

**DATE:** Tuesday, October 25, 2016

Public Comments  
Report to the Legislature on DPR  
Deadline:10/25/16 12:00 noon

**TO:** Jeanine Townsend, Clerk to the Board,  
California State Water Board  
commentletters@waterboards.ca.gov

**FROM:** Citizens Coalition for A Safe Community, Dr. Tom W

**SUBJECT:** Draft Report - Report to the Legislature on DPR  
Feasibility of Developing Uniform Water Recycling Criteria for DPR

**RE:** Comment Letter - Draft DPR Report



Citizen Coalition for A Safe Community thanks the State Water Board for thi opportunity to comment on the Draft Report to the Legislature on Direct Potable Reuse (DPR) for treated wastewater. Dr. Williams has worked in wastewater engineering and research and environmental assessments for 40 year in California and worldwide with Engineering-Science Berkeley/Arcadia, Worley-Parsons Corporation, AECOM/URS, and Dubai Government (Ports Authority). Dr. Williams has also commented on a wide array of oil and gas, geology, and environmental regulation within the State of California. Dr. Williams is currently retired and provide technical advice and assistance for many community groups.

Dr. Williams has reviewed the related DPR documents and report but has focused comments entirely on Chapter 5 as the culmination of much research and consideration for over a year.

We hope that the currrent draft can be substantially revised before submission to the State Legislature. Dr. Williams is available for further clarifications either indirectly, immediately or directly in Sacramento with a few day notice.

Dr. Tom Williams, Snr. Technical Adviser,  
Citizens Coalition for A Safe Community  
323-528-9682  
ctwilliams2012@yahoo.com

**DPR - General Comment**

**A. Chapter 5 Implementation Plan**

This chapter does not provide any plan, metrics, or milestones. Plans require a set of goals/objectives, and objectives are suppose to include numerical levels along with a temporal sequence which are not provided anywhere. Metrics require some numerical or quantitative measures which are not provided anywhere.

**B. Committee/Division**

As the Drinking Water Division (DDW) includes many Units but no DPR or IPR branches or units. The entire process for developing, implementing, and operating DPR facilities and regulations must be established in a specific branch of the DDW.

**C. Framework/Timeline**

Qtr/#/Year	Criteria	Gap Fillers -
1/2017		
1	DDW Drafts	Initiations Months 1 Source, Treatment, & Controls Monitoring Contaminants - Sources/Effluents All Materials - Status Drafts - On-Line/RealTime Status/Findings (DDW& Office of Admin. Law)
2	Emergency Regs - OAL	Status/Findings
3	Initial Adm. Draft - OAL	Status/Findings
4	Final Adm. Draft - OAL	Status/Findings
2/2018		
1	Operating-Interim Regulations	
2	Initial Revised Draft - OAL	Status/Findings
3	Periodic Interim Reg.s Updating	
4	Periodic Interim Reg.s Updating	Status/Findings
3/2019		
1	Operating Regulations	
2		Status/Findings
3		Status/Findings/Completions
4	Annual Reviews/Updates/Upgrades	New Gaps and Findings
4/2020		
1 2 3	Annual Reviews/Updates	Status/Findings/Completions
4		New Gaps and Findings
5/2021		
1 2 3	Annual Reviews/Updates	Status/Findings/Completions
4		New Gaps and Findings

**D. Accessibility**

The entire process for at least three years must be made publically avialable through a web page(s) with appropriate links. All information and communications must available in real-time (not more than 24 hr delay) and on-line with public subscriptions for specific process elements (more than 20 different elements).

**E. Phased Criteria Developments**

- #1 *Minimum size:*                    **≥25 MGD 2017-2022,**  
   **20 MGD 2023-2025,**  
   **15 MGD 2026-after**
  
- #2 *Effluent Sources for DPR*    **ATW    2017-2019,**  
   **TTW:    2020-2021,**  
   **STW:    2022-2023, and**  
   **Others - equivalent to A-/T-/S- thereafter**

**FORMAT: Draft Text - The investigation....Important text - feasibility Comments - *Feasibility***

**DPR - Specific Comments**

**p.24/1-3 Chapter 5. Implementation Plan**

p.24/1 The investigation of the feasibility of developing uniform water recycling criteria for DPR has revealed a number of knowledge gaps and research recommendations that must be addressed before criteria can be adopted.

*Feasibility is not defined nor quantified.*

*"Must be addressed" has no meaning relative to criteria or recommendations.*

*If Criteria cannot be developed (why start if no certainty for adopting) until "recommendation gaps" have been "addressed" then criteria cannot be developed til ongoing efforts are completed.*

*Please clarify*

p.24/1 The State Water Board can start developing criteria for DPR, but the following implementation recommendations in Table 1 must be addressed before criteria for DPR can be adopted.

*Previous sentence stated that gaps/research recommendations must be "addressed" BEFORE criteria can be adopted...this sentence says criteria can start but Table 1 "gaps".*

*State appears limited to starting criteria development only following "implementation of recommendations" rather than their completion. If criteria developers don't know what the outcomes of the "addressments" are, they cannot develop proposed criteria. Criteria cannot be developed (and why start if don't know when adopting) until "recommendation gaps" have been "addressed" then criteria cannot be developed til ongoing efforts are completed.*

*Provide specific schedule/sequence of gap closures and development criteria for 2017-2022.*

p.24/2 ...Board has identified some program improvements designed to enhance the safety of DPR from a management control perspective that should be evaluated for implementation as interest in the development of DPR projects grows.

*No specifics as applied to safety and relevant criteria.*

*TMF as a criterion is virtually under definable...especially in light of the "Flint Syndrome".*

*"should be" is useless in regulations, criteria, and safety. Only "Shalls" can be used.*

...recommendations in Table 2...non-treatment barriers...part of the multiple barrier concept for...reliability.

*No mention of multi-train - redundant process and monitoring*

p.24/3 As key milestones...the State Water Board will inform the public and stakeholders.

*Milestones not defined nor scheduled; provide a basic timeline with draft milestones for 2017-2021.*

*No distinction mentioned nor any listings for "key" or non-"key" "milestones".*

p.24/3 Additionally, the Administrative Procedure Act which guides the regulation adoption process ensures that the process is transparent and accessible by the public, with a rigorous public comment process.

*Specific reference to Act (and derived regulation) is required.*

*No definition of rigorous is provided or referenced.*

*Transparency and accessibility in the 21st Century require putting everything online-realtime for emergency regulations, interim regulations and at the end of two years real regulations, even though upgrading/updates may continue on an annual basis til end of 2021.*

*Information = meeting and comments ONGOING - when can they start preparing criteria.*

**Table 1: Implementation Plan – Research and Knowledge Gaps**

No	Recommendation	Metric for Success	Milestones
	will advise	consider	establish
	should research		recommend

*Numerous introductory verbs are used outside the context of "Recommendation": e.g.,*

will engage                      work with                                      continue to work with                                      partner with  
 will convene                                      will monitor

***such use does not parallel recommendations;  
 no metrics are provided as to quantified parameters/criteria for enumeration/closures of the gaps;  
 no milestones are provided.***

1 The State Water Board **recommends** that the development of uniform water recycling criteria for direct potable reuse be **initiated concurrently** with the six Expert Panel research recommendations such that the findings from these parallel efforts can be used to inform the development of criteria.

DPR criteria that is protective of public health

Monitor progress of research

***Initiation of criteria development and recommendations at the same time in parallel efforts appear appropriate but still requires findings/gap-closures to be in place before the criteria are adopted.***

***No metrics nor definitions of successes are provided.***

***No milestones in monitoring progress? - at its beginning or end? - "ongoing"***

2 The State Water Board **recommends** that a "blue ribbon" **panel be convened** pursuant to the State Water Board's Recycled Water Policy to review the scientific literature and report on the current state of scientific knowledge regarding the risks of emerging constituents to public health.

The panel **should research** the potential health risks of compounds likely to be present in recycled water that could present serious harm to health over short durations of exposure, especially chemicals that adversely affect the development of fetuses and children. **Update** the state of the science on CECs every 5 years.

Panel assessment of potential health risks of CECs in recycled water that present serious harm to health

A process to convene panel and produce reports is established

***Process to convene a "Panel" and to "produce report(s)"***

***SWB must form a Panel/Committee for coordination of a five year program of research efforts (#1 & #2), and other***

***"Should research" and "likely to be present" are irrelevant as recommendations without specific "metrics" and "milestones".***

***No metrics nor completions of successes are provided.***

***A 5th-year update in first five years of is too long to be incorporated into the criteria without implementation of emergency, interim, and final criteria/regulations and continuing/annual updates.***

***Milestones are not provided in a process-convening/conclusions or report(s) - at its beginning or ends/closures.***

***Current reports and submittals do not provide a current/2016 status listing of constituents and estimated risks for CECs, Children, Fetuses, and Panel.***

3 The State Water Board **will consider** probabilistic QMRA as part of criteria development for DPR, which **should**

provide a better assessment of the performance of DPR treatment trains,

provide an opportunity to identify additional effective DPR **treatment trains**, and

result in DPR criteria that further ensure the protectiveness of DPR.

The State Water Board **will engage** a **small workgroup** of subject matter experts to **help develop** probabilistic QMRA and determine **how to incorporate** this element into **DPR criteria**.

Implementation of QMRA via DPR criteria development

Establish QMRA process

***QMRA is specific to pathogens but none are identified; unclear as to whether QMRA can include chemically-resistant gene/chromosomes, viruses, ETC..***

***Be specific or clearly defined "consider", "engage", and "small"***

***The SWB through a single Panel/Committee can establish many working groups or subcommittees for the following:***

***DPR Criteria - initial, interim, and final Phase One (2017-2021);***

***DPR Monitoring, Sampling, Testing, and Statistical Analyses/Presentations;***

***DPR Analyses/Modeling, Data Processing and Data Bases.***

***How small is "small", 3-5, 7, or 9?***

**Reference to "treatment trainS" appears to establish a Criterion: all DPR facilities shall have more than one treatment train; please clarify or include.**

4 The State Water Board will work with the RWQCBs to include monitoring requirements for pathogens (i.e.,...) in the raw (untreated) wastewater feeding potable reuse systems, using improved methods that allow for better characterization and improved precision of concentrations of pathogens, to provide more complete information on concentrations and their variability.

Process for sampling, analysis, and data collection is established

Agreement with RWQCBs on process for sampling, analysis and data collection

**Item 3 states a "small work group" of experts while #4 states "work with" RWQCBs for characterization and precision of monitoring pathogens.**

**#4 does not provide a recommendation and does not integrate with #3.**

**#4 presumes that DPR may begin with raw sewage influent which must be considered a Criterion, compared to requiring at least for five years to use treated effluent from Advanced treatment for 2017, Tertiary treatment for 2018, Secondary treatment for 2019-20, and perhaps Primary treated after 2020. Untreated wastewater sources should not be considered within the Criteria.**

**Use of "better", "improved", and "more complete" are not defined, enumerated, or quantified and thereby are largely irrelevant as indicative of "Criteria".**

5 The State Water Board will work with CDPH, local health departments and wastewater agencies to investigate the feasibility of collecting pathogen concentration data for raw wastewater associated with community outbreaks of disease. If feasible, the State Water Board recommends that a process be developed to prioritize pilot projects and collect such data where possible.

Process for data collection and compilation is established;

evaluation of data and peer-reviewed conclusions

Monitor for community outbreaks of waterborne disease

**SWB currently works with other state/local and utilities/services agencies and thereby #5 does not represent a new recommendation for DPR**

**Raw wastewater is not defined herein and generally would be totally untreated sewage and influent Introduction of "Feasibility/Feasible" for collecting data and a process to priortizing renders the recommendations as worthless and require specific definitions and some cost/benefit ratio.**

**Collecting of pathogenic concentrations is only one element of a complete pathogen study and does not include, strictly, monitoring, determination, testing for many different pathogenic classes, and then enumeration of one or ten or thousands of of samples**

**Although recommended, no process or timeframe is included to propose, compare, and prioritize pilot projects.**

6 The State Water Board recommends that short term research be conducted to identify suitable treatment options for final treatment processes that can provide some attenuation with respect to potential chemical peaks (in particular, for chemicals that have the potential to persist through advanced water treatment) is best conducted by the water and wastewater industry as an engineering application.

The State Water Board will monitor the completion of WE&RF projects that address this research need.

Completion of research projects

Evaluate demonstration projects to assess the efficacy of these options

**Short-term is not defined as to 1 month, 1 quarter, 1 year, or 1 decade after 40 years nor is the research . Suitable treatment**

**AWT Effluent Chemicals**

**Research categories are badly confused and appear to be incomplete: Chemical Pathogens Genes Chromosomes Unknowns Treatment Monitoring Sampling/Testing Controls.**

7 The State Water Board recommends that the research to develop more comprehensive methods to identify low molecular weight unknown compounds for DPR, including non-targeted analysis as a screening tool and bioanalytical tools, be conducted.

It is an important **research need** that has been prioritized in the State Water Board's CEC Research Prioritization Workshops.

The State Water Board **will also coordinate** with WE&RF [*Water Environment & Reuse Foundation*] and other research foundations to determine if **this research project** can be **expedited via their research programs**.

Methods developed to identify low molecular weight unknown compounds for DPR

Consider Proposition 1 funding on research efforts

**Research may be unending within at least a five-year period for DPR sources, treatments, monitoring, controls, and coordination, while DPR Criteria and regulations (emergency, interim, and perhaps some final versions) must be initiated in Year One, along with research and be adaptable to research findings on a periodic basis.**

**"Non-Targeted Analyses" can not be the basis for any research program; change to "multi-targeted" research program and studies.**

**All research and implementation must be "expedited" (whatever that means) and must produced results on quarterly basis during the first two years and annually thereafter to end of Year Five**

8 The State Water Board **will convene** technical **workgroups** to address the **remaining** knowledge gap questions regarding the development of DPR criteria.

Convene workgroups and address knowledge gaps

Monitor progress of research

**Formation of a single committee with subcommittees and workgroups under SWB must be recommended.**

**Workgroups must be targeted specifically on DPR sources, treatments, monitoring, controls, and coordination and for TOMF certifications.**

**They must also have clear and enforced goals/objectives/completions/status schedules for integrating their and research findings into the DPR Interim Criteria/Regulations.**

**At least one workgroup must target Quality Controls/Assurances for the entire program and for public health.**

**All workgroup, partners, research programs, Criteria and upgrades, and any other DPR related/relevant activities and effort must be reported monthly to the public and stakeholders with provisions for ongoing and periodic public review and comments.**

**"Remaining" is undefined and as the gaps must be closed before the Criteria can be adopted the entire process for Gap Research and for DPR Criteria would become "ONGOING".**

**ADD TO #9 and #10 in a single SWB-led committee.**

9 The State Water Board **will continue to work with** WE&RF on its DPR Research Initiative, **advising** its project prioritization process and serving on **Project Advisory Committees**.

Completion of research projects

**Ongoing**

**ALTERNATIVE WORDING #9 "The State Water Board recommends continuing and expanding coordination of the SWB Committee with WE&RF with an MOU to assure backgrounding and support of project prioritization/coordination processes with development of DPR criteria."**

**SEE BELOW #10**

10 The State Water Board **will partner**

with relevant agencies within CalEPA,...and the Office of Environmental Health Hazard Assessment (OEHHA), university research centers, and water and wastewater research foundations

**to develop** the research projects necessary to **improve** the science and public health knowledge relevant to DPR.

**Ongoing**

**"Will partner" vs "work with" are not defined nor compared or differentiated and therefore are useless for the implementation process.**

**ALTERNATIVE WORDING 10 The State Water Board recommends formation and operations of Research (Sub)Committee to identify, develop, fund, report/contribute to Criteria Development, and complete research related and relevant to DPR.**

and **recommends scheduling and coordination of SWB-led Committee and DPR technical workgroups (sub-committees) to address the knowledge gaps regarding the development and support of DPR criteria."**

**SWB must direct all program related/relevant to DPR, as the single point of jurisdiction and responsibilities is required. Therefore change "partnering" and "working with" to "shall direct", "shall fund", and/or "shall be responsible for" all research and study programs, etc.**

**Develop vs implement vs initiate vs conduct vs complete.**

**"Improve" and "Relevant" to DPR are undefined; define or revise.**

**Committee/subcommittees and Criteria must be started together...not when projects are complete  
If ongoing then impossible to start criteria development as the gaps would never be closed.**

**Table 2: Implementation Plan – DPR Program Development**

No	Recommendation	Metric for Success	Milestones
<b>Table has no "recommendations", no numerical or quantitative "metrics" nor criteria, and no "milestones", therefore the heading titles are misleading and incorrect.</b>			

**11 Operator certification program:** the State Water Board **will advise**...in **their** development of an operator certification program for **advanced water treatment**, and **develop** a strategy for implementing such a program at the State Water Board.

Implementation of an advanced operator certification program for **DPR**

Complete job analysis; identify expected range of knowledge; develop examination

**Unclear references to "WILL" instructions (or shall), compared to "advise", or "recommends"**

**Alternative: The SWB recommends that the SWB continue, lead, and implement both an advanced and focused DPR operator and management certification programs and phase in greater than 50% compliance with the program between 2017 and December 2021.**

**Recommendation is unclear as to AWT vs DPR advanced operator certification program and must exclude programs for any NON-DPR operations.**

**SWB must direct all program related/relevant to DPR, as the single point of jurisdiction and responsibilities is required. Therefore change partnering, working with, or advise to "shall direct", "shall fund", and/or "shall be responsible for" all research, studies, and certification programs, etc.**

**Certification programs must be integrated along with TMF #12 (prefer TOMF) below and must include a "Management Certification Program". Include "Financial Certification Program" in the TMF #12 below and must include provisions for Life Cycle Costs, Budget Processing, and Five year Costing/Funding and Affordability.**

**All future operations of this effort (whole thing) must incorporate a "Quality Control and Assurance" and**

**12 Technical managerial and financial (TMF) capacity:** the State Water Board will **establish** a TMF capacity assessment process for potable reuse projects.

Develop TMF capacity evaluation package

**SWB shall establish a "pilot" TOMF agency (committee), operate any operator program, develop actively updated plan and assessment process, and implement before addressing gaps and starting development of Criteria.**

**Technical managerial and financial (TMF) capacity must be expanded to Technical, operations, managerial and financial (TOMF) capacity.**

**Provide external public review process including health and quality controls and assurance (via ISO 9000/14000)**

**13 Wastewater treatment plant (WWTP) optimization:** the State Water Board **will work with** the RWQCBs to develop a **framework for optimizing** WWTPs supplying a DPR project that aligns with the **objectives** of DPR and the RWQCBs.

Implement framework for WWTP optimization for DPR

Identify proper surrogates to monitor

**"Will work with" must be defined clearly within the inter-agency coordination and through a MOU.**

**No objectives of/for DPR and RWQCBs or WWTPs nor such developments have been provided in Chptr.5. No definitions of Objectives has been provided nor have distinctions been stated regarding "Objectives" and "Criteria".**

**WWTP-DPR Frameworks must be incorporated into regulations and Criteria for both jurisdictions along with the TOMF for both. Presumably, all DPR facilities would directly receive effluent from various types of WWTPs or indirectly from IPR groundwaters. Please CLARIFY.**

**"Optimizing" is meaningless, and specific WWTP additional process, monitoring, and control system must be specifically incorporated into "criteria" and regulations for both WWTP and DPR facilities and systems.**

14 **Source control:** the State Water Board **will work with** the RWQCBs to determine how **pretreatment programs** associated with DPR can be improved to address CECs, monitoring of unauthorized discharges, characterization and reduction of chemical spikes, and other concerns related to DPR.

Implement pilot "advanced source control program" for DPR

Identify proper surrogates to monitor

**As in #13, "will work with" is meaningless and must be defined clearly within the inter-agency coordination and through a MOU between the SWB and representative RWQCBs. Form a pacific coordinating committee.**

**"Pretreatment" is unclear as to DPR pre-treatment (= WWTP and its effluents = DPR source) or to WWTP source/influent pretreatment - wastewater generators. Please clarify.**

**Sources as indicated in #13 equal WWTP.**

**Other DPR Related Comments**

**Specifically require:**

- a. **At least two (2) treatment trains (Recommend three (3) trains) from influent diverter to effluent connections to a service system.**
- b.1 **Off-spec effluent diversion of non-residual/reject discharge to IPR facilities and effluent facilities.**
- b.2 **Off-spec effluent diversion of non-residual/reject discharge to NPDES effluent/discharge facilities; NPDES revisions for DPR discharges of off-spec process-flow and residual/reject effluents**
- c. **Case-by-case regulatory process for all DPR projects for 2018-2020.**
- d. **Issuance final criteria in 2021 with two-year updates until 2024.**
- e. **Restriction of DPR facilities to those sytems with flow of greater than 25 MGD without special assessments and criteria.**
- f. **Restriction of DPR facilities to those sytems with influent treatment levels of advanced (Quaternary) treatment for 2017-2019, tertiary for 2020-2021, and secondary for 2022 and thereafter.**  
 e.g., **WWTP Timeline**  
 2022 **SWT > DPR > PWDS**  
 2021 **TWT > DPR > WST > PWDS**  
 2020 **TWT > DPR > WST > PWDS**  
 2019 **SWT-TWT-AWT > DPR > WST > PWDS**  
 2018 **SWT-TWT-AWT > DPR > Reservoir 3d >WST > PWDS**  
 2018 **SWT-TWT-AWT > DPR > Reservoir 16d >WST > PWDS**  
 2017 **SWT-TWT-AWT > DPR > Reservoir30d >WST > PWDS**  
 2017 **SWT-TWT-AWT > DPR > SfW > Gwtr > WST > PWDS**  
 2017 **SWT-TWT-AWT > DPR > Gwtr30/60/120 > WST > PWDS**
- g. **Restriction of DPR facilities to those sytems without storm water connections to the influent treatment facilities for 2017-2021.**

- h. Monitoring/Control Program using fully integrated and online/realtime electronic system - sensors>data base>OPS model>Control actuation>Emergency-Shutdown/Diversion.***
- i. Annual and three year projected budgets and expenditures for all agencies and organizations.***
- j. SWB Committee or Division for directing and coordinating DPR related state and local agencies and industry organizations.***
- k. Formation, funding, and reporting system for Independent Stakeholder Oversight Committee.***