhance State Collaboration on Water Reuse (Action 2.2.2)

Action Attributes | Action Team | Implementation Milestones | Outputs and References

Action Attributes

Status: Developed

Action Leaders and Key Contact:

- U.S. Environmental Protection Agency (EPA)
Jeff Lape
jlape.jef@epa.gov
- Association of Clean Water Administrators (ACWA)
Jake Adler
jadler@acwa-us.org
- Association of State Drinking Water Administrators (ASDWA)
Wend Wilkes
wwilkes@asdwa.org

Description: Provide forums and opportunities for states to discuss water reuse. Some states, particularly in arid areas, have well-established opportunities to exchange ideas, experiences, successes, and challenges to learn from each other; (2) identify common needs to of water reuse.

Background: The Annual WaterReuse Pacific Northwest Conference, organized by the policies and strategies. This conference provides a useful model and a coordinated state-focused forum to encourage states to come together in September 2018, ACWA and ASDWA co-convened and facilitated the representatives from 28 state water programs participate in this event engagement of additional state associations to engage in future state.

Opportunities:

- Increase state collaboration on water reuse across the spectrum of water reuse.
- Share experiences across state organizations.
- Enable water reuse discussions and networking opportunities.

Implementation Milestones

5. Convene the 2nd state summit on water reuse at the 34th Annual WaterReuse Symposium in San Diego, CA.

Lead(s): ACWA (Jake Anastasio, janastasio@acwa-us.org), ASDWA (Wend Wilkes, wwilkes@asdwa.org)

Partners: EPA, WaterReuse

Target Completion Date: September 2018

Actual Completion Date: September 2018

Milestone Complete: Yes

Status/Updates: Completed (28 representatives from 18 states attended)

3. Secure meeting facilitation and notetaking support for the 2nd state summit on water reuse.
3. Conduct water reuse-focused discussions at a session at the ASDWA Member Meeting.
4. Conduct water reuse-focused discussions at a session at the ACWA Midyear Meeting.
5. Initiate planning for next annual state summit on water reuse.
6. Compile a list of state water reuse contacts and roles and post in an accessible location online.
7. Convene the 2nd state summit on water reuse at the 33th WaterReuse Symposium in Denver, CO.
8. Prepare state summit on water reuse meeting summary for state representatives.
9. Additional milestones to be determined.

Use the arrows to navigate between actions.

← Previous Action | Next Action →

<https://www.epa.gov/waterreuse/national-water-reuse-action-plan-online-platform>

What's Next for the WRAP: Looking Forward

- **Action implementation and development**
 - Action teams focused on implementation of the 37 developed actions
 - New actions onboarded quarterly
- **Next Action Plan – Spring 2021**
 - Highlight progress across the 37 active actions
 - Demonstrate collective impact
 - Showcase new actions



Breakout session at one of the WaterReuse expert convenings on water reuse during development of the draft Action Plan.

Get Involved!

● Pitch a new action idea

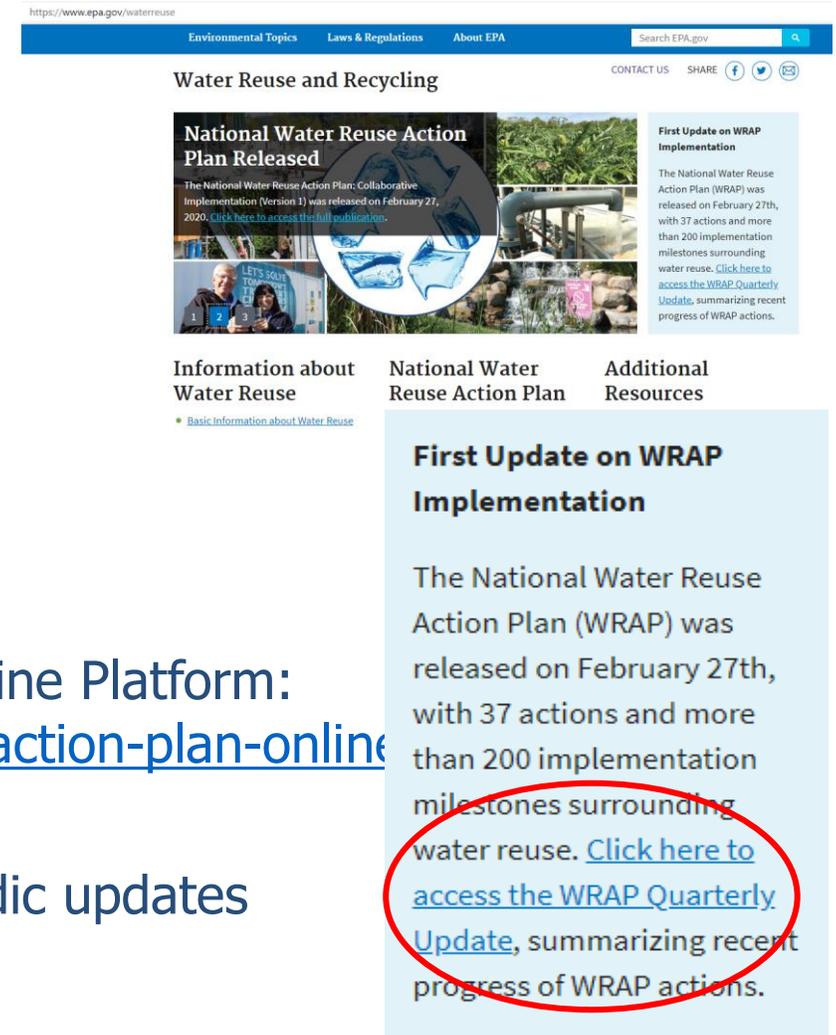
- Share your idea with EPA's Water Reuse Team
- Quarterly action onboarding

● Support an existing action

- Reach out to action leader(s) about possible roles

● Stay informed

- Follow action implementation progress in the WRAP Online Platform: <https://www.epa.gov/waterreuse/national-water-reuse-action-plan-online-platform>
- Email waterreuse@epa.gov to join our listserv for periodic updates



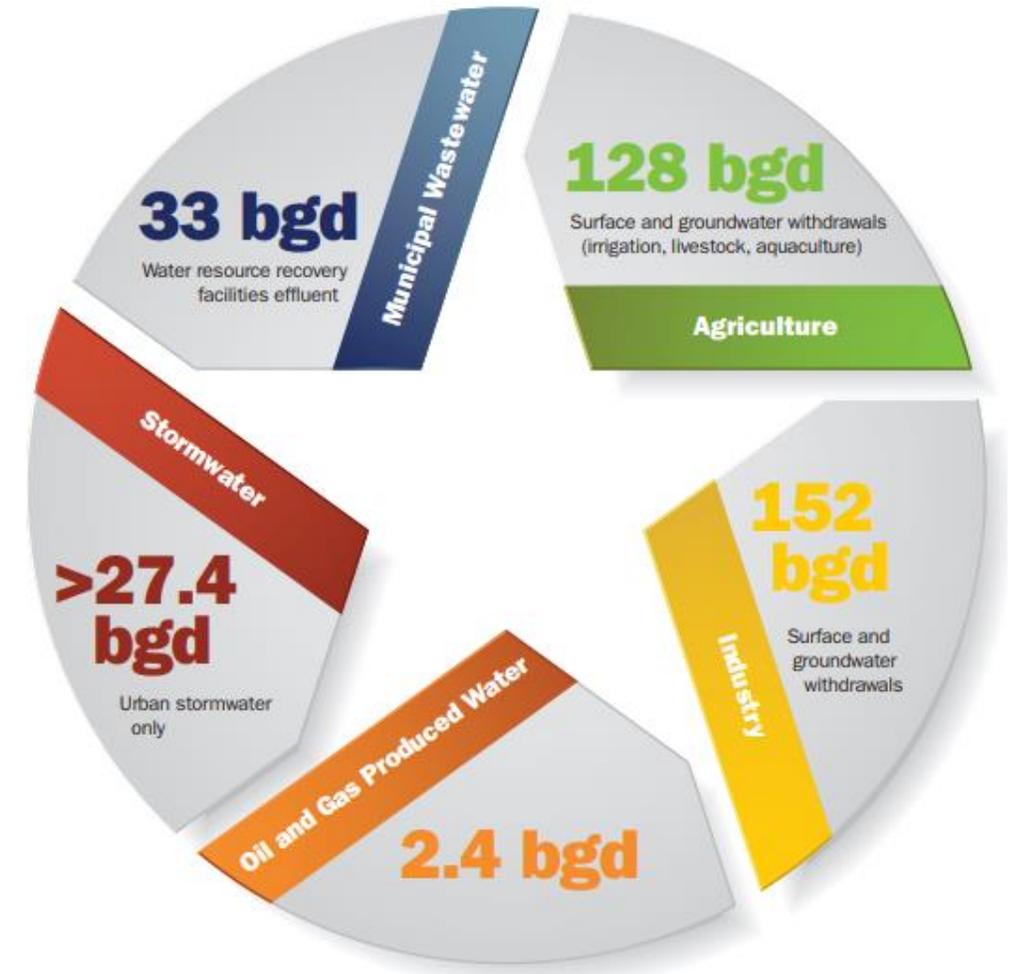
The screenshot shows the EPA website's "Water Reuse and Recycling" section. The main headline is "National Water Reuse Action Plan Released". Below it, a sub-headline reads: "The National Water Reuse Action Plan: Collaborative Implementation (Version 1) was released on February 27, 2020. [Click here to access the full publication.](#)" To the right, a sidebar titled "First Update on WRAP Implementation" contains the text: "The National Water Reuse Action Plan (WRAP) was released on February 27th, with 37 actions and more than 200 implementation milestones surrounding water reuse. [Click here to access the WRAP Quarterly Update](#), summarizing recent progress of WRAP actions." The link "Click here to access the WRAP Quarterly Update" is circled in red in the original image. Below the main article, there are three columns of links: "Information about Water Reuse" (with a sub-link "Basic Information about Water Reuse"), "National Water Reuse Action Plan", and "Additional Resources".

Water Reuse 101

Clear potential to reclaim more of the nation's water

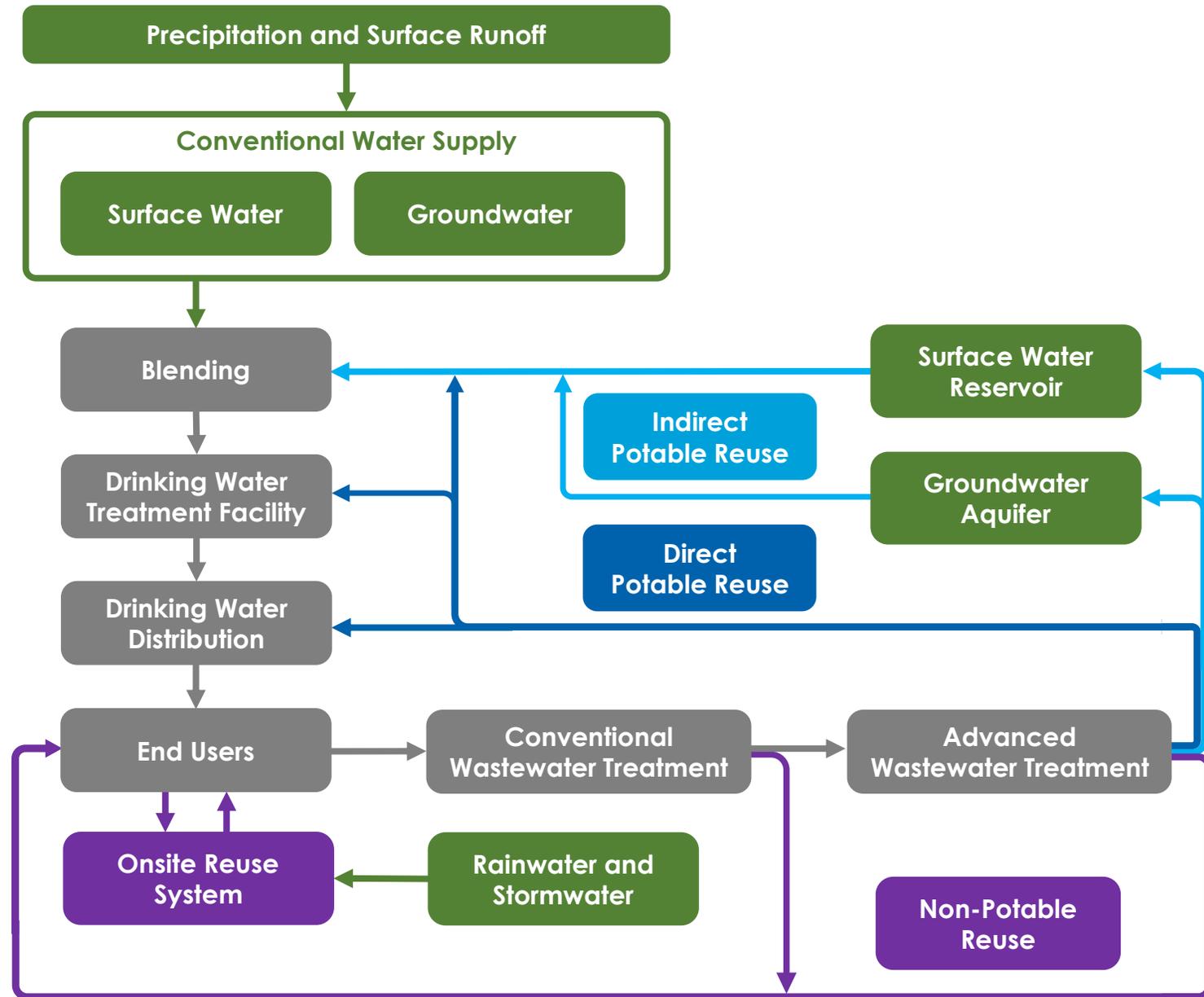
- Nearly 350 BGD from various sources of water discharged
- Over 280 BGD potentially available for reuse

* Estimates from draft Action Plan, page 6



Water Reuse in the Urban Water Cycle

These are just a small number of examples and there are many ways to implement water reuse!



Landscape Irrigation

The use of non-potable recycled water for the irrigation of public or private landscapes to replace or reduce the use of potable water.



Public landscapes throughout Northern California's City of Roseville are irrigated with recycled water

Agricultural Irrigation



Monterey One Water in California delivers reclaimed water for irrigation of 12,000 acres of edible food crops

The use of non-potable recycled water for the irrigation of commercial crops including food crops. Source waters can include municipal wastewater and other source waters.

Potable Reuse

The treatment of wastewater to drinking water standards for potable use, including both direct and indirect potable reuse.



The Orange County Water District (OCWD) in California is receiving a \$186 million CWSRF loan, among other sources of financial capital, to finance the final expansion of its Groundwater Replenishment System (Photo credit: OCWD)

Stormwater Capture and Use



Runoff from a Florida interstate and adjacent drainage basins flows into a regional stormwater facility that delivers reclaimed water to the city of Altamonte Springs non-drinking purposes

The collection, treatment, and use of stormwater for a variety of potable and non-potable purposes. Stormwater capture and use can be incorporated into existing potable or non-potable reuse systems or be implemented separately.



2.3.3

WRAP Action: Convene Experts on Urban Stormwater Capture and Use

- Convene a small group of approximately 25 national experts to review potential for urban stormwater capture for use
- Assess the institutional, legal, financial, and technical barriers to advancing stormwater capture for use
- Recommend key actions to address these challenges. The convening will involve representatives from states, local stormwater programs, NGOs, and other expert organizations.

Onsite Non-Potable Reuse

The collection and reuse of water at a building or neighborhood-scale for non-potable uses such as irrigation, toilet flushing, or other purposes.



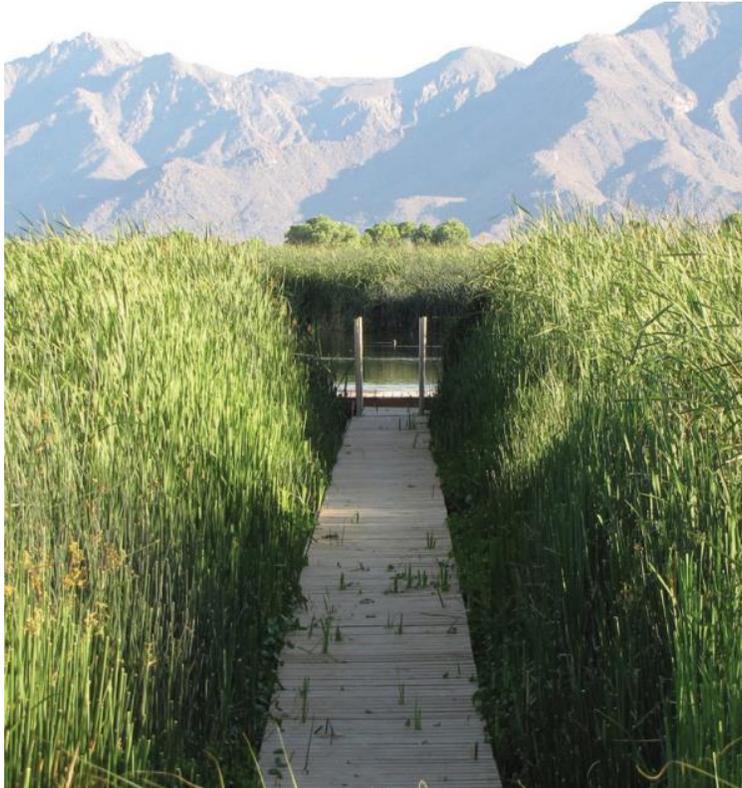
The San Francisco Public Utilities Commission building irrigates exterior vegetation using onsite water reuse. (Photo credit: San Francisco Public Utilities Commission)

2.3.4

WRAP Action: Develop Research and Tools to Support Onsite Non-Potable Water Systems (ONWS)

- Refine and expand fit-for-purpose specifications for alternative onsite sources waters, non-potable end uses and natural treatment systems (i.e., wetlands)
- Enhance available operator training materials and develop certificate program
- Improve decision-making tools
- Perform research on key technical areas (e.g., bacterial inactivation and/or removal from ONWS)

Environmental Restoration



The Tres Rios Environmental Restoration Project in Arizona pumps treated wastewater effluent through 700 acres of Salt River wetlands, creating wildlife habitat and reducing flood risk.

The reuse of water for habitat protection and restoration such as wetlands restoration. This is typically accomplished through the reuse of municipal wastewater.

Industrial Reuse

The reuse of water for a variety of industrial uses including cooling tower water, boiler feed water, or as part of other industrial processes.



Loudoun Water in Northern Virginia has received multiple CWSRF loans to finance recycled water projects that provide cooling water to more than 40 data centers. (Photo credit: Loudoun Water)

Produced Water Reuse



Produced water storage in the Permian Basin stretches across southeast New Mexico and southwest Texas. (Photo credit: Solaris Midstream Water)

The treatment and reuse of produced water from oil and gas extraction activities. Water is typically reused for additional oil and gas extraction, but other end-uses including agricultural irrigation are also under consideration.

Treatment and Distribution for Water Reuse

Non-Potable Reuse

- Level of treatment is dependent on the end-use (“Fit-for-Purpose”)
- Tertiary treatment along with disinfection is typically sufficient for many uses (e.g., landscape irrigation) but higher levels may be needed for other end-uses (e.g., certain industrial uses)
- Removal of salts and other compounds can be important for some uses such as agricultural irrigation
- In all cases, a separate “purple-pipe” distribution system is needed

Potable Reuse

- Requires treatment to drinking water standards with pathogen removal/inactivation of paramount importance
- Utilizes advanced treatment processes to remove pathogens and chemicals
- State regulations and frameworks are quickly evolving
- Advanced treated water can be blended at various points in a drinking water system or directly into a drinking water distribution system

Eligibility of Water Reuse in the SRF Programs

CWSRF Program

- **All** types of water reuse projects are eligible for funding
- Includes both publicly- and privately-owned facilities
- Water reuse is also eligible for additional subsidization as it can address water efficiency goals
- **State-specific restrictions may still apply**

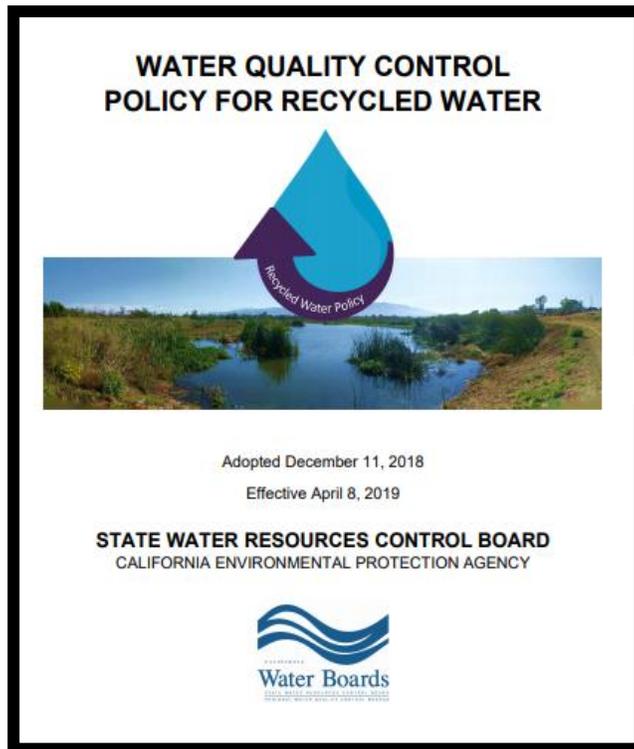
DWSRF Program

- **All** types of water reuse projects are eligible for funding **if** it mitigates the need for additional potable supply
- Includes both publicly- and privately-owned facilities
- Only public water systems are eligible
- **State-specific restrictions may still apply**

Drivers for Water Reuse

Drought Mitigation and Developing New Water Supplies

- Water reuse creates a drought resilient source of water that can be used for a variety of purposes
- Availability of recycled water is less dependent on climatic conditions



3.1.1. 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.

Source: https://www.waterboards.ca.gov/water_issues/programs/water_recycling_policy/

Drivers for Water Reuse

Protection of Groundwater Supplies

- Groundwater injection of purified water can create a saltwater intrusion barrier
- Mitigate land subsidence to prevent aquifer compaction and preserve capacity

Can often be accomplished in tandem with groundwater augmentation as part of an indirect potable reuse project

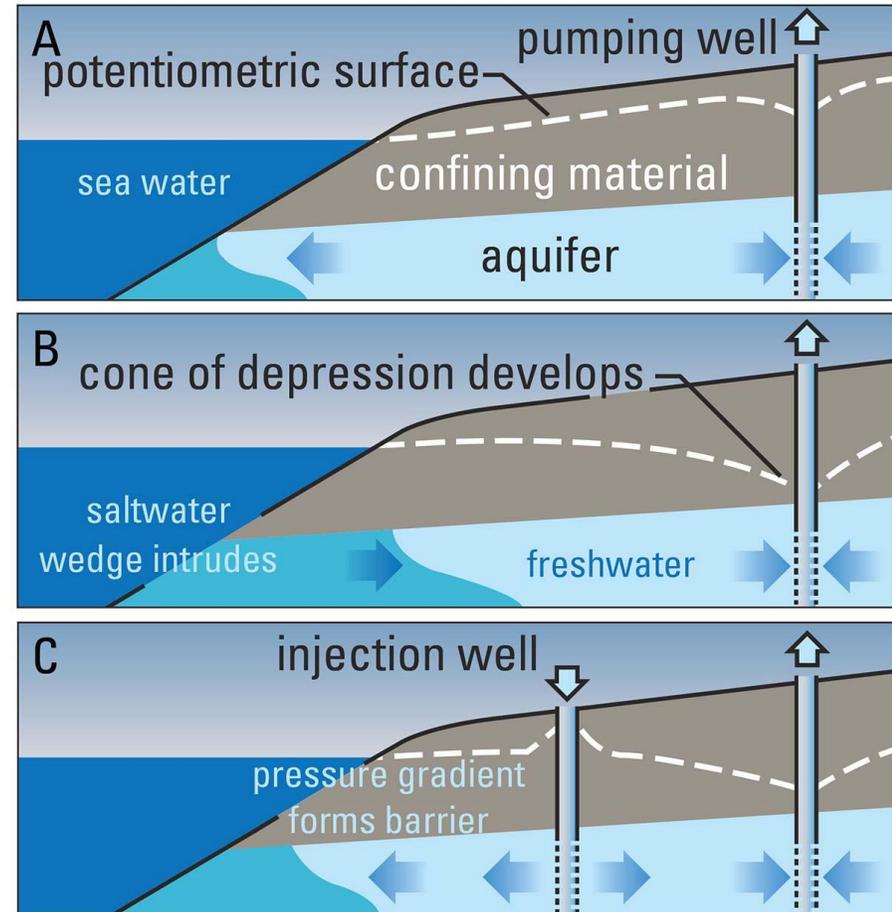


Image source: <https://ca.water.usgs.gov/sustainable-groundwater-management/seawater-intrusion-california.html>

Drivers for Water Reuse

Management of Wastewater and Stormwater Discharges

- Reusing wastewater can prevent discharges into sensitive ecosystems
- Important in regions under pressure to reduce nutrient loadings such as Florida or the Chesapeake Bay

The Hampton Roads Sanitation District's Sustainable Water Initiative for Tomorrow (SWIFT) project will decrease nutrient discharges into the Chesapeake Bay



Drivers for Water Reuse

Reduction in Energy Demand

- In some cases, energy demand for water reuse can be less than traditional potable supplies (e.g., imported water in California)
- Can prevent the “overtreatment” of water

Table 6.1. Comparative Energy Requirements for Alternative Sources of Water

Technology/Water Source	Energy Required (kWh/AF)		Carbon Footprint (kg CO ₂ e/AF)
	Range	Typical	
Secondary treatment without nitrogen removal ^a	330–520 ^b	450 ^c	156
Tertiary treatment with nitrogen removal and effluent filtration ^a	520–670 ^b	600 ^d	208
CAT	1050–1140	1080	373
Brackish water desalination ^d	1500–2000	1900	657
Ocean water desalination ^d	3100–4900	3900	1349
California State Project water ^e	2500–5300	3300	1142
Colorado River water	2000–2100	2000	692
Conventional drinking water treatment ^f	120–130 ^b	124 ^c	43
Membrane-based water treatment ^f	140–150	145 ^c	50

Highly site-specific driver depending on energy requirements of existing water supply and necessary treatment for recycled water

Potential Metrics for Evaluating Water Reuse Projects

1. Amount of Water Produced

- Can represent the volume or percentage of current demand for traditional water supplies that will be displaced or the volume and future demand that can be met

2. Nutrient and Pollutant Removal

- Can account for nutrient and pollutant removal not just from treatment, but from the reduction/elimination of a discharge

3. Decrease in Discharges to Treatment Facilities

- Can account for a decrease in needed capacity for collection and treatment from stormwater capture and or on onsite non-potable water reuse

4. Drought Resilience and Supply Reliability

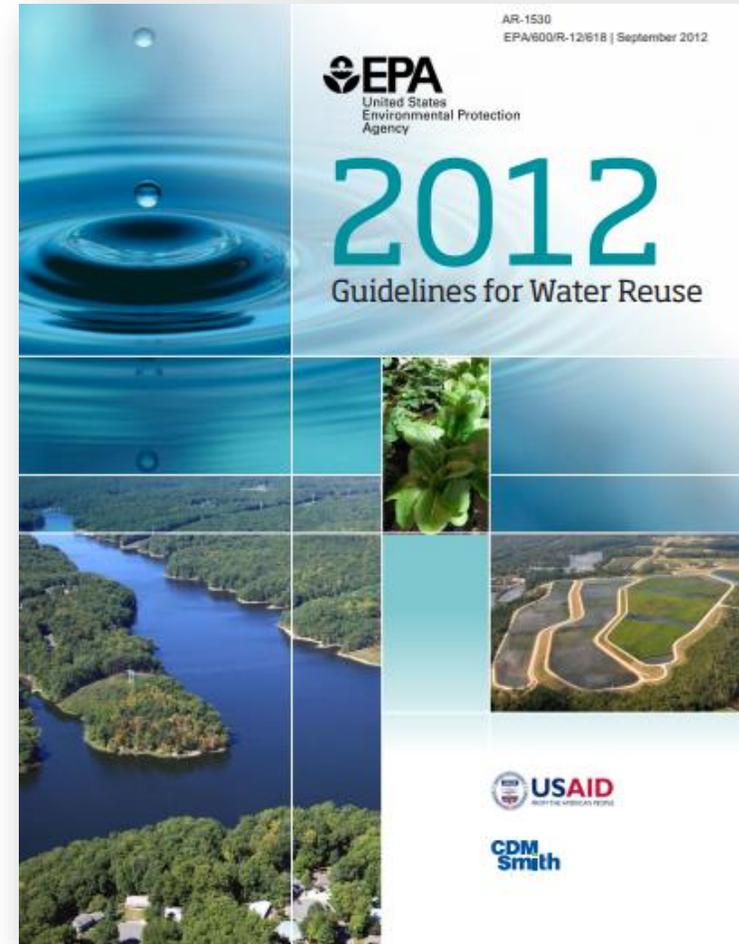
- Can qualitatively account for drought resilient and local supplies of water

5. Environmental Enhancement

- Can account for environmental benefits such as improved in-stream flows downstream of a drinking water intake due to decreased demand for freshwater withdrawals

Non-Potable Reuse Regulatory Frameworks

- Regulations for non-potable reuse are developed on a state-by-state basis
- Required level of treatment largely dependent on the end-use
- Uses where there is human exposure will typically require higher levels of disinfection
- New uses of recycled water are continuously being developed
- Regulations for onsite non-potable reuse systems are developing quickly in some areas



Potable Reuse Regulatory Frameworks



- California has regulations for Indirect Potable Reuse, but no state has final regulations for Direct Potable Reuse
- Arizona has interim DPR regulations with more extensive regulations later
- California DPR regulations coming by the end of 2023
- Texas has approved DPR projects on a case-by-case basis
- SDWA regulations will still apply
- Primary issues are the level of pathogen removal needed and removal of chemicals/total organic carbon

Potable Reuse in the United States

(Source: 2017 EPA Potable Reuse Compendium)



2.2.1

WRAP Action: Compile Existing State Policies and Approaches to Water Reuse

- Identify and collate existing information to develop a compilation of state policies and approaches
- Create a searchable tool for water sector stakeholders to review and compare different approaches to managing water reuse activities

2.3.1

WRAP Action: Compile Existing State Policies and Approaches to Water Reuse

- Compile existing fit-for-purpose specifications (e.g., chemical and microbial) for different sources of water for potential reuse and end-use applications.
- The compilation will rely on federal, state, and international sources to inform best practices and facilitate broader implementation of water reuse.

2.6

WRAP Actions on Finance Support

- Action 2.6.1: Compile Federal Funding Sources and Develop Interagency Decision Tool
 - Provide an easy-to-access information about the most relevant federal funding sources for water reuse in a single platform
- Action 2.6.2A: Communicate Eligibility of Water Reuse in SRF Programs
 - Demonstrate the type of reuse projects that can be funded by the SRFs
- Action 2.6.2B: Support and Communicate WIFIA Funding
- Action 2.6.4: Compile and Promote Existing USDA Resources for Rural Communities
 - Increase opportunities for water reuse to be achieved within existing Rural Utilities financial assistance programs



2.6.2A WRAP Milestones on the SRF Programs

- | | |
|--|-----------------------|
| 1. Identify the eligibility of the major sources of water for reuse and their end uses | Complete! |
| 2. Provide water reuse project highlights in CIFA newsletters | TBD |
| 3. Present the WRAP and the progress on this action at the fall CIFA workshop | Happening Now! |
| 4. Compile water reuse projects funded in the CWSRF and update the CBR database | Complete! |
| 5. Compile tally of overall CWSRF funding for water reuse projects | Complete! |
| 6. Incorporate water reuse as a called-out textbox in the DWSRF Eligibility Handbook. | In Progress |
| 7. Promote water reuse projects and eligibility matrix in EPA's Water Finance Newsletter | Complete! |
| 8. Develop a guide that describes best practices for water reuse funding in the CWSRF | In Progress |
| 9. Develop a fact sheet and case that describes water reuse eligibility under the DWSRF | In Progress |



Thank You!

Justin Mattingly

EPA Office of Water

Mattingly.Justin@epa.gov

<https://www.epa.gov/waterreuse/water-reuse-action-plan>

waterreuse@epa.gov

Together, we can ensure the sustainability, security, and resilience of our nation's water resources.