OCEAN WATER DESALINATION SUBSURFACE INTAKE STUDY

National Water Research Institute – Expert Panel Meeting

November 16, 2015

PRESENTER: DIANE GATZA

ELECTED BOARD OF DIRECTORS

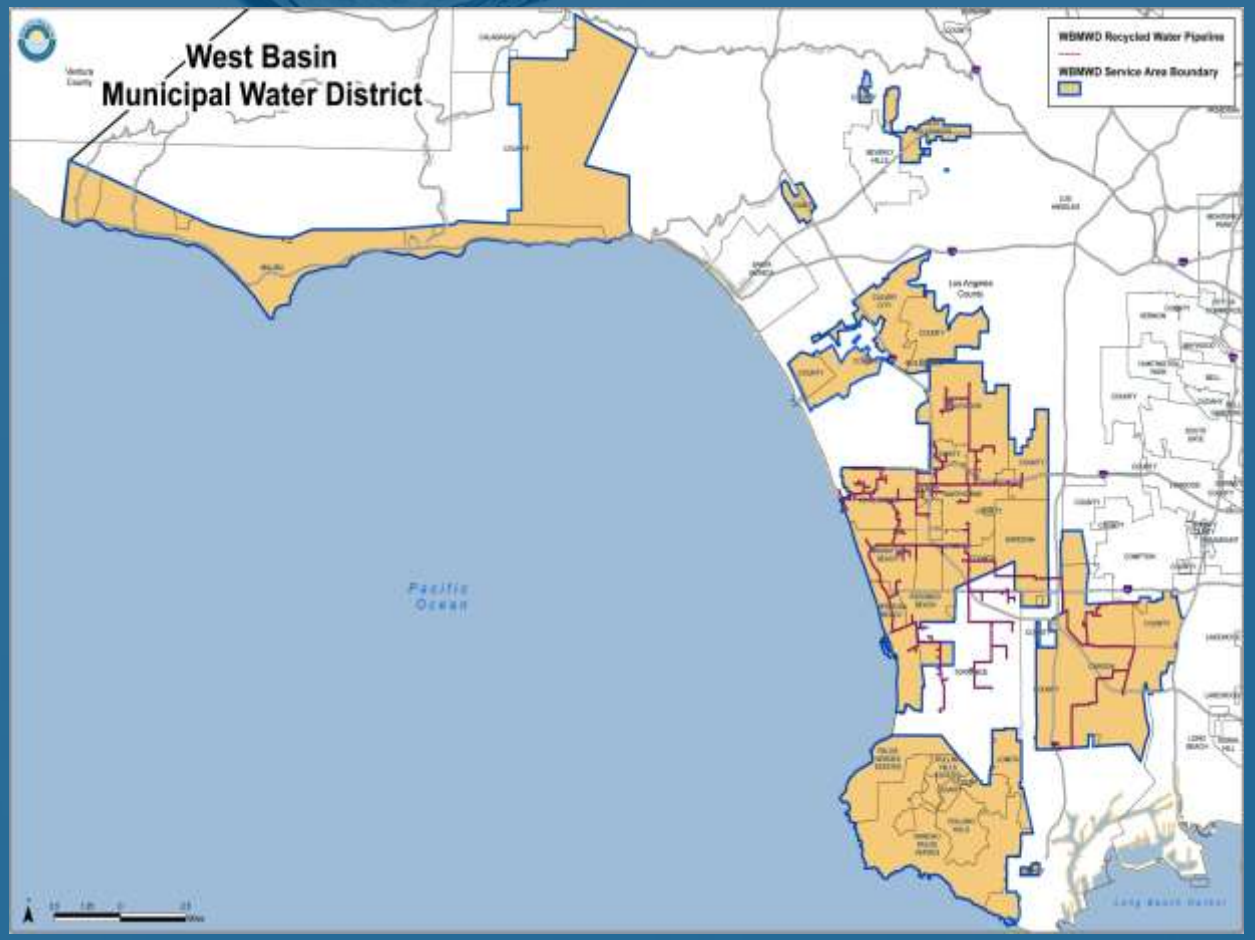
Division I:
HAROLD C. WILLIAMS
Treasurer

Division II:
GLORIA D. GRAY
President

Division III:
CAROL W. KWAN
Vice President

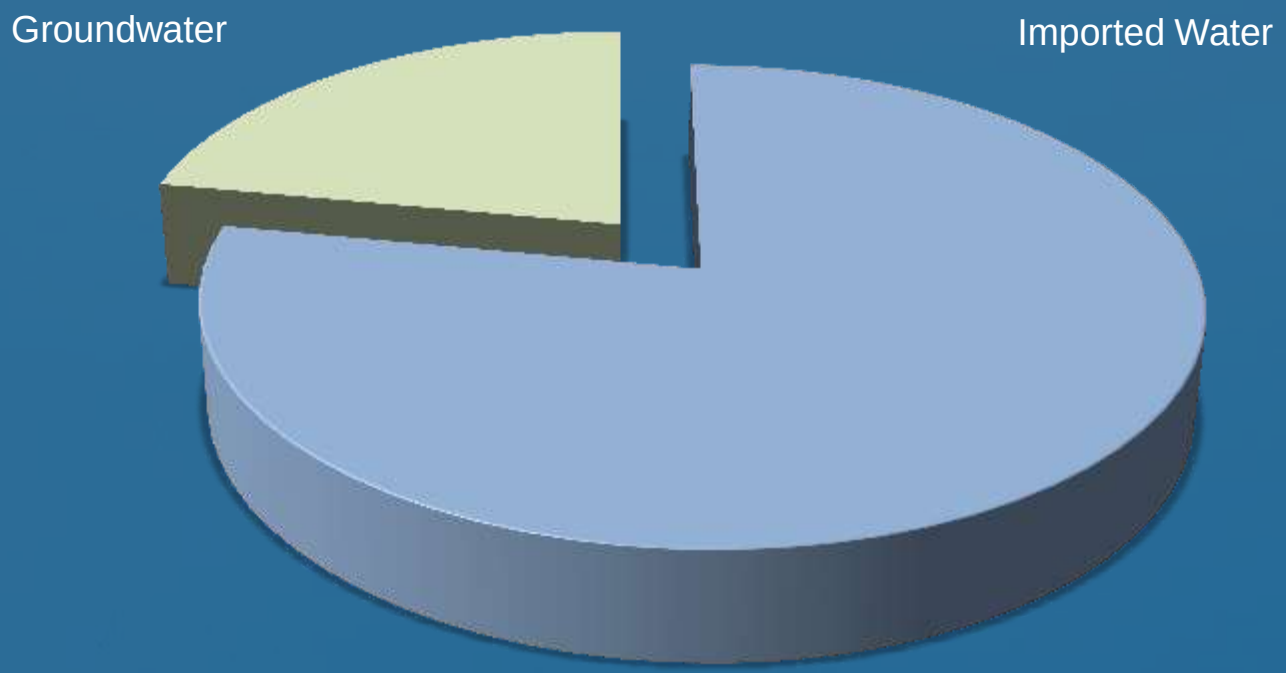
Division IV:
SCOTT A. HOUSTON
Secretary

Division V:
DONALD L. DEAR
Board Member

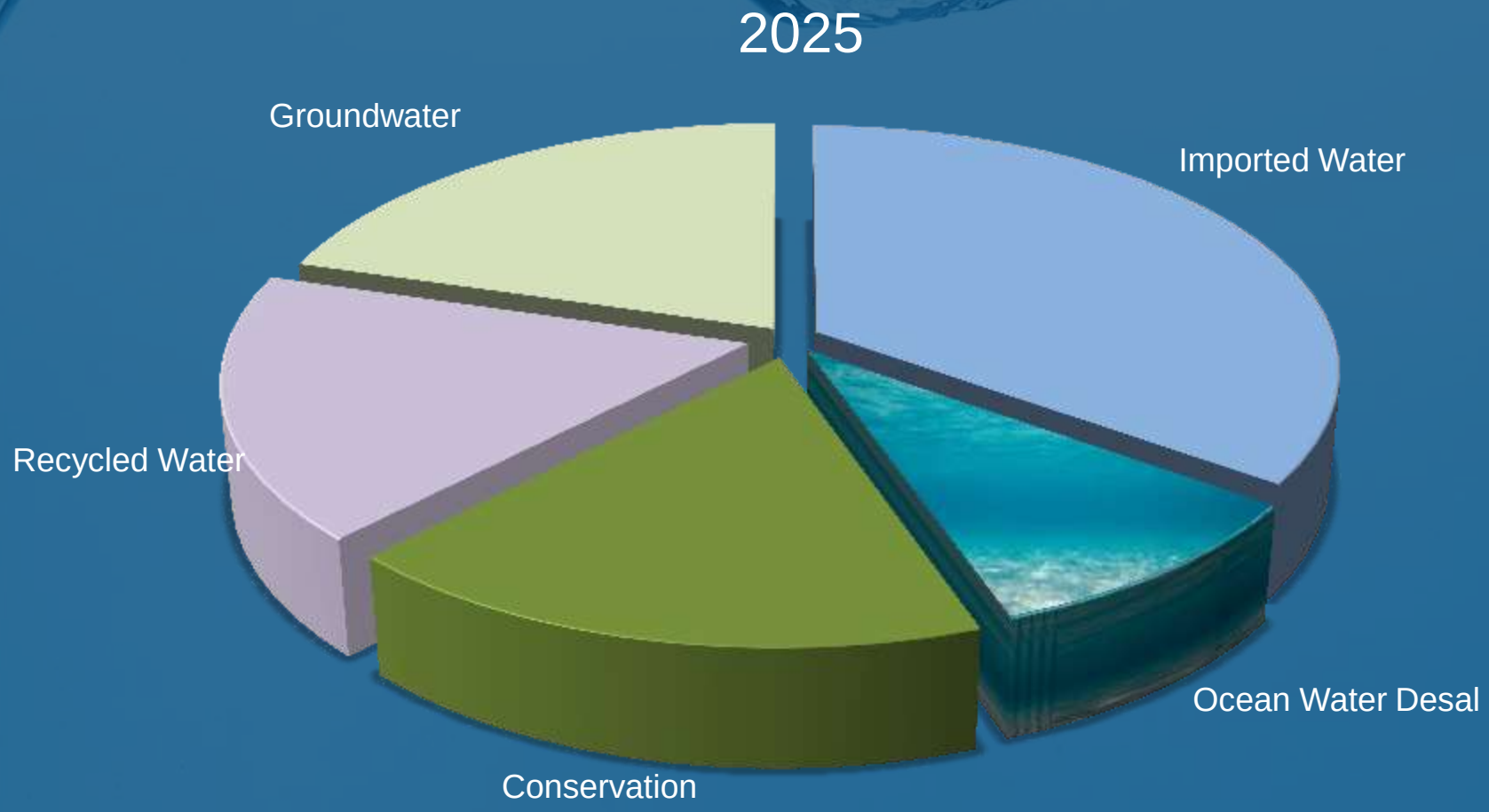


WATER RELIABILITY THROUGH SUPPLY DIVERSIFICATION

1990



WATER RELIABILITY THROUGH SUPPLY DIVERSIFICATION



PROGRAM HISTORY

Pilot Facility
El Segundo, Calif.
2002-2009

- 5 Research Studies Completed
- ~$3.3M

Demonstration Facility
Redondo Beach, Calif.
2010-2014

- 15 Research Studies
- ~$25M

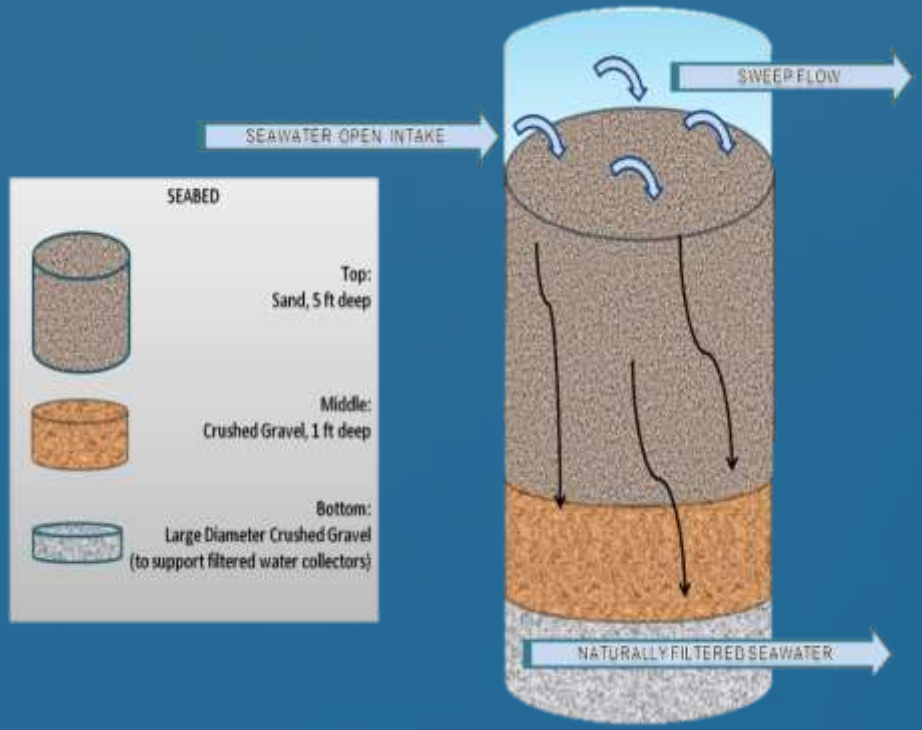
PROGRAM RESEARCH

	Facility	Name	Value of Study	Partnering Org	Environment	Education	Economics	Energy
1	Pilot	Harmful Algal Bloom and Marine Biotoxin Study	$ 930,446	DWR	X			
2		Ocean Water Desal Pilot Plant Project	-	USBR	X		X	X
3		Water Quality Implications for Large-Scale Applications of MF/RO Treatment for Seawater Desalination	$ 1,052,296	AWWRF			X	X
4		Pilot-Test Pre-formed Chloramines as a Means of Controlling Biofouling in Seawater Desalination	$ 195,309	WateReuse			X	X
5		Water Sources "Powering" Southern Califoria		DWR				X
6	Demo	High Salinity Sensitivity Study	$ 160,883	-	X			
7		Ocean Water Desalination Program Master Plan	$ 802,228	MWD	X	X	X	X
8		Brine Diffuser Entrainment Study	$ 20,000	-	X			
9		Intake Effects Assessment Study	$ 861,962	-	X			
10		Water Quality Integration Study	$ 487,000	MWD	X	X		
11		Emerging Energy-Reducing Technologies for Desalination Applications	$ 10,000	WateReuse				X
12		Ocean Water Desalination Demonstration Final Facility Operational Report	-	-	X		X	X
13		Demonstration of Integrated Membrane Seawater Desalination	$ 9,000,000	DWR	X	X	X	X
14		Energy Consumption Modeling Study	$ 252,000	WRF	X			
15		Benthic Site Survey	$ 16,000	-	X			
16		Intake Biofouling and Corrosion Study	$ 330,000	MWD	X		X	
17		IM&E Mitigation Development	$ 10,000	WateReuse	X		X	
18		Desalination Concentrate Disposal	$ 5,000	WaterReuse	X			
19		Concentrate Management in Desalination	-	ASCE-EWRI	X			
20	Future Planning	Subsurface Intake Study*	$ 600,000	USBR	X	X	X	
21		Environmental Impact Report*	$ 1,750,000	-	X	X	X	X

SAFE INTAKE OF OCEAN WATER

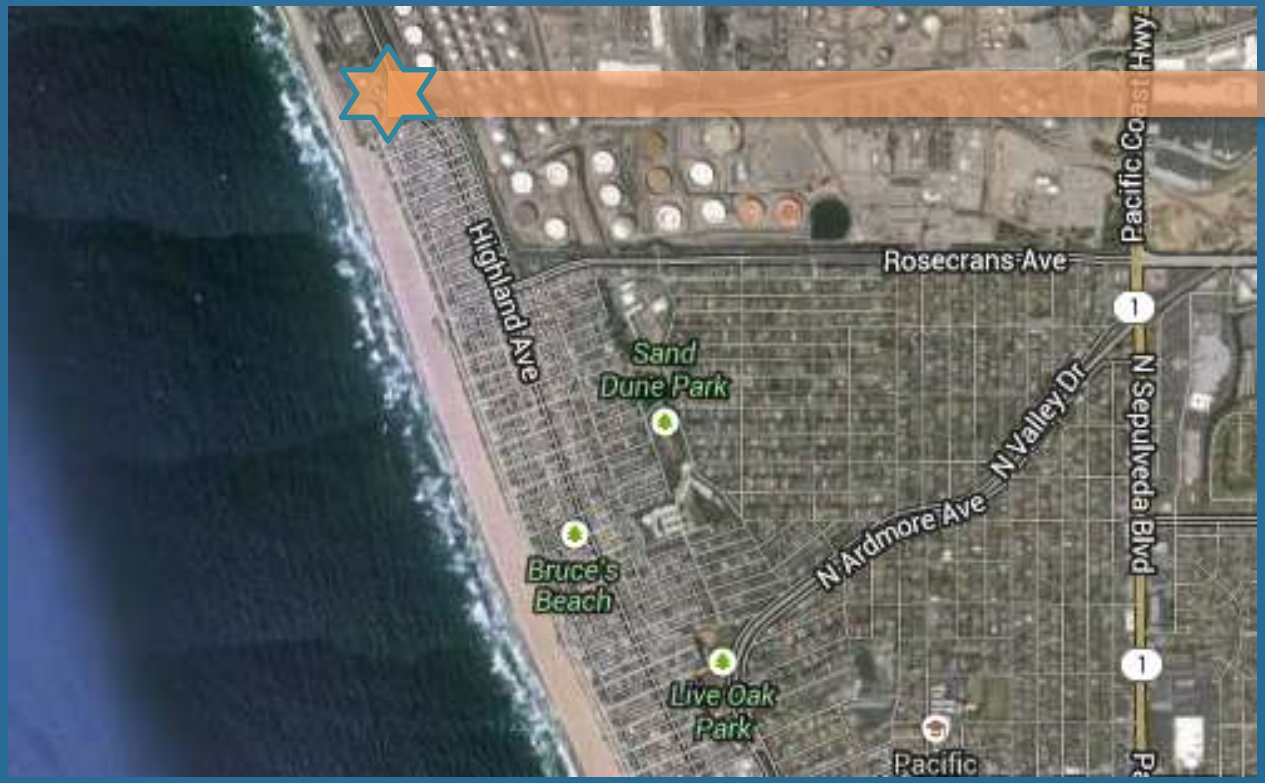
Current passive wedge wire screens proven to protect 100% of adult and juvenile marine life and most, if not all, mature larvae

Ocean floor acts as a filter with subsurface intake systems



PROPOSED PROJECT OVERVIEW

- 20 Million Gallons per Day
- NRG in El Segundo, Calif.
- Estimated $385M
- Drinking Water Delivery by 2023



Proposed Site
NRG – El Segundo

Alternative Site
AES – Redondo Beach
(not pictured)

REGULATORY OVERSIGHT

New State Regulations:

- Intake
- Discharge
- Mitigation
- First-ever rules for permitting of desal projects in CA

REGULATORY OVERSIGHT

III.M.2.d.1.(a) Subject to Section L.2.a.(2), the regional water board in consultation with State Water Board staff shall require subsurface intakes* unless it determines that subsurface intakes* are not feasible* based upon a comparative analysis of the factors listed below for surface and subsurface intakes.* A design capacity in excess of the need for desalinated* water as identified in chapter III.L.2.b.(2) shall not be used by itself to declare subsurface intakes* as not feasible.*

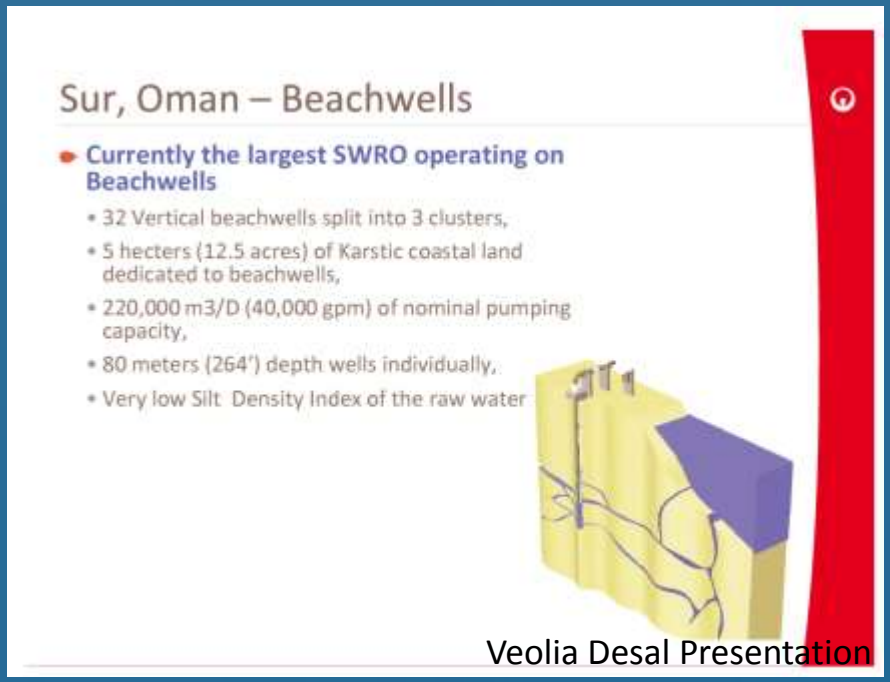
III.M.2.d.1.(a).i. The regional water board shall consider the following factors in determining feasibility of subsurface intakes:* geotechnical data, hydrogeology, benthic topography, oceanographic conditions, presence of sensitive habitats,* presence of sensitive species, energy use; impact on freshwater aquifers, local water supply, and existing water users; desalinated* water conveyance, existing infrastructure, design constraints (engineering, constructability), and project life cycle cost. Project life cycle cost shall be determined by evaluating the total cost of planning, design, land acquisition, construction, operations, maintenance, mitigation, equipment replacement and disposal over the lifetime of the facility, in addition to the cost of decommissioning the facility. In addition, the regional water board may evaluate other site- and facility-specific factors. Subsurface intakes* shall not be determined to be economically infeasible solely because subsurface intakes* may be more expensive than surface intakes. Subsurface intakes* may be determined to be economically infeasible if the additional costs or lost profitability associated with subsurface intakes,* as compared to surface intakes, would render the desalination facility* not economically viable.

SUBSURFACE STUDY APPROACH

- Subsurface Intake Study – Nov 2014 - Dec 2015
  - USBR Grant Funded Study - $600,000
  - Develop industry wide guidance manual
    - Expert Panel review
  - Assess technical feasibility for West Basin desal
  - Assess complete feasibility for West Basin desal
  - Final Report
    - Expert Panel Review

SUBSURFACE STUDY APPROACH

- Identify subsurface technologies
- Where are the existing subsurface intakes?
  - Oman, Spain, Japan
- What are the site specific conditions for intakes?
- What are the conditions for success?
- How are the existing facilities currently operating?
- What challenges exist with subsurface intakes?

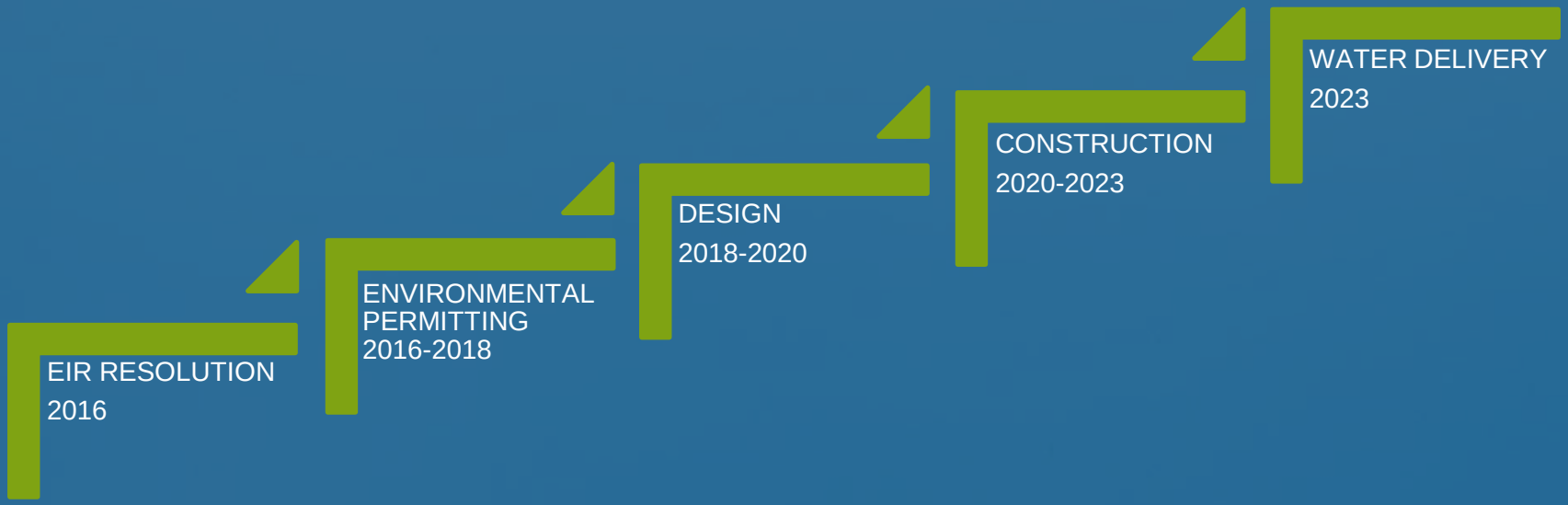


Veolia Desal Presentation

SUBSURFACE STUDY PROCESS

ENVIRONMENTAL IMPACT REPORT PROCESS

PROPOSED PROJECT TIMELINE



LEARN MORE

Contact us for a facility tour or briefing

Diane Gatza, Ocean Desalination Project Manager

DianeG@westbasin.org | 310-660-6226

www.westbasin.org/desal

Connect with us: