

Projected Brackish Water Desalination Projects in California

Prepared to Comply with Water Supply Strategy Requirements

California's Water Supply Strategy: Adapting to a Hotter, Drier Future (Water Supply Strategy), adopted by the Newsom Administration in 2022, identifies multiple actions necessary to bolster water supply reliability in the face of climate change. The first set of actions drive the development of new water supplies and set explicit goals for expanding the production of both recycled and desalinated water. Action 1.2 includes specific targets for expanded brackish water desalination: 28,000 acre-feet by 2030, and 84,000 acre-feet by 2040.

The Water Supply Strategy identifies five steps toward achieving this goal. This document addresses the first implementation step under the action to expand brackish groundwater desalination production:

By January 1, 2024, the Department of Water Resources (DWR) and the State Water Board, in coordination with local agencies, will identify the brackish desalination projects that have the potential to be operational by 2030 and by no later than 2040. The State will consider investing in grants to local agencies for planning and building desalination projects.

Also provided is a discussion of how these anticipated projects will contribute towards Action 1.2's specific brackish water production targets.

Information included in this document was compiled from 2020 urban water management plans (UWMPs) submitted to DWR and from direct communication with local water suppliers and operators. UWMPs provide the best estimate of future water supplies because UWMP preparers are required by state law to provide information on planned new water supply projects and reliability of water supplies under both normal and drought conditions. Only water suppliers supplying more than 3,000 acre-feet per year, or with

more than 3,000 service connections are required to submit UWMPs. That means smaller suppliers may not be providing information to DWR on future water projects or water supply reliability.

Desalinated Water Sources

In California, three general types of water sources are desalinated:

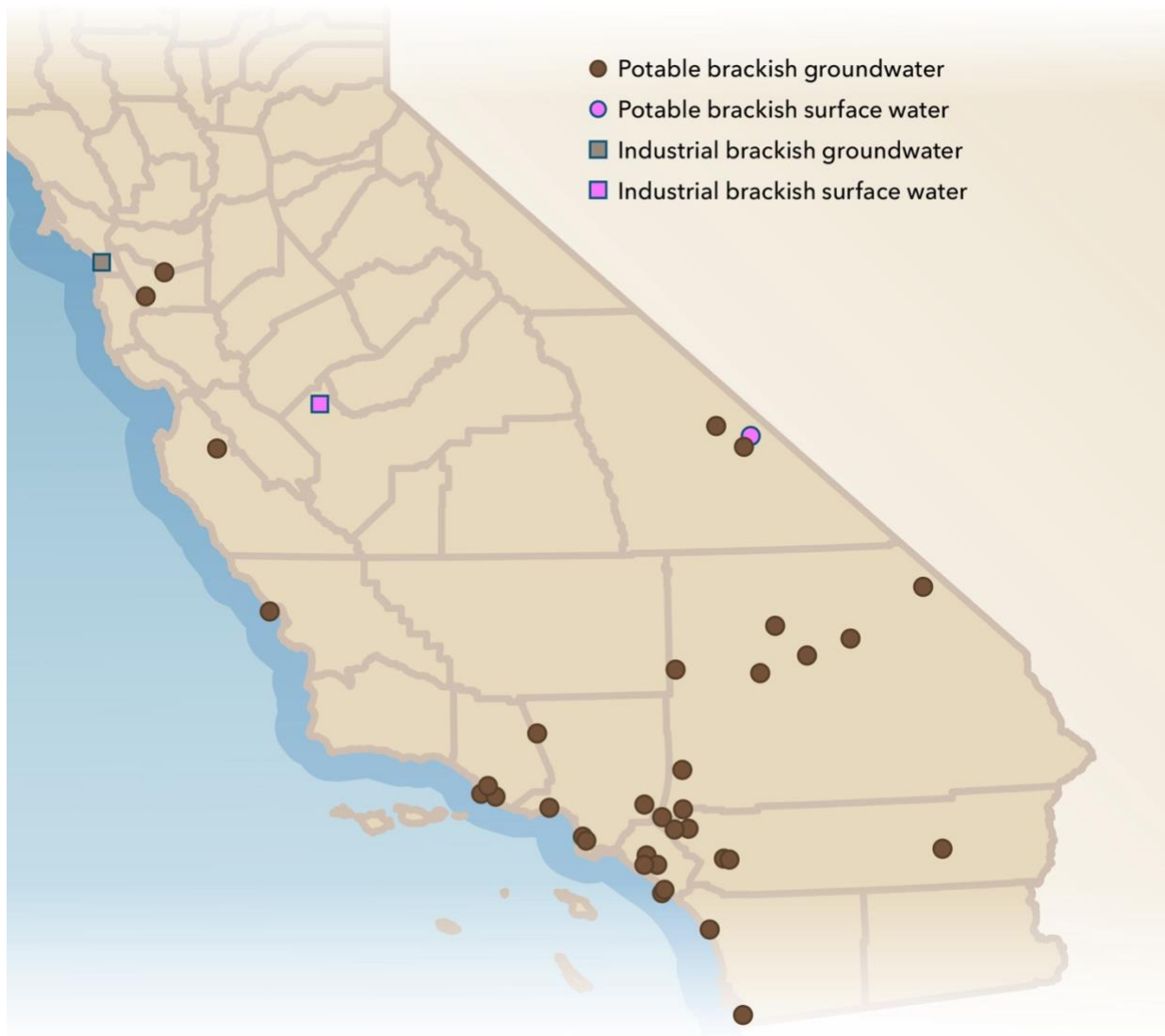
- Brackish groundwater.
- Brackish surface water.
- Sea water, which is saline surface water.

Brackish groundwater and sea water have been desalinated in California for several decades, whereas desalination of brackish surface water has only occurred at a small facility in Death Valley. Two additional communities are adding desalination treatment to address increasing salinity in inland surface water supplies. In 2021, the city of Fort Bragg began desalinating water from its Noyo River intake because of seawater intrusion during high tide. In 2025, the city of Antioch will begin desalinating water from its San Joaquin River intake because of increasing saline bay water intrusion. Other communities are known to be considering future desalination of brackish surface water to augment or replace existing vulnerable supplies.

Existing Brackish Desalination Facilities

Figure 1 shows the locations of existing brackish water desalination facilities, distinguished by water source (groundwater or surface water) and use (municipal or industrial).

Figure 1 2020 California Brackish Desalination Facilities



Key findings from the inventory of existing brackish desalination facilities:

- Brackish groundwater is the source water for two-thirds of California's desalinated water. In 2020, 106,000 acre-feet of brackish groundwater and less than 100 acre-feet of brackish surface water were desalinated for potable supply.
- Desalination occurs in a wide range of coastal and inland locations, including urban areas, desert communities without reliable fresh water supplies with access to brackish or saline supplies, and island communities.

- Desalinated water supplies are effectively supporting communities as a water supply portfolio component. It is a resilient baseline supply that enables suppliers to manage other variable supplies.
- There are two existing industrial facilities desalinating brackish water.

Future Brackish Desalination in California and the Water Supply Strategy Goals

Table 1 summarizes the production capacity of brackish desalination projects planned to be online between 2021 and 2030, and then between 2031 and 2040. These projects are individually identified in Table 2, grouped by source water type. The locations of these projects are shown in Figure 2. In addition to these projects, DWR is tracking others that are in early planning phases and may ultimately contribute to meeting the 2040 production goal. DWR will continue to track the status of these projects and update the tables, as needed.

Table 1 Estimate of Annual Increase in Brackish Water Desalination Capacity Compared to Water Supply Strategy Goals

Category	Water Supply Strategy: Goal for Annual Brackish Water Production Increase	Brackish Groundwater	Brackish Surface Water
Actual 2020 Production (acre-feet)	-	106,000	Less than 100
Planned Capacity Increase by 2030 (acre-feet per year)	28,000	39,600	3,000
Planned Capacity Increase by 2040 (acre-feet per year)	84,000	500	-

State Funding and Innovation

DWR has managed funds from Proposition 50 (2002, \$50 million) and Proposition 1 (2014, \$100 million) to support a wide range of desalination activities. These local assistance programs supported four local brackish water desalination facilities that are either operating, under construction, or in the permitting process. These are:

- City of Torrance Goldsworthy Desalter Expansion (brackish groundwater).
- City of Camarillo North Pleasant Valley Desalter (brackish groundwater).
- City of Antioch Brackish Water Desalination Project (brackish surface water).
- City of Santa Monica Brackish Desalter Production Efficiency Enhancement (brackish groundwater).

DWR is also leading State engagement with the National Alliance for Water Innovation (NAWI) run by Lawrence Berkeley National Laboratory and primarily funded by the U.S. Department of Energy. NAWI's primary objective is to develop new technologies that reduce the financial and environmental costs of desalination. Through this effort, the State is actively supporting research to identify methods to improve efficiency, reduce energy consumption, and improve brine management options — each of which are challenges to increasing desalination opportunities.

Table 2 Planned Brackish Desalination Projects Expected to be Online by 2040

Agency	Facility	County	Planned Year	Source Water	Planned Capacity (af/yr)	2023 Status
The Ranch at Live Oak	Desalination Facility	Ventura	2021	GW	-	Operating. Restart of existing facility.
City of Camarillo	North Pleasant Valley Groundwater Desalter	Ventura	2022	GW	3,877	Operating
Ventura County Waterworks District No. 1	Moorpark Groundwater Desalter	Ventura	2030	GW	5,000	Project dependent on extension of existing brine line.
City of Thousand Oaks	Los Robles Desalter	Ventura	2025	GW	500	Planned
United Water Conservation District	Point Mugu	Ventura	2030	GW	5,000	Treatment will begin in Phase II of the project
City of Beverly Hills	Beverly Hills Desalter	Los Angeles	2022	GW	2,952 to 3,327	Operating. Restart of existing facility. Expansion in 2030.
Water Replenishment District	Regional Brackish Water Reclamation Program	Los Angeles	2027	GW	10,000	Planned expansion of the existing Goldsworthy Desalter.
Eastern Municipal Water District	Perris II Desalter	Riverside	2022	GW	5,400	Operating
Naval Facilities Command	Twentynine Palms Treatment and Blending Facility	San Bernardino	2022	GW	3,363	Operating
Rainbow Municipal Water District	Rainbow MWD Desalination Facility	San Diego	2030	GW	2,000	Planned

Projected Brackish Water Desalination Projects in California

Agency	Facility	County	Planned Year	Source Water	Planned Capacity (af/yr)	2023 Status
Olivenhain Municipal Water District	San Dieguito Basin Desalter	San Diego	2028	GW	1,120	Planned
Otay Water District	Rancho Del Rey Groundwater Well Project (Desalination)	San Diego	2035	GW	500	Planned
City of Fort Bragg	Fort Bragg	Mendocino	2022	BSW	2	Operating
City of Antioch	Antioch	Contra Costa	2025	BSW	3,000	In construction

Table 2 Notes: af/yr = acre-feet per year, BSW = brackish surface water, GW = groundwater

Figure 2 Planned Brackish Desalination Projects Expected to be Online by 2040

