

A Proposed Framework of Regulating Direct Potable Reuse in California Addendum version 8-17-2021

DPR Framework 2nd edition Addendum – Early Draft of Anticipated Criteria for Direct Potable Reuse



Examining the DPR Alternatives Clause: A Case Study Using San Diego's Central Area Raw Water Augmentation Project

December 9, 2022

Alternatives Clause in DPR Regulations

Original March 2021 Version

§ 64669.115 Alternatives

(a) A DiPRRA may use an alternative to a requirement in this Article if a DiPRRA:

Identical to Alternatives Clauses in all three IPR regulations

Groundwater Recharge via Spreading

§60320.130. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP's project sponsor:

Groundwater Recharge via Injection

§60320.230. Alternatives.

(a) A project sponsor may use an alternative to a requirement in this Article if the GRRP's project sponsor:

Surface Water Augmentation

§60320.330. Alternatives.

(a) A SWSAP WRA may use an alternative to a requirement in this Article if the SWSAP WRA:



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(a) A SWSAP WRA may use an alternative to a requirement in this Article if the SWSAP WRA:



...because we don't know what we will learn when we do DPR!



Alternatives Clause in DPR Regulations

Revised August 2021 Version

§ 64669.115 Alternatives

(a) A DiPRRA may use an alternative to a treatment requirement in section 64669.50 if the DiPRRA:



 Revised version limits alternatives to only <u>one section</u> of the regulation – the chemical control section (64669.50)

Question: Is this a problem?



Pure Water San Diego Overview



- Central Area Project to produce 53 MGD
- 53 MGD to Murray Reservoir would be considered <u>direct</u> <u>potable reuse</u>



Central Area RWA Project Nearly Identical to North City SWA



Central Area Pure Water Facility treatment same as North City:



- Reservoir retention time is 23 days at 53 MGD flow
- Project is Raw Water Augmentation (direct potable reuse)



Treated Water Augmentation Project



Most direct form of potable reuse

Direct potable reuse criteria written to be protective in this case



What makes San Diego's Central Area RWA Project Unique?







What makes San Diego's Central Area RWA Project Unique?

DDW and the Expert Panel agree: <u>RWA projects reduce risk</u>

DDW: "some RWA projects may have features that provide significant risk management benefit"

Treate

Central A

Enhand

Enhand Co Expert Panel: "there are clear features that distinguish RWA and TWA that warrant both separate and consistent specifications for treatment and monitoring within the DPR criteria"





Do the DPR criteria acknowledge this diversity?

Anticipated Approach



Based on 2016 State Board DPR Feasibility Report, 2016 DPR Expert Panel Report, AB 574, 2018 State Board DPR Regulatory Framework Actual Approach





Goals of Presentation

Present San Diego's public health framework for DPR tailored for RWA with Murray Reservoir

 Highlight limitations in draft regulations that prevent alternative requirements for RWA projects

 Advocate for modifications to DPR criteria that allow additional flexibility for San Diego and future DPR projects



Benefits of Murray Reservoir







Chemical Peak Attenuation Requirement





Murray provides >25x more dilution than required



Trussell

DPR Retention Time Comparison





V/Q = 8 hours t_{10} = 0.85 hours Volume = 18 MG



These benefits should be accounted for in the DPR criteria







Using Reservoir Benefits to Offset TWA Requirements: Pathogens



	Environmental benefits		
GWR	Long retention in aquifer		
	High dilution / long retention		
SWA	High dilution / moderate retention		
	Low dilution / moderate retention		



Environmental benefits

GWR	Long retention in aquifer		
	High dilution / long retention	on	
SWA	High dilution / moderate retention		1-log
	Low dilution / moderate retention	2-log re	dundancy



Environmental benefits

GWR	Long retention in aquifer			
	High dilution / long retention			
SWA	High dilution / moderate retention		1-log	
	Low dilution / moderate retention	2-log re	dundancy	





Moral of the Story Reuse requires more redundancy as the environment gets smaller

Environmental benefits

GWR	Long retention in aquifer				
	High dilution / long retention				
SWA	High dilution / moderate retention 1-log			1-log	
	Low dilution / moderate retention		2-log redundancy		
SD's RWA w/ Reservoir	w/ oir10:1 dilution / 23-day retention3-log redundancyNo dilution/retention4-log redundancy		dancy		
TWA			edundancy		
	Redundancy				



Environmental benefits





Proposed Pathogen Control Framework for Central Area RWA

Requirement Category	Draft DPR Requirement	Proposed Framework	City Rationale
Pathogen Control (§64669.45)	20/14/15 down to 16/10/11 for V/G/C log reduction	Require 1-log less redundancy (19/13/14 down to 16/10/11)	Increased in dilution, retention time, and separation with the use of Murray Reservoir



Using Reservoir Benefits to Offset TWA Requirements: Source Control







Advanced warning allows us to divert to avoid the peak





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We can use treatment to dampen peaks (and provide control against unknowns)





Advanced warning allows us to divert to avoid the peak

We can use treatment to dampen peaks (and provide control against unknowns)

Why aren't these things required in Surface Water Augmentation?





Advanced warning allows us to divert to avoid the peak

We can use treatment to dampen peaks (and provide control against unknowns)

In Surface Water Augmentation, the reservoir provides chemical peak control





San Diego Central Area RWA Request



Remove requirement for online sewershed monitoring

City will still provide O3/BAC (for peaks and unknowns)

Reservoir provides >250:1 dilution of 1-hr peak



Proposed Source Control Framework for Central Area RWA

Requirement Category	Draft DPR Requirement	Proposed Framework	City Rationale
Wastewater Source Control (§64669.40)	Sewershed surveillance including online source water monitoring	Eliminate requirement for online sewershed monitoring	Murray Reservoir provides 10-fold reduction of 24-hr peaks and DPR Expert Panel recommendation



Using Reservoir Benefits to Offset TWA Requirements: Operator Certification and Staffing



What benefits does retention time provide?

Most of our discussion has focused on the benefits of dilution...



...but what benefits can time provide?





Retention time provides more response time





Retention time provides more response time



Trussell

Retention time provides more response time





DPR Operator Certification & Staffing Requirements





DPR Operator Certification & Staffing Requirements





DPR Operator Certification & Staffing Requirementsif pathogen control provided at other plants





San Diego Central Area RWA Request





Proposed Staffing Framework for Central Area RWA

Requirement Category	Draft DPR Requirement	Proposed Framework	City Rationale
Operator Certification and Staffing (§64669.35)	24/7 onsite staffing for chief and shift operator	Eliminate 24/7 onsite staffing for chief and shift operator at AWPF Eliminate DPR staffing requirements at WWTP and DWTP	Murray Reservoir provides ~2 days retention time (t_{10}) .



Summary of San Diego's RWA Framework

Requirement Category	Draft DPR Requirement	Proposed Framework	City Rationale
Pathogen Control (§64669.45)	20/14/15 down to 16/10/11 for V/G/C log reduction	Require 1-log less redundancy (19/13/14 down to 16/10/11)	Increased in dilution, retention time, and separation with the use of Murray Reservoir
Wastewater Source Control (§64669.40)	Sewershed surveillance including online source water monitoring	Eliminate requirement for online sewershed monitoring	Murray Reservoir provides 10-fold reduction of 24-hr peaks and DPR Expert Panel recommendation
	Quantitative risk assessment of chemical constituents	Eliminate project-specific quantitative risk assessment	Evaluate contaminant concentrations based on thresholds established by State-convened panel.
Operator Certification and Staffing (§64669.35)	24/7 onsite staffing for chief and shift operator	Eliminate 24/7 onsite staffing for chief and shift operator at AWPF Eliminate DPR staffing requirements at WWTP and DWTP	Murray Reservoir provides ~2 days retention time (t ₁₀).
Chemical Control (§64669.50)	BAC EBCT ≥ 15 minutes	BAC empty bed contact time < 15 min if CASSF testing demonstrates 1-log reduction of formaldehyde and acetone at shorter EBCTs	Demonstration of equivalent treatment performance
	RO permeate TOC operational triggers at 0.1, 0.15, and 0.25 mg/L	Eliminate operational triggers for RO permeate	Murray Reservoir provides 10-fold reduction of 24-hr peaks
	Immediate diversion if nitrate or nitrite concentration > MCL in RO permeate or if TOC > 0.5 mg/L	Eliminate immediate diversion Allow exceedance for up to 24 hours	Murray Reservoir provides 10-fold reduction of 24-hr peaks.



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Wastewater Source	Sewershed surveillance including online source water monitoring	Eliminate requirement for online sewershed monitoring	Murray Reservoir provides 10-fold reduction of 24-hr peaks and DPR Expert Panel recommendation
(§64669.40)	Quantitative risk assessment of chemical constituents	Eliminate project-specific quantitative risk assessment	Evaluate contaminant concentrations based on thresholds established by State-convened panel.
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	RO permeate TOC operational triggers at 0.1, 0.15, and 0.25 mg/L	Eliminate operational triggers for RO permeate	Murray Reservoir provides 10-fold reduction of 24-hr peaks
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Expanded alternatives clause does not threaten public health protection



Equivalent or better level of performance of removal of contaminants of concern

• At least the same level of protection to public health



Recommendations

Expand the alternatives clause to apply to all DPR criteria

- San Diego has identified need for flexibility in first DPR project
- Future DPR projects will undoubtedly seek additional flexibility

 Use San Diego's public health framework as a template for future RWA DPR permitting discussions



Thank you!



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