Regional Recycled Water Program Feasibility Study Report

Municipal Water District of Orange County
February 1, 2017

Presentation Outline

- Background
- Potential Program
- Major Findings
  - Technical feasibility
  - Advisory panel
  - Consistent with IRP
  - Costs
- Next Steps

Potential Regional Recycled Water Program Background

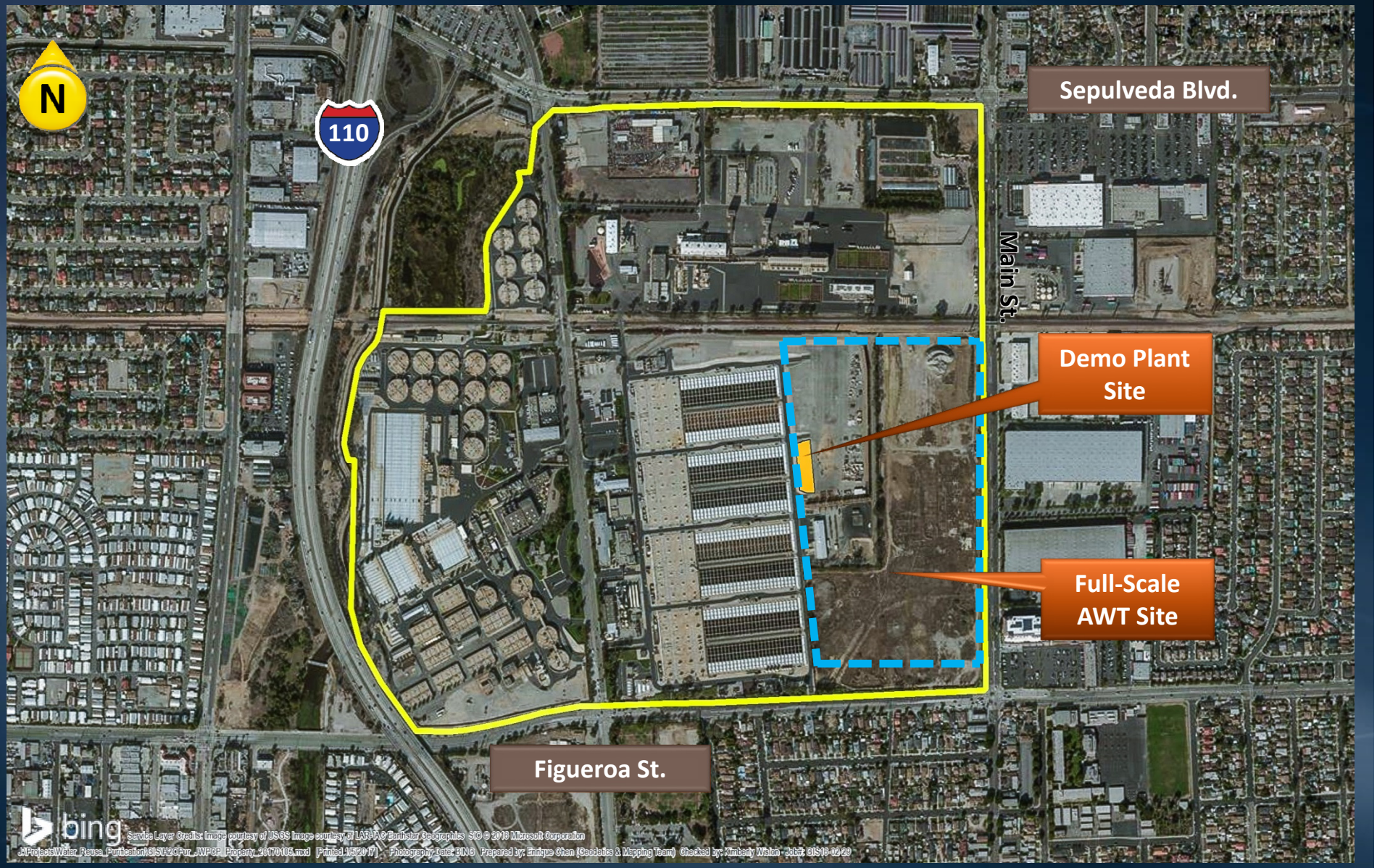
- ✓ Pilot Scale Studies (2010-12)
- ✓ Progress Report (September 2015)
- ✓ Board approval and appropriation for Demonstration Plant (November 2015)
- ✓ Historical Review and 2015 Update (February 2016)
- ✓ Progress Report (August 2016)
- ✓ Feasibility Study Final Draft (December 2016)
- Demonstration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

Potential Program

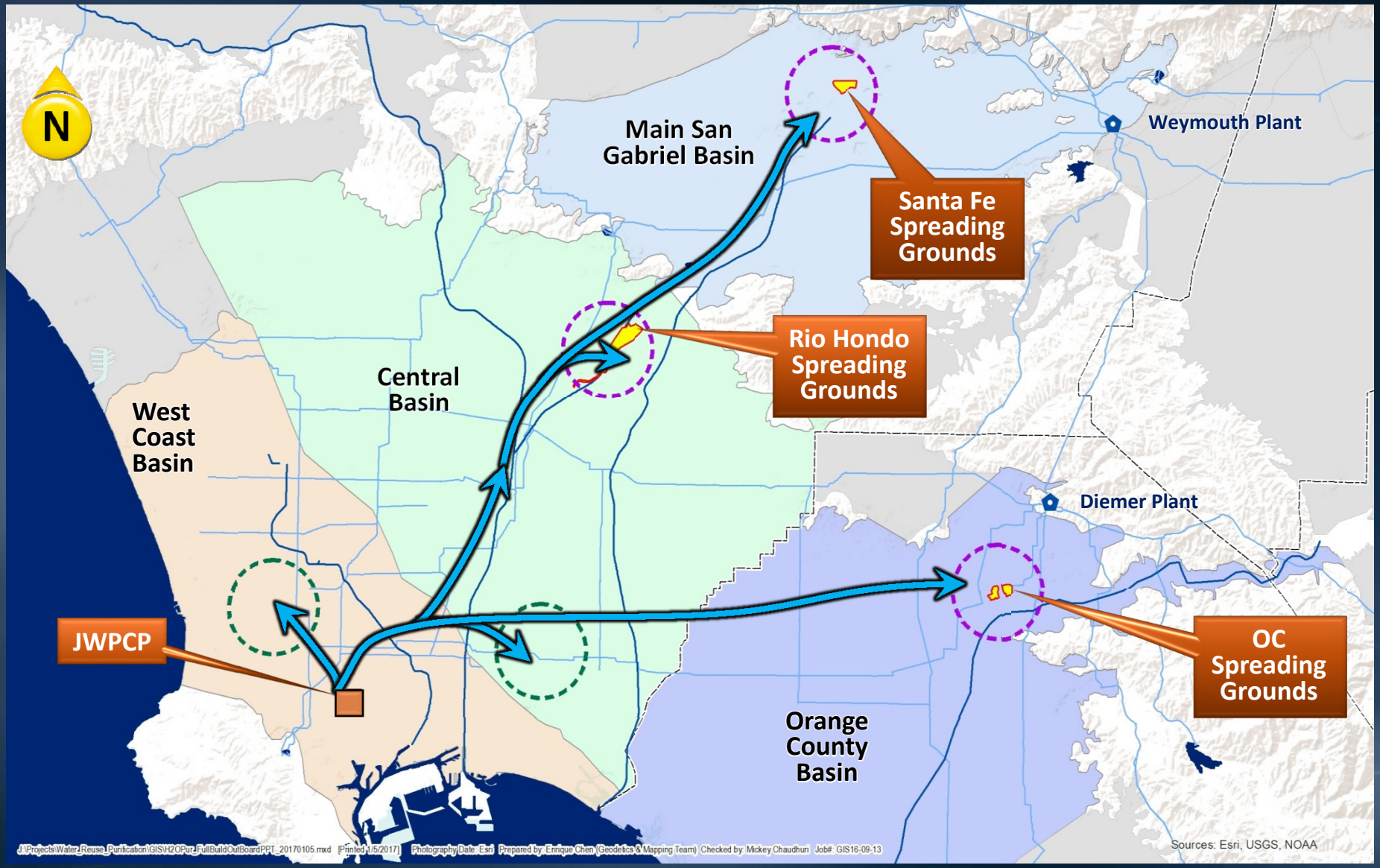
Potential Regional Recycled Water Program

- 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 regional storage reserves

Location of AWT Facilities at JWPCP



Potential Full Program (up to 150 MGD)



Major 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 JWPCP?
- 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

- Potential 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

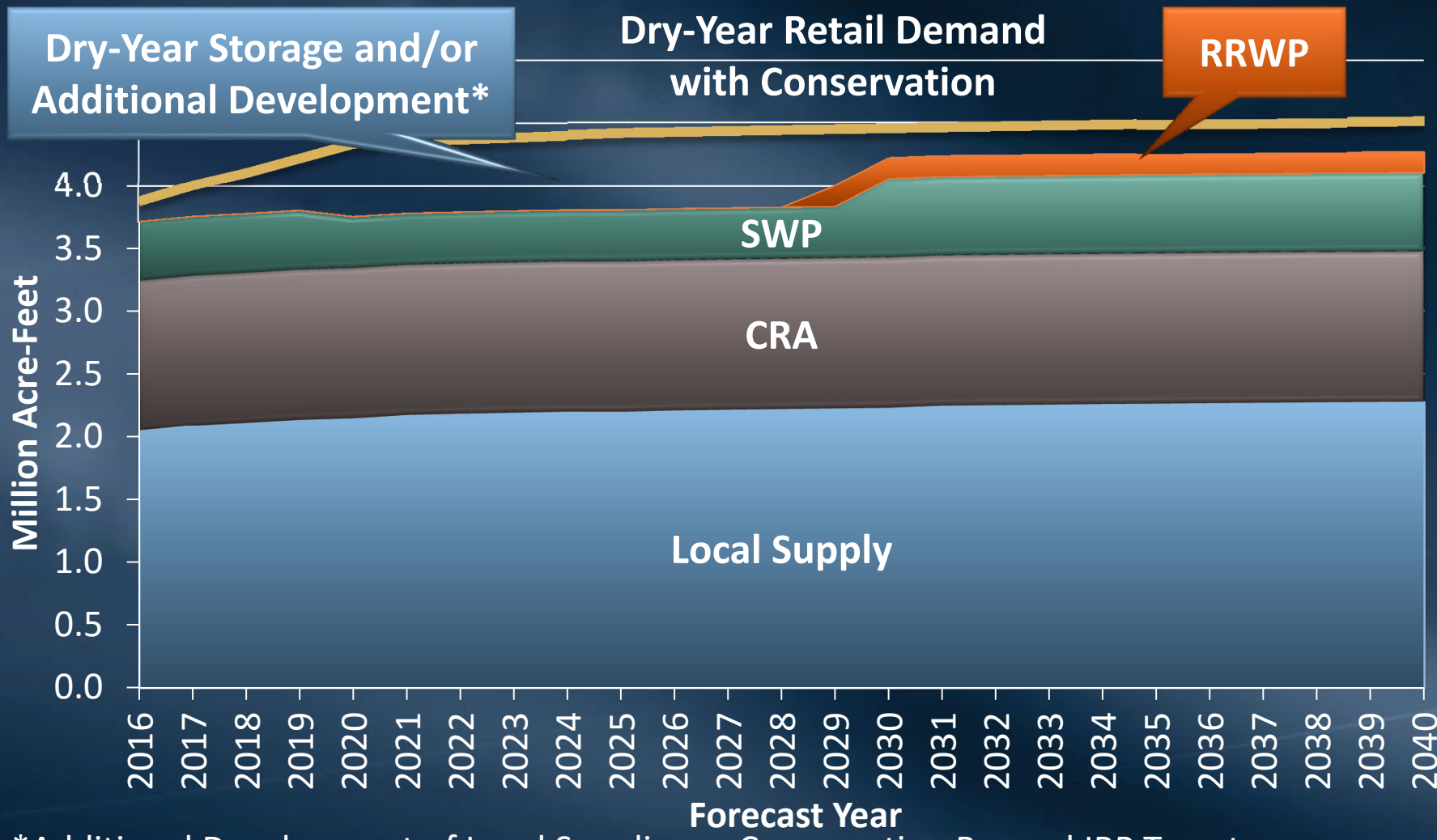
- Concluded findings are reasonable
- Do not see any technical fatal flaws
- Emphasized institutional complexity
- Helped identify program risks
- Contributed to and support recommendations

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

Regional Benefits

- Consistent with Metropolitan's 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 regional storage reserves

Regional Recycled Water Project
Dry-Year Supplies with IRP Targets



*Additional Development of Local Supplies or Conservation Beyond IRP Target

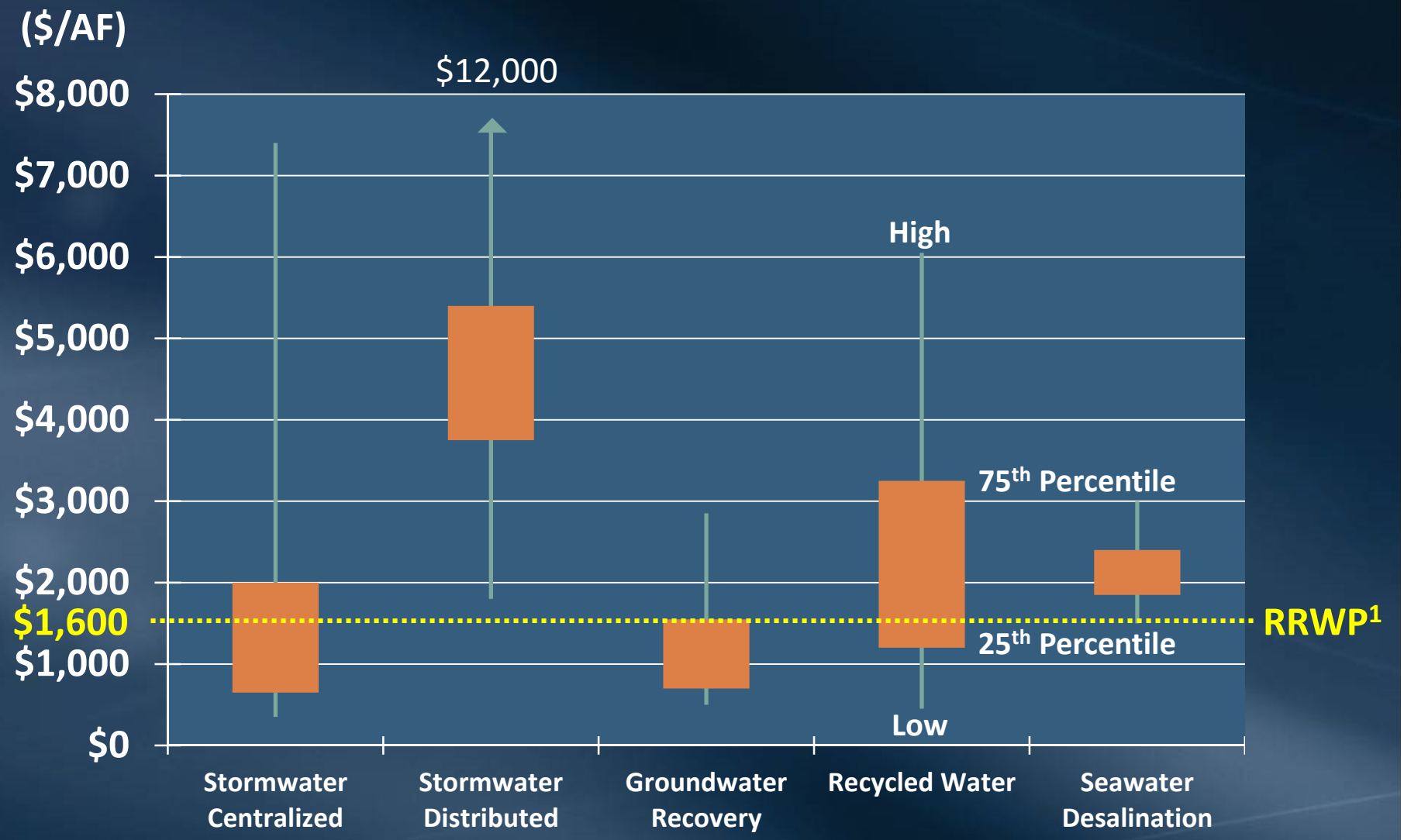
RRWP Provides Supply Reliability Benefits to All Metropolitan Member Agencies

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

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 cost of $129 million
  - Includes power costs for AWT and pump stations
- Total unit cost of $1,600/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

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.

Range of Unit Costs

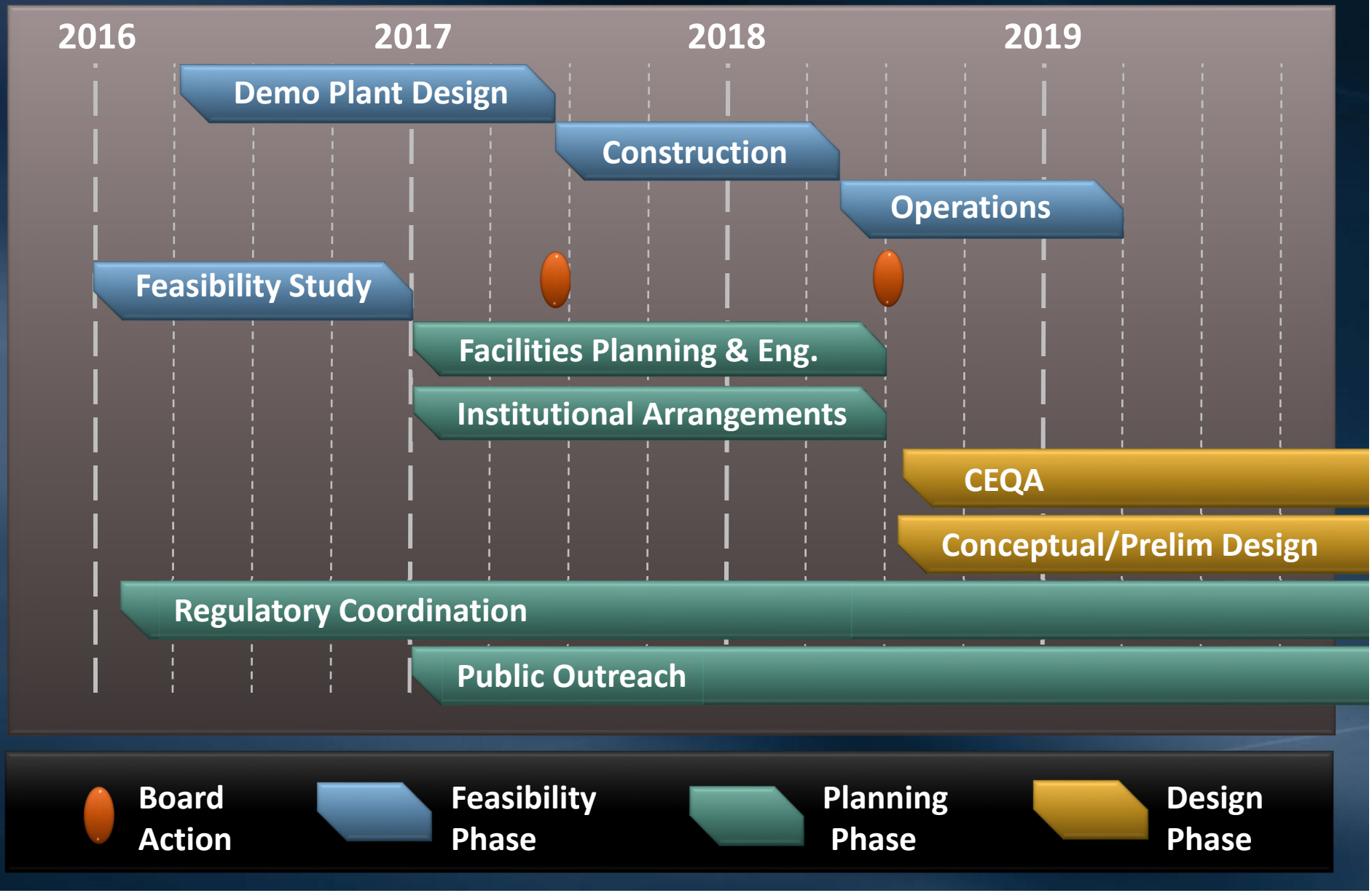
	Low	Base	High
Capital Cost Contingency	25%	35%	50%
Financing Interest Rate	2.0%	4.0%	5.0%
O&M Contingency	-0-	-0-	25%
Unit Cost per Acre Foot	**$1,368**	**$1,600**	**$2,013**

Next Steps

Next Steps

- Complete design, construction, start-up and operation of Demonstration Plant
- Proceed with facility planning & optimization, 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)



Potential Future Opportunities

- Additional Indirect Potable Reuse deliveries
  - Chino and Raymond Basins
- Flexibility to accommodate future Direct Potable Reuse regulations
  - Potential 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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SOUTHERN CALIFORNIA
1928