



# County of San Diego



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Letter 16

Jeanine Townsend, Clerk to the Board  
State Water Resources Control Board  
P.O. Box 100  
Sacramento, CA 95812-2000

Dear Ms. Townsend:

## COMMENT LETTER – BACTERIA PROVISIONS

The County of San Diego (County) appreciates the opportunity to comment on the proposed modifications to the bacteria provisions in the Water Quality Control Plans for Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE) and Ocean Waters (Ocean Plan).

16.01 The County supports the State Water Resources Control Board's (State Board's) effort to align the State's recreational water quality standards with the United States Environmental Protection Agency's (USEPA's) 2012 Recreational Water Quality Criteria<sup>1</sup>, which are based on recent epidemiological studies linking indicator bacteria levels to human health impacts. The County has identified some suggested modifications that will support efforts to use emerging science being developed in Region 9 and target control measures on the bacteria sources most likely to reduce the risk of illness for recreators.

### 1. Provide a more in-depth description of the risk-based approach to the Bacteria Provisions

16.02 The County requests that the State Board include a more detailed description of the risk level that is the basis for the Bacteria Provisions. The only mention of risk level in the Bacteria Provisions occurs in the header of the WQOs table. Since risk level is the basis upon which fecal indicator bacteria levels are established to protect human health, it should be clearly described in both the Bacteria Provisions and the Staff Report.

<sup>1</sup> USEPA, 2012. Recreational Water Quality Criteria. U.S. Environmental Protection Agency, Office of Water. Washington D.C. (EPA 820-F-12-058, 2012).

The USEPA has a long record of establishing recreational water quality criteria based on acceptable risk levels. The USEPA published recommended criteria in 1986 that establish the ambient condition of a recreational waterbody necessary to protect the designated use of primary contact recreation<sup>2</sup>. Criteria values were selected for E. coli and enterococci in order to carry forward the same level of public health protection believed to be associated with USEPA's previous criteria recommendations<sup>3</sup> based on fecal coliform. The USEPA carried forward this risk-based approach in its 2012 Criteria development. Elevated levels of indicator bacteria were linked to increased risk of gastrointestinal illness through epidemiological studies conducted by USEPA during the National Epidemiological and Environmental Assessment of Recreational Water (NEEAR)<sup>4</sup> and the 2012 Criteria were established to carry forward the risk-based approach to setting recreational criteria based on corresponding indicator bacteria levels.

At the same time, the science behind recreational water quality criteria is evolving rapidly. Research in southern California is at the forefront of scientific advancements that have increased the number of pathogens and indicators that can be measured in recreational waters, lowered the cost of sample analysis, and increased the reliability of health risk estimates at local sites based on site-specific data. The recent Surfer Health Study (SHS) conducted in the San Diego region was the second largest epidemiology study of its kind, and the first to focus on ocean recreation-related health outcomes during the winter season. In addition to its epidemiological component, the SHS included a Quantitative Microbial Risk Assessment (QMRA), which found a different relationship between indicator bacteria levels and human health risk than the epidemiological studies used to establish the USEPA criteria. Importantly, the study also found frequent detection of human waste markers in runoff from two urban watersheds, suggesting that elimination of human bacteria sources may be the most effective way to reduce illness risk since human sources of fecal bacteria are known to contain more pathogens than other sources.<sup>5</sup>

The ultimate goal of recreational water quality improvement programs should be to reduce risk of illness to recreators, as opposed to focusing solely on reducing densities of fecal indicator bacteria. As such, incorporating a discussion of the risk-basis for the Provisions will allow them to be adaptable to the evolving science in the event that a better indicator

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<sup>2</sup> USEPA. 1986. EPA's Ambient Water Quality Criteria for Bacteria – 1986. U.S. Environmental Protection Agency: Washington, DC. EPA440/5-84-002.

<sup>3</sup> USEPA. 1976. Quality Criteria for Water. U.S. Environmental Protection Agency: Washington, DC.

<sup>4</sup> USEPA, 2010a. Report on 2009 National Epidemiologic and Environmental Assessment of Recreational Water Epidemiology Studies. United States Environmental Protection Agency, Office of Research and Development. (EPA Report Number EPA-600-R-10-168, 2009).

USEPA, 2010b. Quantitative Microbial Risk Assessment to Estimate Illness in Fresh water Impacted by Agricultural Animal Sources of Fecal Contamination. United States Environmental Protection Agency. EPA 822-R-10-005.

<sup>5</sup> SCCWRP, 2016. The Surfer Health Study: A Three-Year Study Examining Illness Rates Associated with Surfing During Wet Weather. Southern California Coastal Water Research Project. Technical Report 943. September 2016.

becomes available. It will also ensure a clear understanding that the risk-level established in the provisions is protective of human health.

**Recommendation:** *Include a discussion within the Bacteria Provisions of the risk-level basis of the E. coli and Enterococci numeric criteria, and acknowledge that the fecal indicator-based criteria were established by USEPA to support an acceptable risk level.*

**2. Allow flexibility in the frequency of samples, and method of calculating the GM and STV to determine compliance**

16.03

The County supports the inclusion of a minimum of a six-week period for the calculation of the geometric mean (GM). However, we recommend that the Bacteria Provisions not require this calculation on a weekly, rolling basis and that the provisions allow Regional Water Boards to implement a different averaging period if justified by a site-specific analysis or within the context of a TMDL. A requirement for weekly, equally spaced samples is unnecessarily restrictive for stormwater programs, as it limits flexibility to adapt sampling frequency in response to weather conditions, or in response to exceedances.

The requirement for a rolling GM calculation may result in the persistent identification of a violation even when the actual violation no longer exists. This same reasoning was cited in the Staff Report to justify performing a static statistical threshold value (STV): "Using a rolling average to calculate the STV could result in the reporting violations over a 6-week period where the actual violation no longer exists."

There should be consistency between how the GM and STV are calculated.

**Recommendation:** *Allow flexibility in sampling timing by removing the language in the Bacteria Provisions requiring "equally spaced" sampling for the GM and STV, remove the specification of a rolling calculation for the GM, and allow Regional Water Boards to establish site-specific averaging periods and compliance determinations.*

**3. Seasonal considerations should guide the applicability of the objectives**

16.04

The 2012 Recreational Criteria were derived based on epidemiological studies in climates very different from California's (e.g., which do not have distinct wet and dry seasons). Within California, there are areas with disparate patterns of pollutant concentrations between dry and wet conditions, with high pollutant runoff occurring during infrequent wet events confined to a distinct wet season. The analysis of the objectives should clearly evaluate the applicability of the science to these disparate conditions and identify appropriate implementation procedures for the objectives under the two conditions.

16.05

Under the California Water Code (Section 13241), the State Board and Regional Boards are required to consider a number of factors when adopting water quality objectives, including in relevant part here: "Past, present and probable future beneficial uses of water, and water quality conditions that could reasonably be achieved through coordinated control of all factors which affect water quality in the area". The Staff Report should include appropriate information separately for wet and dry weather events to ensure that the State Board has all of the necessary information to consider the required 13241 factors. Dry and wet weather have different foreseeable methods of compliance that could impact the analysis of the water quality that could be reasonably achieved. The language in the draft Bacteria Provisions does not indicate if differences between wet and dry conditions were evaluated

in the Section 13241 analysis. Without such information, the State Board will be unable to properly consider compliance with section 13241. In short, such considerations might result in different requirements for wet weather since achieving the proposed objectives during wet weather may not be reasonable to achieve.

Further, implementation provisions for WQOs should clearly define implementation requirements for both wet and dry weather. The implementation procedures should be developed based on the 13241 analysis results, consideration of the underlying science used to develop the objectives, consideration of the short duration of storm events, and the associated potential impacts to beneficial uses. Establishing water quality objectives should assess the ecological impact of wet weather exceedances and establish associated implementation procedures that account for allowable exceedances and impacts that occur as a result of the exceedance during wet weather as distinct from dry weather.

16.06

In order to address this issue, the County recommends the Bacteria Provisions be amended to exclude data collected during wet weather events from GM calculations and only apply the acute STV endpoint to wet weather events. A similar approach is currently in place for AB411 data such that GM calculations only include dry weather events. The epidemiological studies that were the basis for the 2012 USEPA criteria were used to establish relationships with indicator bacteria collected during dry weather. Wet weather events are sporadic, short-term events that do not have lasting impacts on bacteria water quality in receiving waters. As a result, wet weather data is not appropriate to be considered in the longer term conditions represented by the GM. Because the GM and STV both offer the same level of risk protection, using only the STV for wet weather conditions will not result in higher risk to human health and will be more representative of impacts from wet weather events. In addition, the implementation section needs to be amended to provide explicit guidance to the Regional Water Boards on how to apply the WQOs during wet and dry weather conditions.

**Recommendation:** Conduct a 13241 analysis specific to wet weather and modify the objectives for wet weather if necessary after the analysis; and specify that the GM is to be calculated based on data from dry weather conditions only, and that only the STV should apply for wet weather events.

#### **4. Allow high flow and seasonal suspensions of the objectives without a use attainability analysis**

16.07

The County fully supports the State Board's inclusion of high flow and seasonal suspension of REC-1 beneficial use as implementation options in the Bacteria Provisions. However, we request that the State Board allow these to be completed without a use attainability analysis (UAA). The requirement to complete a UAA requires review by USEPA, and places an unnecessary burden upon the dischargers and Regional Boards, which will likely impede these options from being implemented.

There is precedent within Regional Board Basin Plans for a temporary suspension of objectives. The Santa Ana Regional Board includes criteria within the Basin Plan for temporary suspension of recreational use designations and objectives, which can be implemented without a UAA. As part of the work that led to the adoption of the Santa Ana Basin Plan recreation standards amendments in 2012, the Stormwater Quality Standards Task Force considered the merits of, and various alternatives for, modifying the REC-1

definition to improve clarity and precision, based on careful consideration of the scientific basis of the 1986 USEPA Recreational Criteria and earlier criteria guidance. The Santa Ana Basin Plan provides definitions for site-specific flow triggers, eligibility for temporary suspensions, engineered or highly modified channels, and for the termination of the temporary suspension. The County suggests that the State Board either provide similar guidance, or allow Regional Boards to develop regional guidance for temporary suspensions without development of a UAA.

**Recommendation:** Remove the requirement to conduct a UAA to use the implementation provisions provided in the amendments (high flow suspension, seasonal suspension, etc.), and allow Regional Boards to develop region-specific guidance.

#### 5. Allow for mixing zones in the Ocean Plan Bacteria Provisions

16.08

The County encourages the State Board to incorporate mixing zones for stormwater and wastewater discharges within the Bacteria Provisions, and to allow the bacteria objectives to be calculated taking into account dilution as applicable, and/or for receiving water monitoring points to be located where discharges are mixed with receiving waters.

Within the Staff Report, State Board staff include mixing zones for point sources within the “Issues eliminated from further consideration after early outreach and public consultation,” and acknowledge that with no statewide policy, existing Regional Board policies and procedures will apply. Regional Water Boards would likely continue their current practices for allowing mixing zones where appropriate. The County is concerned that the Ocean Plan definition of Receiving Water on page 60<sup>6</sup> of the Ocean Plan and the lack of specific authorization and discussion of mixing zones for stormwater in the Ocean Plan may preclude the ability of the Regional Boards to apply a mixing zone for stormwater if desired.

As noted in the Staff Report, the Ocean Plan already has a statewide policy regarding mixing zones for toxic pollutants which are implemented through NPDES Permits. It is logical to extend a similar policy to the Bacteria Provisions in order to establish a statewide standard for addressing stormwater discharges. A statewide standard would remove burden from individual Regional Boards to establish appropriate practices, and would be protective of recreational use in waters (such as oceans) where discharge and receiving water are mixed. This would also clarify that mixing zones are allowed for stormwater dischargers. Furthermore, the Surfers Health Study supports allowing a mixing zone for stormwater discharges since dilution factors for Enterococci ranged from 22 to 300 times from the mouth of the San Diego River to the nearby ocean beach recreation areas. The measured illness level at the beach recreation areas during storm events and the three days following the storm was also relatively low despite large exceedances of bacterial indicators standards in the San Diego River just upstream of the mixing zone with the ocean.

**Recommendation:** Include language in the Ocean Plan Provisions and Staff Report to allow for mixing zones for stormwater dischargers.

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<sup>6</sup> RECEIVING WATER, for permitted storm water discharges and nonpoint sources, should be measured at the point of discharge(s), in the surf zone immediately where runoff from an outfall meets the ocean water (a.k.a., at point zero). (Ocean Plan page 60)

16.09

**6. Specify that the objectives only apply to waters where ingestion is reasonably possible**

The County requests that the State Board specify that the Bacteria Provisions do not apply to waters designated as REC-2 or other waters where ingestion is not reasonably possible, to be consistent with USEPA guidance on the applicability of the recreational objectives. The 2012 Criteria, and the prior 1986 Criteria, are based on epidemiologic studies of illness following full-body contact recreation. USEPA's rule promulgating *E. coli* objectives for recreational freshwaters in certain Great Lakes states<sup>7</sup> provides that the pathogen indicator objectives apply "only to those waters designated by a State or Territory for swimming, bathing, surfing or similar water contact recreation activities, not to waters designated for uses that only involve incidental contact." USEPA defines this "secondary contact" recreation as "those activities where most participants would have very little direct contact with the water and where ingestion of water is unlikely. Secondary contact activities may include wading, canoeing, motor boating, fishing, etc."<sup>8</sup>. Basin Plan definitions of REC-2 are functionally equivalent to the USEPA description of "secondary contact" recreation and some activities included in the REC-1 definition fall in this category. To avoid misinterpretation of the USEPA 2012 Criteria, it is important to only apply the objectives where ingestion of water is reasonably possible.

***Recommendation:*** Specify that the Bacteria Provisions are not applicable to REC-2 and waters where ingestion is not reasonably possible.

16.10

**7. The Economic Analysis should consider Stormwater in addition to Wastewater**

The County requests that the State Board consider the economic impact to stormwater dischargers within the Economic Analysis. The Staff Report only considers the cost savings for municipal wastewater treatment plants and industrial plants for bacteria monitoring, as the required indicators would be reduced from three to one. However, this is not the case for stormwater dischargers subject to AB411 monitoring requirements.

Within the Staff Report, it is stated that monitoring costs will be reduced at popular public beaches, as only Enterococci would be required to be monitored. This statement conflicts with the inclusion of the AB411 Total coliform, Fecal coliform, and Enterococci objectives included within the Ocean Plan Bacteria Provisions.

***Recommendation:*** Modify the Staff Report Economic Analysis to consider the impact to stormwater dischargers.

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<sup>7</sup> USEPA. 2004. Water Quality Standards for Coastal and Great Lakes Recreation Waters - Final Rule. 69 FR 220, 67218. November 16, 2004.

<sup>8</sup> U.S. Environmental Protection Agency. May 2002. Implementation Guidance for Ambient Water Quality Criteria for Bacteria, Draft. EPA-823-B-03-XXX.

16.11

**8. Amendments should include the option to develop site-specific objectives using procedures outlined in the USEPA 2012 Criteria.**

The ISWEBE Plan includes language that bacteria WQOs do not supersede any site-specific numeric water quality objective for bacteria established for the REC-1 beneficial use (ISWEBE Provisions III. E.3). However, the Ocean Plan Provisions do not include similar language. Furthermore, neither Provision includes a discussion for developing site-specific objectives. Such an approach was encouraged in the USEPA 2012 Criteria (e.g. Quantitative Microbial Risk Assessment [QMRA]), which includes the following language:

*“States could adopt site-specific alternative criteria to reflect local environmental conditions and human exposure patterns” and include examples of tools to develop the site-specific numeric values: “(1) an alternative health relationship derived using epidemiology with or without QMRA; (2) QMRA results to determine water quality values associated with a specific illness rate; or (3) a different indicator/method combination.” (USEPA 2012 Criteria, p. 48)*

As mentioned in Comment 1, the recent SHS in the San Diego region incorporated an epidemiological component and QMRA component, and found a different relationship between indicator bacteria levels and human health risk than the epidemiological studies that supported the USEPA criteria. The County would like to focus resources on mitigating human health risk, and such QMRA studies are critical in developing site-specific objectives that are protective of human health.

The County strongly encourages the State Water Board to include implementation language supporting the development of site-specific objectives within the Bacteria Provisions as well as more detailed guidance in the Staff Report as that will streamline adoption of site-specific objectives if conducted.

**Recommendation:** *Include an option to develop site-specific objectives via QMRA or an equivalent approach in both the ISWEBE and Ocean Plan Provisions. Update the Staff Report to provide guidance on how to develop and streamline adoption of site-specific objectives.*

16.12

**9. Reassess all existing waterbodies included on the 303(d) List for REC-1 bacteria exceedances with the new WQOs.**

While many TMDLs have been developed for bacteria in San Diego County, several waterbodies are still included on the 2010 303(d) list as impaired due to indicator bacteria, pathogens, fecal coliform, total coliform, Enterococci, E. coli, or enteric viruses. Currently, the provisions do not address how these new WQOs will be used to evaluate legacy waterbody 303(d) listings. The County requests that the Bacteria Provisions require these listings to all be reassessed using the new, scientifically defensible WQOs. Any waterbodies that no longer meet the 303(d) Listing Policy’s criteria for impairment should be delisted, regardless of whether or not they meet the delisting requirements.

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At a minimum, any waterbody undergoing TMDL development should be required to be reassessed for exceedances with the new WQOs prior to developing the TMDL. This requirement should be clearly stated in the Bacteria Provisions and discussed in the Staff Report in order to standardize the regional approach and avoid unnecessary TMDLs for waterbodies that are not in exceedance under the new objectives.

**Recommendation:** *Include language in the Bacteria Provisions requiring legacy 303(d) bacteria listings to be reassessed under the next 303(d) Listing cycle using the new WQOs and the criteria for listing (not delisting) waterbodies. Include language in the Staff Report requiring that development of any new bacteria TMDL must include an analysis of bacteria exceedances with respect to the new WQOs prior to TMDL development and implementation.*

In conclusion, the County is fully supportive of the State Board's effort to establish recreational water quality objectives that reflect up to date scientific understanding and that promote uniformity in implementation among Regional Boards. We recognize the tremendous effort that this project has involved, and look forward to working with the State Board to develop the objectives. Thank you for your consideration of these comments.

If you have any questions or require additional information, please feel free to contact Jo Ann Weber at (858) 495-5317 or at [JoAnn.Weber@sdcounty.ca.gov](mailto:JoAnn.Weber@sdcounty.ca.gov).

Sincerely,



TODD E. SNYDER, Manager  
Watershed Protection Program