



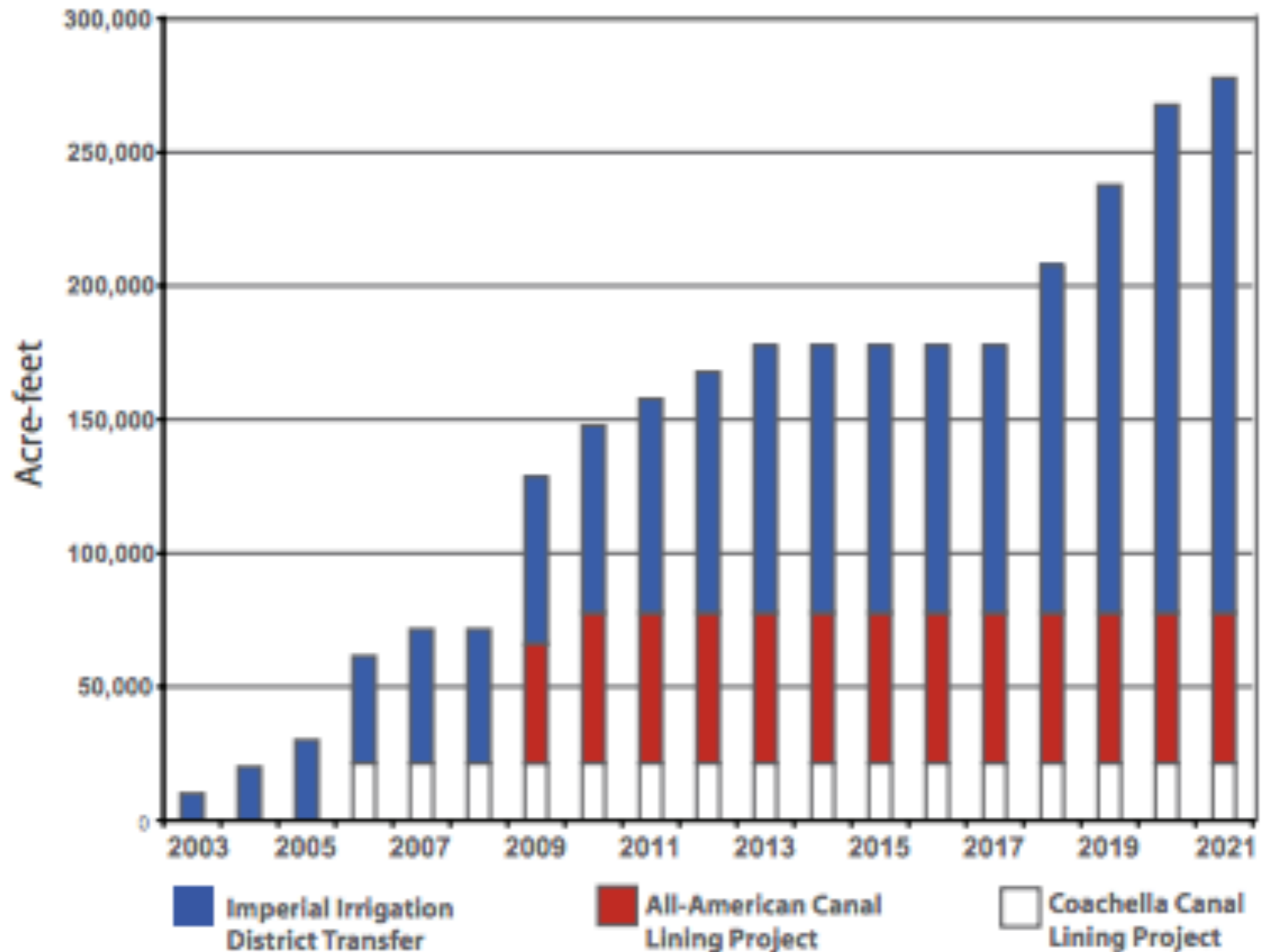
1 acre foot = 325,851 gallons

1 square mile = 640 acres

# QSA 2003

- Water companies involved in the water transfer - IID, CVWD, MWD, SDWD
- 9.9 million acre feet in 45 years equals to over 32 trillion gallons of water
- \$150 million were paid to farmers in the past 15 years to dry 50,000 acres in Imperial Valley

# QSA Water Supply 2003 - 2021

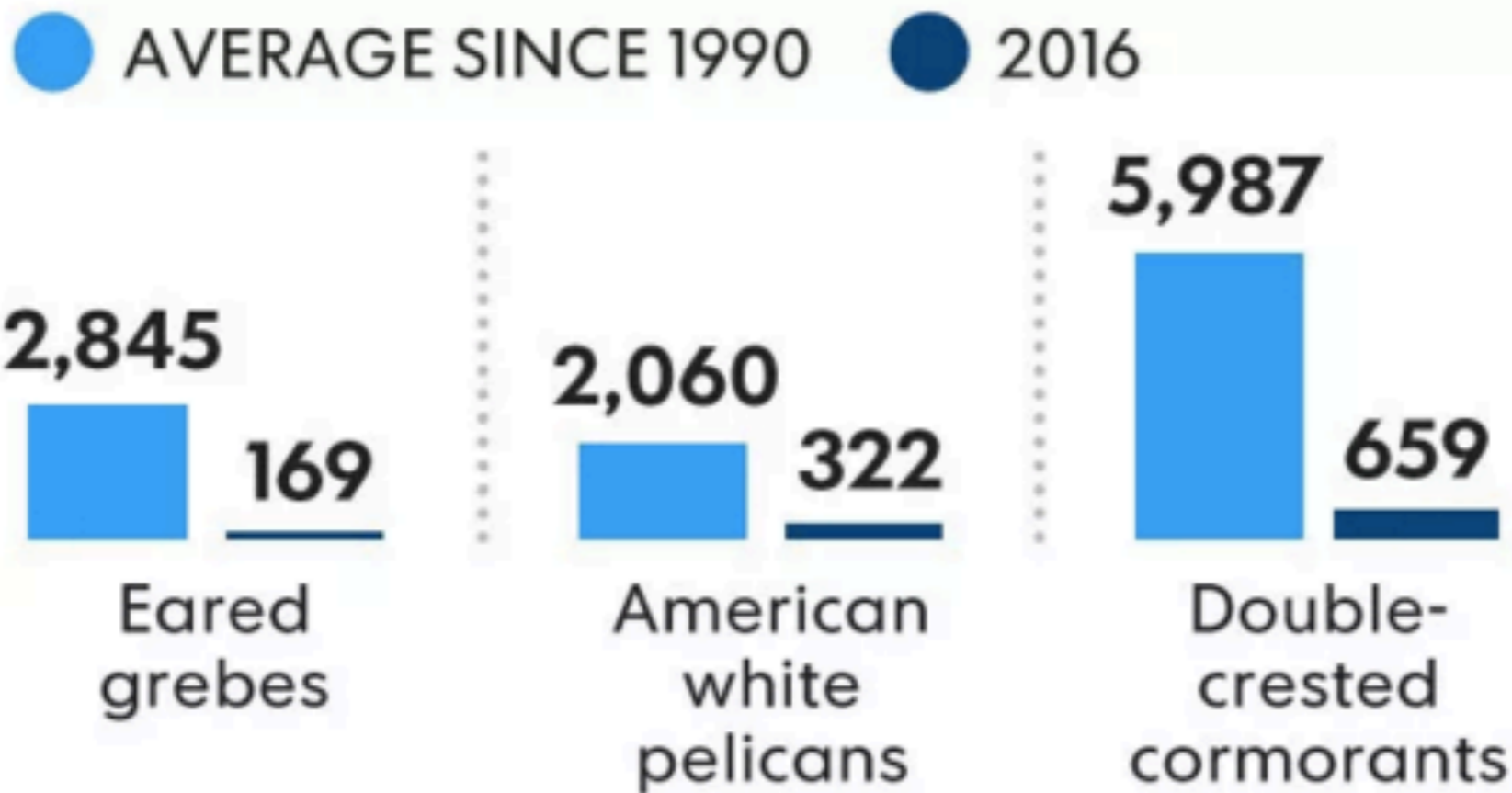


# Health and environmental effects

- Imperial Valley with highest childhood asthma hospitalization rates
- pesticides, like DDT, and heavy metals found in lakebed
- decline of bird population has ecosystem effects here and in other countries

Birds that have long depended on the lake and its fish are disappearing.

## Annual bird count at south end of lake

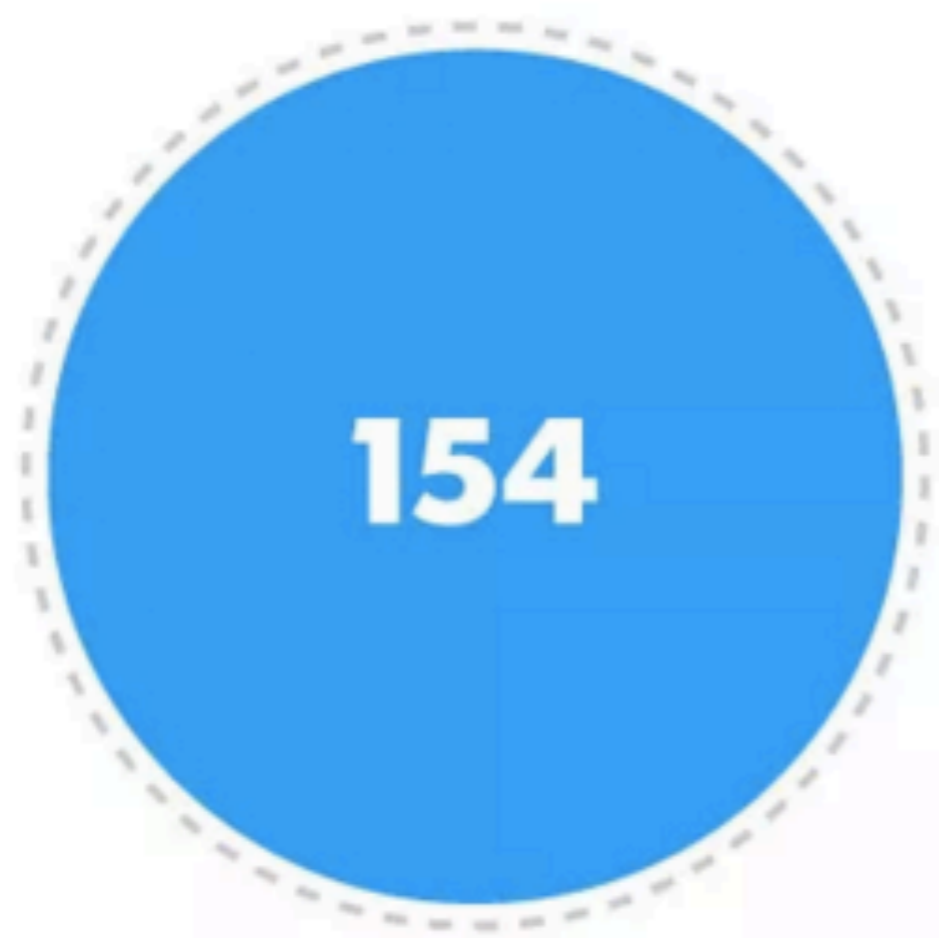


National Audubon Society

# Asthma-related emergency room visits for children ages 5-17

Rate per 10,000

IMPERIAL COUNTY



CALIFORNIA



California Environmental Health Tracking Program.

## Mitigation & Restoration Projects



San Diego County  
Water Authority

4677 Overland Ave  
San Diego, California  
92123-1233  
858.522.6700

[sdcwa.org](http://sdcwa.org)



@sdcwa



Printed on recycled paper

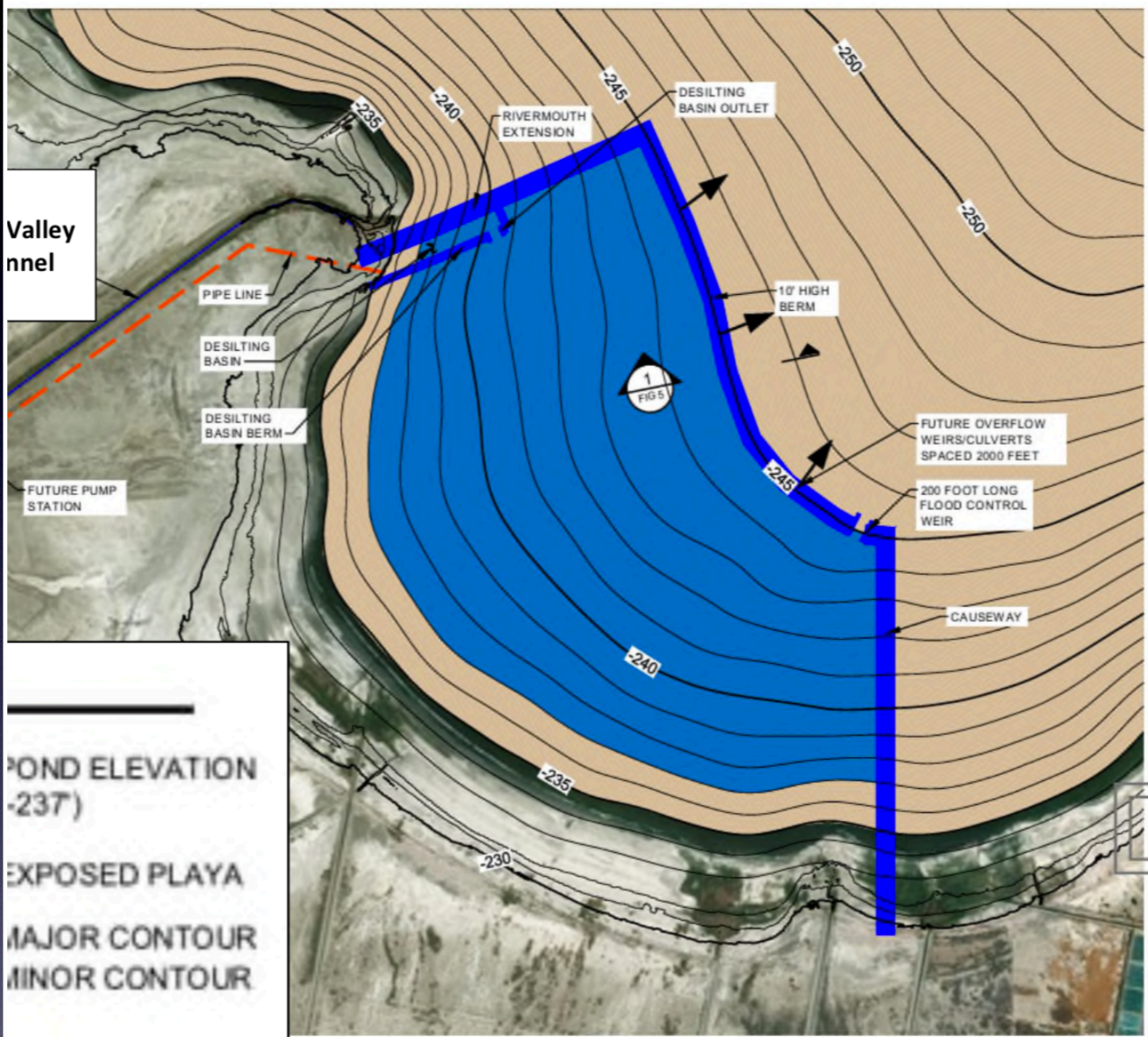
Several mitigation and restoration projects supported by the Water Authority are under way in the Salton Sea Basin.



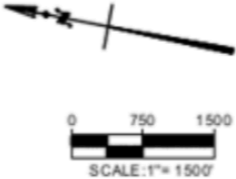
**Salton Sea Management Program  
Phase I: 10-Year Plan  
March 2017**



[http://resources.ca.gov/docs/salton\\_sea/ssmp-10-year-plan/SSMP-Phase-I-10-YR-Plan-with-appendices.pdf](http://resources.ca.gov/docs/salton_sea/ssmp-10-year-plan/SSMP-Phase-I-10-YR-Plan-with-appendices.pdf)



# PRELIMINARY CONCEPTUAL



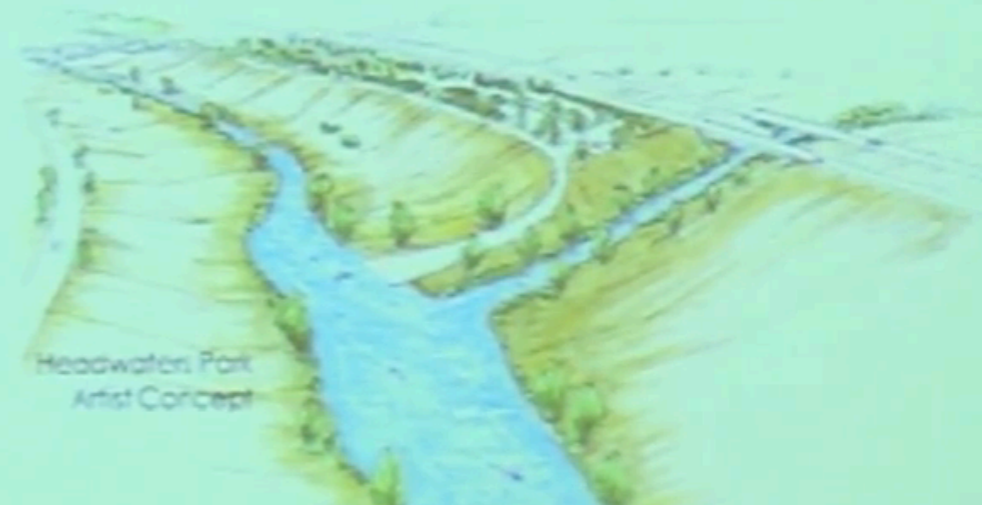
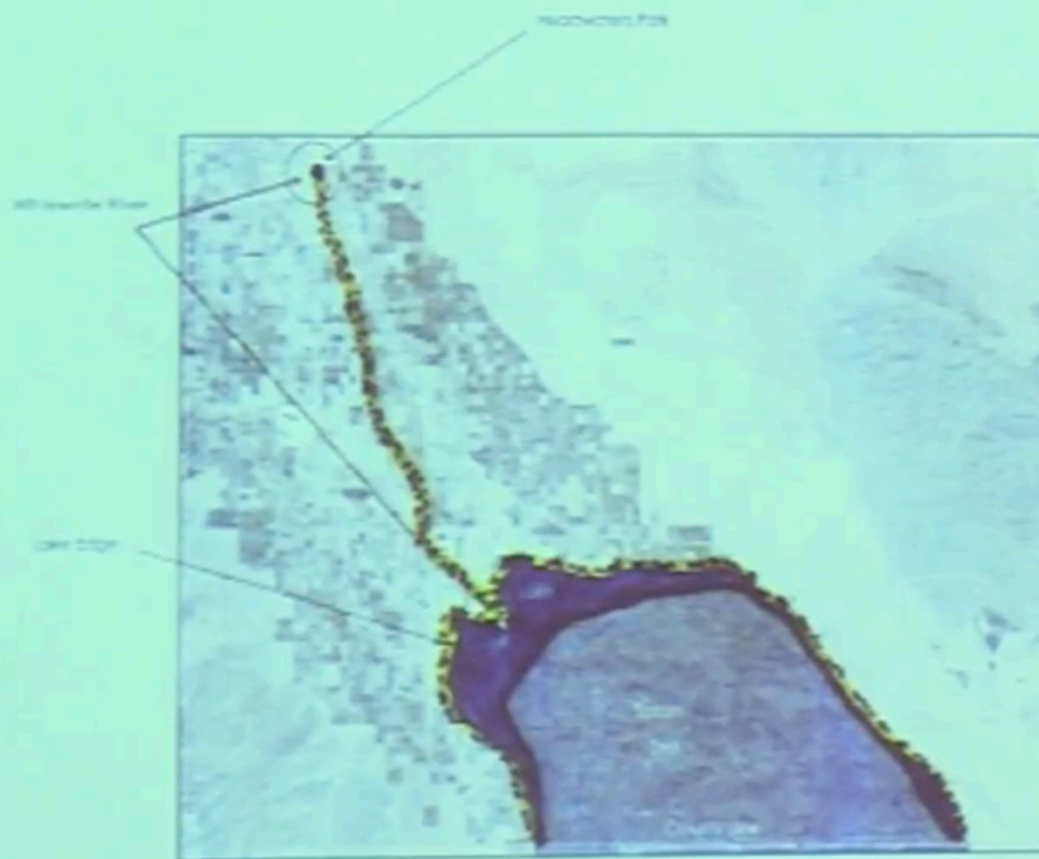
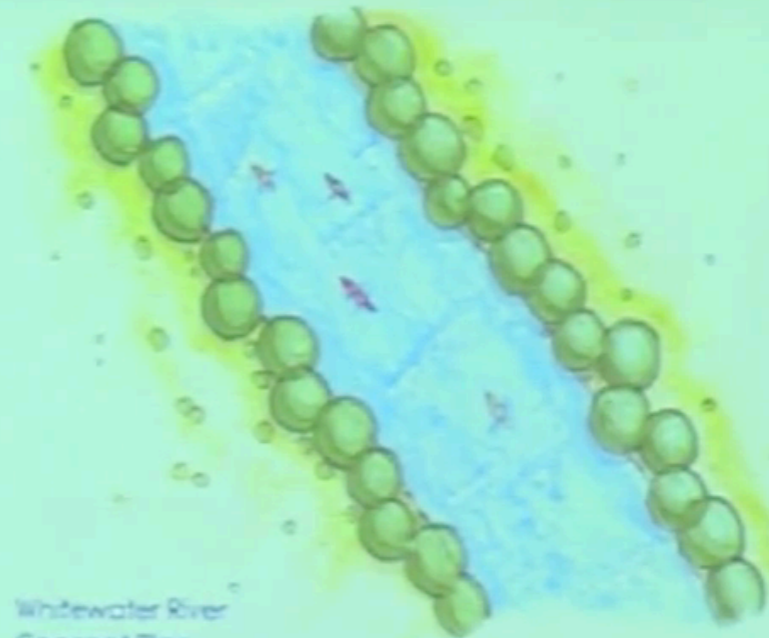
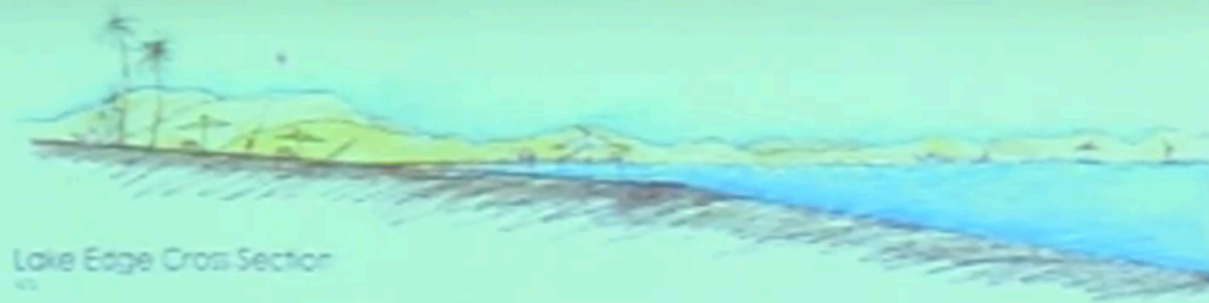
**LEGEND**

<span style="display:inline-block; width:20px; height:10px; background-color:blue;"></span>	POND ELEVATION (-237)
<span style="display:inline-block; width:20px; height:10px; background-color:brown;"></span>	EXPOSED PLAYA
<span style="display:inline-block; width:20px; border-bottom:2px solid black;"></span>	MAJOR CONTOUR
<span style="display:inline-block; width:20px; border-bottom:1px solid black;"></span>	MINOR CONTOUR

POND ELEVATION (-237)  
EXPOSED PLAYA  
MAJOR CONTOUR  
MINOR CONTOUR

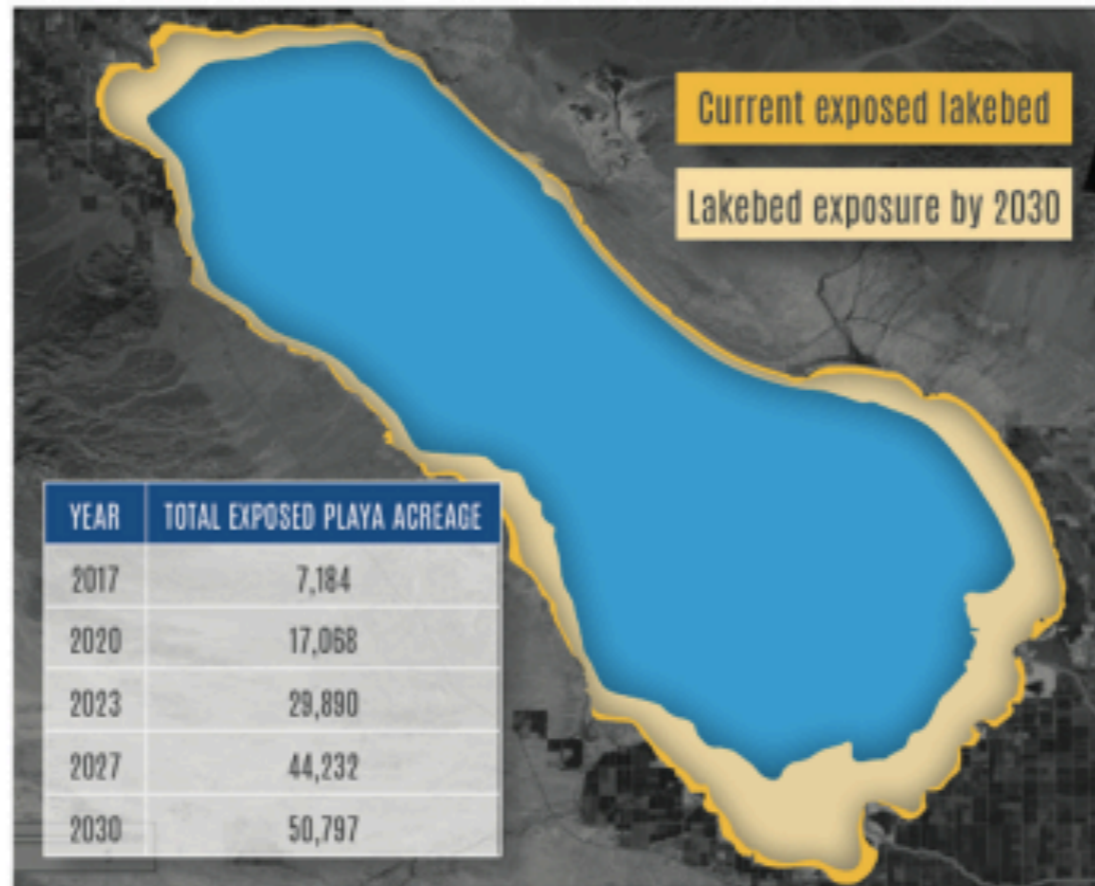
8' DEEP LAKE  
TOTAL LAKE AREA = 883 ACRES  
TOTAL LEVEE LENGTH = 6500 FEET  
TOTAL CAUSEWAY LENGTH = 5200 FEET  
RIVERMOUTH EXTENSION LENGTH = 42  
DESILTING BASIN BERM LENGTH = 2000

DESILTING BASIN BERM LENGTH = 2000  
RIVERMOUTH EXTENSION LENGTH = 42  
TOTAL CAUSEWAY LENGTH = 5200 FEET  
TOTAL LEVEE LENGTH = 6500 FEET  
TOTAL LAKE AREA = 883 ACRES



Improve and expand Whitewater channel

## PLAYA EXPOSURE: 2012 - 2030



The Salton Sea Restoration & Renewable Energy Initiative, launched by the Imperial Irrigation District in partnership with Imperial County, will leverage funds generated by new renewable energy projects located at the sea to help finance activities for air quality management and habitat restoration. Projects sited on exposed lakebed will serve a dual purpose: producing renewable energy while doubling as groundcover to mitigate air emissions. Under legislation enacted in 2013, planning and implementing projects at the sea are being driven locally by the Salton Sea Authority, with support from the State of California.

# Owens Valley



Photo copyright - Great Basin Air  
Pollution Control District, Owens Valley  
2012

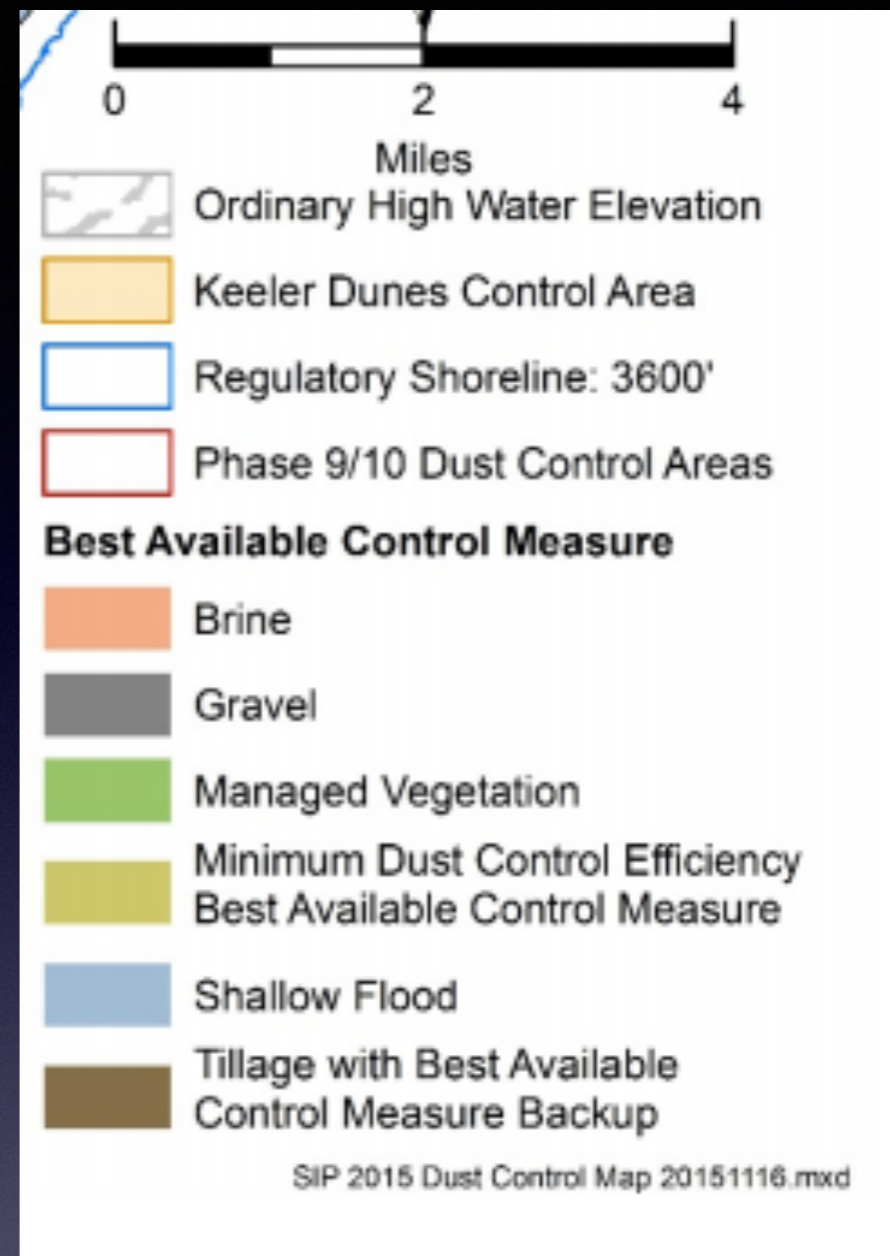
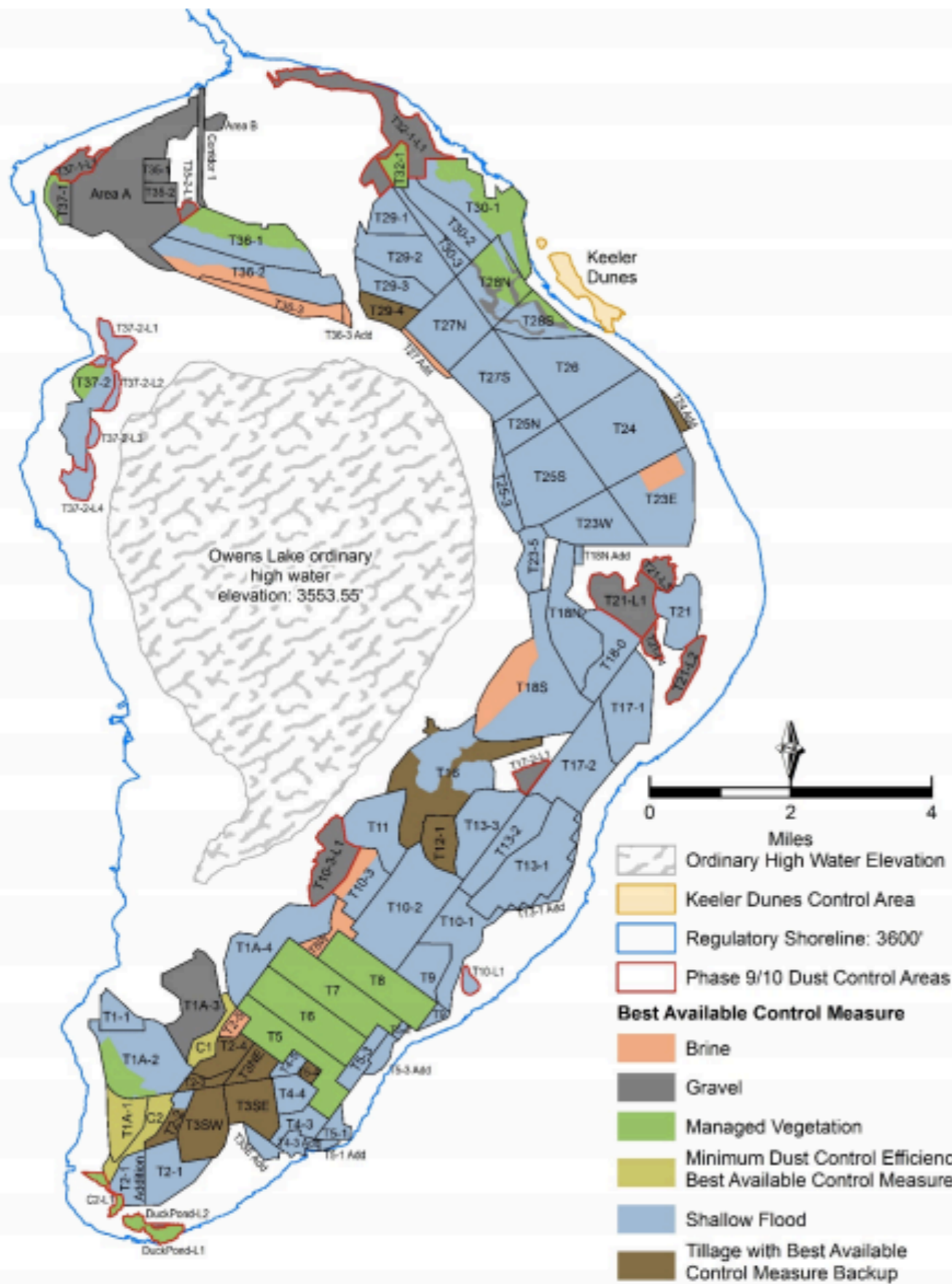
Southern Inyo Healthcare District, Lone Pine, CA, "2012  
Community Health Needs Assessment Report,"  
Southern Inyo Healthcare District, Lone Pine, CA, May  
2012, p. 6.

High rates of asthma and  
lung cancer

91% of cancer deaths  
result from lung cancer  
whereas nationwide it is  
54%\*

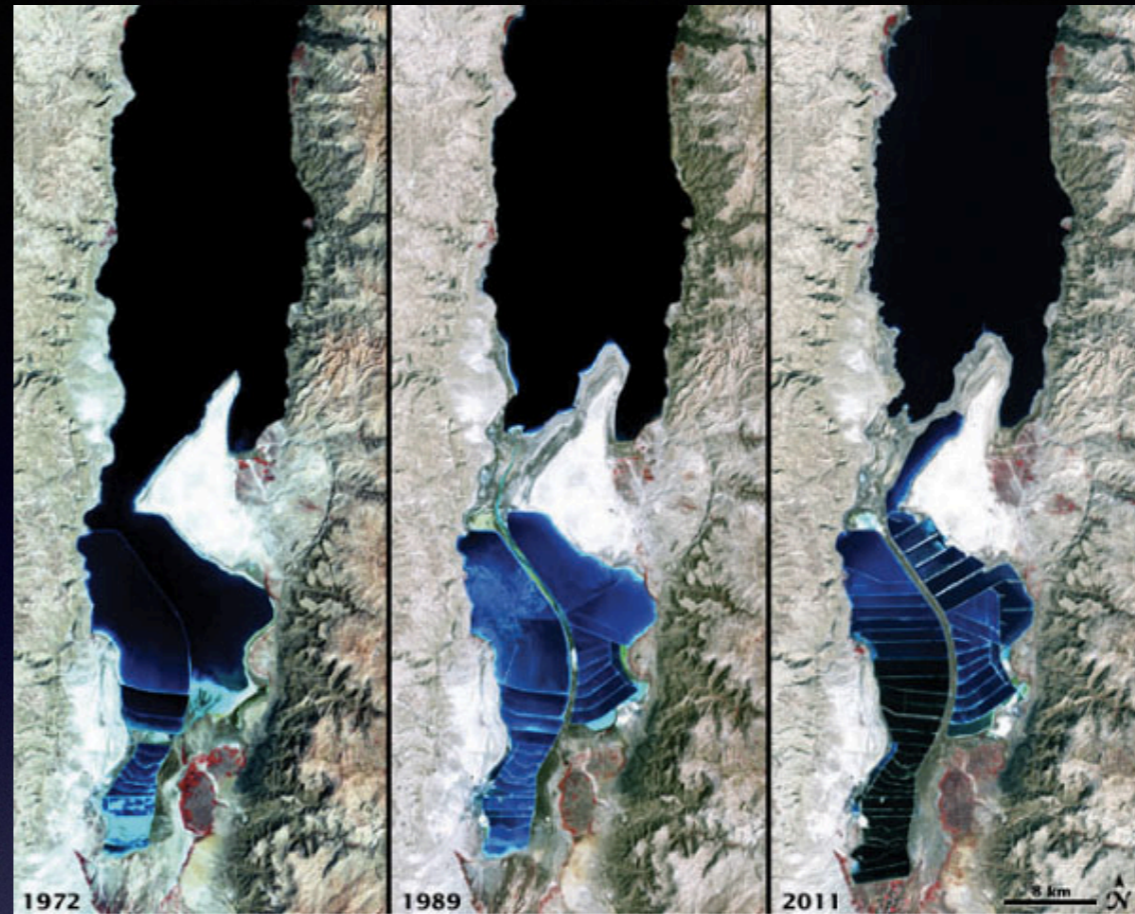
\$1 billion in dust control  
projects for  
18,000 acres of exposed  
lakebed

At the Salton Sea, 18,000 acres has already  
been exposed, 60,000 more in 10 years.



# Dead Sea

Jordan  
Palestine  
Israel



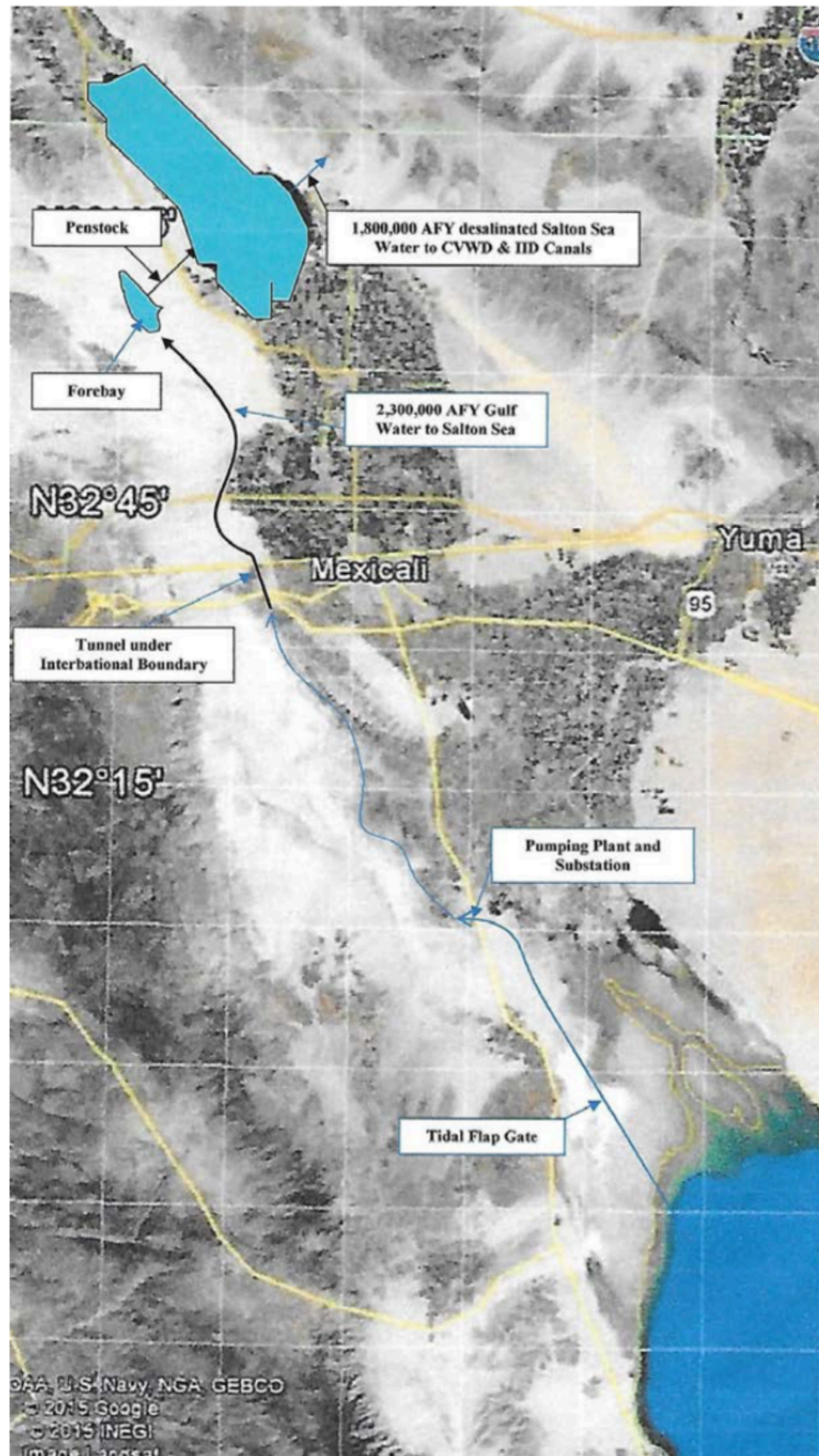
**BEST COUNTRIES**

[RANKINGS](#) [DATA EXPLORER](#) [VIDEOS](#) [NEWS](#)



## Receding Hopes Along the Dead Sea

A proposed pipeline raises expectations for cooperation but new environmental worries.



# Bi-National Canal for Salton Sea Restoration and Colorado River Augmentation

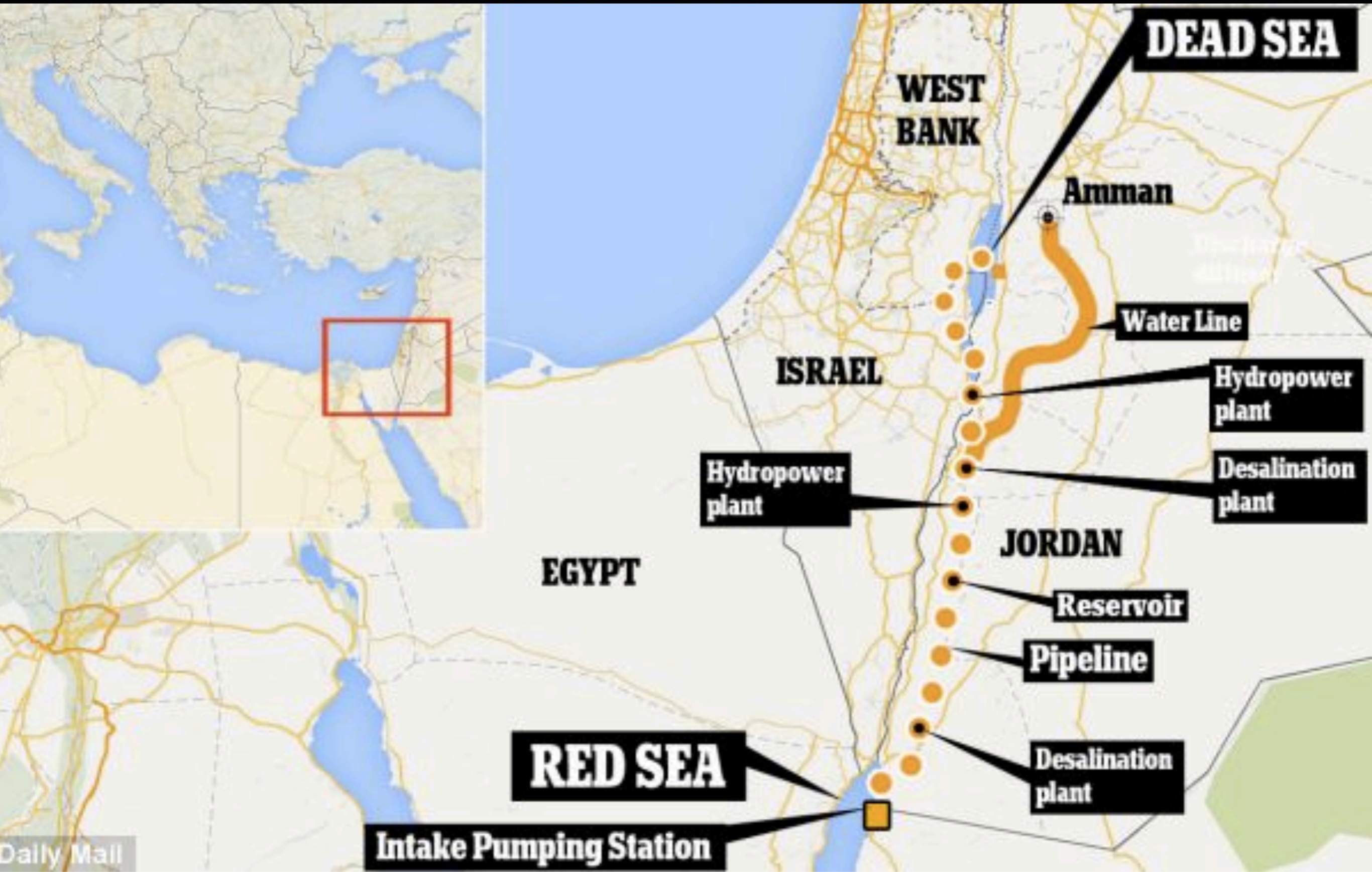
Proposal to the California Natural Resources Agency in Response to December 8, 2017 Request for Information for Salton Sea Water Importation Projects

Submitted by:  
 GEI Consultants, Inc.  
 and Michael Clinton Consulting, LLC

March 9, 2018







# Red Sea - Dead Sea Water Project

## \$800 million project

### THE JORDAN TIMES

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## Donors pledge around \$400 million for Red-Dead project

US, UK and Japan main contributors of grants, cash and in-kind assistance

The US embassy announced on Friday in a statement to the press that the US intends to contribute \$100 million to the Red-Dead project.

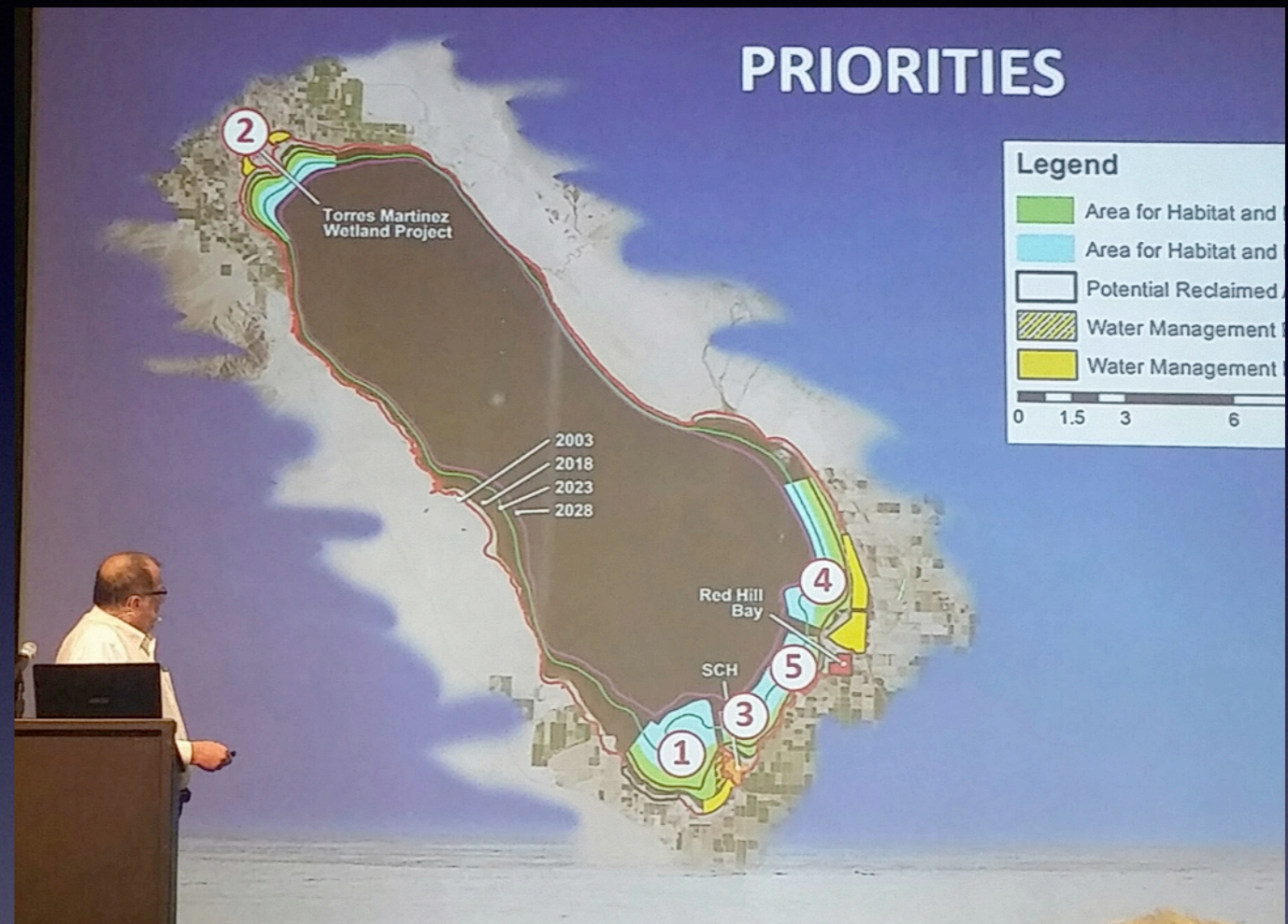
# Solutions for the Salton Sea

Information provided by the Salton Sea Coalition,  
Ecomedia Compass, Mark Johnson, & the  
Ca. Department of Natural Resources,

DECEMBER  
2018

# 10 year plan

- “Shrink and manage” sea
- Four 700-acre projects for habitat and contain dust
- \$80 million now being used from prop. 1, \$200 million from prop 68, Garcia is proposing \$100 million from state budget
- \$8 billion in interest over 40 years
- 4 inch deep gravel, vegetation, berms



“Areas 4 and 5 have plans for geothermal construction” -Bruce Wilcox, July 2017

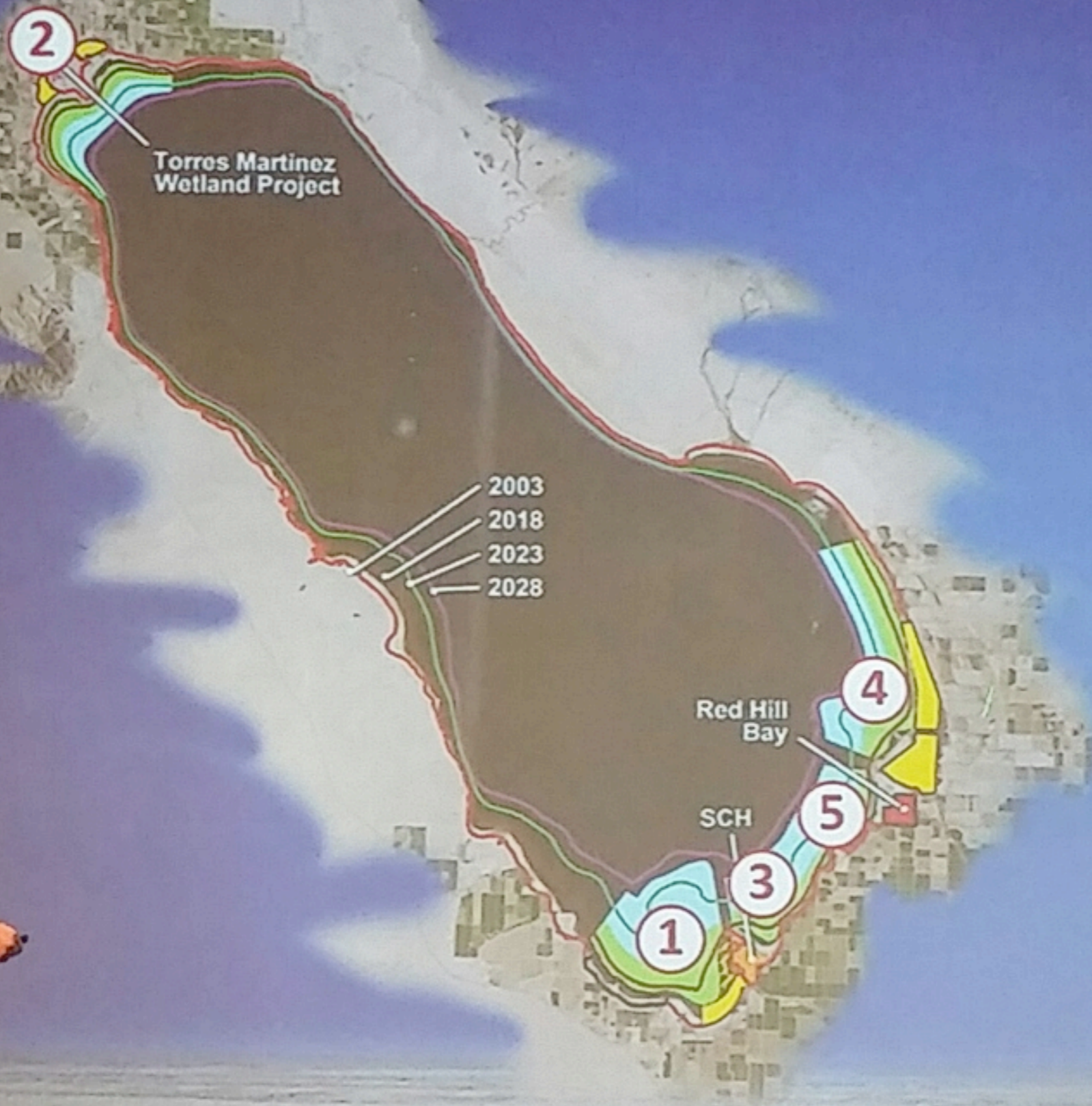
**Australian firm plans nation's largest geothermal plant in Imperial Valley**



alt

Alter

# PRIORITIES



**Legend**

- Area for Habitat and
- Area for Habitat and
- Potential Reclaimed
- Water Management
- Water Management

0 1.5 3 6

**Table 2. 2018–2028 Exposure and SSMP Phase I Projected Construction**

<b>YEAR</b>	<b>EXPOSED ACRES</b>	<b>PROPOSED CONSTRUCTION</b>
2018	3,500	500
2019	4,200	1,300
2020	5,000	1,700
2021	5,600	3,500
2022	5,500	1,750
2023	5,300	2,750
2024	4,900	2,700
2025	4,300	3,400
2026	3,900	4,000
2027	3,300	4,000
2028	2,800	4,200
<b>TOTAL</b>	<b>48,300</b>	<b>29,800</b>

$$48,300 - 29,800 = 18,500 \text{ acres}$$

# Problem

- 10 year plan presented since June 2017
- What does it mean for our health?
- What does it mean for our environment?
- limited dust suppression projects for east-west shoreline communities
- no mention of hydrogen sulfide management (rotten egg smell)

# The Project

\*Place a berm at the mouth of the Desert Shores Keys.

\*Pump Seawater in to refill.

\*Work toward a higher quality water source for habitat and restoration, either by transfer or localized desalination.

\*High quality habitat is created and maintained.

\*Project can be scaled and duplicated at other shoreline locations.

# Desert Shores Restoration

## Key Benefits:

\*Control dust for health of residents

\*Rejuvenate habitat areas

\*Maintain property values

\*Increase quality of life



Desert  
Shores  
Marina



Nathan White with AGESS, Inc.

# North Lake Plan proposed by Supervisor Manuel Perez in 2018

- Originally, 4,200 acre lake, double the size of Big Bear Lake, now reduced to 883 acres.
- Original cost would be \$400 million, proposed funding through a combination of tax and bonds, no update on cost for 883 acres.
- water source would be water runoff via the Whitewater River channel.



CREATE NORTH LAKE BY BUILDING A DIKE

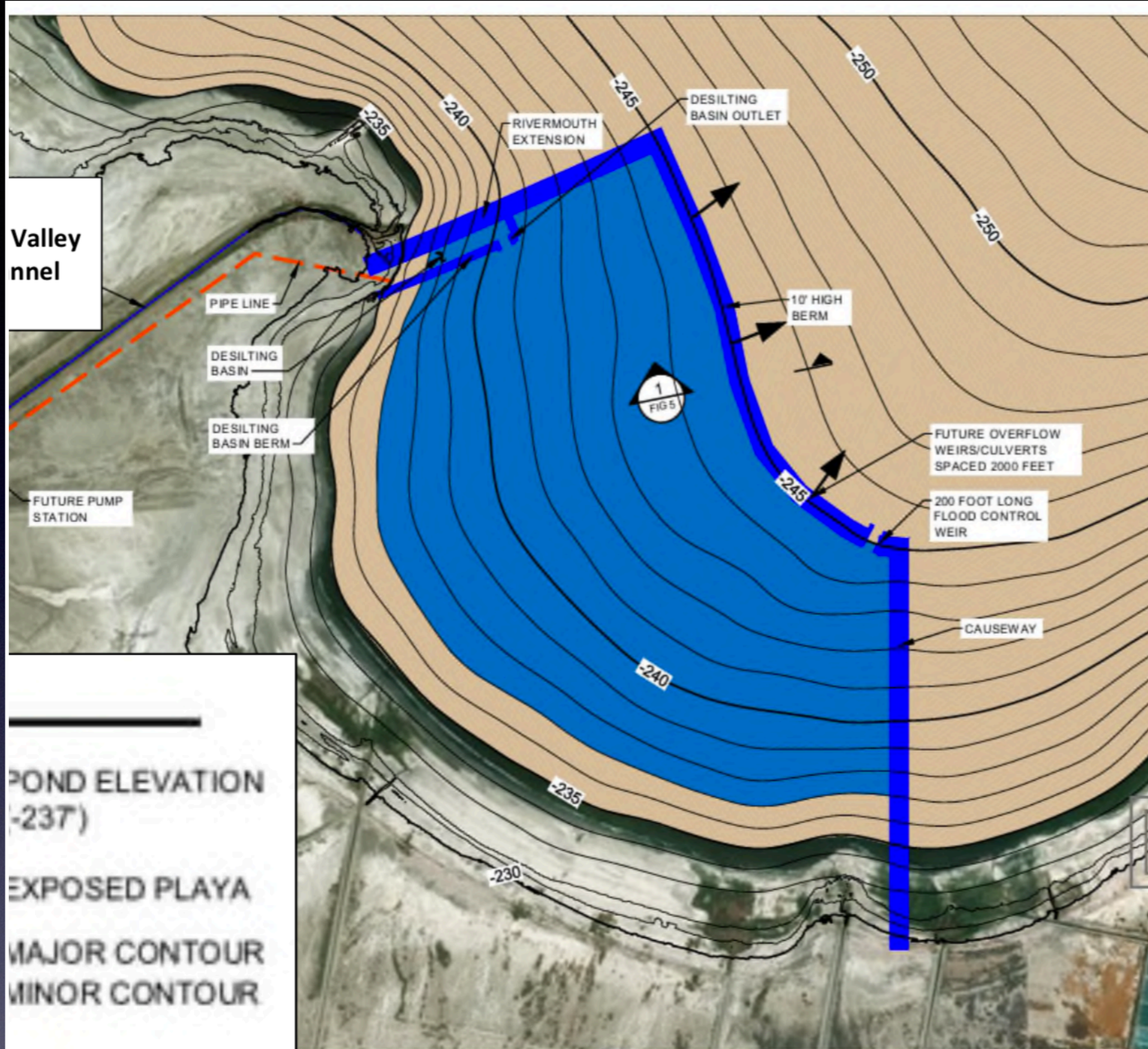
# PRELIMINARY CONCEPTUAL



## LEGEND

- POND ELEVATION (-237')
- EXPOSED PLAYA
- MAJOR CONTOUR
- MINOR CONTOUR

DRAFT



POND ELEVATION (-237')  
 EXPOSED PLAYA  
 MAJOR CONTOUR  
 MINOR CONTOUR

8' DEEP LAKE  
 TOTAL LAKE AREA = 883 ACRES  
 TOTAL LEVEE LENGTH = 6500 FEET  
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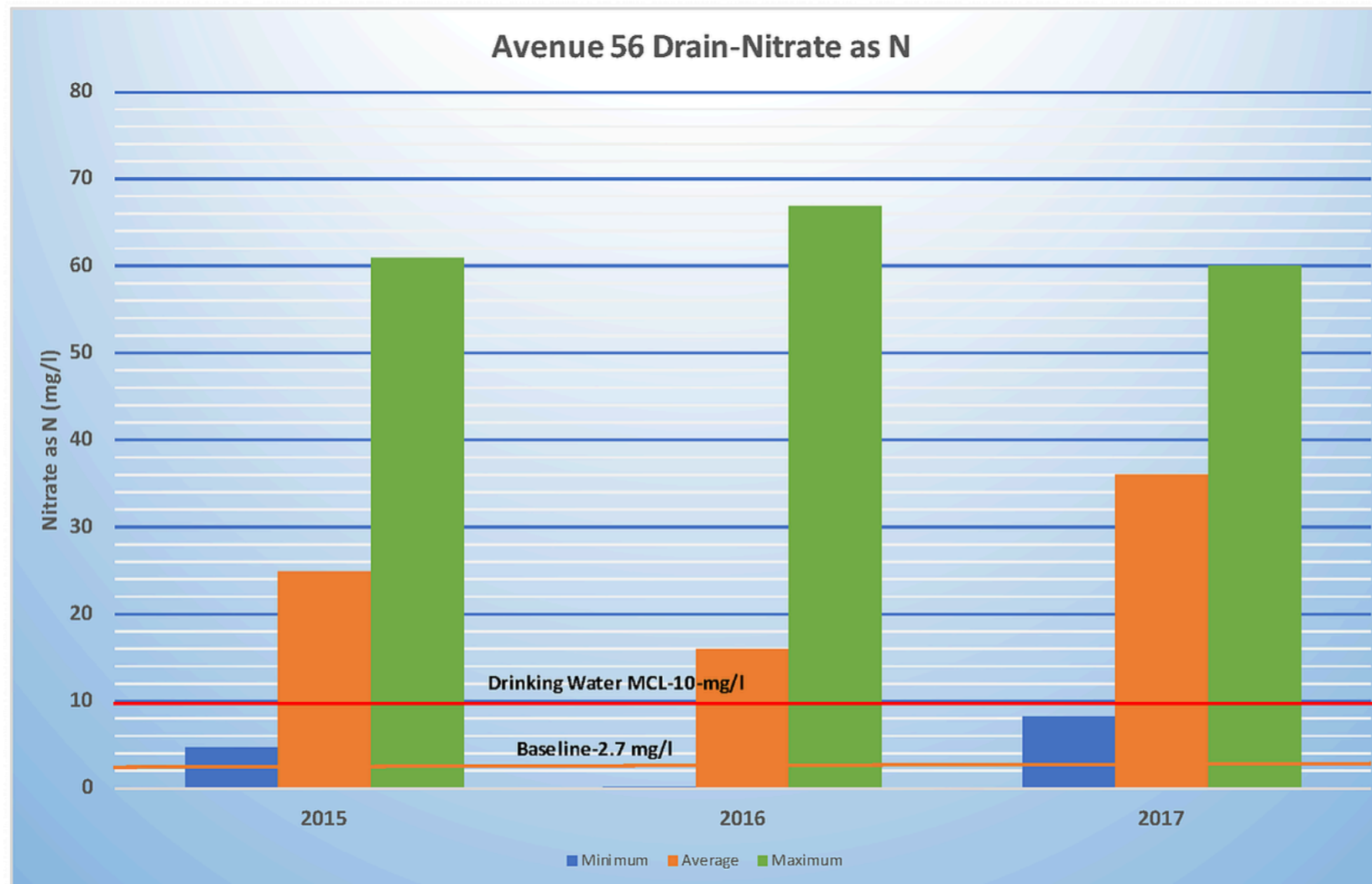
# NORTH LAKE

883 ACRES



# CWWD Ag runoff

Nitrate levels for the Avenue 56 Drain for the three-year period are shown in the chart below.



Average nitrate levels for the three-year period are 26 mg/l (9.6 times the baseline) and increased to 36 mg/l in 2017. Maximum nitrate concentrations are 60 mg/l or higher for each of the three years.

# Ecomedia & Salton Sea Coalition

- “We believe that the North Lake project could benefit the local environment, people and economy but should only be undertaken while supporting larger scale restoration including seawater import. Water quality/quantity and funding issues must also be addressed for the North Lake project to be viable.”

# Long Term Solutions

- A number of engineers and scientists have come forward with long term solutions.
- Water importation - Department of Natural Resources has accepted 11 water import proposals in March 2018.
- In July, 2018 SSMP selected three proposals as the best, to be considered to move forward: GEI, Cordoba, and Bi-national.

## Proposals Submitted by:

AECOM

Agess, Inc.

CIM Group, LLC

Cordoba Corp.

GEI Consultants, Inc. and Michael Clinton Consulting, LLC

Geothermal Worldwide, Inc.

Quadrant II

Sea to Sea Development Team

Sephton Water Technology, Inc.

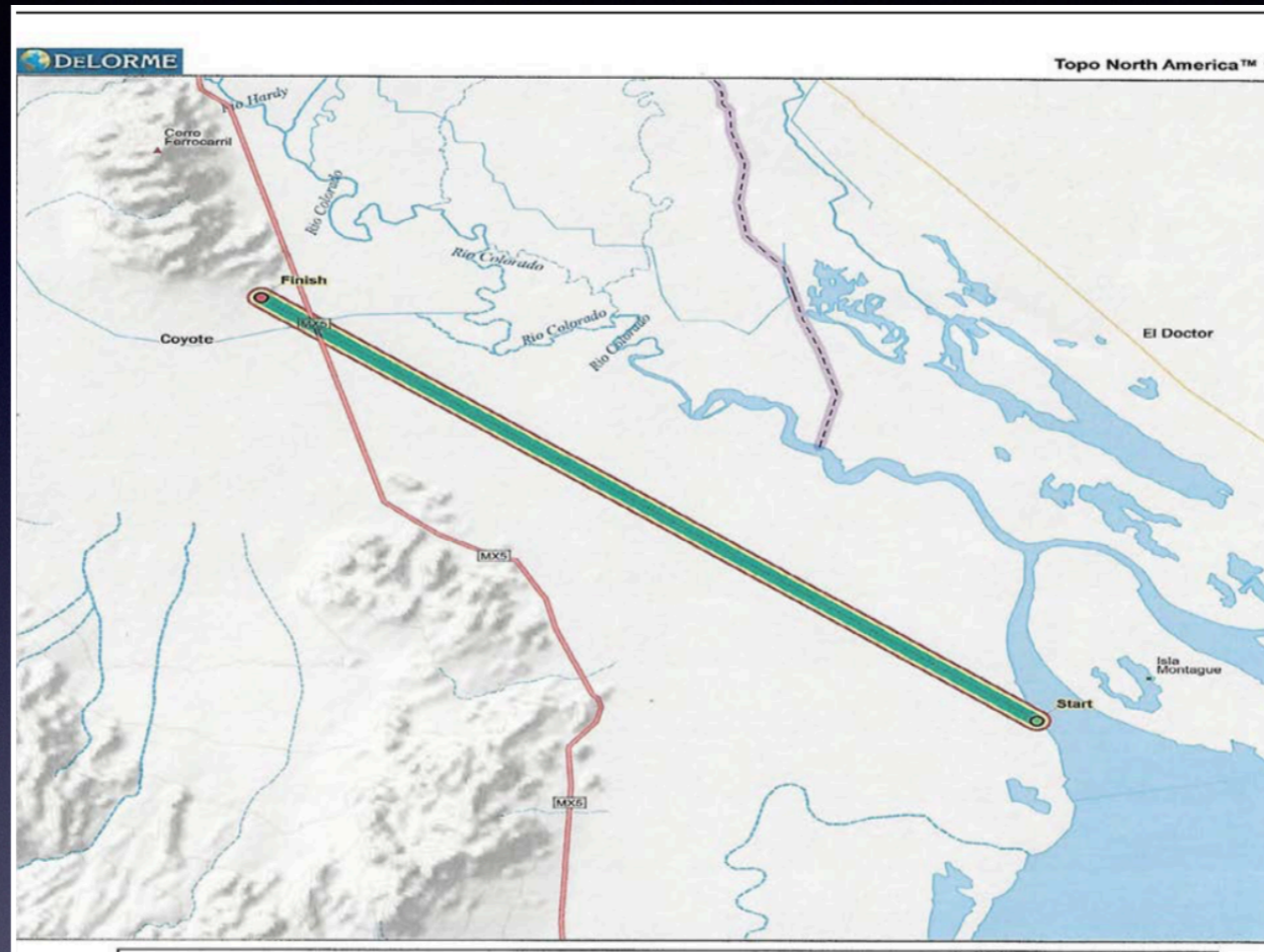
The Binational Water Group, LLC

Transform Water & Power



# GEI - Bring Water by canal to S.S. & Co. river

- Use lined canal and pipeline to raise level of sea and lower salinity. Desalinate 2 million acre feet per year and mix this with Co. river water. Dispose of or sell large volume of salt. Cost: \$3-5 billion. State of Ca. to fund water import, Federal govt. to fund desalination.

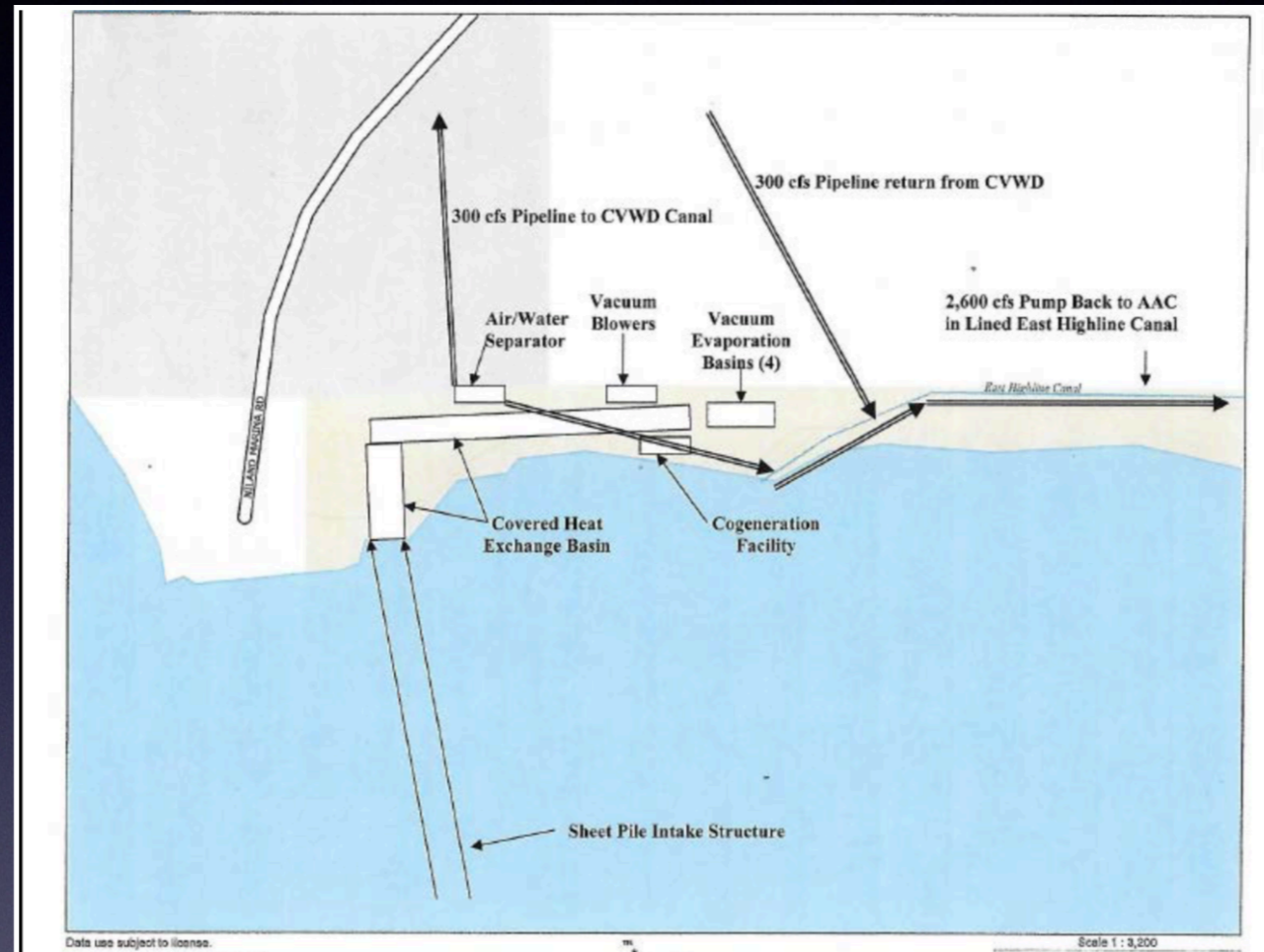


# Canal from Gulf



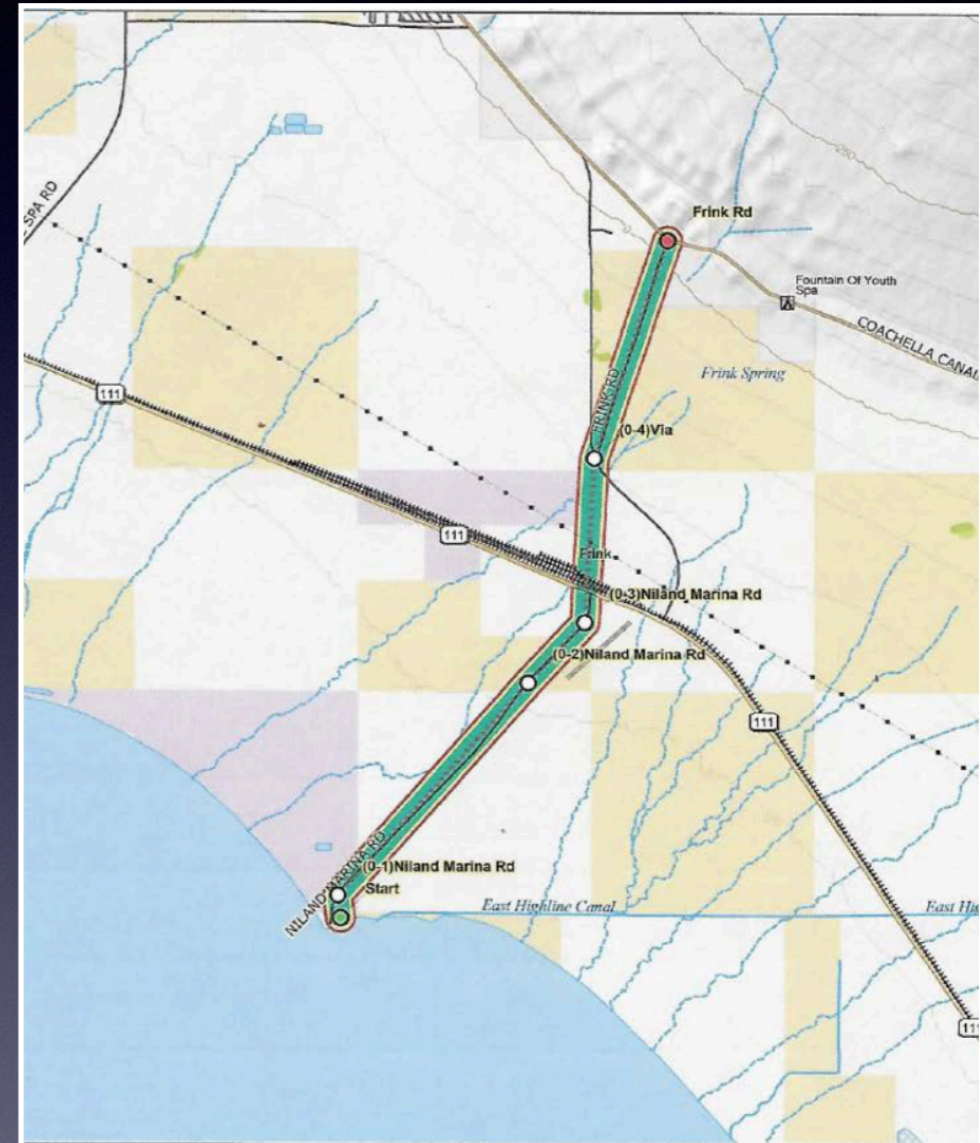
# Tunnel & Feeder Canal





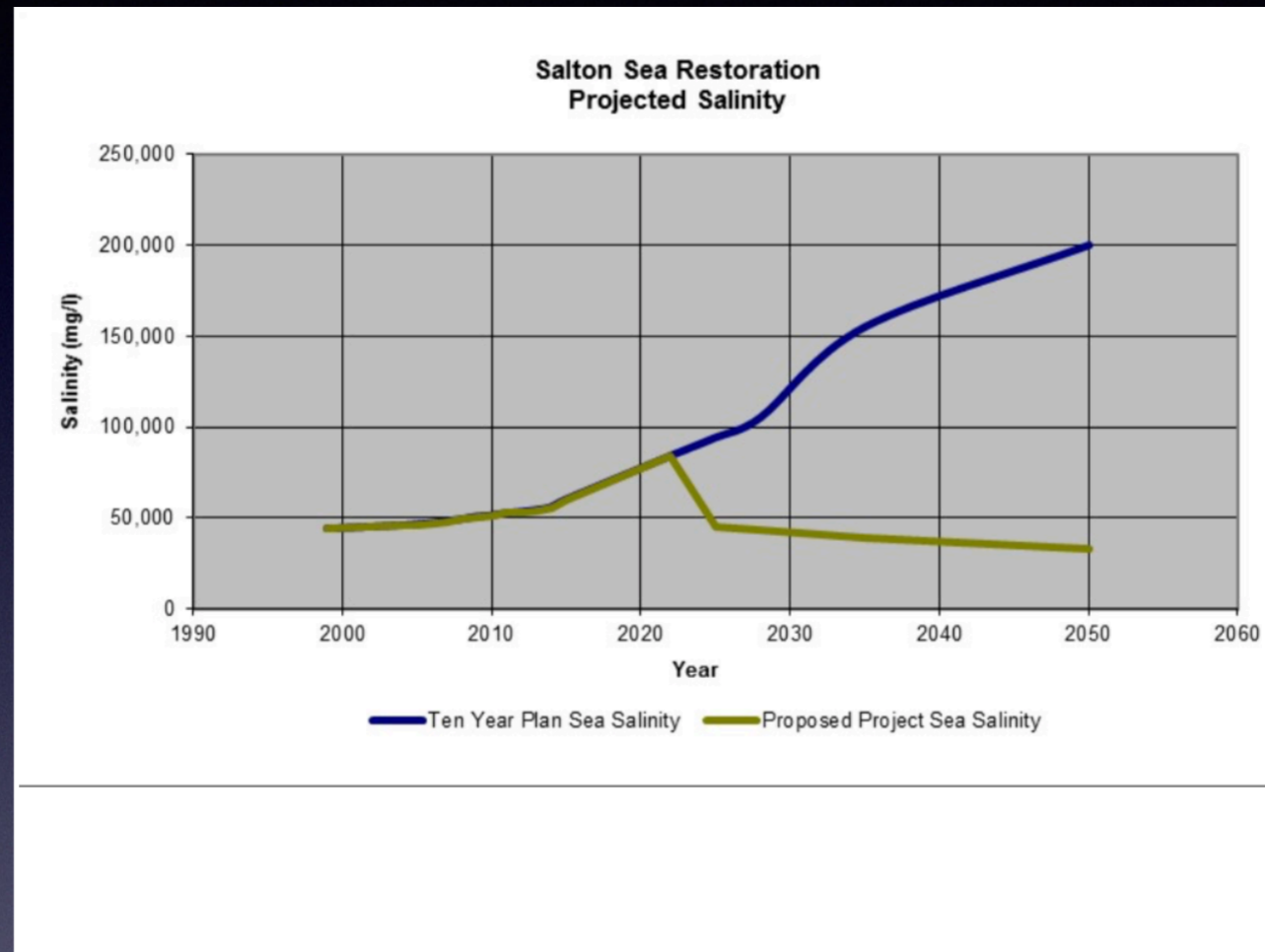
# Desalination Complex

# Coachella Canal Exchange Pipeline



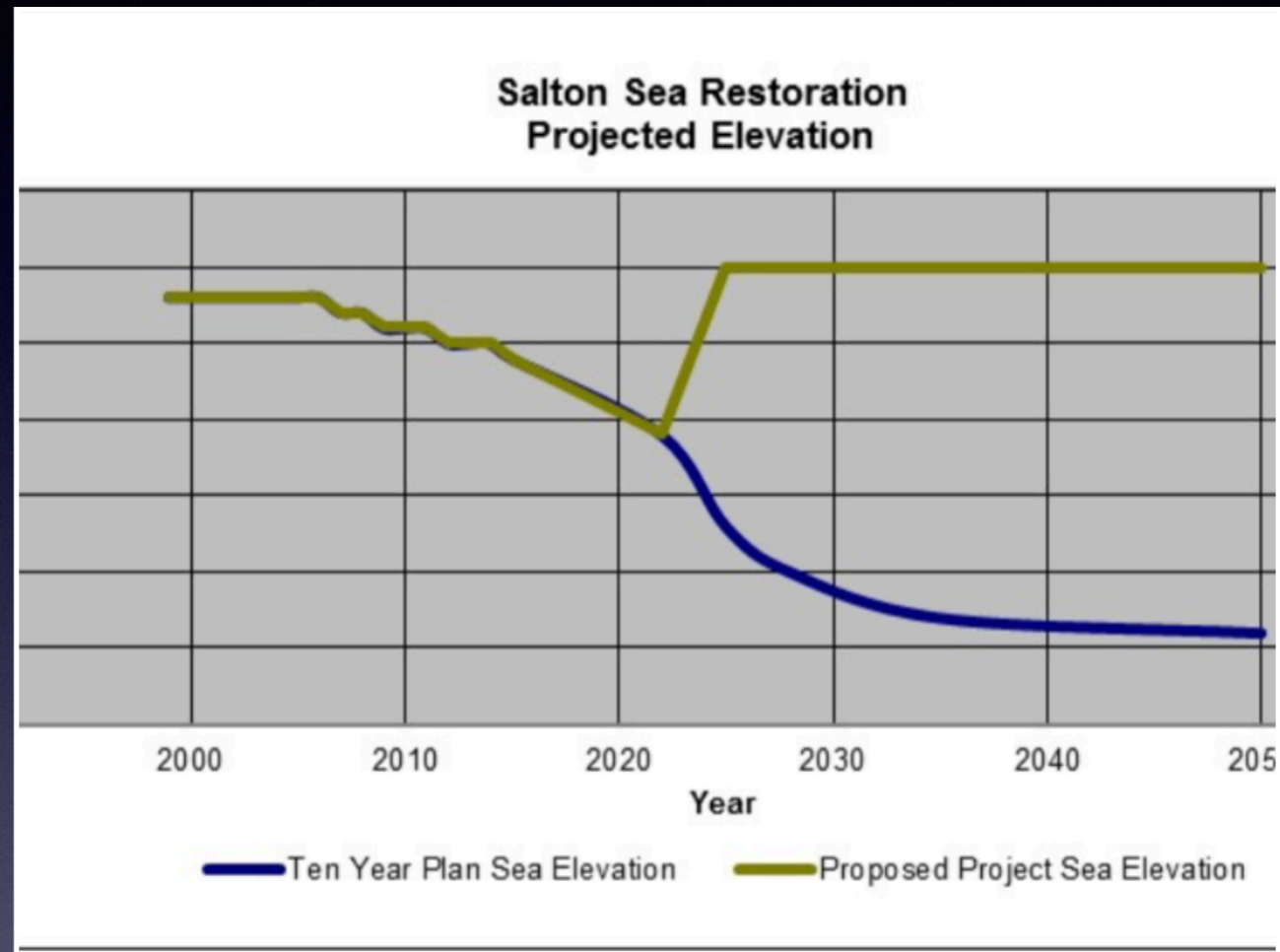
# East Highland Canal Pumpback





# Projected Salinity





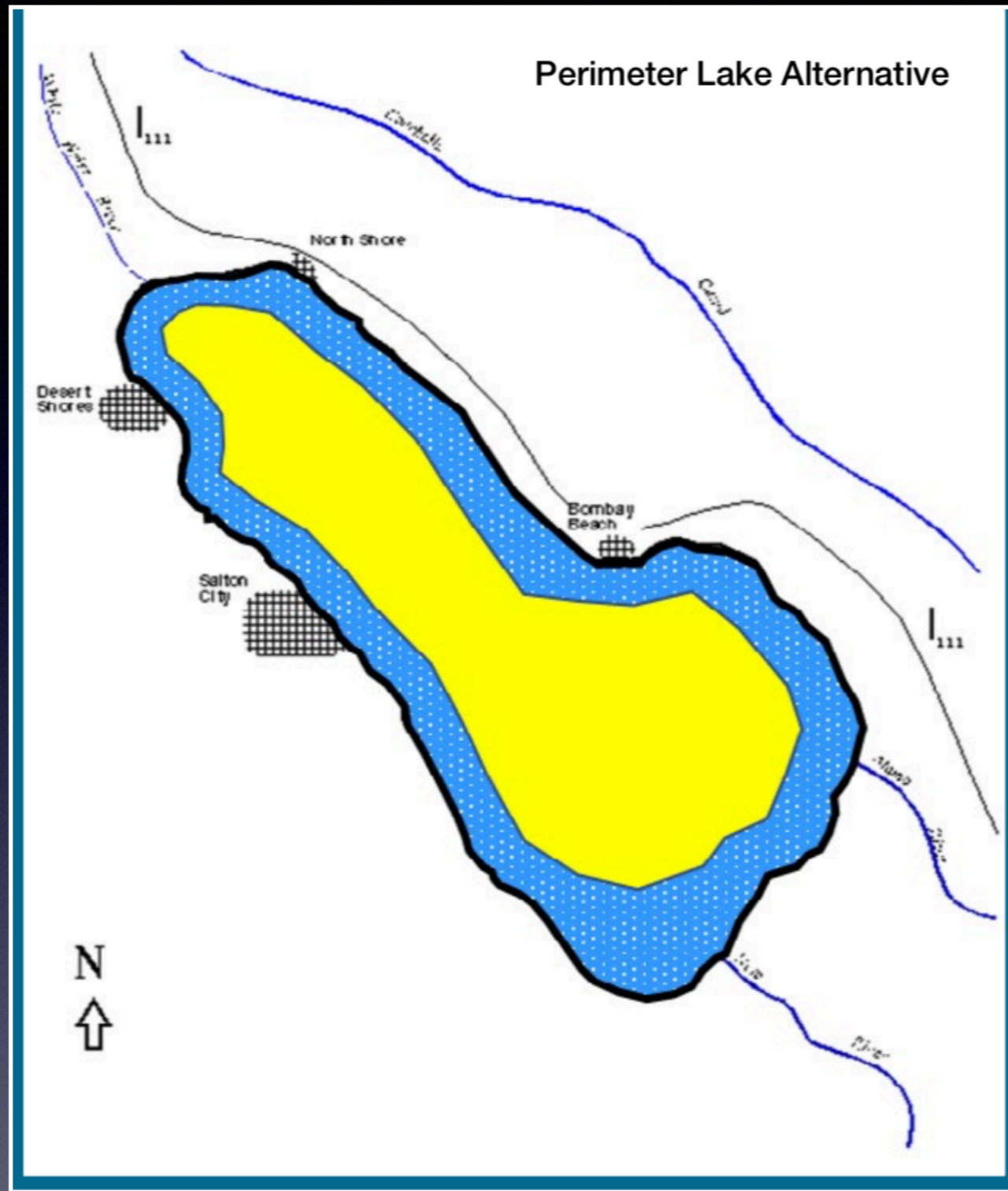
# Projected Elevation



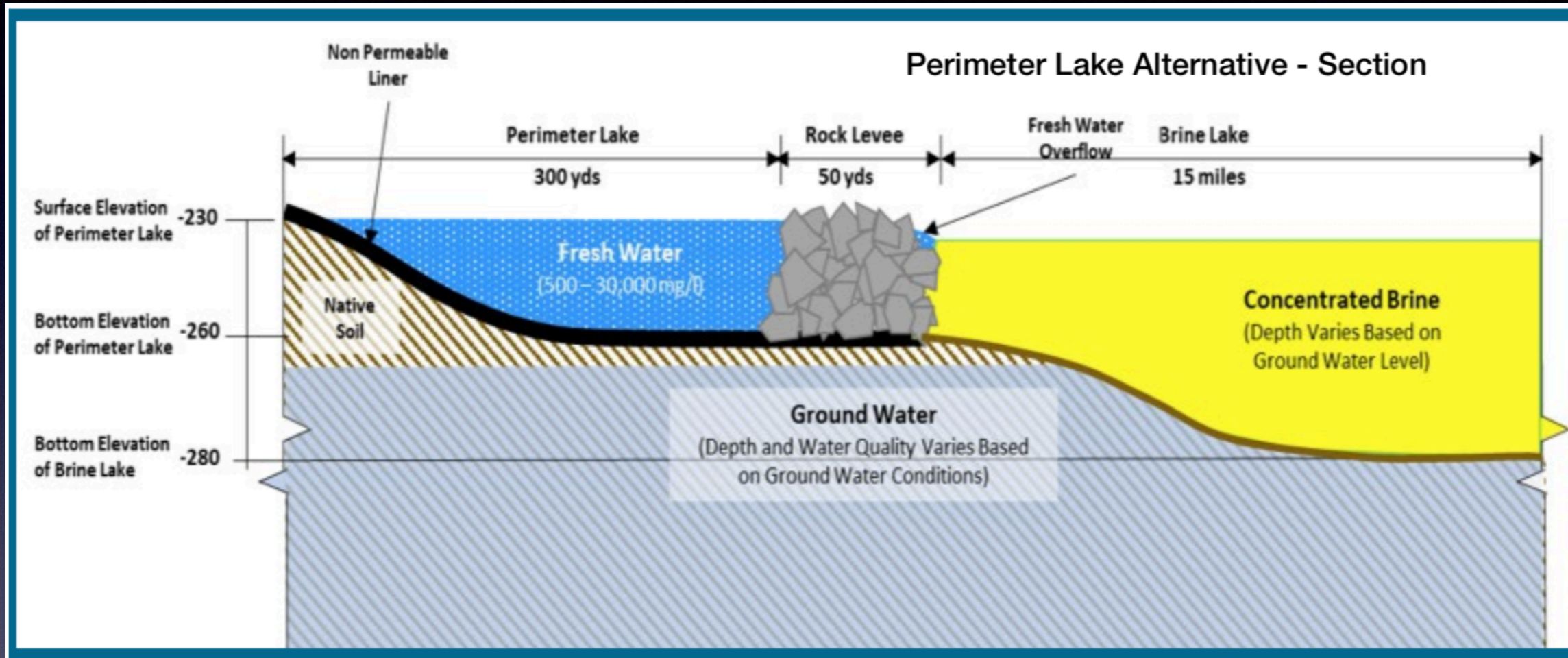
Cordoba Proposal

# Cordoba Corp.

- Convey water by pipeline, create a perimeter lake that will receive ocean water, leave a central brine lake where salt will accumulate. No desalination. Water import cost - \$1-3 billion, no cost estimate for construction of perimeter lake. Funding: public-private combination.



# Perimeter Lake



# Perimeter Lake

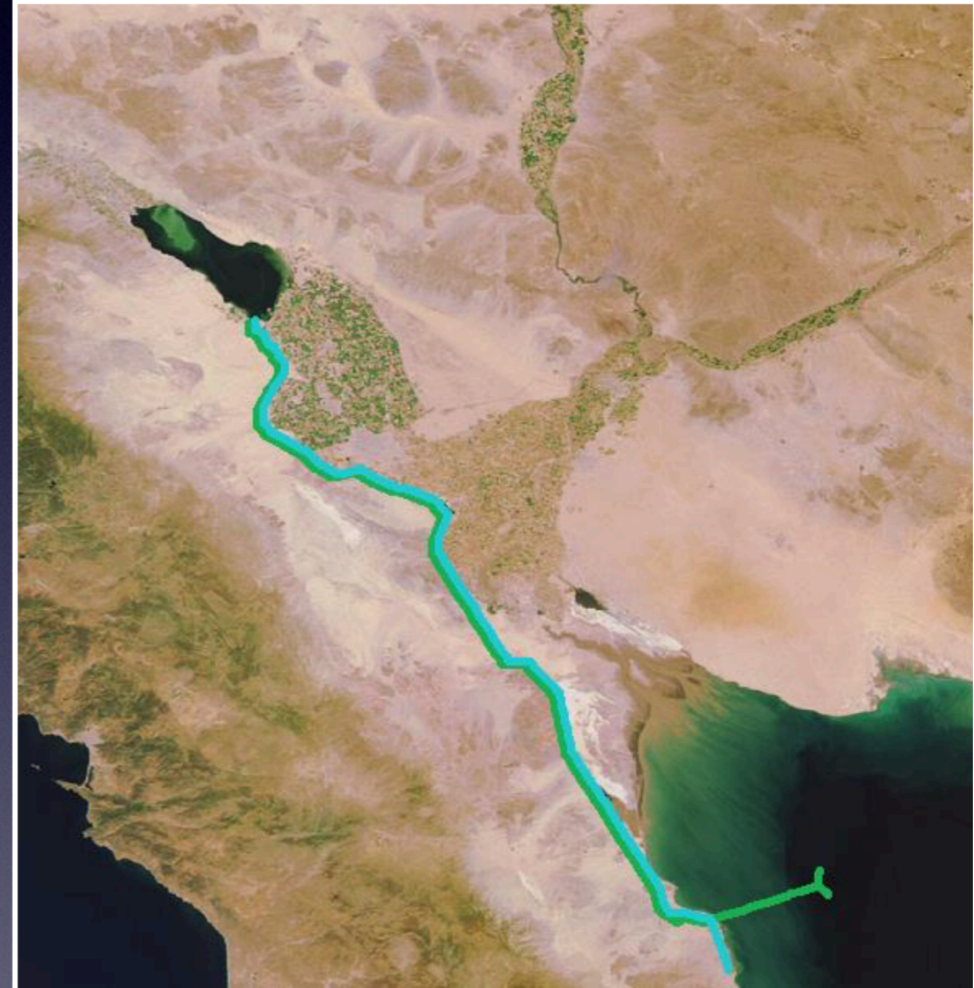
# Bi-national Proposal

Submitted by: **The Binational Water Group, LLC**

In Response to: **Request for Information for Salton Sea Water  
Importation Projects**

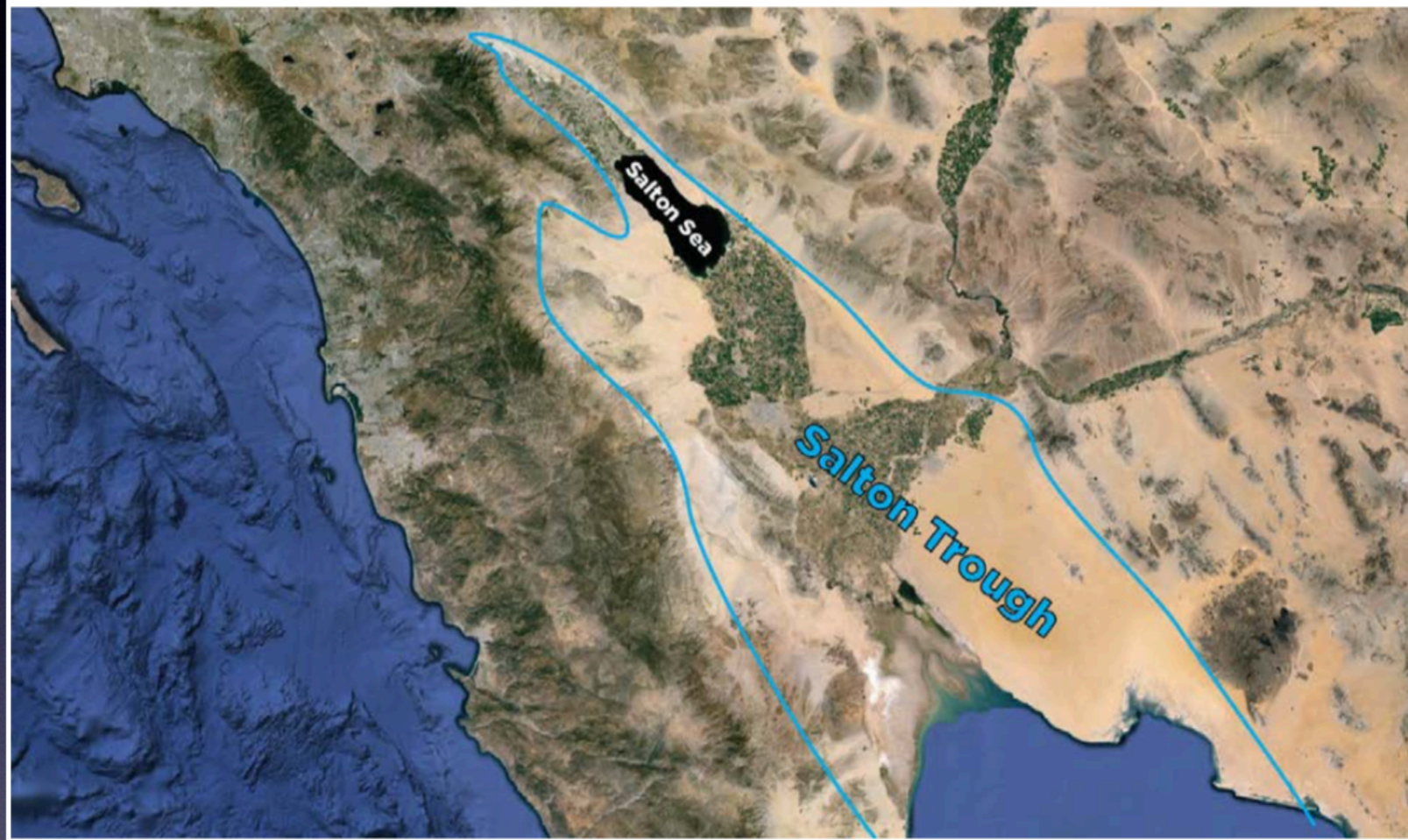
California Natural Resources Agency

March 9, 2018



# Bi-National - Salton Trough Interconnection

- Restore historic inflow and outflow to and from the Salton Trough - a geologic area including the Salton Sea which stretches from Palm Springs to the Sea of Cortez. Import water through double 12' diameter pipeline, return saline water through single 12' pipeline to deep part of Sea of Cortez to mix with Pacific Ocean. Cost: \$7-8 billion. Funding: public-private partnership

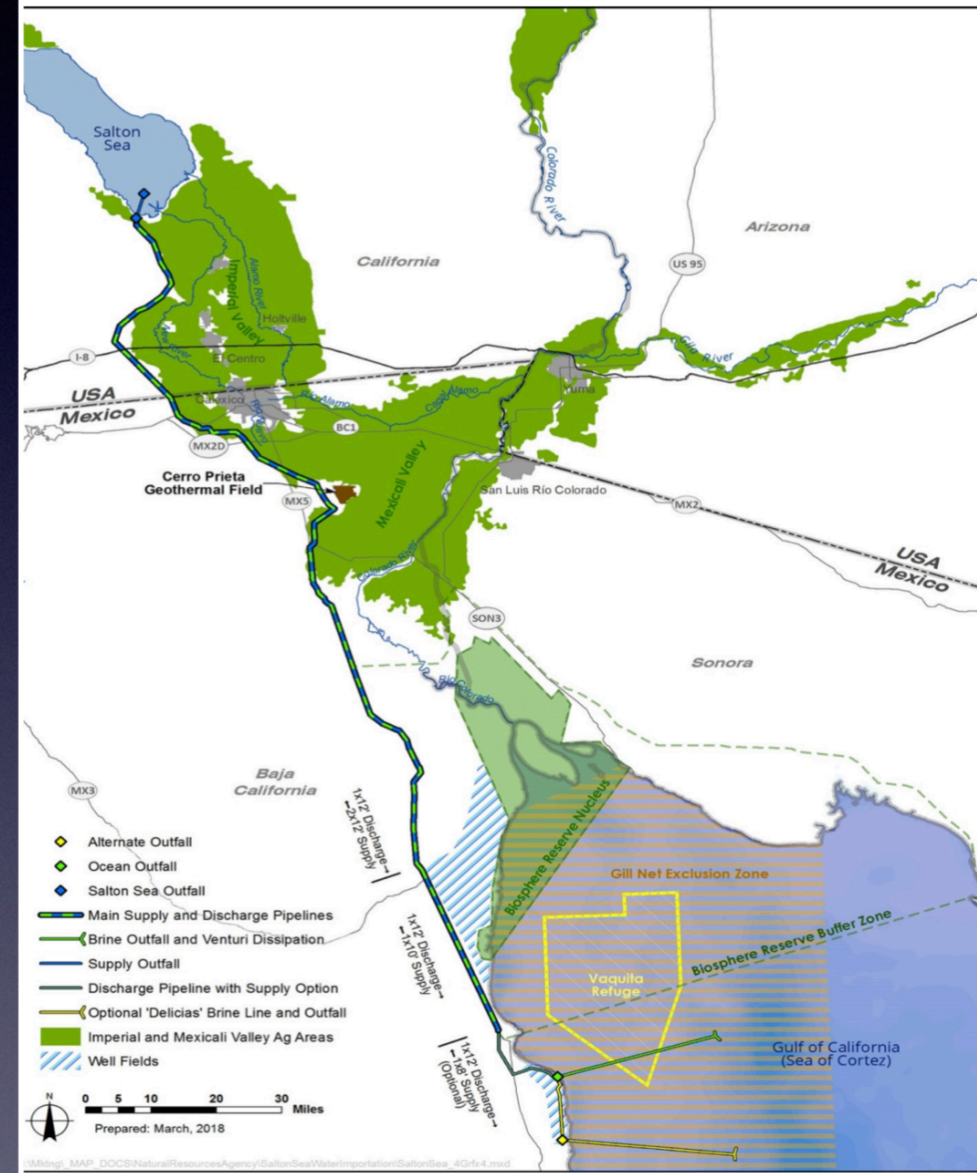


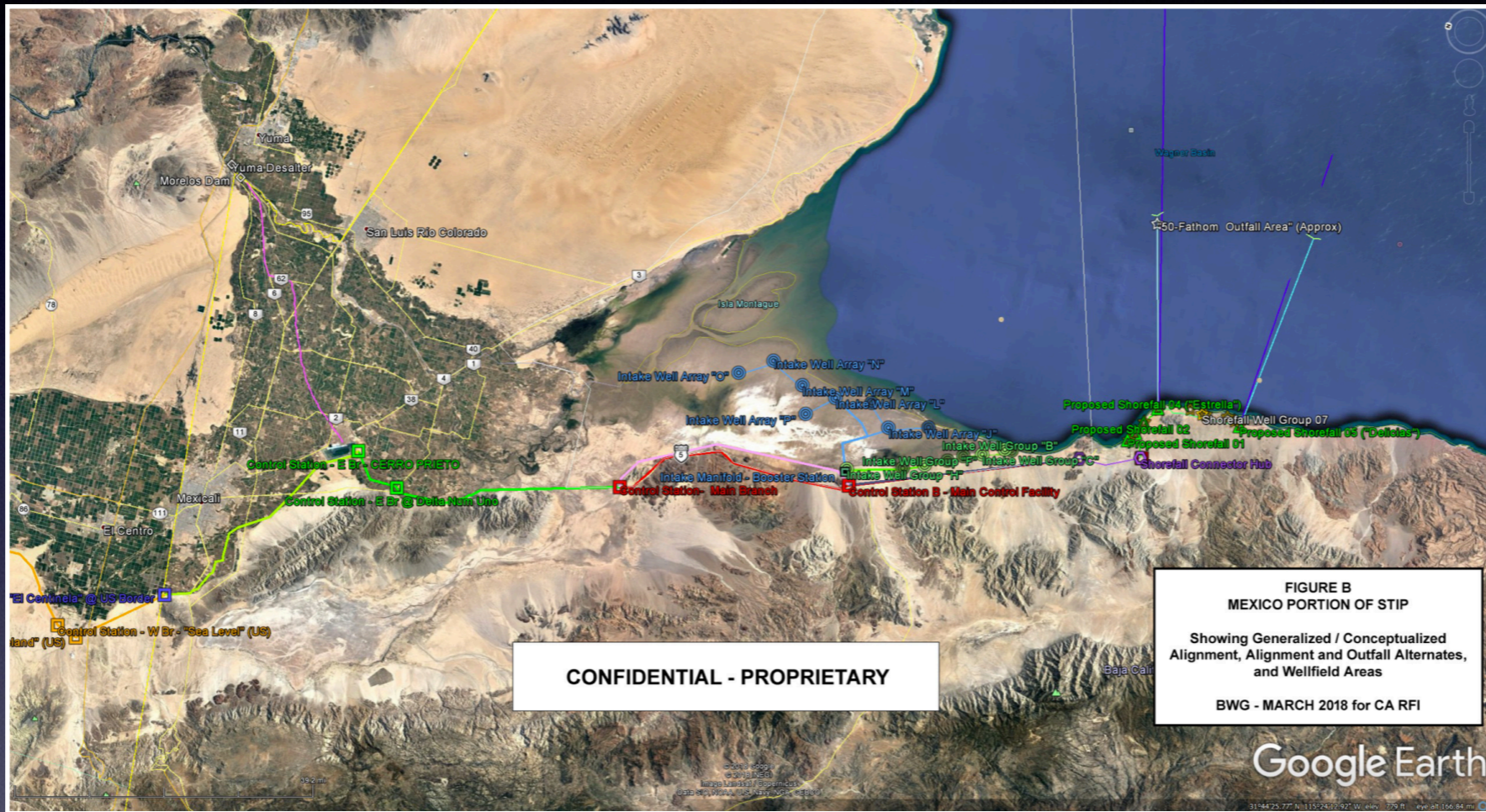
# Salton Trough



# Salton Trough Interconnection Project

Figure 1: Overview of the Salton Trough Interconnection Project (STIP). Not shown is the location of desalination plants, which are to be determined through coordination with the Natural Resources Investment Center.





# Mexico Part of STIP



# U.S. Part of STIP

# Anticipated Costs

Plan	Cost	Affects
10 year plan	\$383 million, more per year after 10 years to cover exposed playa	decreased bird life, low property values, higher rates of asthma, premature death, increase in rotten egg smell (hydrogen sulfide)
water importation	\$350 million in construction,	increase in bird life, vibrant ecosystem, maintain or increase in property values, decrease in asthma rates

# Possible demands

- continue mitigation water until there is a long term plan
- preserve health conditions - human health is a priority (more medical checks)
- restore habitat for birds and wildlife
- amend SB 701 to include \$1 to \$3 million set aside for a water importation feasibility study

# Possible demands (cont'd)

- local air quality management district similar to Owens Valley for the Coachella Valley, train local students
- dust cameras for surrounding shoreline communities, similar to IVAPC
- transparency and easier access to information on air quality and Salton Sea plan from agencies

# What can we do?

- organize and stay connected
- sign petition and help collect signatures
- class action lawsuits for health and property
- more presentations
- communicate with legislators

Comments, questions,  
ideas



# References

- Ian James, Sammy Roth, “California far from solutions as Salton Sea crisis looms”, Desert Sun <https://www.desertsun.com/pages/interactives/salton-sea/two-paths-for-long-term-fixes-at-californias-shrinking-sea/>
- Tim Stephens, (July 11, 2013), “Geothermal Power Facility Induces Earthquakes, Study Finds” UC Santa Cruz Newsletter <https://news.ucsc.edu/2013/07/geothermal-earthquakes.html>
- Ivan Penn, (January 14, 2017) “Australian firm plans largest geothermal plans nation’s largest geothermal thermal plant in Imperial Valley”, Los Angeles Times, <http://www.latimes.com/business/la-fi-geothermal-salton-sea-20170114-story.html>
- Ben Hueso, Eduardo Garcia (April 2017) “SB-701 Salton Sea Obligations Act” [https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill\\_id=201720180SB701](https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201720180SB701)
- Tony Starr (April 8, 2017) “To save water, some Arizona farms temporarily cut production” Arizona Daily Star [http://tucson.com/business/tucson/to-save-water-some-arizona-farms-temporarily-cut-production/article\\_71ae6921-6076-5fb2-af65-00b679f824b4.html](http://tucson.com/business/tucson/to-save-water-some-arizona-farms-temporarily-cut-production/article_71ae6921-6076-5fb2-af65-00b679f824b4.html)

# References cont'd

- Imperial Irrigation District “A solution to restoring the Salton Sea lies within the sea itself” <http://www.iid.com/home/showdocument?id=8265>
- San Diego Water Authority “Quantification Settlement Agreement” <https://www.sdcwa.org/sites/default/files/qsa-fs.pdf>
- Hana Namrouqa (Dec. 3, 2016) The Jordan Times, <http://www.jordantimes.com/news/local/donors-pledge-around-400-million-red-dead-project>
- Tim Krantz presentation (April 18, 2016) “New Initiatives for Restoring the Salton Sea” <https://www.youtube.com/watch?v=IQsJGoqSer8&t=3597s>
- Salton Sea Management Program: 10 year plan [http://resources.ca.gov/docs/salton\\_sea/ssmp-10-year-plan/SSMP-Phase-I-10-YR-Plan-with-appendices.pdf](http://resources.ca.gov/docs/salton_sea/ssmp-10-year-plan/SSMP-Phase-I-10-YR-Plan-with-appendices.pdf)

# Resources

- Southern California Air Quality Management District, Diamond Bar, California
- Imperial Valley Air Pollution Control District (webpage has cameras)

**1.6 maf to cover 75,000 acres of dry lakebed, Salton Sea**  
**1.0 maf to cover 25,000 acres of dry lakebed, Laguna Salada**  
**115 miles of canal (40 ft. x 20 ft. dirt canal), Sea of Cortez to Salton Sea**



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