Pure Water Southern California & Regional Conveyance Subcommittee

Roadmap for Direct Potable Reuse

Item 3b

September 24, 2024

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Roadmap for Direct Potable Reuse

Subject

White Paper on Direct Potable Reuse Roadmap for Pure Water Southern California

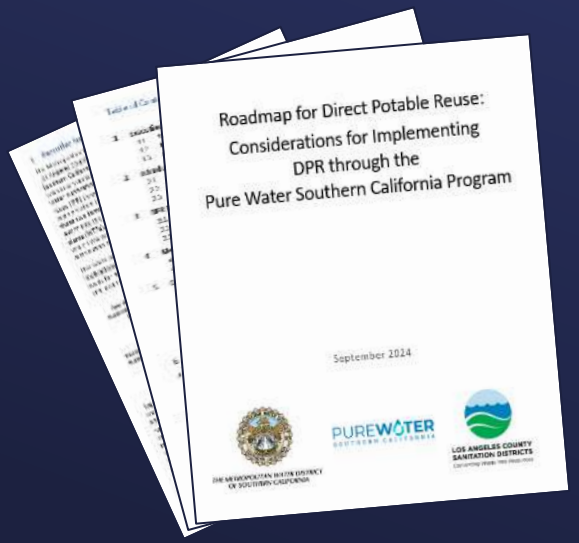
Purpose

Describe considerations for implementing DPR through the Pure Water Southern California Program

Next Steps

Establish a detailed research plan, conduct technical studies, build partnerships, develop an outreach strategy, and advance workforce readiness

Roadmap for Direct Potable Reuse

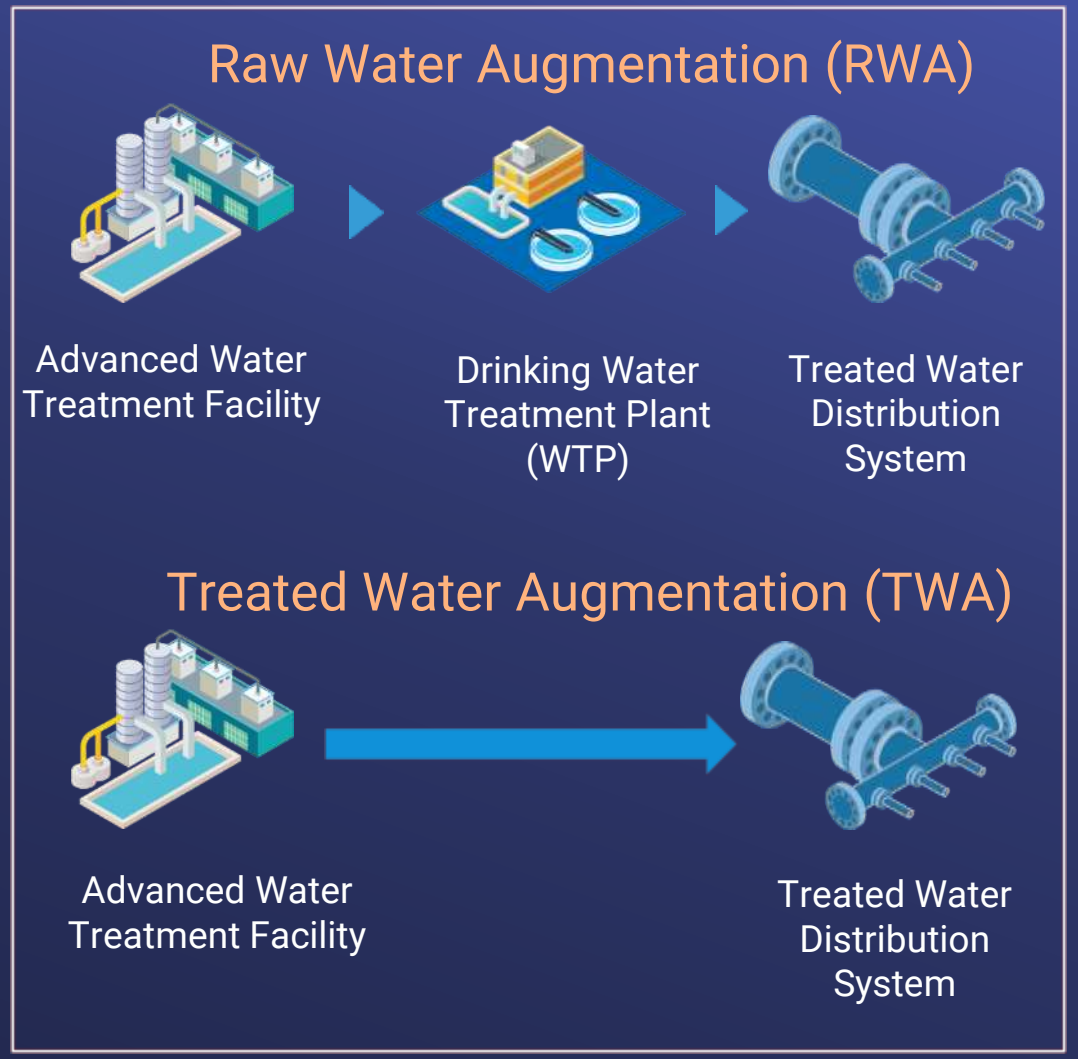


DPR White Paper

- Evolution of DPR in the PWSC program
- Regulatory requirements and implications
- Other DPR initiatives
- Metropolitan's research approach
- Benefits and challenges with DPR
- Next steps

Regulatory Pathway and Applicability of DPR to PWSC

- State Water Board DPR regulatory development
  - Mandated by SB918 and SB322
  - 2016-2019: Feasibility and framework documents
  - Initially focused on RWA
- Regulations approved by Office of Administrative Law (August 6, 2024)
  - Effective date of October 1, 2024
  - Regulations provide opportunity to consider implementing TWA



DPR through Raw Water Augmentation

DPR water would enter the treated water system through the **Weymouth and Diemer Plants**

DPR through Treated Water Augmentation

DPR water would enter the treated water system through **tie-ins with treated water feeders**

DPR Regulations 2024

DPR responsible agency (DiPRRA)

Must possess the necessary technical, managerial, and financial capacity

Extensive Treatment Requirements

- *Validate treatment processes* can achieve high levels of pathogen and chemical contaminant removal
- *Identify surrogates* that can be *continuously monitored* to confirm robust treatment is occurring
- *Establish a unified SCADA system* across all facilities to continuously communicate sufficient treatment

More treatment validation and performance monitoring than existing surface water treatment regulations

DPR Regulations 2024

Plans & Programs Required

- Joint Plan
- Water Safety Plan
- Source Control Program
- Early Warning Program
- Operations Plan
- Monitoring Plan
- Corrosion Control & Stabilization Plan
- Water Safety Plan

Automated System Responses

- *Rapidly evaluate large amounts of real-time monitoring data*
- *Develop meaningful correlations* and trending tools for data and water quality
- *Automatically divert or halt flow* to avoid water quality threats, and operate across agencies if needed

More stringent process monitoring required than existing surface water treatment regulations

More Stringent Operator Certification

DPR Regulations 2024

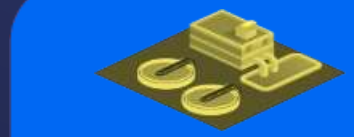
- A Chief & Shift *Treatment Operator* at each location
- A Chief & Shift *Treatment Operator* to oversee all locations
- A Chief & Shift *AWT Operator* at the AWT Facility and potentially at the Weymouth and Diemer plants
- Collaboration with LACSD on operator development
  - Shared operations at the Napolitano Center
  - Future workforce development center in Carson

AWT OPERATOR CERTIFICATION

American Water Works Association California-Nevada Section

CWEA

Treatment Locations *(Operational Responsibility)*



Warren Facility + MBR

(LACSD)

AWT Facility

(Metropolitan)

Weymouth or Diemer Plant

for RWA Only

(Metropolitan)

Collaboration with Others Pursuing DPR Projects

- Several other California agencies interested in DPR, including:
  - LADWP (Pure Water Los Angeles)
  - City of San Diego (Pure Water San Diego)
  - City of Santa Monica
  - Moulton Niguel Water District (OASIS)
  - Santa Clara Valley Water District

- Initiatives such as DIREKT (DPR Investment in Research Enhancing Knowledge Transfer) for knowledge sharing in research or planning

- Only one DPR (RWA) project currently operating in the U.S.

Key Components of the DPR Research Approach

Workshops
Formulate process trains

Literature Reviews
Identify key knowledge gaps

Bench-Scale Testing
Perform screening studies

Pilot & Demonstration Testing
Validate and assess long-term performance

- DPR research for RWA and TWA will be similar to prior Metropolitan programs to investigate alternative treatment processes
  - Extensive research on ozone prior to implementation
  - IPR research began in 2010 and demonstration testing started in 2019
- Additional treatment processes planned at the Napolitano Center for DPR testing
  - Ozone, GAC, UV, microfiltration, chlorine dioxide, post-treatment stabilization

Benefits and Challenges of RWA

- ✓ Capitalizes on additional conveyance detention time and optimal hydraulic distribution and blending points
- ✓ May help safeguard from unknown contaminants with additional treatment above regulatory requirements
- ✓ Draws on long history of operations, expertise, protocols, monitoring and response

- ? New raw source water to the WTPs, requiring treatment efficacy evaluations
- ? More rigorous requirements for operations, monitoring, and reporting on existing WTPs
- ? Unknown regulatory pathway for “satellite” treatment at higher RWA blends (above 10 percent)

Benefits and Challenges of TWA

- ✓ Potential for less conveyance infrastructure with connections to existing feeders
- ✓ Less energy needed for pumping
- ✓ No impact to existing WTP compliance requirements

- ? Increased control measures to compensate for shorter response time within the AWT facility
- ? Hydraulics evaluations for the treated water system
- ? Blending studies to manage water quality in the treated water system
- ? Indirect impacts to WTPs and other distribution system areas with lower demands/longer detention times

Water Quality and Technical Research

Recommended Next Steps

- Develop a comprehensive DPR Research Plan for RWA and TWA
- Conduct bench-, pilot-, and demonstration-scale DPR testing
- Collaborate with LACSD on enhanced source control, treatment, and monitoring
- Conduct technical and conceptual studies for TWA development
- Rehabilitate the demonstration facility at Weymouth for DPR testing capabilities

Recommended Next Steps

CALIFORNIA WATER BOARDS
State Water Resources Control Board

Partnerships and Outreach

- Establish partnerships with leading research institutions and industry experts on DPR
- Develop a program for online monitoring for DPR
- Continue engaging with regulators and ISAP to refine approach for regulatory approval
- Develop a comprehensive DPR communication and outreach strategy

Recommended Next Steps

Operational and Workforce Readiness

- Assess and develop a plan to meet operational, staffing, training, and certification needs for DPR
- Collaborate with LACSD on coordinated operations of a DPR treatment train
- Develop a pathway for reliable operations, monitoring, and SCADA control systems for DPR
- Develop frameworks for key plans required for DPR implementation

DPR
A New Source of Water

Summary

- Technical studies needed to develop DPR concepts and inform rephasing efforts
- As we explore the integration of DPR as a new source of supply, Metropolitan is committed to:
  - Comprehensive planning
  - Rigorous research and development
  - Strategic partnerships
  - Ensuring successful implementation if the PWSC program is approved
- Return to Board for periodic progress updates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