

Proposed Amendments to Water Quality Control Plans

Desalination Facilities and Brine Disposal

*California Ocean Plan
and
Enclosed Bays, Estuaries and Inland Surface Waters Plan*

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Monterey, CA*



Outline

- **Need for a policy/ plan**
- **Current status**
- **Issues**
- **Next steps**

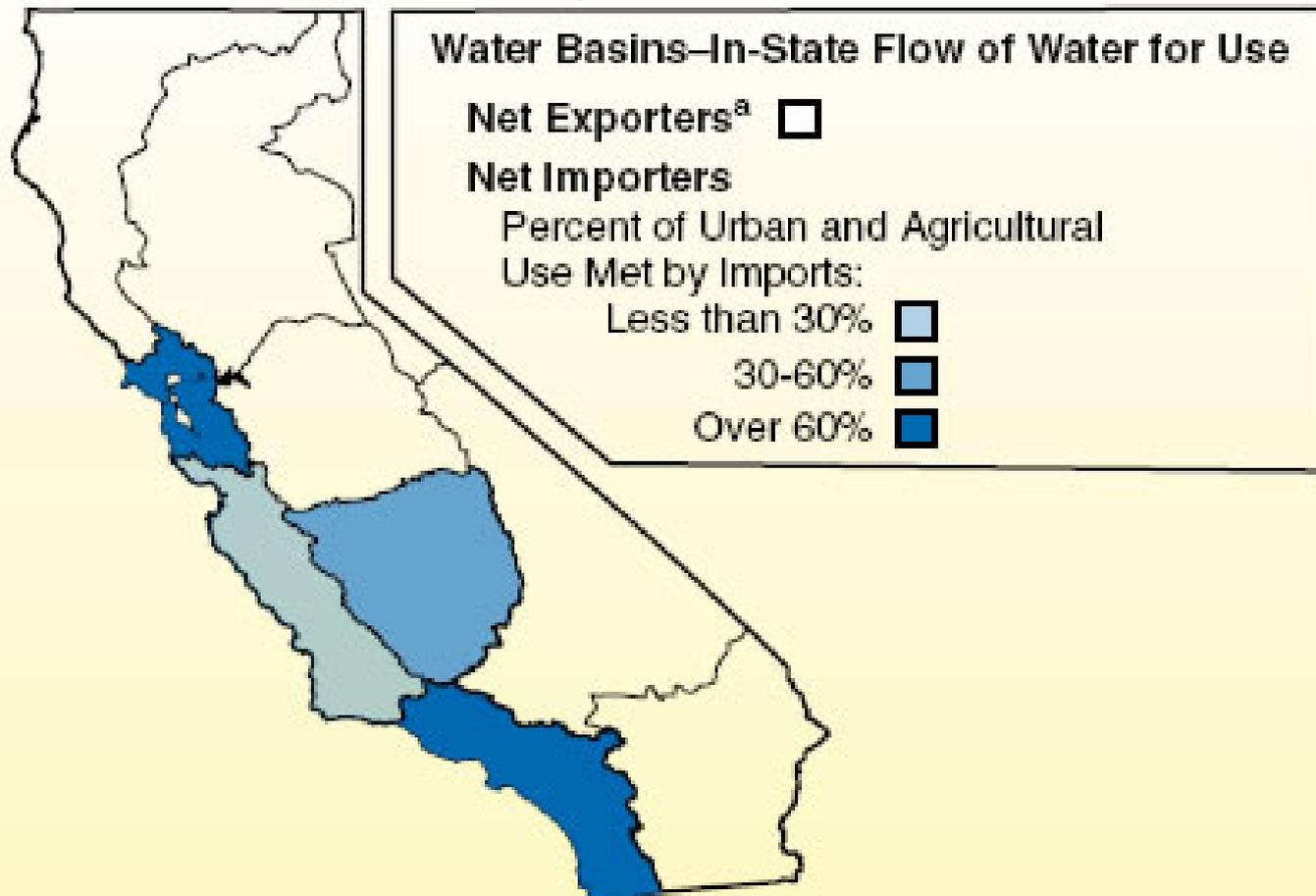
Traditional Local Supplies are Dwindling



San Clemente Dam near Monterey, CA



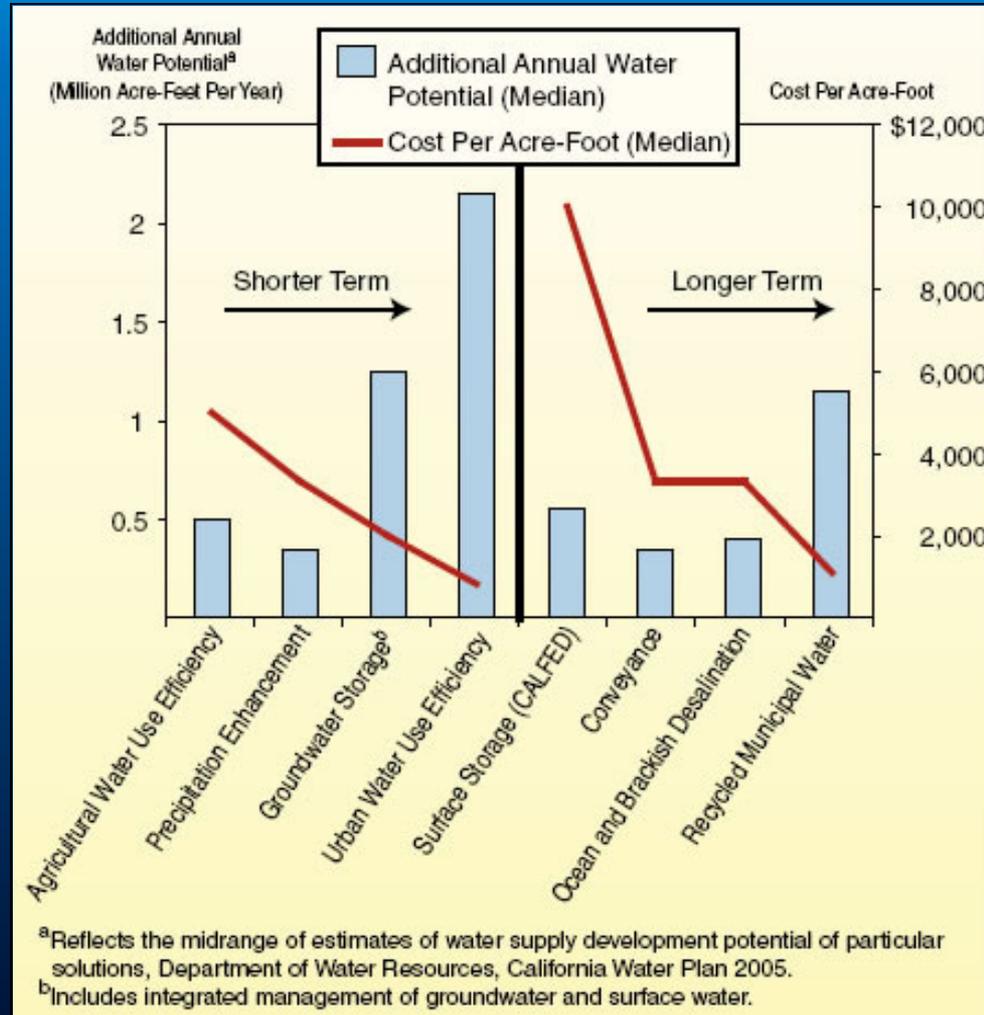
Interbasin Transfers



^aWhile the Colorado River region is a net exporter of water within California, its main source of water is imported from the Upper Colorado River Basin.

Options for Additional Supply

Benefits and Costs



Desalination

- Intake Impacts Impingement and Entrainment
- Discharge of brine
- Energy Use and Cost

Statewide Proposed Desalination Facilities

1. East Bay MUD
2. CA Water Service Company
3. City of Santa Cruz
4. DeepWater, LLC
5. The People's Moss Landing
6. Cal Am
7. Ocean View Plaza
8. Monterey Peninsula WMD
9. Monterey Bay Seawater Desal Vessel
10. Cambria Community Services District
11. Oceano Community Services District
12. West Basin MWD
13. Poseidon Resorces, Huntington Beach
14. South Coast Water District
15. City of Oceanside
16. Poseidon Resorces, Carlsbad
17. San Diego County Water Authority



Legend

Proposed Desalination Facilities

Capacity (MGD)

- 0 - 10
- 10 - 25
- 25 - 50

3nmLimit

Enclosed Bays And Estuaries

Areas of Special Biological Significance (ASBS)

Marine Protected Area (MPA)

National Marine Sanctuary (NMS)

Regional Board Boundary

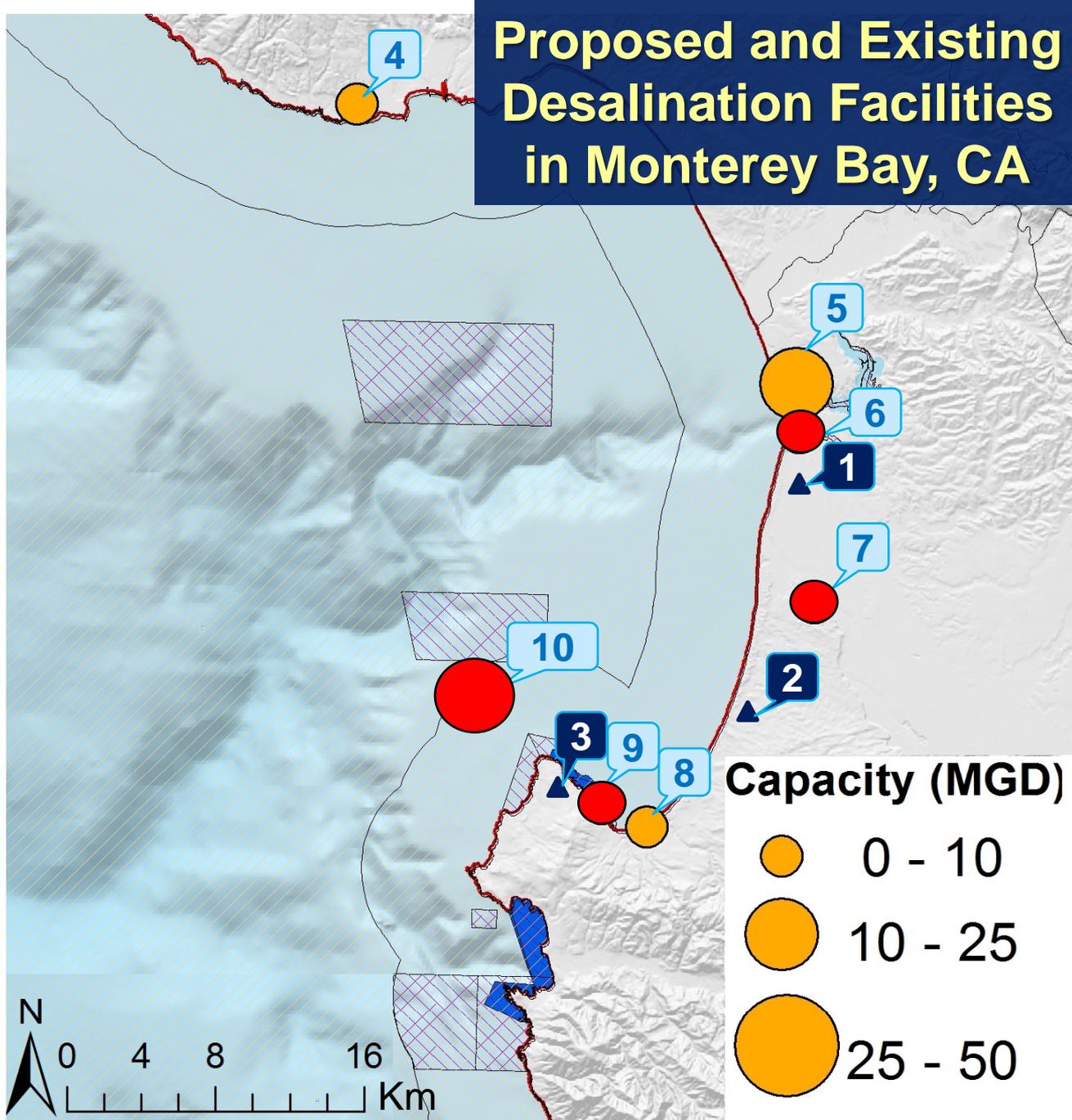
County Boundary



Why is a new regulation needed?

Many new desalination projects have been proposed along the CA coast to alleviate water shortages.

Proposed and Existing Desalination Facilities in Monterey Bay, CA



Existing Facilities ▲

1. Duke Energy
0.5 MGD
2. MCWD/Sand City
0.3 MGD
3. MB Aquarium
0.04 MGD

Proposed Facilities ●

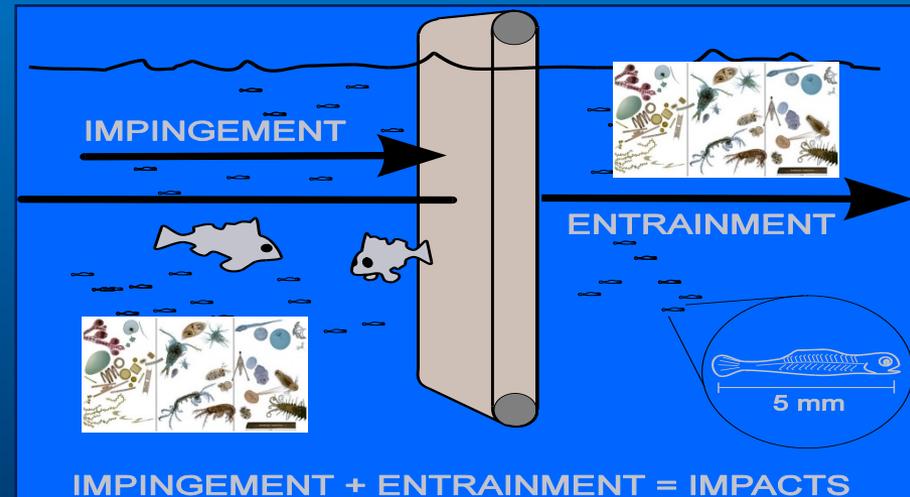
4. scwd²
 5. Deepwater
 6. Regional Desal Project (People's)
 7. Cal Am
 8. Ocean View Plaza
 9. MPWMD
 10. SW Desal Vessel
- Competing Proposals

Current Regulations

- The current California Ocean Plan, and the Enclosed Bays, Estuaries and Inland Surface Water Plan do not address intakes or brines discharges from desalination facilities.
- Desalination facilities are currently regulated under the NDPES program by Regional Boards on a project-specific basis.

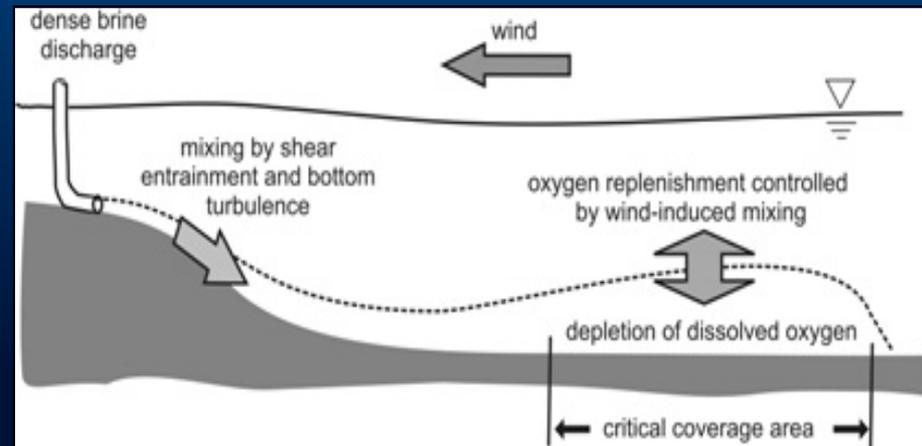
Potential Impacts from Desalination Facilities

Intakes: Withdrawal of ocean or estuarine water will impinge and/or entrain aquatic life.



(from Steinbeck)

Discharge: Brine wastes discharged into the ocean may form a dense plume that settles on the ocean floor, harming benthic marine life.



Previous Steps

First Scoping Meeting
June 26, 2007

Public Stakeholder Meeting
April 18, 2011



Last TR Workplan Adopted
March 15, 2011

Second Scoping Meeting
March 30, 2012

Project Status

**Interagency Meeting
April 24, 2012**

**Stakeholder Meeting
January 30, 2013**

**Interagency Meeting
March 12,
May 22, 2013**

**Three scientific studies
completed and
presented at Board
Workshop
August 22, 2012**

**Draft SED and
Proposed
Amendments**

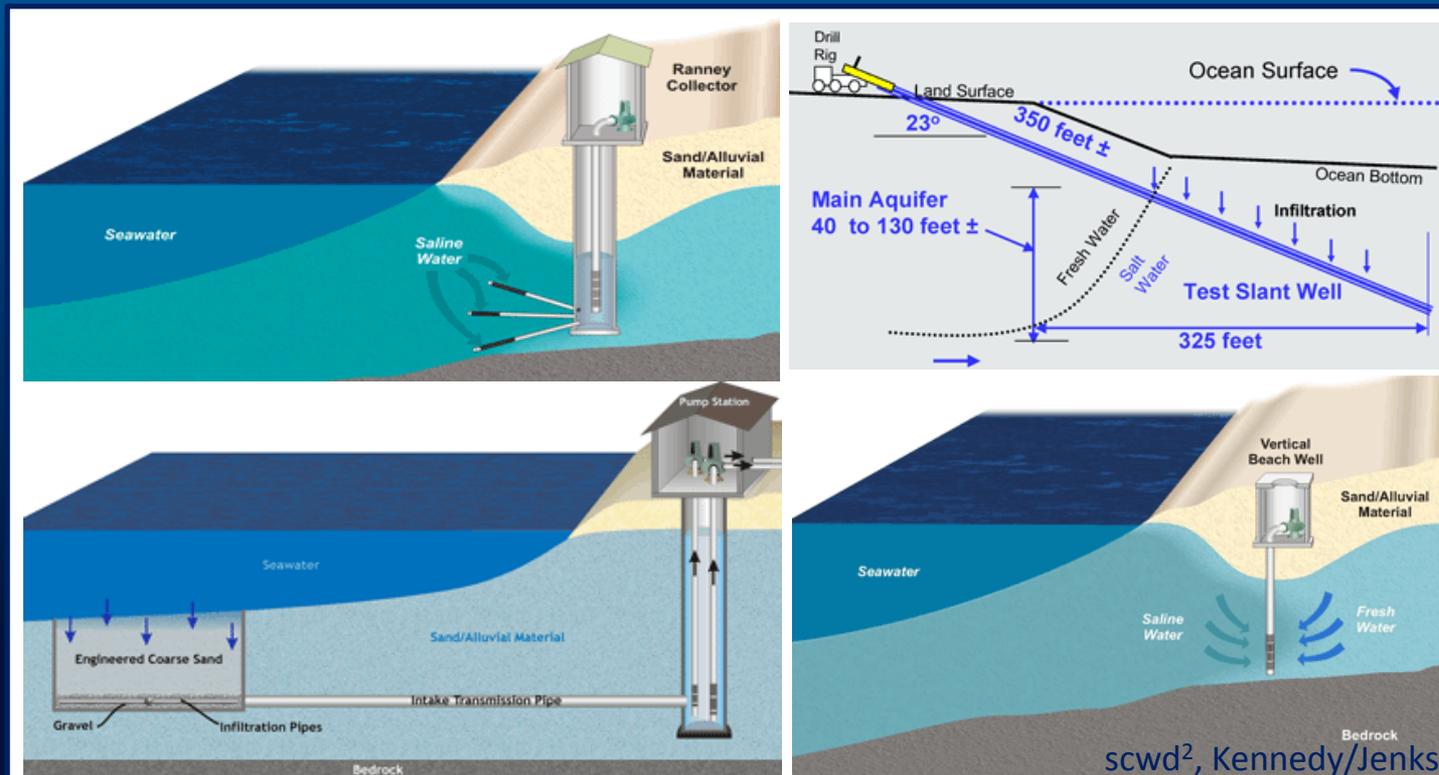


Issues After Stakeholder Meeting

- Effects of stresses on planktonic organisms in the water column due to diffusers.
- Peer review of West Basin salinity and entrainment studies.
- Concern about the use of mitigation funding.
- Need to reconvene the Expert Review Panel.

EPR Recommendations - Intakes

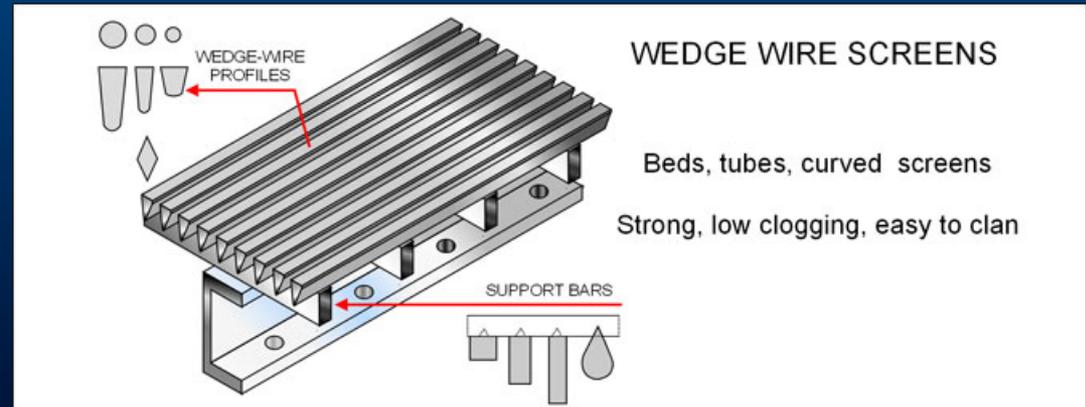
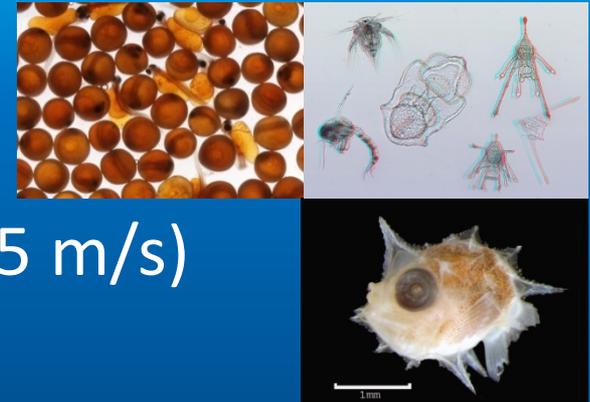
- **Track 1 - Subsurface** (below ground or seabed)
 - Wells- brackish or saline groundwater
 - Below substrate- infiltration galleries (installation and maintenance impacts)



ERP Recommendations - Intakes

- **Track 2 – Surface water**

- Limit intake velocity to 0.5 ft/s (0.15 m/s)
- Fine Screens (0.04 in/1 mm)
- Avoid sensitive habitat (rocky reefs, kelp beds, etc.)



ERP II Recommendations on Intake Impacts and Mitigation

How should any remaining IM&E be mitigated after the best site, design and technology are determined for a new desalination plant intake?

- A fee, based on Habitat Production Foregone, could be used to fund mitigation for entrainment losses
- Provided an equation that could be used to determine a volume-based fee (per million gallons)



Recommendations – Process and Mitigation

- **Process** : Best site and design for a new facility to be determined by the Water Boards following a collaborative process with other state agencies involved in facility permitting.
 - Consider any prior project-specific determinations made by the State Lands Commission or by the California Coastal Commission.
- **Mitigation**: For residual impacts after intake controls, mitigation based on Habitat Production Foregone, determined using Empirical Transport Model.

Potential Discharge Impacts

- The effects of exposing benthic marine life to a dense, highly saline plume are not very well understood.
- Granite Canyon Brine Toxicity Study investigated sensitivity of red abalone, purple urchin, sand dollars, mussels, mysid shrimp, giant kelp and topsmelt to elevated salinity.

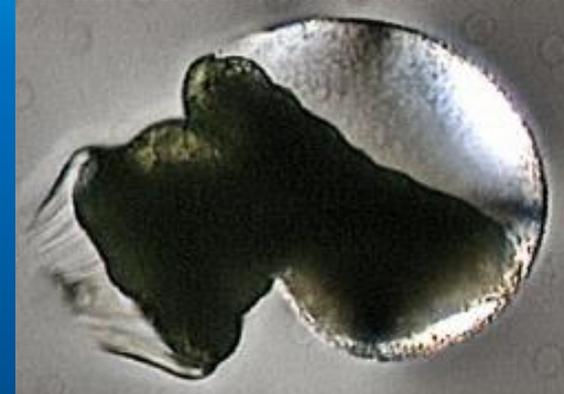




Potential Discharge Impacts

Granite Canyon Brine Toxicity Study Results:

- Invertebrates are sensitive to elevated salinity.
- Red abalone were most sensitive (observed effect at ~5% above 'average' seawater).
- Implications for endangered black abalone?

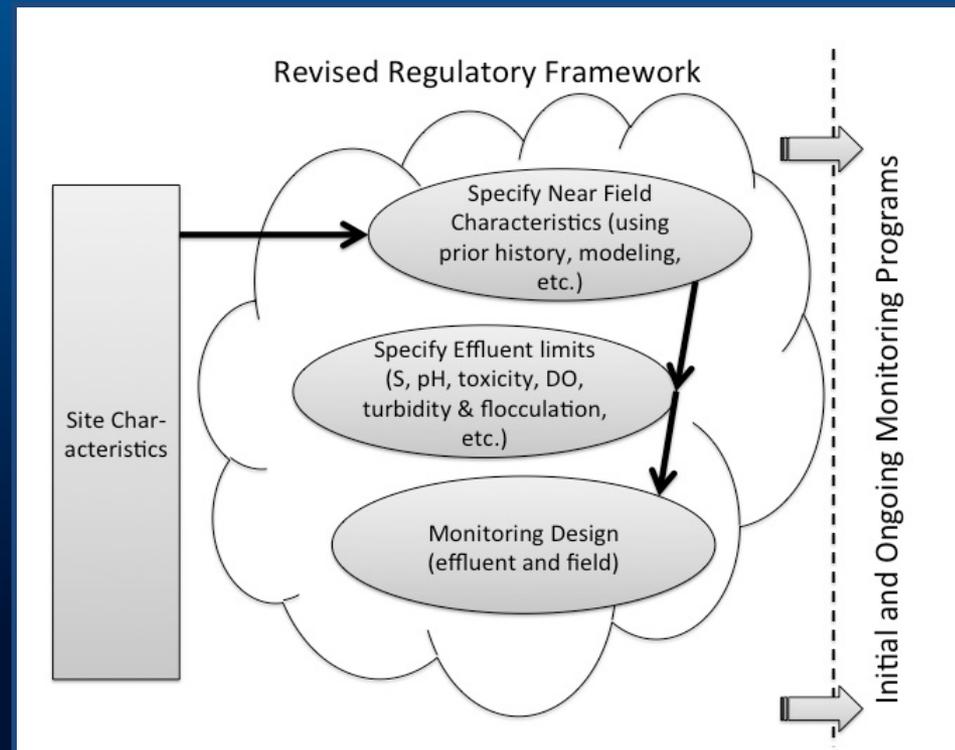


Brine Panel Recommendations on Brine Fate and Disposal

- A salinity increase of no more than 5 percent (2-3 ppt) in the receiving waters around the discharge appears protective to biota.
- Monitoring programs should be required for all discharges (effluent and receiving environment).

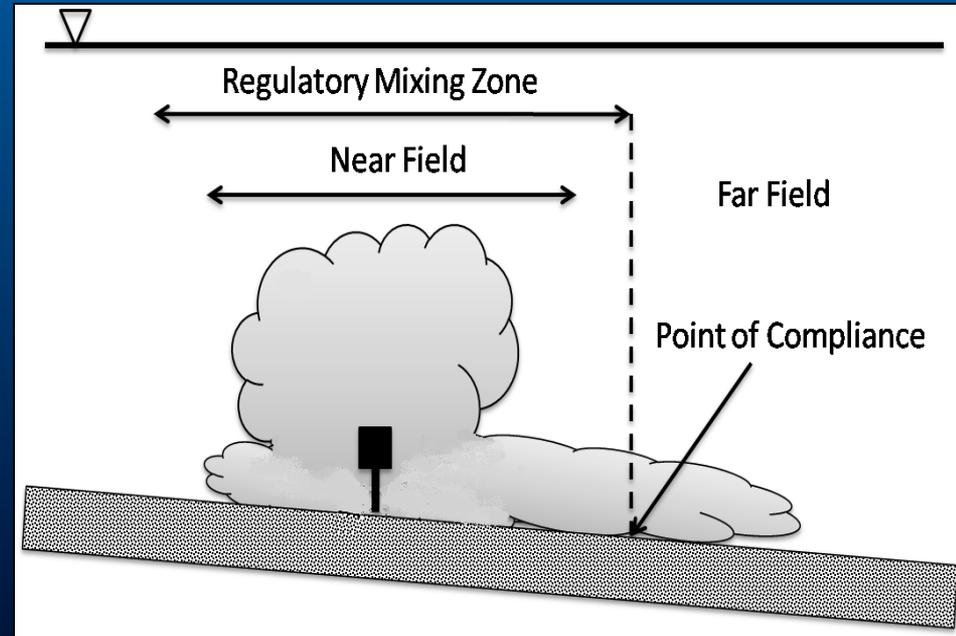
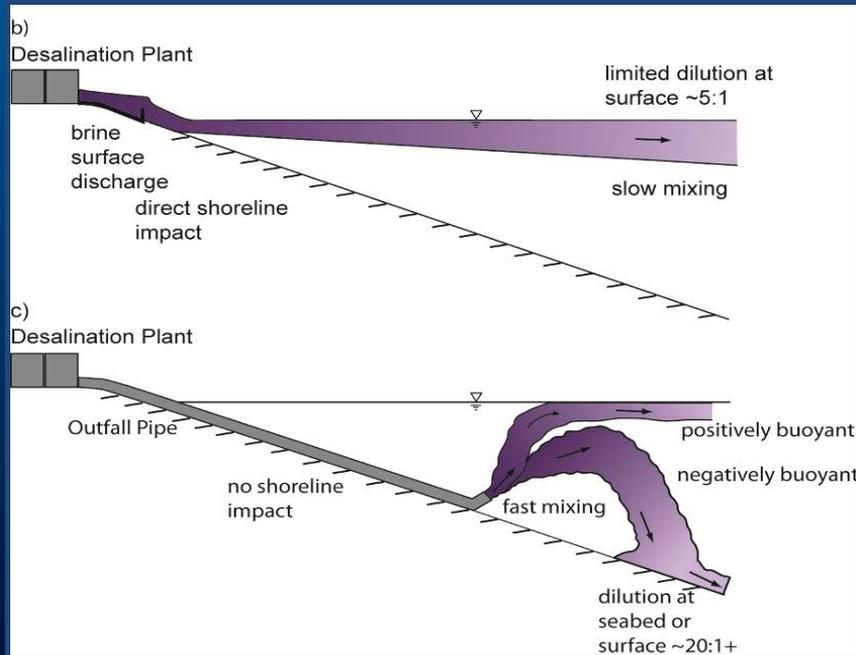
Recommendations- Controlling Discharge Impacts

- **Prohibition on** the use of seawater from a surface water intake for the specific purpose of increasing **in-plant dilution.**
- Commingling with treated POTW wastewater allowed as long as receiving water objectives are met.

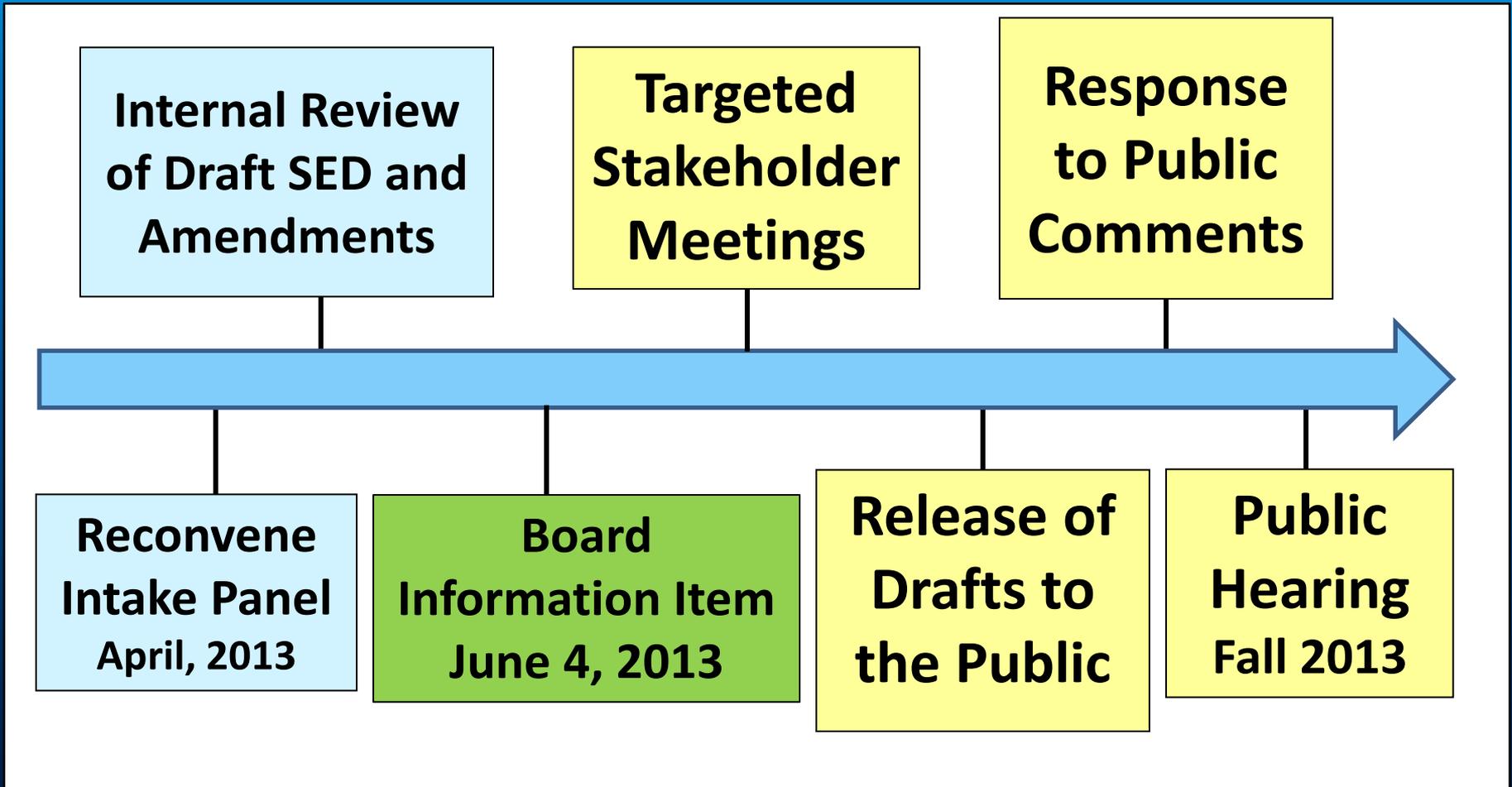


Recommendations on Brine Fate and Disposal

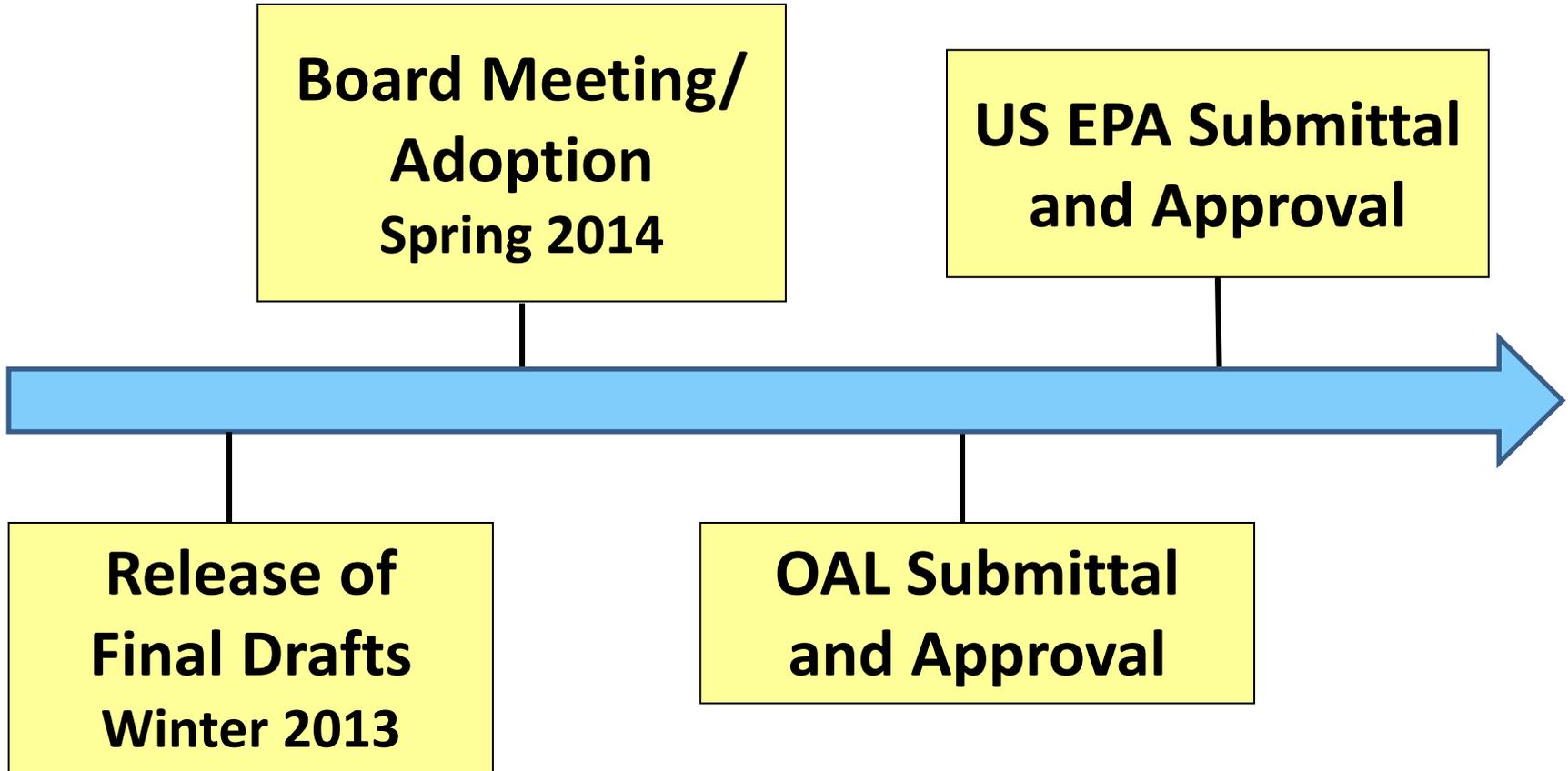
- WQOs must be met at the edge of a regulatory mixing zone that extends vertically through the water column



Timeline: Planning Steps



Next Steps



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