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RE: **Comment Letter - Report to the Legislature on DPR**

I am writing this letter as a public citizen and as a registered Professional Engineer in the State of California who is experienced with advanced water treatment processes and its associated State of California regulations. For the past 28 years, I have been involved in the piloting, design, start-up and operational support of drinking water and recycled water facilities that use membrane technologies such as microfiltration (MF) and reverse osmosis (RO). I have made contributions to publications regarding membrane technology for USEPA, AWWA and WE&RF. I like many others in the environmental and engineering community who may not have been directly involved have awaited the development of the State Water Resources Control Board (SWRCB) Draft Report to the Legislature (Draft Report), have monitored the progress information, attended public meetings and workshops, and recognize the importance of a public comment period.

There is a story of success that needs to be told. Through the efforts of many, including Districts, operators, scientists, engineers and regulators, we have been able to accomplish the remarkable. Over the past 40 years, we have methodically developed and refined our ability to take treated wastewater and transform it into a resource to improve our potable water supplies. Billions of gallons, and years of successful operation has demonstrated the following: Advanced Treated Water nominally contains only 10 to 20 percent of the inorganic chemical constituents present in our drinking water supplies. Advanced Treated Water is also more accurately differentiated by the absence of trace organic contamination (including CEC's) from wastewater than its occurrence. Yet, the misleading narratives that are associated with the production of Advanced Treated Water can be perpetuated by confusing terminology and incomplete reports, including the Draft Report issued by the SWRCB, which can easily be taken out of context to support the incorrect perception of inferior water quality.

Underneath the perception associated with recycled water, the operating data and scientific evidence reveals an entirely different story. Advanced Treated Water is far more likely to be of higher quality than most of our potable water supplies. Thus, until regulators and experts make the difficult comparison, and assess the results for what they actually are, our ability to improve the water quality of our potable water supplies and protect public health will be encumbered by our own adherence to the very perception that we are proposing to change. It is a paradox that will remain unresolved until it is recognized and addressed by the regulatory and expert community.

The primary emphasis of this letter, is the concern that the legislative mandate which required that the SWRCB to consider "the water quality and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater and agricultural run-off" in any meaningful manner that would facilitate any type of comparison, has been effectively obscured by the Draft Report. I have contemplated the question as to how an element of a legislative mandate could remain unaddressed, and no reasonable answer has been identified.

I wish to complement the members of the Expert Panel and Advisory Committee for their work as the items which they focused upon were addressed in detail. However, until all of the requirements of the legislative mandate are provided due consideration by the SWRCB, the Legislative Report on DPR can only be described as an incomplete effort. DPR is a complex subject; however it is necessary to consider all aspects of water quality and health risks that may affect subsequent regulations in an objective manner with all of the information, even information that may indicate that our public water supplies may contain some level of trace contamination from unregulated constituents that we know are not contained in Advanced Treated Water. The following comments are offered for consideration by the SWRCB in development of its Final Report to the Legislature. Comments are provided with a discussion and summary with references to the Draft Report or existing regulations.

Comment 1: Water Quality and Health Risk Assessment of Existing Potable Water Supplies

Discussion

One of the items that Water Section Code Section 13566 required the State Water Board to consider in its investigation was of the following:

> "(f) Water quality and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater and agricultural runoff." (pg. 15)

The legislative mandate required consideration of <u>all</u> of the issues (pg. 15). A review of the Draft Report including the appendices suggests that adequate consideration to this issue was not provided.

The current IPR regulations require the use of an environmental buffer. If the SWRCB is to move forward with the development of DPR regulations, there is an underlying need to address the issue of the environmental buffer versus engineered storage, process reliability or other alternatives (pg. 15-16). To answer this, water quality and health risk assessments associated with existing potable water supplies was required by legislative action.

Those familiar with looking at years of detailed water quality data from Advanced Treated Water Facilities and drinking water supplies have generally recognized that it is the quality of the receiving water which is being improved under the IPR/DPR treatment scenario. Reverse osmosis membranes with an average rejection of no less than 99.2 percent for sodium chloride are required (60320.201). Water quality information for current IPR facilities prior to the environmental buffer indicate that for the overwhelming majority of chemical constituents, concentrations, including unregulated CEC's and microbial contaminants are indeed lower than in drinking water supplies. Consequently, there is a presumption that Advanced Treated Water is of higher quality. However, general recognition and presumption cannot replace the formal water quality and health risk assessments for subsequent consideration by the SWRCB in the development of its future DPR regulations.

Discharges from municipal wastewater, stormwater and agricultural runoff are known to be present in source waters to existing potable water supplies in trace quantities. This has been defined as de-facto reuse or unplanned potable reuse within the recycled water community. The same level of scientific scrutiny has not been applied to the existing public water supplies that have been provided to the water from an Advanced Treated Water facility prior to the environmental buffer. What if the water from an Advanced Treated Water Facility operated under the current regulatory standard prior to the environmental buffer is in fact determined to be of significantly higher quality and has lower health risks?

General water quality data from potable water supplies and Advanced Treated Water facilities is readily available. There is also data on the concentrations of CEC's in Advanced Water Treatment facilities, whereas the data associated with unregulated CEC's in potable water supplies is more limited, but exists. It is recognized that the data associated with unregulated CEC's is a difficult issue to address, as data associated with unregulated contaminants and CEC's in potable water raises issues regarding the source and/or finished water quality from existing drinking water facilities. The public health concerns regarding unregulated CEC's in potable water remain and are now being addressed by others outside the regulatory community. NSF/ANSI Standard 401 Emerging Contaminants/Incidental Compounds is being used to establish removal by point of use (POU) and point of entry (POE) filters for 15 CEC's through third party certification. Thus, difficulty does not preclude the legislative mandate as the water quality and health risk assessments will ultimately provide a better understanding as to the composition of our potable water supplies, the true impact of an IPR/DPR project and subsequent level of regulations that are to be developed for these facilities.

This oversight has the potential to encumber and delay proposed DPR projects moving forward until it is addressed by those capable of making the formal evaluation of the water quality and health risk assessments complete their work. It will also make the SWRCB's development of uniform water recycling criteria more difficult as proposed regulations are many times built upon existing regulations which may have been constructed without contemplation of future needs or developed in the absence of information. Without these assessments, answerable questions regarding the net effect of the addition of an Advanced Treated Water to an IPR/DPR project will remain. Moreover, the regulatory requirements for additional engineering storage, process reliability or other mitigation alternatives will have been developed without consideration of all the information that was required by the legislative mandate.

The absence of water quality and health risk assessments on existing potable water supplies limits the ability of the SWRCB to view overall water quality in perspective as only half of the necessary information is being reviewed. The data that is associated with Advanced Water Treatment facilities alone lacks context and provides no comparative basis. The Draft Report places an inordinate amount of focus on potential water quality issues associated with the water produced from an Advanced Treated Water Facility and overlooks its consequential impact and the potential for improvement of potable water supplies that may have DPR as a component.

Additional rationale can be found within the discussion on page 18 regarding the Expert Panel recommendation for alternatives to RO and the SWRCB statement regarding the difficulty associated with writing criteria for any such alternatives. The crux of this issue is as follows: The use of RO presents challenges to inland facilities that do not have an economic means of RO concentrate disposal. Alternative processes not involving RO have been proposed and investigated, however these processes do not provide the same level of removal on an item by item basis when compared to RO. Proponents of alternatives suggest that sufficient treatment has been provided to meet applicable water quality standards. Water quality and health risks assessments of existing potable water supplies have the potential to provide information that indicates the level of treatment provided by RO may be higher than required. Until scientific evidence such as water quality and health risk assessments associated with existing water supplies is provided for consideration, it is reasonable to conclude that RO will be required as part of the IPR/DPR framework, effectively eliminating the potential for regulatory approval of any proposed alternative (60320.230) as the only metric that is available is the one that includes RO.

The completion of the water quality and health risk assessments is one approach to address regulatory, perception and public health concerns. The SWRCB has described three potential alternative scenarios for DPR (pg. 18). What is not known is how water from an Advanced Treatment Facility would impact

source or finished water quality of a potable water facility under the aforementioned scenarios when a requirement of the legislature was not included for consideration by the SWRCB.

The inclusion of RO and advanced oxidation has been demonstrated to be an effective and reliable solution for the production of water under the IPR scenario. It is essential that Advanced Treated Water facilities be operated at a very high level to assure the protection of public health and recommendations regarding such measures to improve water quality and reliability are essential when DPR is considered. There are additional measures that can be easily implemented to assure water quality and reliability. However, the necessity of additional measures in lieu of an environmental buffer will remain unanswered and presents the potential for the development of regulation without the corresponding understanding of water quality and health risk assessments necessary to establish scientifically based treatment requirements and Advanced Water Treatment Facilities that can be operated reliably.

Summary of Comment 1

1) The SWRCB should consider the water quality and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater and agricultural run-off as required by the legislature mandate using data.

2) The Expert Panel should amend its report to formally address the water quality and health risk assessments associated with existing potable water supplies subject to discharges from municipal wastewater, stormwater and agricultural run-off.

3) The SWRCB should not issue a Final Report until it has considered and revised its report to include sufficient discussion as to how it will consider and use the water quality and health risk assessments associated with existing potable water supplies in the development of its DPR regulations.

4) The water quality and health risk assessments that are associated with Advanced Treated Water and existing potable water supplies should continue to be further developed to provide context to the SWRCB in the development of its DPR regulations using data. This item should be included as part of item 4.2 Recommendations – Research and Knowledge Gaps.

Comment 2: Terminology – Advanced Treated Water

Discussion

The Advisory Group has recommended that alternative terminology (Advanced Treated Water, Purified Water, and Advanced Treated Recycled Water) be used. This recommendation is based upon both technical merit and public perception with detail and rationale provided by the Advisory Group. The use of different terminology is justifiable, as the water produced from an IPR/DPR facility no longer exhibits the characteristics of wastewater or recycled water. To the general public that associates recycled water with "purple pipe" and "do not drink" signs using the same terminology for Advanced Treated Water complicates communication, as further explanation is required. Differentiation of Advanced Treated Water from recycled water is necessary to indicate that a higher level of treatment has been provided, and to assure that public health is being protected. It is also recognized that this becomes a challenge with existing sections in the Water Code and the wording of the legislative mandate, but the use of different terminology is essential to the future communication of IPR/DPR concepts.

Although it is implied throughout the document, a significant conclusion of Draft Report is that only water produced from an Advanced Treated Water Facility is being considered for subsequent use as part of a DPR facility. The definition of what exactly constitutes "highly treated recycled water" from an Advanced Treated Water Facility is subject to further regulatory definition as described on page 18. However, an explicit statement by the SWRCB regarding this subject matter would address this issue, facilitate further technical description, and address the difficult issues associated with understanding, communication, public perception and acceptance (page 28) that have long been associated with the implementation of IPR/DPR.

The use of recommended terminology by the Advisory Panel would not be setting precedent as the term "environmental buffer" (i.e. storage, attenuation, and response time) is contained in the Draft Report and is associated with regulated concepts of (Diluent Water, Recycled Water Contribution, Response Retention Time) contained in the current IPR regulations which do not contain the environmental buffer reference.

Summary of Comment 2

1) The SWRCB should review the Draft Report and make clear both in the Executive Summary and Conclusions that only Advanced Treated Water is being discussed in the context of its DPR regulation development.

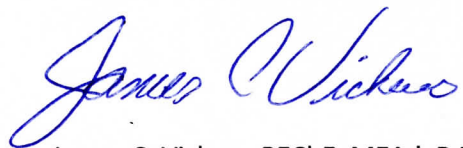
2) The SWRCB should revise inadvertent references to "recycled water "(pp. iv, 2, 3, 4,10,11,18,21,25), "highly treated recycled water" (pg. 3), "treated wastewater "(pg. 4) "wastewater" (pg. 20), to more accurately describe the Advanced Treated Water that is being considered under IPR/DPR scenarios.

Please understand that it has been very difficult for me to prepare this letter. It is difficult for me to be critical of others whom I respect and appreciate their ability to advance science and technology and those who are provided the opportunity to serve public interest and protect public health. I share the same concerns for the protection of public health and the protection as well as the improvement of our potable water supplies. Ultimately my reservations have become outweighed by the concern that an important element of legislate mandate was not addressed, and if such consideration is given, may eventually result in a more timely and practical approach moving forward to its implementation.

As I have discussed with those who have inquired, when Advanced Treated Water and the protection of public water suppliers are considered, a mutually exclusive choice between one and the other does not exist. In fact, we have learned that these considerations can be complementary, as Advanced Treated Water can be used as a means to improve our public water supplies.

Please contact me if you have any questions regarding this letter.

Respectfully submitted for your consideration,



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