Revised Principles to Govern Development of a Drought Policy[1]

Background

1) In the Recycled Water Policy (Res. No. 2009-0011), the State Water Resources Control Board ("State Water Board") found that severe drought was *"challenging California's ability to provide the clean water needed to support a healthy population, a healthy environment and a healthy economy now and in the future."*

2) In adopting the Recycled Water Policy the State Water Board declared their *"independence from relying on the vagaries of annual precipitation and move towards sustainable management of surface water and groundwater, together with enhanced water conservation, water reuse and the use of stormwater."* The Recycled Water Policy directs Regional Water Quality Control Boards ("Regional Board") to *"exercise the authority granted to them by the Legislature to the fullest extent possible to encourage the use of recycled water, consistent with state and federal water quality laws."*[2]

3) *"When used in compliance with this [Recycled Water] Policy, Title 22 and all applicable state and federal water quality laws, the State Water Board finds that recycled water is safe for approved uses, and strongly supports recycled water as a safe alternative to potable water for such approved uses… The State Water Board [also] finds that the use of recycled water in accordance with this Policy, that is, which supports the sustainable use of groundwater and/or surface water, which is sufficiently treated so as not to adversely impact public health or the environment and which ideally substitutes for use of potable water, is presumed to have a beneficial impact." [RWP, §1 & §3, pgs. 2 & 3]*

4) The Recycled Water Policy requires the Regional Board to develop and implement regional and sub-regional salt and nutrient management plans to encourage greater use of recycled water while assuring compliance with applicable water quality standards. The degree of specificity within these plans will vary with a number of site-specific factors including stormwater recharge. *"It is also the intent of the State Water Board that because stormwater is typically lower in nutrients and salts and can augment local water supplies, inclusion of significant stormwater use and recharge component within the salt/nutrient management plans is critical to the long-term sustainable use of water in California." [RWP, §6(b)(2), pg. 5]*

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[1] Substantive changes from the prior version (discussed on 1/15/16) are highlighted in yellow.

[2] Increasing the use of recycled water during drought conditions is consistent with Gov. Brown's Executive Order (April 25, 2014) directing the State Water Board to *"adopt statewide general WDRs to facilitate the use of treated wastewater that meets the standards set by the CDPH in order to reduce demand on potable water supplies."*

Regulatory Issues

6) Permit limitations governing the discharge of treated wastewater (aka "recycled water") may include restrictions on the salt concentration in the final effluent. The limits themselves may be derived based on the applicable narrative or numeric water quality objective, or based on high quality receiving water, or based on a maximum allowable increase in Total Dissolved Solids (TDS) compared to the average salinity concentration in the water supply source, or based on the best demonstrated performance of the treatment plant using representative historical discharge data.

7) Historically, waste discharge requirements (WDRs) rarely included any special provision or consideration for variations in effluent quality that may be directly or indirectly related to recurrent drought conditions.

8) Extended periods of below normal precipitation (aka "droughts") can create conditions that may make it more difficult to comply with some WDRs governing salinity.

   a) During droughts there is generally less high quality (low TDS) surface water available and water agencies commonly increase their reliance on lower quality (higher TDS) groundwater sources to augment their water supply. Most wastewater treatment systems are not designed to remove TDS. Consequently, higher salinity in the water supply tends to result in higher salinity in effluent.

   b) Mandatory conservation measures undertaken in response to prolonged drought may significantly alter the behavior of water users (shorter showers, larger laundry loads, less frequent flushing, etc.). The cumulative effect of these behavior changes combine to reduce water use which previously helped dilute the average TDS concentration in raw sewage and treated wastewater.

   c) These drought-related changes in water quality temporarily aggravate a long-term trend toward increasing TDS that is caused by widespread adoption of high efficiency, low-flow fixtures and appliances and greater use of in-home water softening technologies that increase TDS discharged to sewer systems.

   d) The net result is that, even where wastewater treatment plants have been able to cope with the long-term trend of rising TDS in the sewage influent, drought-related conditions may temporarily eliminate the small but critical buffer needed to assure consistent compliance with salinity-based WDRs (including TDS, EC, and various individual salt ions such as chloride and sulfate).

Regulatory Issues *(continued)*

e) Drought conditions create similar concerns for agricultural operators. Reduced availability of high quality (low TDS) surface water forces increased reliance on lower quality (high TDS) sources (e.g. groundwater and/or reuse of irrigation return flows) to maintain crop yields or assure long-term survival for orchards. The net result is temporarily higher TDS concentrations recharging to groundwater below the root zone.

9) Inability to assure consistent compliance with WDRs governing salinity makes it more difficult to increase the use of recycled water for landscape or crop irrigation. In addition, these requirements may inadvertently disincentivize greater implementation of more efficient irrigation systems.

10) This problem is compounded by the fact that compliance with WDRs for TDS may be evaluated using relatively short-term averaging periods (e.g. daily, weekly, monthly means). Since droughts typically persist for several years, even WDRs expressed as an annual average may be practically impossible to meet given the elevated salinity concentrations in the best available water supplies at such times.

Recommendations

11) For discharges to groundwater, calculate compliance with the applicable narrative or numeric salinity objectives using a long-term (10+ yr.) flow-weighted average while simultaneously taking into consideration the expected recharge and potential dilution from natural precipitation and streambed percolation to the same basin or sub-basin.[3]

Such an approach would be consistent with the Recycled Water Policy in that it accounts for the influence of stormwater recharge over the long-term and is also consistent with the State Board's previous precedential orders deeming it appropriate to consider dilution and system mixing. [SWRCB Order No. 81-5; Lompoc]

Many of the short-term averaging periods in common use originated in EPA regulations intended to protect surface waters [see, for example, 40 CFR 122.45(d)]. These averaging periods are unnecessarily restrictive where discharges to groundwater take several years to pass through the vadose zone and reach the underlying aquifer.

Most important, this approach would continue to protect water quality by assuring that compliance with a receiving water limitation for salinity is evaluated, holistically, based on the cumulative net effects of all sources of recharge to the receiving water.

[3] Recharge models and long-term precipitation estimates should be periodically reassessed and updated to assure protections are based on best available data.

Recommendations *(continued)*

12) Authorize the use of "Offset Projects," particularly increased stormwater capture and recharge, to demonstrate compliance with WDRs governing salinity discharges.[4] Allow offset credits to be created and banked by constructing and operating such projects or by discharging well below the WDR threshold in non-drought years. Recognize that the credits needed to achieve compliance during periods of drought must be generated at times of above normal precipitation (esp. El Niño winters) and, as such, must remain valid for at least 10 years.

13) Consider amending the Basin Plan to establish a temporary variance/exception from salinity-related standards during certain drought conditions. The variance/exception would be automatically triggered when a drought emergency is declared by an authorized federal or state authority or by some other trigger(s) that have been pre-approved the Regional Board.[5] At such times, more appropriate interim WDRs or effluent limits would apply.[6]

In general, the purpose of this approach is to temporarily exempt dischargers from compliance when exceedances/violations are caused by the loss of high quality (lower TDS) water supplies and/or salinity increases directly related to mandatory conservation measures. It is also important to specify the condition(s) that cause the drought-related temporary variance/exception to be terminated.

14) Consider amending the Basin Plan to establish a temporary variance/exception from salinity-related standards where the TDS concentration in the permitted discharge is significantly better (lower) than the TDS concentration in the receiving water and will improve receiving water quality while promoting maximum use/reuse of available water supplies. Potential impacts to downstream/downgradient water quality must also be evaluated as part of this demonstration.

15) In lieu of authorizing a temporary variance/exception, consider pre-authorizing an automatic allocation of assimilative capacity (where it exists) to accommodate higher TDS concentrations in the discharge/recharge during drought conditions.

16) Consider amending the Basin Plan to recognize Groundwater Recharge (GWR) as a beneficial use of surface water. This is consistent with the goals set forth in the Sustainable Groundwater Management Act (SGMA) and has already been done in some other Basin Plans.

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[4] Projects designed to generate compliance credits by harvesting and recharging stormwater must not interfere with downstream water rights or unreasonably affect downstream water quality.

[5] See, for example, the strawman concept described in "Development of a Basin Plan Amendment for Salt and Boron in the Lower San Joaquin River: Task #4 - Implementation Planning for Proposed Salinity Objectives" 9/18/15 (Table 10 in Chapter 5).

[6] For example: reasonable increment of use or mass-based limits may continue to work as interim restrictions.

Key Questions for CV-SALTS Discussion on May 11, 2016

1) Should a "Drought Policy" be developed for both groundwaters and surface waters? Note: the latter will require EPA approval.

2) Should the "Drought Policy" be restricted to salinity-related constituents (e.g.: TDS, EC, sodium, chloride, sulfate)? To date, that has been the working assumption.

3) Should the "Drought Policy" be limited to providing additional regulatory flexibility to increase the use of Recycled Water (as defined by the Recycled Water Policy)?

4) Should CV-SALTS develop and recommend "triggers" that define when the "Drought Policy" commences and terminates? If so, what sort of objective triggers should be used?

5) Should CV-SALTS develop and recommend the "alternative interim WDRs or effluent limits" that are mentioned in Item #13 above? If so, what sort of interim requirements should be considered?

6) Is the primary purpose of the "Drought Policy" to authorize short-term variations in discharge/recharge quality provided that the long-term average continues to comply with the relevant receiving water objectives or is it to authorize such short term exceedances even if the cumulative long-term average fails to meet the applicable receiving water standard? The latter would seem to require either (a) an allocation of assimilative capacity or (b) a variance/exception if there is no assimilative capacity available.

Table 10: LSJR Reach 83 EC Objective and Performance Goal for Seasonal and Water Year Considerations (µmhos/cm)

Water Year Type	Irrigation Season		Non-irrigation Season
	March – June	July - October	November - February
Wet	1350 (Performance Goal[1])		1550 (WQO[1])
Above Normal	1350 (Performance Goal[1])		1550 (WQO[1])
Below Normal	1350 (Performance Goal[1])	1550 (WQO[1])	
Dry	1350 (Performance Goal[1])	1550 (WQO[1])	
Critical	1550 (WQO[1])		

1. The EC Performance Goal and EC WQO are subject to relaxation during an Extended Dry Period (see definition below).

Alternative #4 includes an EC WQO of 1,550 µmhos/cm and an EC Performance Goal[11] of 1,350 µmhos/cm that is recommended to be established throughout the irrigation season for specific water year types. Compliance with the WQO in Reach 83 shall be monitored as a 30-day running average at Crows Landing. The WQO would apply as indicated in **Table 10**, except during an "extended dry period". An Extended Dry Period is defined as follows:

An Extended Dry Period is defined using the State Water Resources Control Board's (SWRCB's) San Joaquin Valley "60-20-20" Water Year Hydrologic Classification[12] included in revised Water Right Decision 1641 to assign a numeric indicator to a water year type as follows (SWRCB 2000):

- Wet – 5
- Above Normal – 4
- Below Normal – 3
- Dry – 2
- Critically Dry – 1

The indicator values will be used to determine when an Extended Dry Period is in effect:

- An Extended Dry Period shall begin when the sum of the current year's 60-20-20 indicator value and the previous two year's 60-20-20 indicator values total six (6) or less.
- An Extended Dry Period shall be deemed to exist for one water year (12 months) following a period with an indicator value total of six (6) or less.

[11] The Performance Goal will be used to measure progress towards achievement of EC levels during certain water year types and times of the year that are of higher quality than the proposed EC WQO for Reach 83 of the LSJR.

[12] The method for determining the San Joaquin Valley Water Year Hydrologic Classifications (e.g., critical, dry, below normal, above normal, wet) is defined in the SWRCB Revised Decision 1641, March 2000, Figure 2, page 189. This method uses the best available estimate of the 60-20-20 San Joaquin Valley water year hydrologic classification at the 75% exceedance level using the best available data published in the California Department of Water Resources' ongoing Bulletin 120 series. .

In all, twenty-three beneficial uses are now defined statewide; of these, nineteen are recognized within the Santa Ana Region. (The four not utilized are Migration of Aquatic Organisms, Freshwater Replenishment, Inland Saline Water Habitat and Aquaculture). One beneficial use specific to the Region, Limited Warm Freshwater Habitat, has been added, bringing the total number of beneficial uses recognized in the Santa Ana Region to twenty. The region's beneficial uses are listed and described below.

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BENEFICIAL USE DEFINITION

Municipal and Domestic Supply (**MUN**) waters are used for community, military, municipal or individual water supply systems. These uses may include, but are not limited to, drinking water supply.

Agricultural Supply (**AGR**) waters are used for farming, horticulture or ranching. These uses may include, but are not limited to, irrigation, stock watering, and support of vegetation for range grazing.

Industrial Service Supply (**IND**) waters are used for industrial activities that do not depend primarily on water quality. These uses may include, but are not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, fire protection and oil well repressurization.

Industrial Process Supply (**PROC**) waters are used for industrial activities that depend primarily on water quality. These uses may include, but are not limited to, process water supply and all uses of water related to product manufacture or food preparation.

Groundwater Recharge (**GWR**) waters are used for natural or artificial recharge of groundwater for purposes that may include, but are not limited to, future extraction, maintaining water quality or halting saltwater intrusion into freshwater aquifers.

Navigation (**NAV**) waters are used for shipping, travel or other transportation by private, commercial or military vessels.

Hydropower Generation (**POW**) waters are used for hydroelectric power generation.

Water Contact Recreation **(REC 1***) waters are used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These uses may include, but are not limited to, swimming, wading, water-skiing, skin and scuba diving, surfing, whitewater activities, fishing and use of natural hot springs.

* The **REC 1** and **REC 2** beneficial use of designations assigned to surface waterbodies in this Region should not be construed as encouraging recreational activities. In some cases, such as Lake Matthews and certain reaches of the Santa Ana River, access to the waterbodies is prohibited because of potentially hazardous conditions and/or because of the need to protect other uses, such as municipal supply or sensitive wildlife habitat. Where **REC 1** or **REC 2** is indicated as a beneficial use in Table 3-1, the designations are intended to indicate that the uses exist or that the water quality of the waterbody could support recreational uses.