

THE RESOURCES AGENCY DEPARTMENT OF WATER RESOURCES • DEPARTMENT OF FISH & GAME

Salton Sea

ECOSYSTEM RESTORATION PROGRAM



Community Meetings

We Want to Hear From You

January 18 and 19, 2006

Jerry Johns

Deputy Director
Department of Water Resources

Dale Hoffman-Floerke

Chief, Colorado River and Salton Sea Office
Department of Water Resources

Chuck Keene

Environmental Program Manager
Department of Water Resources

Kim Nicol

Senior Environmental Scientist
Department of Fish and Game

Sponsor List

- California Resources Agency
- The Honorable Mary Bono, Member of Congress
- The Honorable Bob Filner, Member of Congress
- Senator Denise Moreno Ducheny
- Senator Jim Battin
- Assemblywoman Bonnie Garcia
- Assemblyman John J. Benoit
- The Salton Sea Authority

Salton Sea 

Meeting Format

- Review of Purpose and Process
- Overview of Development of Alternatives
- Overview of Alternatives
- Review of Advisory Committee Recommendation
- Next Steps
- Conclusion

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The State's Responsibility

- State legislation gave the State of California the responsibility for developing an ecosystem restoration study for the Salton Sea
 - Study must include range of alternatives
 - Study must be submitted to the Legislature by the end of 2006

“It is the intent of the Legislature that the State of California undertake the restoration of the Salton Sea ecosystem...”

Salton Sea 

Vision for the Future

A healthy Salton Sea ecosystem for fish and wildlife that stabilizes and improves water quality and fully mitigates air quality impacts of the Ecosystem Restoration Program.

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Approach to Developing Alternatives

Identify project objectives

Develop a range of concepts based on scoping, Advisory Committee (AC), and public outreach meetings

Follow laws, regulations, & CEQA guidelines as screening criteria to define configurations

Refine configurations based on input from the AC and public comments

Add habitat, water quality and air quality components to make full “Alternatives”

Focus final range of “Alternatives” based on input from the AC and public comments

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Project Objectives - Summarized

- Habitat Management — primary purpose
 - Restore long-term stable aquatic and shoreline habitat for historic levels and diversity of fish and wildlife that depend on the Sea
- Water Quality Protection
 - Reduce nutrients to minimize eutrophication
- Air Quality Management
 - To the maximum extent feasible, eliminate air quality impacts from restoration activities
- Economic and Recreational Opportunities
 - Assess local economic and recreational opportunities

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Existing Laws and Regulations

- Existing laws and regulations provide guidelines for development of alternatives
- Project must obtain necessary approvals and permits
- Relevant existing laws and regulations include:
 - Project's Implementing Legislation
 - California Environmental Quality Act
 - California and Federal resource protection laws
 - Endangered Species Acts
 - Cultural resources
 - Air quality
 - Water quality

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Major Components of Most Alternatives

- Marine Sea
- Brine Sink
- Barrier and Perimeter Dikes
- Saline Habitat Complex
- Air Quality Management
- Water Quality Protection

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Marine Sea and Brine Sink Facts and Figures

Marine Sea

- Salinity of the marine sea for most of the alternatives is between 30,000 and 40,000 mg/L
- Salinity would be similar to typical ocean water

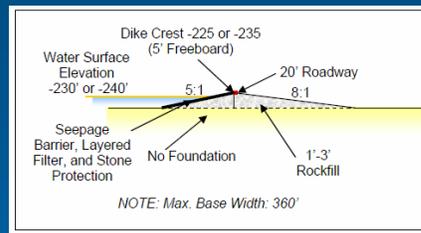
Brine Sink

- Provide the "outlet" necessary to manage the elevation and salinity of the Sea
- Expand and contract seasonally depending on flows
- Salinity would eventually exceed 200,000 mg/L (over 6 times saltier than ocean water)
- For comparison, the Great Salt Lake is 3 to 5 times saltier than ocean water and Mono Lake is 2 to 3 times saltier than ocean water

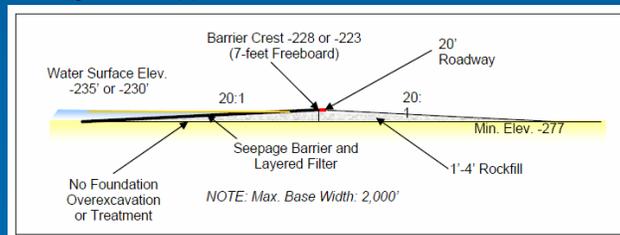


Barrier and Perimeter Dikes Facts and Figures

- Volume of material: 60 to 100 million cubic yards depending on the alternative
- 100 million cubic yards would require 10.5 million dump trucks. If you lined the dump trucks up end to end, you could make seven roundtrips from Los Angeles to New York!
- Require Division of Safety of Dams (DSOD) oversight and approval



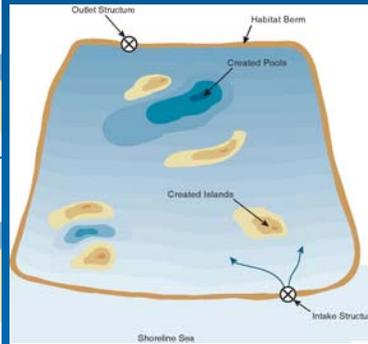
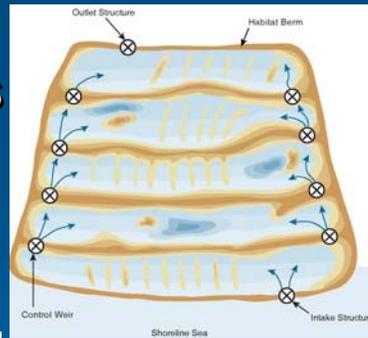
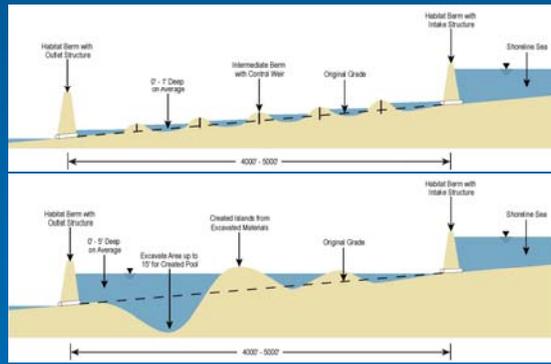
Perimeter Dike < 20 ft



Barrier > 20ft

Saline Habitat Facts and Figures

- Provides wildlife habitat
- Berms would create cells with saline habitat of varying depths, salinities, and structural features
- Saltwater from the brine sink would be blended with inflows to achieve target salinity



Air Quality Management Facts and Figures

- If exposed playas are emissive, air quality mitigation would be implemented with irrigated, salt-tolerant vegetation or other dust control measures



Drip Irrigation Filters



Saltgrass



Salt-tolerant Shrubs

Water Quality Protection Facts and Figures

Key Components:

- Salinity
- Selenium
- Nutrients (nitrogen and phosphorus)
- Temperature
- Sediment
- Hydrogen sulfide
- Ammonia

Water Treatment Options:

- Natural treatment (wetlands)
- Water treatment facilities
- Blending of treated and untreated water



Overview of Alternatives

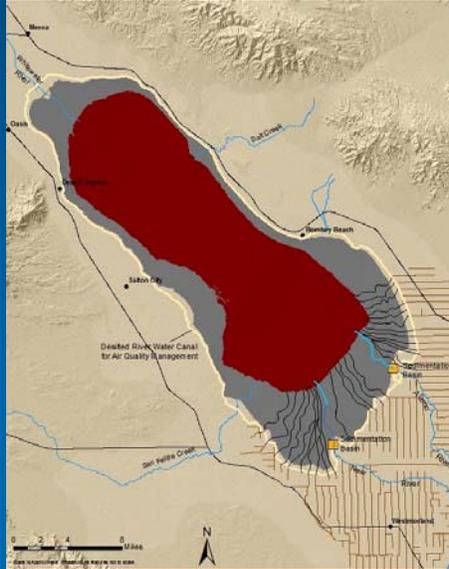
Alternatives:

- No Action/No Action Variability
- South Sea Combined
- North Sea Combined
- North Sea and Minimal Barrier
- Minimal Barrier
- Concentric Rings
- Import/Export

Important Notes:

- Analysis is in progress and subject to change
- Cost Estimates:
 - Very conservative
 - Preliminary capital costs
 - Provided for comparison purposes
- Alternative Layouts:
 - All at design inflow of 650,000 acre-feet per year
 - Shown at the end of 75 years
 - Phased over time

No Action Alt. – Variable Conditions



Purpose:

- Provide a basis for the evaluation of **future** impacts of the other proposed alternatives
- Represents more uncertainty in projected inflows than the No Action Alternative – CEQA Conditions
- Allows for evaluation of future risk if inflows are less than published reports

Major Components:

- Same as No Action—Includes some future actions for pupfish and air quality management
- Shown at 650,000 acre-feet/yr inflows

No Action Alt. – Variable Conditions Facts and Figures

Hypersaline Sea:

- Salinity: $\gg 250,000$ mg/L
- Elevation: 263 feet below msl
- Surface area: > 194 mi²
About the same size as Lake Tahoe

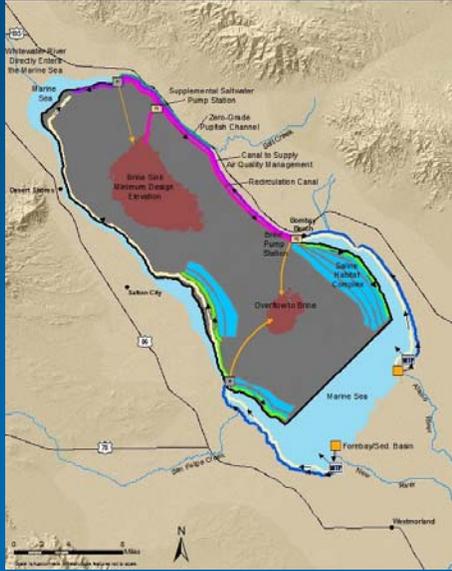
Air Quality Management:

- Total area of exposed playa: 170 mi²
- Area with irrigated vegetation: 85 mi²

Estimated Capital Cost:

- \$1.9 Billion

South Sea Combined



Purpose:

- Provide a deep, marine sea habitat in the southern portion of the Sea
- Sea target elevation of -230 feet msl and salinity similar to ocean water

Major Components:

- Barrier to create Marine Sea
- Perimeter dikes to create western and northern Sea areas
- Canals and pipelines for circulation and moving water to different areas/uses
- Saline habitat complex simulating historical conditions
- Brine Sink provides the “outlet” to manage the elevation and salinity
- Air quality management activities on all exposed playa area

South Sea Combined Facts and Figures

Marine Sea:

- Salinity: 30,000 to 40,000 mg/L
- Surface area: > 62 mi²
About 2x size of Lake Havasu, 9x the size of Diamond Valley Lake, and 1/3 of the size of Lake Tahoe

Brine Sink:

- Elevation: 265 to 275 feet below msl
- Surface area: > 34 mi²

Barrier and Perimeter Dikes:

- Length: 60 mi
- Volume of material: 77.3 million yd³

For comparison of areas,

Lake Tahoe – 193 mi²
Lake Havasu -- 32 mi²
Diamond Valley Lake – 7 mi²

Saline Habitat Complex:

- Salinity: 20,000 to 60,000 mg/L
- Surface area: 39 mi²

Air Quality Management:

- Total area of exposed playa: 240 mi²
- Area with irrigated vegetation: 120 mi²

Estimated Capital Cost:

- \$9.2 Billion
- For comparison, the Comprehensive Everglades Restoration Plan cost \$7.8 Billion (about 1.2x)

North Sea Combined



Purpose:

- Provide a deep, marine sea habitat in the northern portion of the Sea
- Sea target elevation of -230 feet msl and salinity similar to ocean water

Major Components:

- Same major components as South Sea Combined alternative

North Sea Combined Facts and Figures

Marine Sea:

- Salinity: 30,000 to 40,000 mg/L
- Surface area: > 62 mi²
About 2x size of Lake Havasu, 9x the size of Diamond Valley Lake, and 1/3 of the size of Lake Tahoe

Brine Sink:

- Elevation: 265 to 275 feet below msl
- Surface area: > 34 mi²

Barrier and Perimeter Dikes:

- Length: 50 miles
- Volume of material: 100.5 million yd³

Saline Habitat Complex:

- Salinity: 20,000 to 60,000 mg/L
- Surface area: 39 mi²

Air Quality Management:

- Total area of exposed playa: > 237 mi²
- Area with irrigated vegetation: 118 mi²

Estimated Capital Cost:

- \$10 Billion
About 1.3x the Comprehensive Everglades Restoration Plan

Minimal Barrier



Purpose:

- Provide substantial amount of created saline habitat areas along the outer portion of the Sea

Major Components:

- Berms to create saline habitat area
- Canals convey water to different areas/uses
- Saline habitat complex simulating historical conditions
- Brine Sink provides the "outlet" to manage the elevation and salinity
- Air quality management activities on all exposed playa area

Minimal Barrier Facts and Figures

Brine Sink:

- Elevation: 265 to 275 feet below msl
- Surface area: > 34 mi²
About the same size as Lake Havasu, 5x the size of Diamond Valley Lake, and 1/10 of the size of Lake Tahoe

Saline Habitat Complex:

- Salinity: 20,000 to 60,000 mg/L
- Surface area: 117 mi²

Shoreline Sea:

- Northern area: 3 mi²
- Western and Southern area: 14 mi²

Air Quality Management:

- Total area of exposed playa: 210 mi²
- Area with irrigated vegetation: 105 mi²

Estimated Capital Cost:

- \$7.3 Billion
A little less than the Comprehensive Everglades Restoration Plan

Concentric Rings



Purpose:

- Preserve and expand existing shoreline habitat at the Sea

Major Components:

- First perimeter dike constructed at -240 msl, water at -230 msl
- Second perimeter dike constructed at -250 msl, water at -240 msl
- Brine sink provides the "outlet" to manage the elevation and salinity in the perimeter rings
- Air quality management activities on all exposed playa area

Concentric Rings Facts and Figures

First Perimeter Ring:

- Salinity: about 20,000 mg/L
- Surface area: 47 mi²
Almost 1.5 times larger than Lake Havasu
- Water elevation: -230 feet msl

Second Perimeter Ring:

- Salinity: about 35,000 mg/L
- Surface area: 56 mi²
Almost 1.8 times larger than Lake Havasu
- Water elevation: -240 feet msl

Perimeter Dikes:

- Volume of material: 60.8 million yd³

Brine Sink:

- Elevation: 265 to 275 feet below msl
- Surface area: > 34 mi²

Air Quality Management:

- Total area of exposed playa: 225 mi²
- Area with irrigated vegetation: 113 mi²

Estimated Capital Cost:

- \$7.9 Billion
About the same as the Comprehensive Everglades Restoration Plan

Import/Export



Purpose:

- Provide a whole Sea configuration that maintains a stable marine sea at a constant elevation and salinity

Major Components:

- Import water from the Gulf of California or the Pacific Ocean
- Export water to the Gulf of CA or Pacific Ocean to maintain a marine salinity
- Multiple canals and pipelines for import and export
- Need to import/export about 4 millions acre-feet/yr to maintain target salinity

Import/Export Facts and Figures

Marine Sea:

- Salinity: about 44,000 mg/L
- Surface area: 340 mi²
Same as existing Sea

Import/Export Pipelines/Canals:

- Import from Gulf of CA:
 - 4 pumping plants
 - 8 pipelines, each 74 mi long
 - 104 mi of lined canals
- Export from Salton Sea:
 - 5 pumping plants
 - 6 pipelines, each 74 mi long
 - 104 mi of lined canals

Air Quality Management:

- Total area of exposed playa: none below 235 feet msl

Estimated Capital Cost:

- Gulf of CA: \$49 Billion
About 6.3x the Comprehensive Everglades Restoration Plan

Engineering and cost information not available at this time for the Pacific Ocean route



Advisory Committee Recommendation

- On 12/8, the Advisory Committee met at the Torres Martinez Reservation
- Advisory Committee recommended six of the seven alternatives for a complete analysis in the Ecosystem Restoration Study and PEIR
- Advisory Committee also:
 - Discussed the Minimal Barrier Alternative to be a less infrastructure intensive alternative
 - Recommended to eliminate the Import/Export Alternative from further study

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Advisory Committee's Concerns with the Import/Export Alternative

- Concerns Specific to Gulf of California
 - Regulations prohibit discharge/intake in Gulf of CA
 - Gulf designated as a World Heritage Site by the United Nation's Educational, Scientific and Cultural Organization (UNESCO)
 - No major disruptions allowed that will effect biological resources
 - International project
 - Pumping and conveyance facilities in Mexico – Who would own and operate these?
 - Uncertain mitigation responsibilities – Who would mitigate impacts in Mexico?
 - Complicated politics – U.S. Federal law requires any formal discussions with the Republic of Mexico to be coordinated through the U.S. Department of State and International Boundary and Water Commission

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Advisory Committee's Concerns with the Import/Export Alternative

▪ Environmental Concerns

- Gulf of CA and Pacific Ocean
 - Significant construction impacts
 - Introduction of invasive and non-native species
 - Compliance with California Ocean Plan would be difficult
 - Requires that no discharged particle reaches the shore – outfalls and intake pipes would need to be miles long to meet environmental requirements

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Next Steps

Short term:

- January 31 – Advisory Committee makes final recommendation on alternatives
- Early Feb – Secretary for Resources makes determination on the final range of alternatives to be carried forward for detailed analysis
- March – Publish Draft PEIR and Ecosystem Restoration Study

Longer term:

- April to Sept 2006 – Additional public outreach meetings, gather public comment on Draft PEIR, and develop Final PEIR
- Late Fall 2006 – Publish Final PEIR and Ecosystem Restoration Study and identify a preferred alternative
- By December 31, 2006 – Secretary for Resources submits preferred alternative to Legislature
- Decision by State Legislature expected in 2007

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Upcoming Meetings

- Salton Sea Advisory Committee
 - January 31, 9:30 AM to 3:30 PM at the California Association of Counties in Sacramento
 - Videoconference at the Cabazon Administrative Office (at Fantasy Springs Casino)
 - Committee makes final recommendation on range of alternatives for the PEIR and ERS
- Next Round of Public Outreach Meetings
 - Several between April and September



Send Your Comments to:

**Department of Water Resources
Colorado River and Salton Sea Office
1416 9th Street
Sacramento, CA 95814**

Visit www.saltonsea.water.ca.gov for more information

