

Summary of the Proposed Amendments to Water Quality Control Plan for California Ocean Waters to address Desalination Facilities Intakes, Brine Discharges, and to Incorporate Other Non-substantive Changes

Summary

The State Water Resources Control Board (State Water Board) is proposing an amendment to the Water Quality Control Plan for California Ocean Waters (California Ocean Plan) to establish a uniform approach for preventing adverse impacts to beneficial uses of ocean waters due to seawater intake and discharge of brine wastes from desalination facilities. The proposed amendment includes: 1) implementation procedures for Regional Water Boards to evaluate the best site, design, technology, and mitigation measures to minimize adverse impacts to aquatic life at new or expanded desalination facilities; 2) industry specific receiving water limits for salinity; 3) implementation and monitoring provisions for discharges of waste brine; 4) provisions protecting sensitive habitats, species, Marine Protected Areas, and State Water Quality Protection Areas from degradation associated with desalination intakes and discharges; and 5) monitoring requirements.

Problem Statement

Population growth in dry coastal areas of California, combined with extended droughts, dwindling local water supplies, and inter-basin transfers have increased the demand for reliable municipal water supplies, and led water agencies and managers to consider desalination as part of an overall water portfolio. The number of desalination and water recycling projects are increasing along the California coastline, making it important for the Ocean Plan to provide clear and consistent requirements.

At present, there are no Ocean Plan provisions implementing the California Water Code section 13142.5, subdivision (b) requirement that the “best available site, design, technology, and mitigation measures feasible be used to minimize the intake and mortality of all forms of marine life” by new or expanded industrial seawater intakes. Also, there are no provisions that specifically address elevated salinity in receiving waters due to brine waste discharges. Untreated brine waste discharged into the ocean has different properties than waste water treatment plant effluent. An undiluted "brine waste" plume is denser than the receiving ocean water due to its increased salinity, and can settle on the ocean floor resulting in adverse effects on bottom-dwelling marine organisms.

Project Goals

- Amend the California Ocean Plan to include the following:
 - a. Applicability of the amendments to new, expanded, and existing desalination facilities.
 - b. Guidance for the Regional Water Boards on how to evaluate the best site, design, technology, and mitigation measures feasible to minimize intake and mortality of all forms of marine life.
 - c. A receiving water limit for salinity that is applicable to all desalination facilities.
 - d. Discharge provisions to ensure sufficient dilution to meet the receiving water limit for salinity.
 - e. Monitoring requirements to ensure that intake and discharge goals are being met.

Specific Expertise Requirements

- **Marine ecology (2)**
The marine ecologist should have expertise in California marine biological species and communities and their relationship with the physical ocean environment. Knowledge of larval production of California species and larval dispersal modeling is desired.
- **Marine toxicology**
The marine toxicologist should have expertise in the salinity tolerance range for California marine organisms and the acute and chronic adverse effects of elevated salinity in the marine environment. Knowledge of how anoxia or hypoxia impact marine organisms is also desired.
- **Marine civil or environmental engineering**
The engineer should have expertise in the design and construction of intake screens, subsurface intakes, discharge outfalls, and multiport diffusers.
- **Environmental fluid mechanics**
The fluid mechanics expert should have expertise in the application principles of fluid mechanics to the design of water intakes and discharges of non-buoyant waste into coastal waters. The fluid mechanics expert should be able to evaluate and compare brine dilution methods including flow augmentation (in-plant dilution), commingling with wastewater, and discharging through multiport diffusers.

References and all relevant documents will be available to the reviewers via CD and FTP site.