



SANITATION DISTRICTS OF LOS ANGELES COUNTY



Regional Recycled Water Program

Southern California Water Dialogue
January 25, 2017

Presentation Outline

- Background
- Program Overview
 - Treatment
 - Conveyance
 - Groundwater Basins
- Feasibility Study Findings
- Next Steps

Potential Regional Recycled Water Program Background

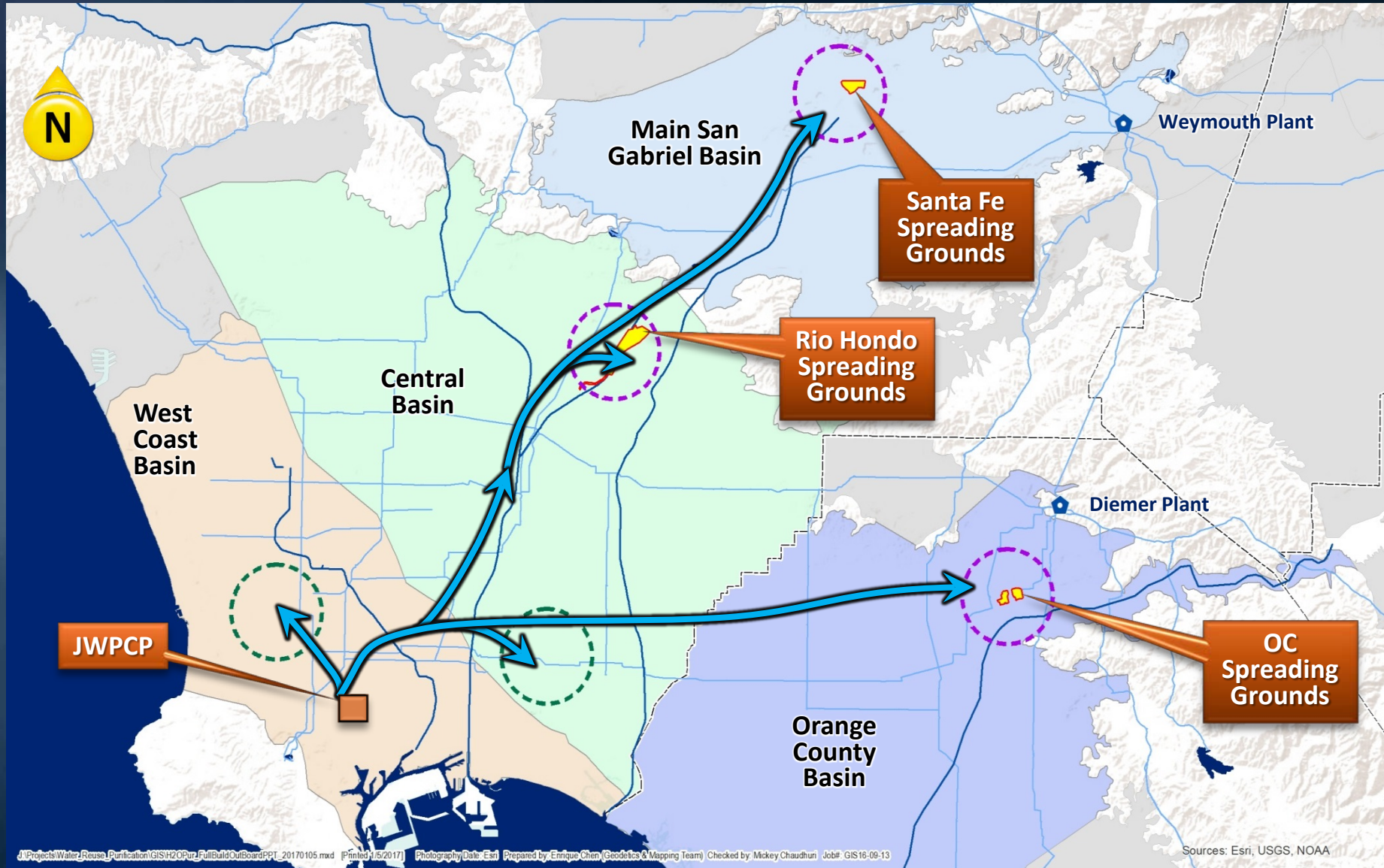
- ✓ Pilot Scale Studies (2010-12)
- ✓ Progress Report (September 2015)
- ✓ Board approval and appropriation for Demonstration Plant (November 2015)
- ✓ Historical Review and 2015 Update (February 2016)
- ✓ Progress Report (August 2016)
- ✓ Feasibility Study Final Draft (December 2016)
- Demonstration Plant
 - Completion of Final Design (February 2017)
 - Award of Construction Contract (June 2017)
- Detailed Facility Planning and Engineering (2017-18)

Program

Regional Recycled Water Program

- Collaboration between Metropolitan and Sanitation Districts of Los Angeles County
- Development of new regional water source
 - Up to 150 mgd (168,000 AFY)
 - Deliveries to Member Agencies
 - Recharge and store in multiple groundwater basins
 - Increases Metropolitan's regional storage reserves

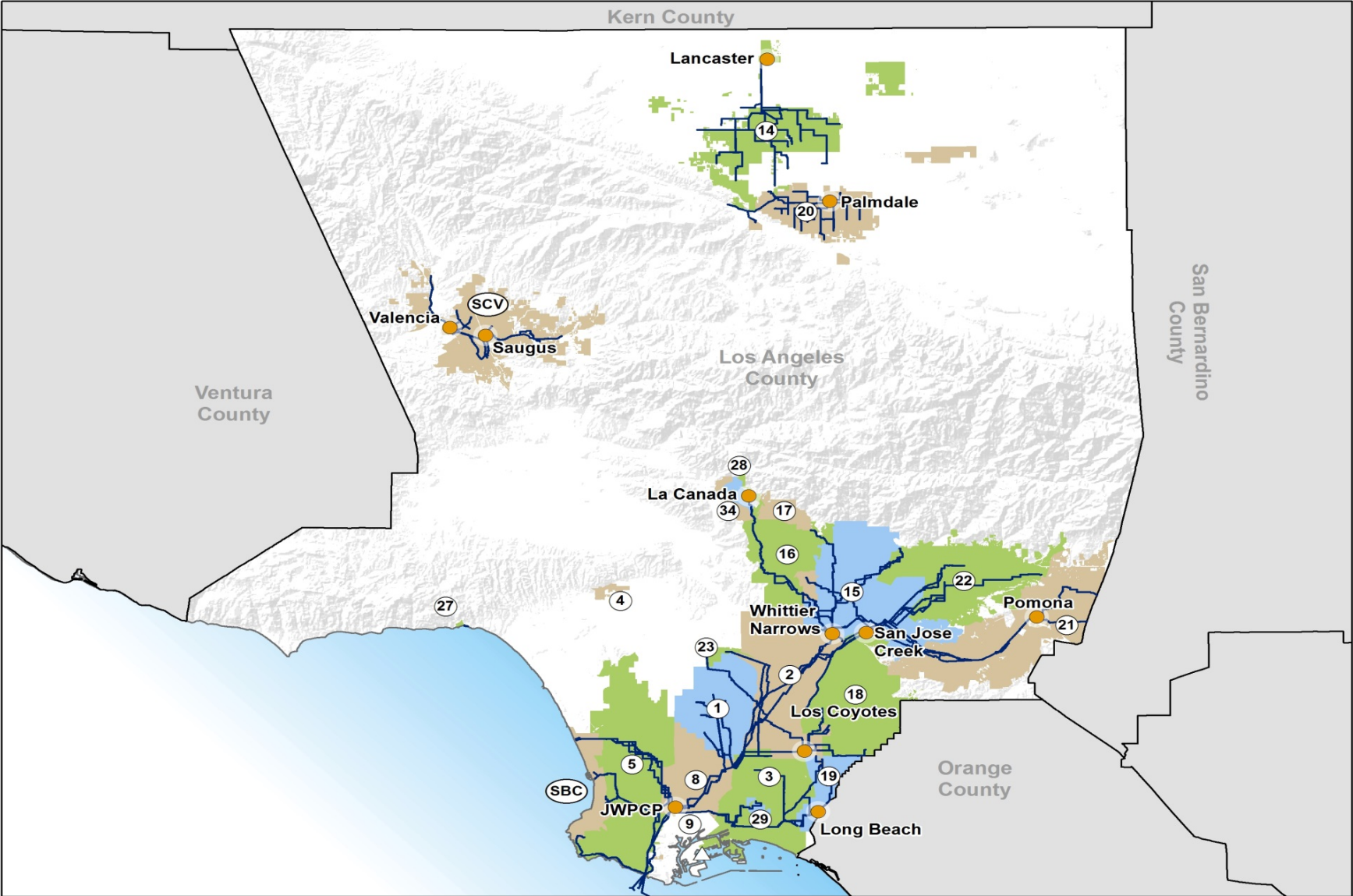
Potential Full Program (up to 150 MGD)



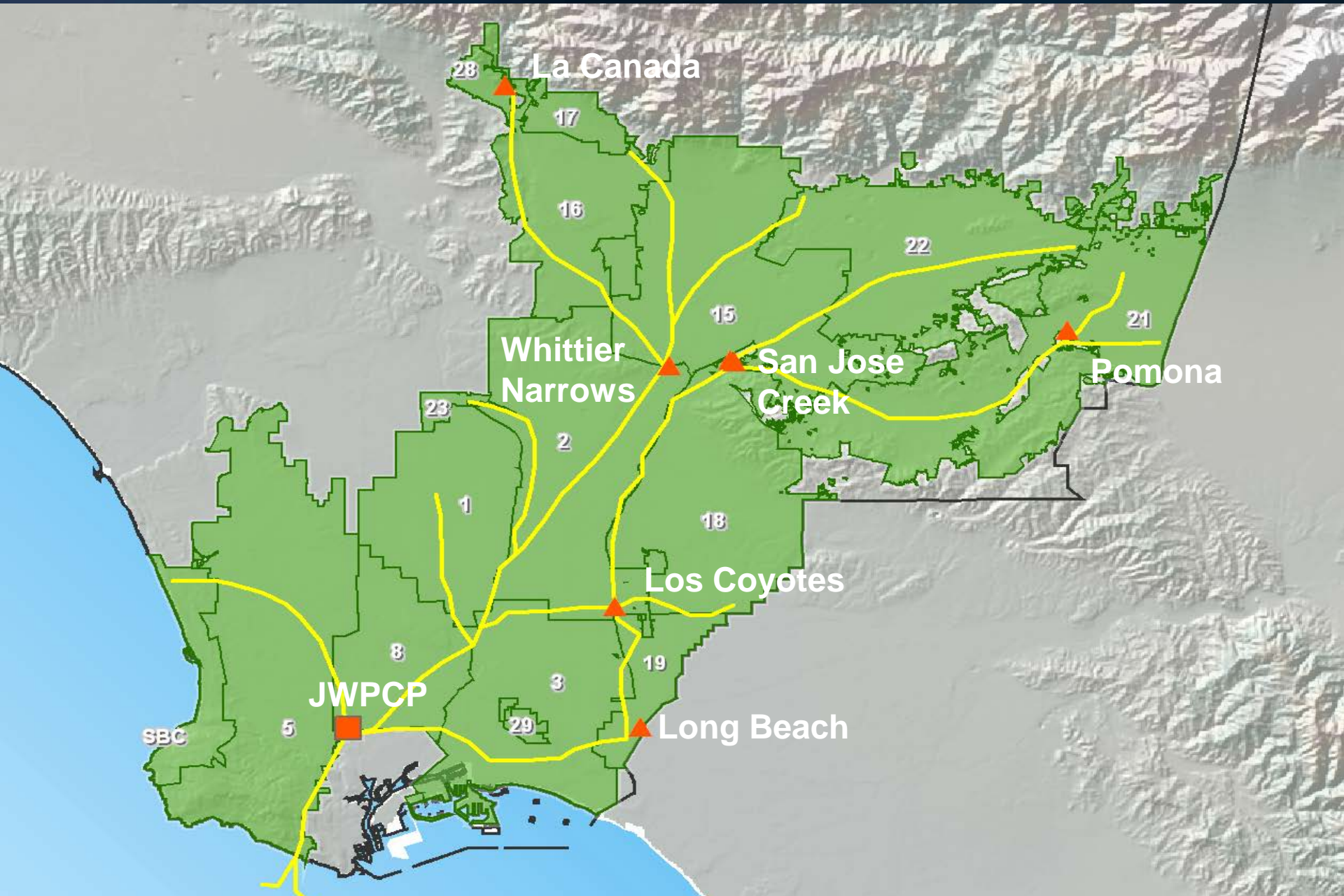
Sanitation Districts of Los Angeles County

- Wastewater and Solid Waste Management
 - Serves 5.0 million people
 - 800 sq. mile service area
 - 400 MGD current average flow
 - 11 water reclamation plants, including JWPCP
- Joint Water Pollution Control Plant
 - Located in Carson
 - Current Avg Flow ~260 MGD
 - Primary and secondary treatment
 - Currently discharges to the ocean

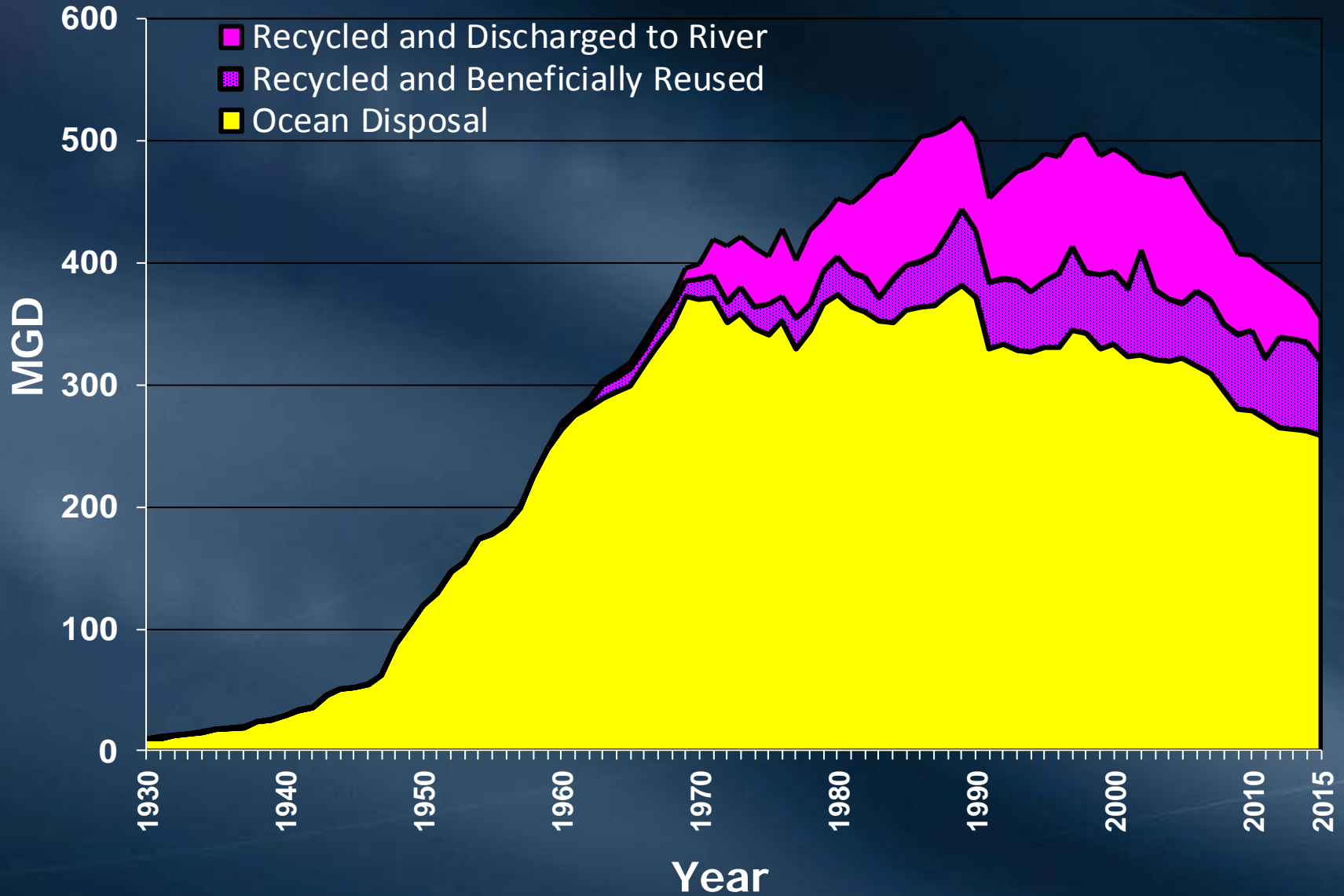
LACSD Service Area



Joint Outfall System



LACSD Recycled Water Production



LACSD Support

- 35 acres of land for the project
- Flow to produce up to 150 mgd of purified water
- Brine and treatment residuals management
- Flow equalization
- Source control for Boron
- Nitrogen management (exact configuration TBD)

Joint Water Pollution Control Plant

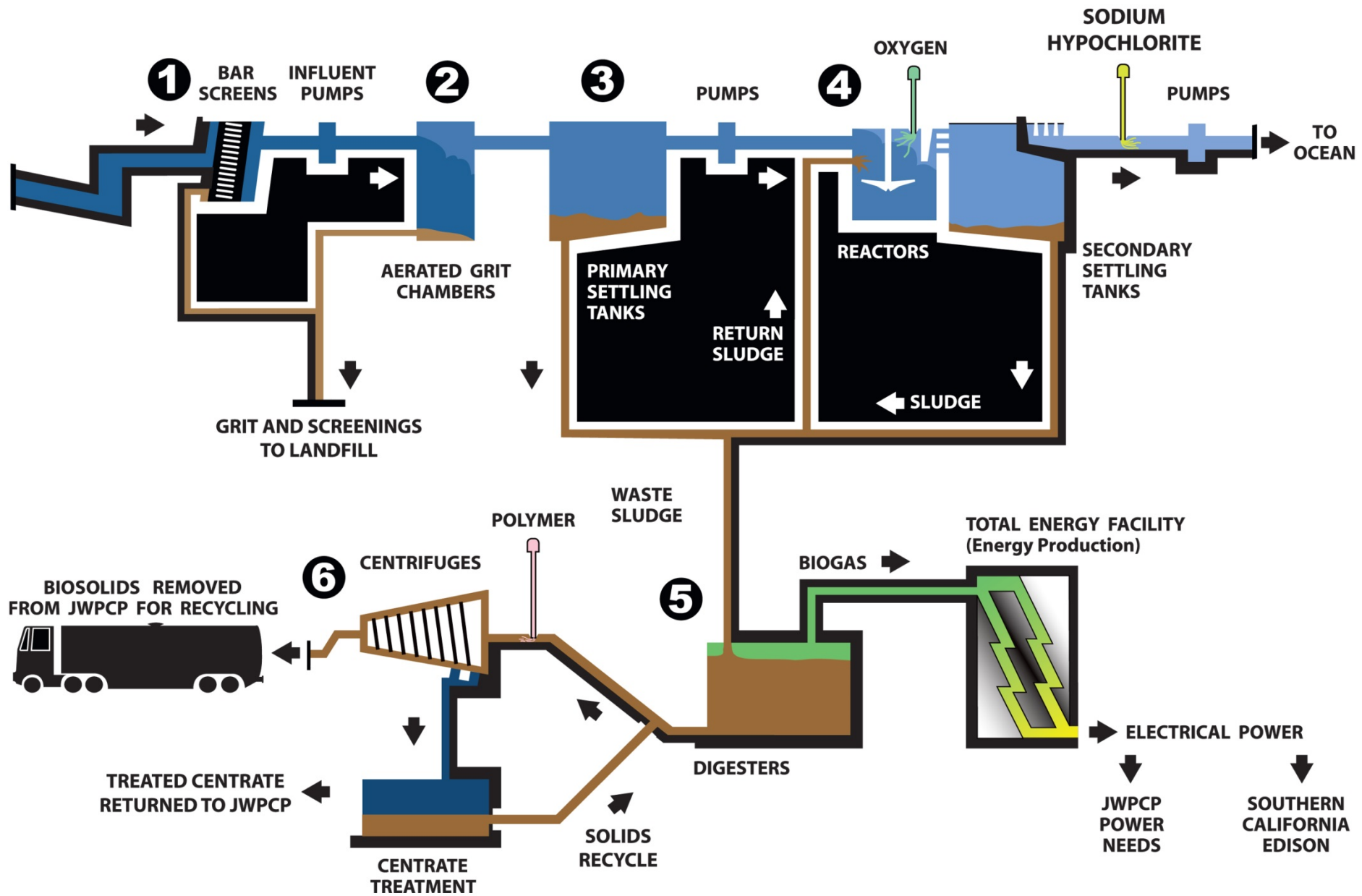


Operational
Boundary



Google earth

JWPCP Treatment Process



Location of AWT Facilities at JWPCP



Sepulveda Blvd.

Demo Plant Site

Full-Scale AWT Site

Figueria St.



Source Layer Credits: Image courtesy of USGS Image courtesy of LARAC Publishers Geographic SIC © 2010 Microsoft Corporation

JWPCP Water Reuse Production (SIS) Pur. JWPCP Property 20170105.mxd Printed 4/5/2017 Photography Date: 3/16 Prepared by: Endyue Chen (Geodetics & Mapping Team) Checked by: Kimberly Winton - 2017 01/10 02:29

Demonstration Plant Objectives

- Develop data for Title 22 Engineering Report for regulatory approval
- Achieve technology acceptance and develop operating criteria AWT
- Establish cost clarity for full-scale treatment
- Coordinate MWD-LACSD operations
- Provide for public outreach and acceptance

Pilot Plant at JWPCP



Builds upon 2010-12 Pilot Study demonstrating capability to successfully treat JWPCP effluent and meet regulatory requirements

Demonstration Plant Rendering

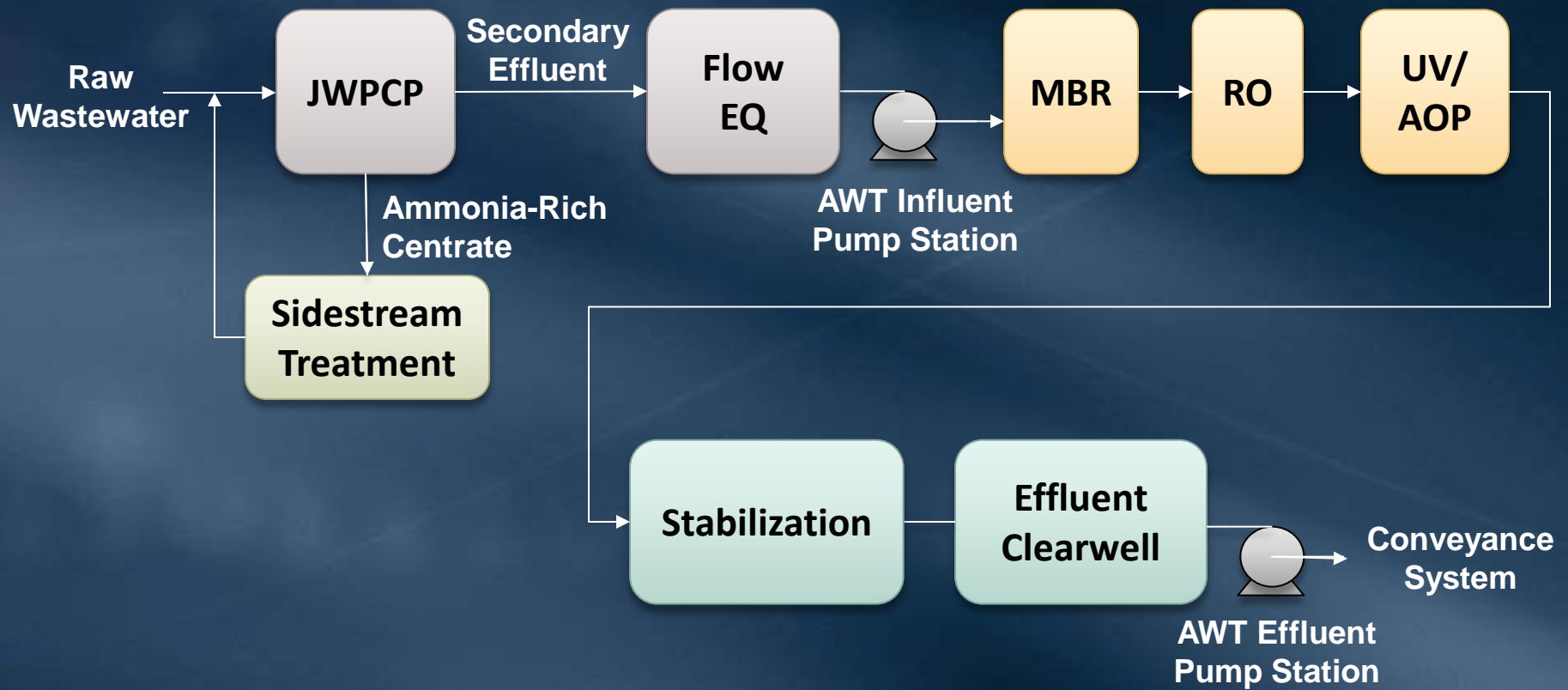




Full-Scale AWT Facilities

- Piloted the proposed process
- Demonstration Plant will enable process confirmation and optimization
- Significant LACSD contributions
- Capital Cost: \$681,600,000
- Annual Operating Cost: \$99,700,000

Full-Scale AWT Base Case Schematic

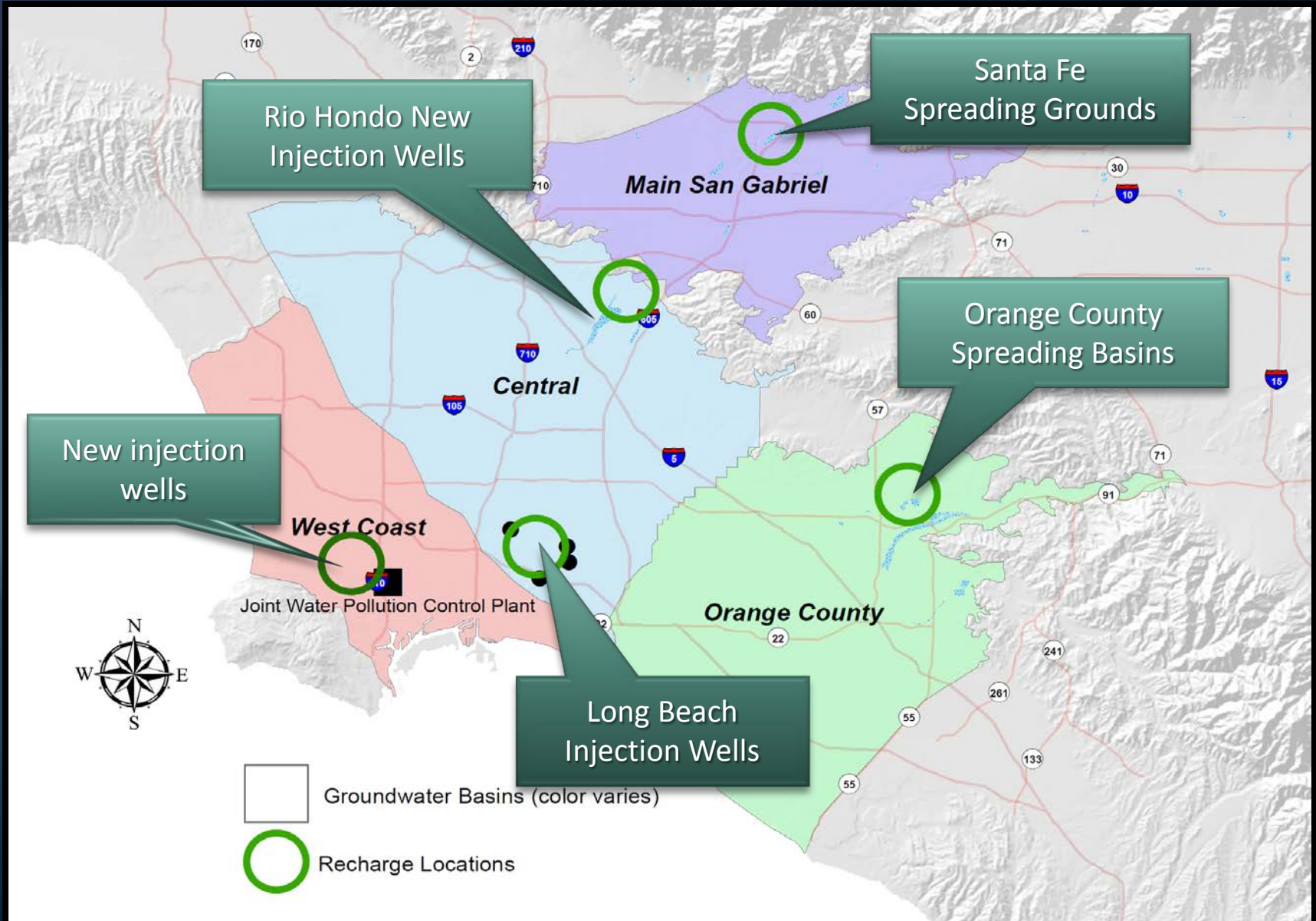




Groundwater Basins

- Modeling prepared together with Member Agencies, basin managers, and LACDPW
- Well Facilities
 - 15 New Injection Wells
 - 4 Repurposed Injection Wells
 - 18 Monitoring Wells
 - 15 Relocated Wells
- Capital Costs: \$155,000,000
- Annual Operating Cost: \$1,200,000

Groundwater Basins

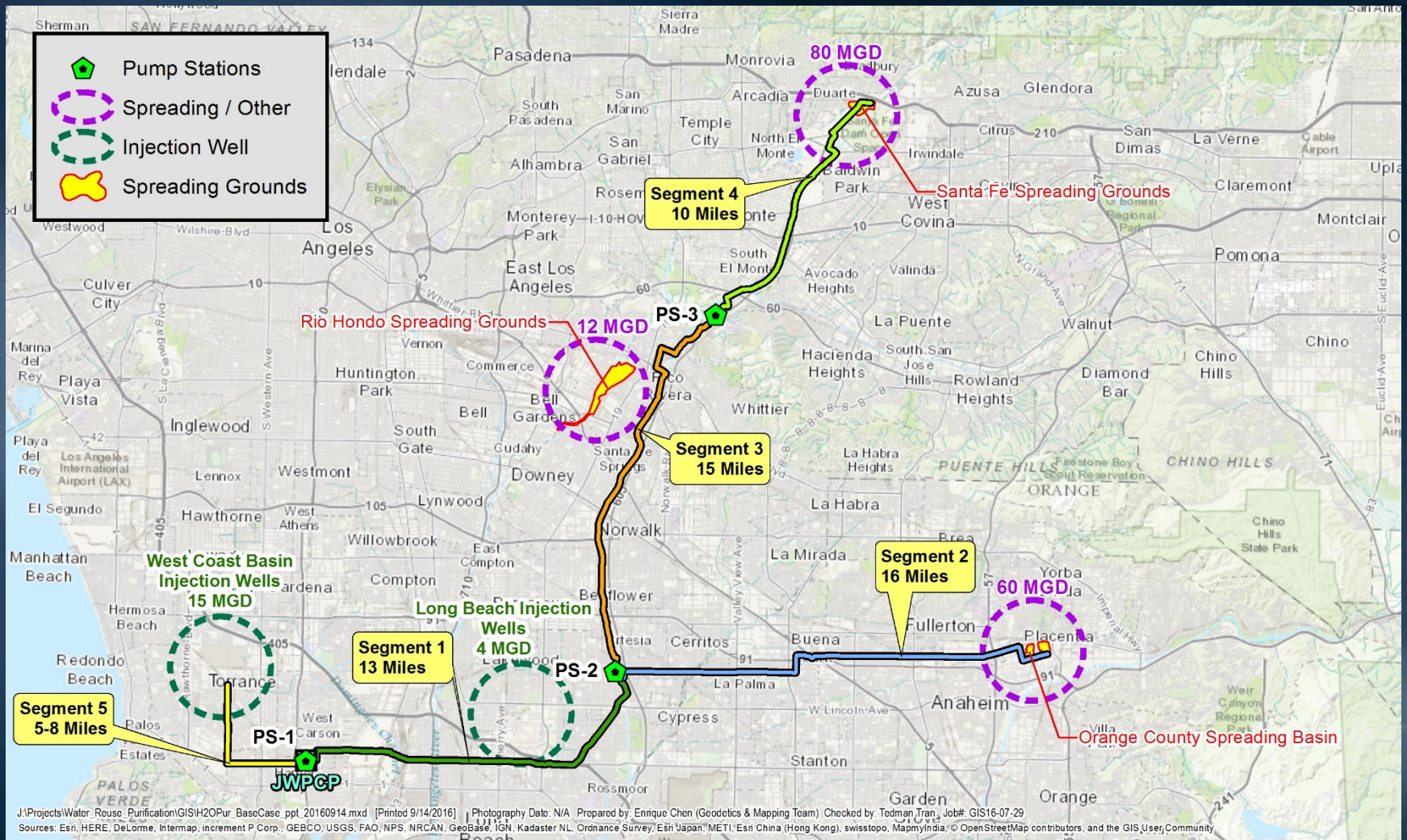


Conveyance

- Approximately 60 miles
- Cement mortar-lined welded steel (diameters 30" to 74")
- ROW challenges and easement possibilities
- Capital Costs: \$769,700,000
- Annual Operations Costs: \$28,100,000

Conveyance System Map

Base Case Alignment



Capital and O&M Costs

- Total capital cost of \$2.7 billion
 - All new facilities including 150-mgd AWT, 60 miles of pipeline, and 3 pump stations
- Annual O&M costs of \$129 million
 - Includes power costs for AWT and pump stations
- Total unit cost of \$1600/AF
 - Interest rate at 4%
 - No grants or low-interest loans
 - Includes 35% capital cost contingency
- Total cost divided by total water sales of \$150-\$160/AF
 - Metropolitan water sales at 1.7 MAFY

Feasibility Study Findings

Key Questions

- No Fatal Flaws?
 - Is it technically, institutionally, and legally possible to implement a 150 MGD Indirect Potable Reuse program using effluent from the LACSD Joint Plant?
- Justified and Cost Effective?
 - Are the costs and benefits of the program consistent with the IRP and other approaches for achieving comparable amounts of recycled water?
- Impacts on cost of water to Member Agencies?
 - How would the cost of water be affected if the base case and its assumptions were implemented?

Feasibility Study Process

- Comprehensive technical evaluation
- Coordination with Regulators throughout
- Cooperation and support from groundwater basin managers
- Expert advisory panel review and input

Major Findings

- 150-mgd program is feasible
 - Treatment, conveyance, and groundwater recharge technically feasible
 - Institutional complexity but no fatal flaws
 - Regulatory approvals and permitting feasible
- Program provides significant regional benefits
- Costs and benefits are consistent with the 2015 IRP Update
- Adaptable to future Direct Potable Reuse regulations, if needed

Program Element Findings

Program Element	Feasibility
1. Advanced Water Treatment Plant	Feasible
2. Conveyance System	Likely Feasible
3. Groundwater Basins, Storage, and Extraction	Feasible
4. Environmental and Regulatory Feasibility	Feasible
5. Feasibility of Essential Agreements with LACSD	Feasible
6. Feasibility of Essential Institutional Arrangements	No Fatal Flaws
7. Regional Benefits and Consistency with IRP	Feasible
8. Overall Estimated Program Costs	Feasible
9. Public Acceptability (with robust outreach effort)	Feasible

Feasible: No fatal flaws, limited dependence on other parties, other examples of success, and some unknowns.

Likely Feasible: No fatal flaws, significant dependence on other parties, limited comparable existing examples, and many unknowns.

No Fatal Flaws: No fatal flaws but in need of further investigations and studies.

Advisory Panel Members

- Richard Atwater, Chair

- Former Executive Director of Southern California Water Committee

- Shivaji Deshmukh

- Assistant General Manager of West Basin Municipal Water District

- Thomas Harder

- Thomas Harder and Associates (Hydrogeology)

- David Jenkins

- Professor Emeritus, University of California, Berkeley

- Edward Means

- President, Means Consulting LLC

- Joseph Reichenberger

- Professor, Loyola Marymount University

- Paul Westerhoff

- Professor, Arizona State University

Advisory Panel

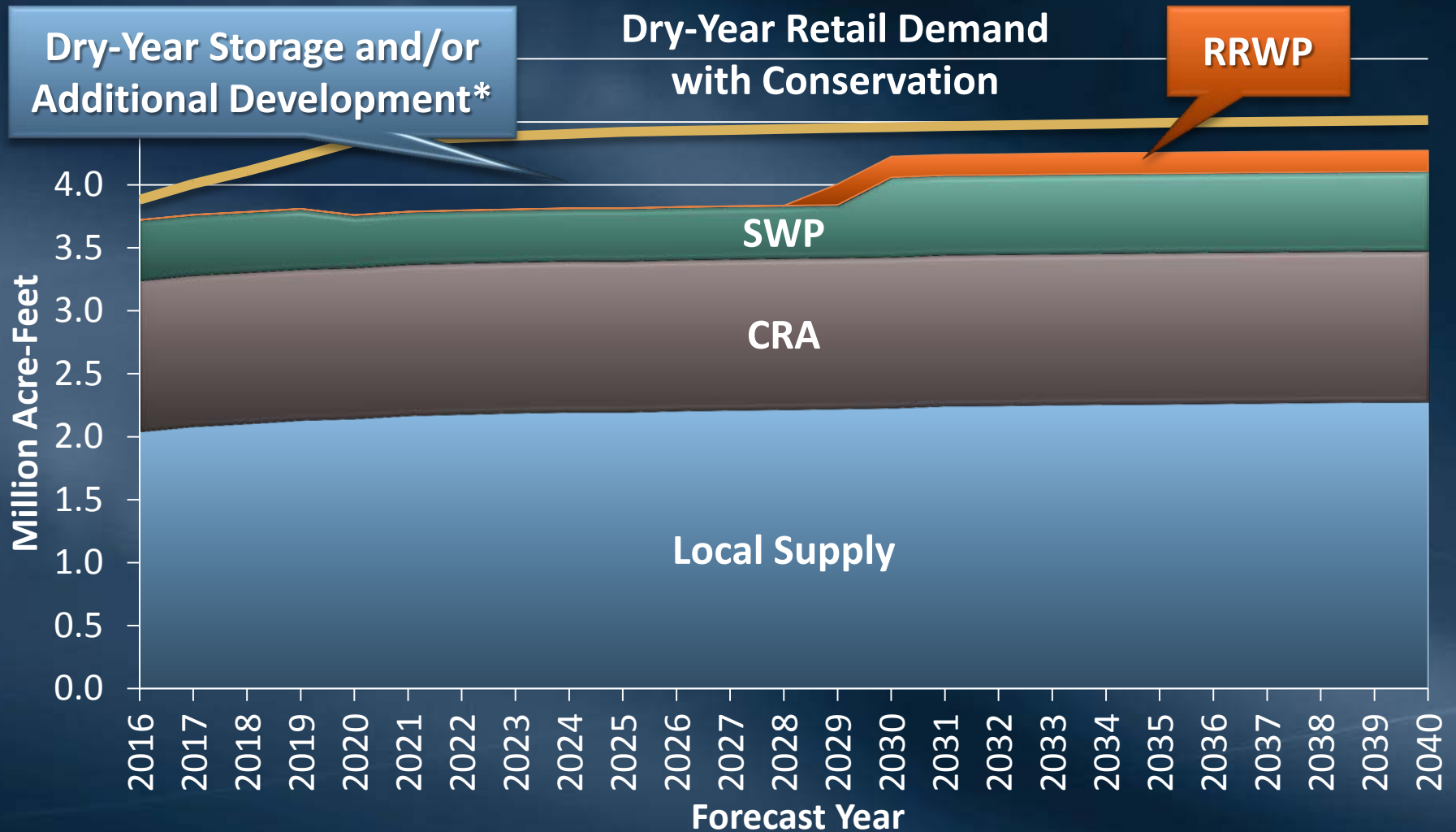
- Concluded findings are reasonable
- Do not see any technical fatal flaws
- Emphasized institutional complexity
- Helped identify program risks
- Contributed to and support recommendations

“The Advisory Panel agrees with the findings and recommendations of the Feasibility Study Report and supports moving forward”

Regional Benefits

- Consistent with MWD IRP 2015 Update
- Augments regional supplies during normal, drought, and emergency conditions
- Reduced frequency and magnitude of supply allocations
- Increases storage in groundwater basins and Metropolitan storage reserves within Southern California

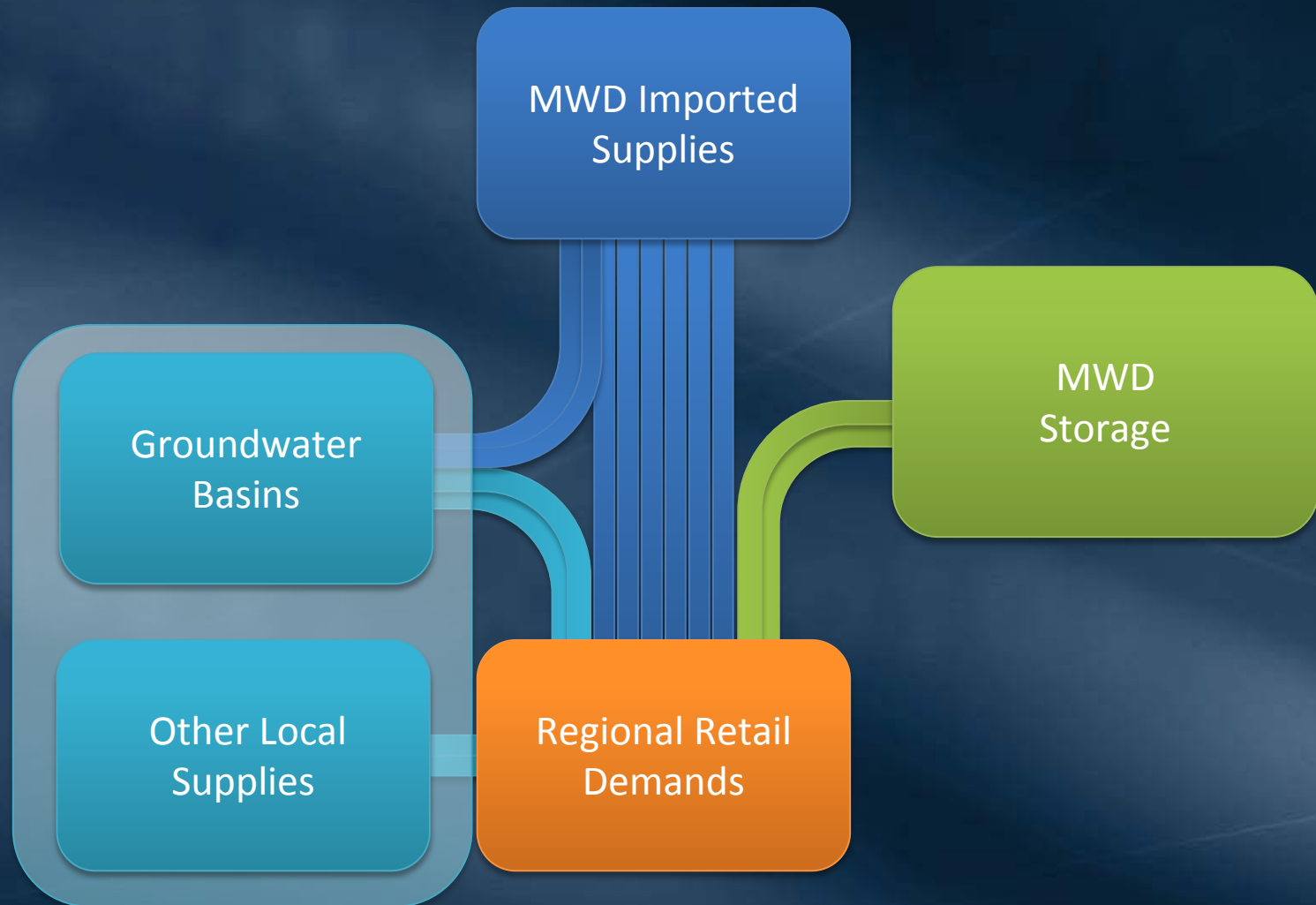
Regional Recycled Water Project Dry-Year Supplies with IRP Targets



*Additional Development of Local Supplies or Conservation Beyond IRP Target

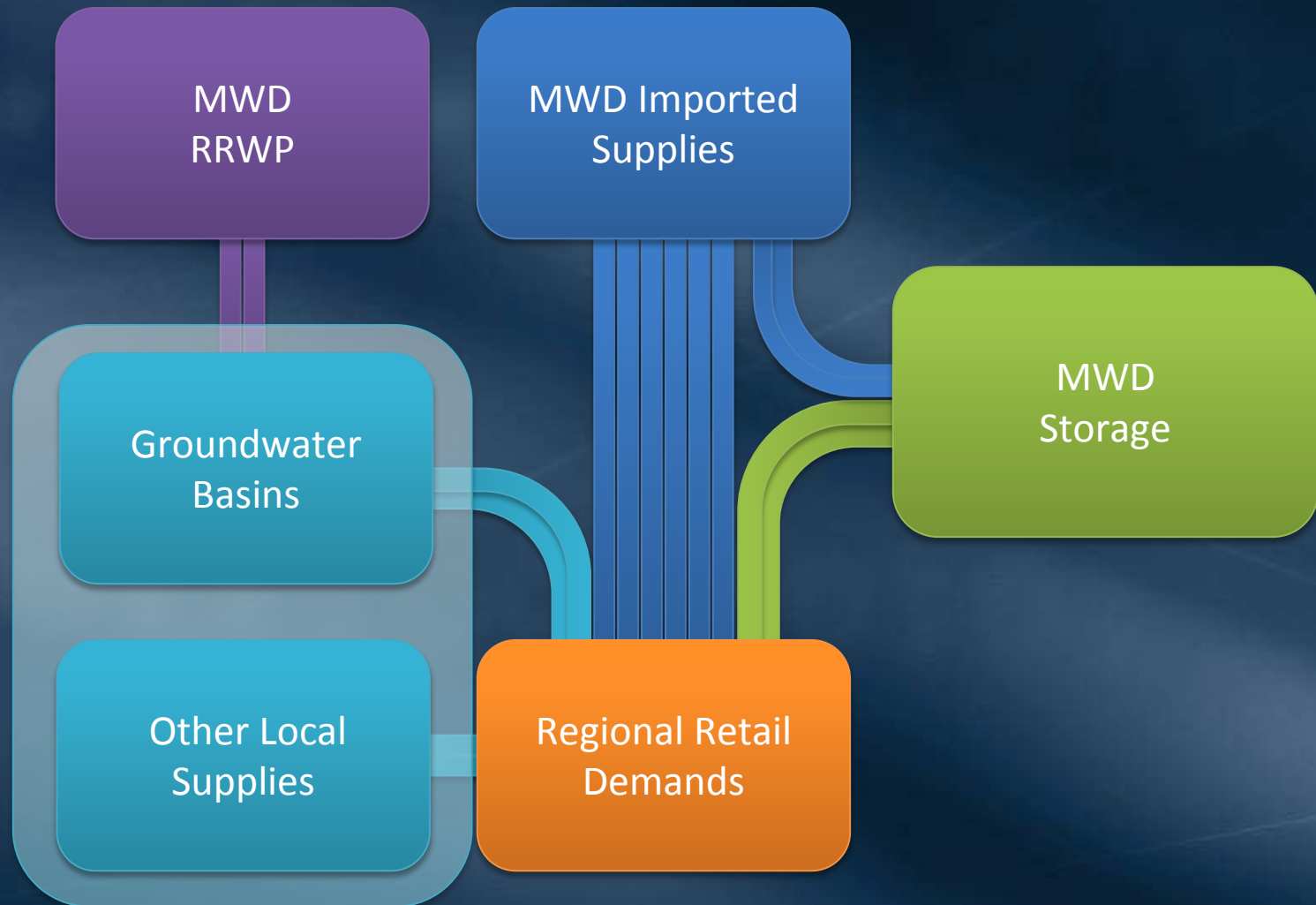
Meeting Regional Demands

Without Program



Meeting Regional Demands

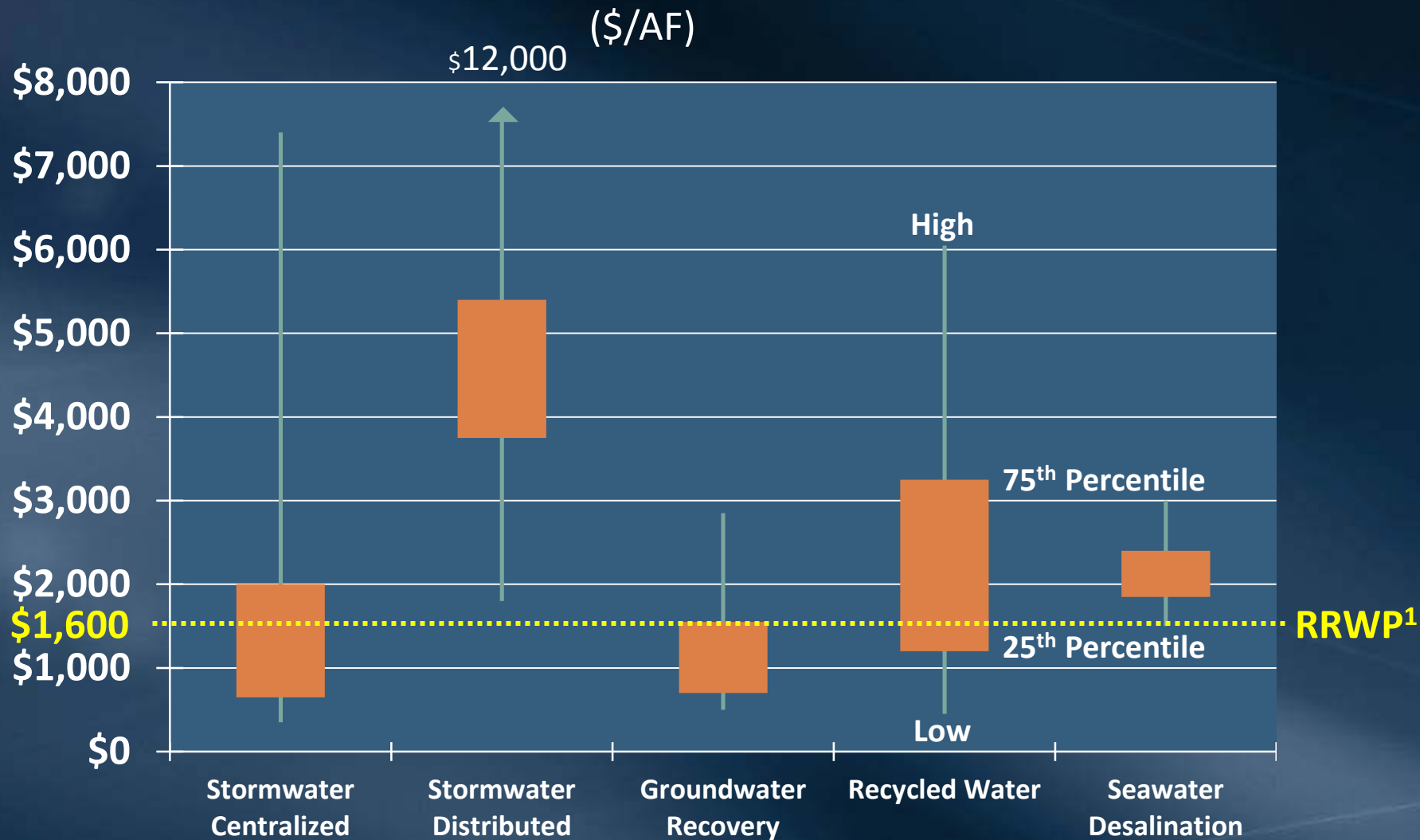
With Program



RRWP Provides Supply Reliability Benefits to All MWD Member Agencies

- RRWP offsets the use of imported supplies to meet groundwater replenishment needs
- The offset imported water is stored in MWD regional storage for use in dry-years
- Dedicated replenishment supplies stabilize groundwater production

Future Resource Development Costs



Source: Integrated Water Resources Plan 2015 Update

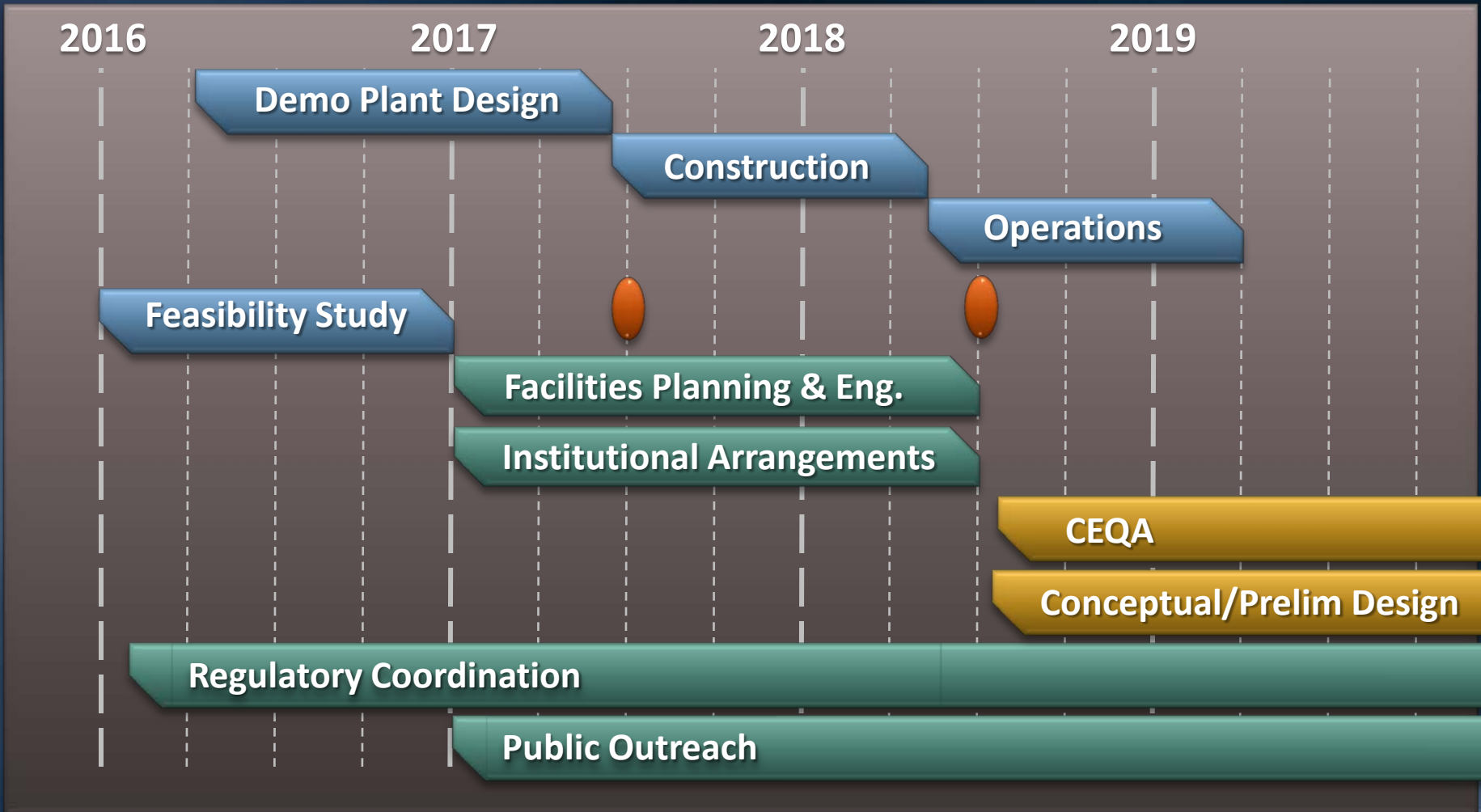
¹ Estimated unit cost is based on 4% interest rate financing and does not include additional outside funding or optimized design.

Next Steps

Next Steps

- Complete design, construction, start-up and operations of Demonstration Plant
- Proceed with facilities planning, engineering, and additional groundwater modeling
- Finalize agreements with Sanitation Districts
- Develop institutional and financial arrangements needed for implementation
- Initiate public outreach effort focused on Demonstration Plant

Program Timeline (2016-2019)



**Board
Action**



**Feasibility
Phase**



**Planning
Phase**



**Design
Phase**

Future Opportunities

- Additional Indirect Potable Reuse deliveries
 - Chino and Raymond basins
- Flexibility to accommodate future Direct Potable Reuse regulations
 - Regional conveyance in close proximity to Weymouth and Diemer plants
 - Treatment augmentation through Weymouth and Diemer Plants
 - Additional recycled water delivered from Joint Water Pollution Control Plant or other regional wastewater treatment plants (e.g., Hyperion)



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