

INFORMATIONAL DOCUMENT

Public Scoping Meeting for Proposed Statewide Water Contact Recreation
Bacteria Objectives Amendments To Water Quality Control Plans For
Inland Surface Waters, Enclosed Bays And Estuaries And The Ocean
Waters Of California

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DIVISION OF WATER QUALITY
STATE WATER RESOURCES CONTROL BOARD
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

Introduction

The State Water Resources Control Board (State Water Board) is proposing amendments to the statewide Water Quality Control Plans for Inland Surface Waters, Enclosed Bays and Estuaries and the Ocean Waters of California (Ocean Plan) to include updated water quality objectives for bacteria to protect human health for the beneficial use of water contact recreation (REC 1) in fresh and marine waters (proposed amendments). The proposed amendments may include a revised indicator organism [*Escherichia coli* (*E. coli*) or enterococci] and risk protection level. The proposed amendments may also include elements necessary for bacteria control implementation including reference beach and natural source exclusion approaches, high flow suspension, variances, seasonal suspensions and designation of Limited Water Contact Recreation (LREC 1). This document presents the purpose and initial scope of the proposed amendments to seek input on the scope and content of the environmental information that should be included in the draft substitute environmental documentation prepared to support the amendments.

Background

The Clean Water Act directs states, with oversight by the U.S. Environmental Protection Agency (U.S. EPA), to adopt water quality standards to protect the public health and welfare, enhance the quality of water, and serve the purposes of the Clean Water Act. States' standards consist of: (1) designated uses for all water bodies within their jurisdictions, (2) water quality criteria (referred to as water quality objectives under California law) sufficient to protect designated uses, and (3) an antidegradation policy. States are also required to review their standards once every three years and, as appropriate, modify and adopt standards. The results of a state's triennial review must be submitted to U.S. EPA for approval. Clean Water Act section 303(c) directs U.S. EPA to promulgate standards if it disapproves a state-submitted standard, or if it has determined that a new or revised standard is needed.

Clean Water Act section 304 requires U.S. EPA to develop and publish criteria recommendations to aid states and tribes in developing water quality standards. Those recommendations are not regulations themselves. States may adopt water quality criteria based on U.S. EPA's water quality criteria recommendations or criteria developed using other scientifically defensible methods. A state's adopted water quality standards are the basis for water quality control actions. A state's water quality control actions may include developing water quality-based effluent limitations in National Pollutant Discharge Elimination System (NPDES) permits, a list of waters that do not meet standards, Total Maximum Daily Loads (TMDLs) and, in some cases, posting public notifications at waterbodies where standards are not met.

In 1986, U.S. EPA revised its ambient water quality criteria recommendations for bacteria to protect human health, which advised that the indicators of health risks from bacteria in marine and fresh water be established as *E. coli* and enterococci instead of fecal coliform. U.S. EPA based its revised criteria recommendations on a review of epidemiological studies correlating gastrointestinal illness to specific bacteria indicators.

The Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act) added section 303(i)(1)(A) to the Clean Water Act, which requires states with coastal recreational waters to adopt new or revised water quality standards for the coastal recreation waters for those pathogens and pathogen indicators for which U.S. EPA has published criteria. The BEACH Act also stipulates that if a state fails to adopt criteria in accordance with section 303(i)(1)(A), U.S. EPA must promptly propose regulations for the state setting forth revised or new water quality standards for pathogens and pathogen indicators for its coastal recreational

waters. (Clean Water Act § 303(i)(2)(A).) The BEACH Act added subsection (21) to Clean Water Act section 502 to define “coastal recreation waters” as the Great Lakes and marine coastal waters (including coastal estuaries) that are designated by a state for use for swimming, bathing, surfing, or similar water contact activities. The term “coastal recreation waters” does not include inland waters or waters upstream of the mouth of a river or stream having an unimpaired natural connection with the open sea.

In 2012, U.S. EPA issued new recreational water quality criteria (2012 RWQC) recommendations for protecting human health in all coastal and non-coastal waters designated for primary contact recreation use. The 2012 RWQC recommends the use of two bacteria indicators of fecal contamination, *E. coli* and enterococci.

The 2012 RWQC is based on the latest studies which conclude that fecal coliform is not a good indicator of fecal contamination. Studies have also found that while enterococci acts as a good indicator in some fresh waters, it can exist and multiply in other fresh waters and create false positives in samples. *E. coli* has been found to be the most reliable indicator organism in all fresh waters. Additionally, studies have shown that enterococci is a good indicator organism in marine waters.

Table 1 present U.S. EPA’s 2012 RWQC

Criteria Elements	Recommendation 1 Estimated Illness Rate (NGI): 36 per 1,000 primary contact recreators		OR	Recommendation 2 Estimated Illness Rate (NGI): 32 per 1,000 primary contact recreators	
	Magnitude			Magnitude	
Indicator	GM (cfu/100 mL) ^a	STV (cfu/100 mL) ^a		GM (cfu/100 mL) ^a	STV (cfu/100 mL) ^a
Enterococci (marine and fresh)	35	130		30	110
OR					
<i>E. coli</i> – (fresh)	126	410		100	320
<p>Duration and Frequency: The waterbody GM should not be greater than the selected GM magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day interval. NGI = NEEAR – GI illness, NEEAR = National Epidemiological and Environmental Assessment of Recreational Water GM = geometric mean STV = statistical threshold value cfu = colony forming units mL = milliliters</p>					

^a U.S. EPA recommends using U.S. EPA Method 1600 (U.S. EPA, 2002a) to measure culturable enterococci, or another equivalent method that measures culturable enterococci and using U.S. EPA Method 1603 (U.S. EPA, 2002b) to measure culturable *E. coli*, or any other equivalent method that measures culturable *E. coli*.

Note that either enterococci or *E. coli* can be selected for fresh waters, but only enterococci can be selected for marine waters. Additionally either estimated illness rate is protective of REC 1 uses. U.S. EPA 2012 RWQC is intended as guidance to states and tribes in developing standards to protect swimmers from exposure to water that contains organisms indicating the presence of fecal contamination.

As most Regional Water Quality Control Boards (Regional Water Boards) basin plans are not currently consistent with the 2012 RWQC, the State Water Board is proposing to adopt the proposed amendments to provide efficient and consistent implementation statewide.

Fundamentals of the Proposed Amendments

Staff is currently contemplating several issues based on the recommendations contained in the 2012 RWQC. That is, staff currently proposes to provide consistent statewide REC 1 bacteria objectives based on the 2012 RWQC, a natural sources exclusion and reference system approach to address natural bacteria levels, suspension for high flow periods, and additional implementation provisions as necessary to provide for efficient and effective permitting and enforcement. As previously explained the State Water Board is not required to follow U.S. EPA's criteria recommendations and may develop its own bacteria objectives. Additionally, peer review would be required if State Water Board staff did not follow U.S. EPA's criteria recommendations. Accordingly, the following eleven elements describe issues staff is currently considering, from which staff plan to develop draft bacteria objectives and any necessary implementation for the State Water Board's consideration and adoption. Preliminary Staff recommendations are in **bold** below.

Element 1: Bacteria Indicators

All Regional Water Boards basin plans currently have existing bacteria objectives for fecal indicator bacteria (FIB) adopted in their regional water quality control plans (basin plans). Some of the existing bacteria objectives include fecal coliform as an indicator organism. Some basin plans also use *E. coli* and/or enterococci as indicator organisms. Insofar as the proposed amendments include bacteria objectives that differ from those currently contained in basin plans, the statewide objectives would supersede those contained in basin plans, to the extent a conflict existed, unless the statewide amendments expressly provide that those conflicting objectives shall remain in effect.

Fresh Waters:

This element would address the issue of setting a statewide bacteria indicator for fresh waters, using U.S. EPA's 2012 RWQC recommendations.

Staff could consider these options and/or others when developing the proposed amendment:

1. Leave existing bacteria indicators in place. All of the Regional Water Boards basin plans have existing bacteria objectives for fecal indicator bacteria (FIB). Some of the existing bacteria objectives include fecal coliform and/or total coliform as an indicator organism. Some regions also use *E. coli* and/or enterococci as indicator organisms.
2. Use only enterococci as an indicator organism.
3. **Use only *E. coli* as an indicator organism.**
4. Use both *E. coli* and enterococci as indicator organisms.

Marine Waters:

This element would address the issue of setting a statewide bacteria indicator for marine waters, using U.S. EPA's 2012 RWQC recommendations.

Presently, the Ocean Plan and all of the Regional Water Boards' basin plans have existing minimum protective bacteriological standards consistent with those established by the California Department of Public Health (CDPH) for FIB for water contact recreation in ocean beaches (17 Cal. Code Regs. § 7958.) The bacteriological standards established by CDPH are not consistent with the 2012 RWQC. The CDPH bacteriological standards use three FIB (enterococcus, total coliform and fecal coliform) to protect water contact recreation in coastal waters. CDPH requires public health agencies to perform beach water quality monitoring for FIB and notification for public safety. Those objectives (enterococcus, total coliform, fecal coliform and the fecal/total coliform ratio) would still require public beach monitoring until either a legislative or regulatory change.

Changing the Ocean Plan's REC 1 contact standards to require only enterococci would still leave in effect the CDPH bacteriological standards for FIB, to which local public health agencies performing beach water quality monitoring and public notification must adhere.

Staff could consider these options and/or others when developing the proposed amendment:

1. Leave existing bacteria indicators in place. The Ocean Plan and all Regional Water Boards with marine waters currently have bacteriological standards established by CDPH. The objectives use three indicators which are enterococci, total coliform and fecal coliforms.
2. **Use enterococci as a sole indicator. The existing use of total coliform and fecal coliform for beach recreation is not supported by the U.S. EPA studies. Harmonizing this option and CDPH bacteriological standards will be considered in the future but is outside the scope of this project.**

Element 2: Level of Public Health Protection for Illness Rate

Marine and Fresh Waters:

U.S. EPA 2012 RWQC recommendation for *E. coli* and enterococcus consists of a specific risk level based on an illness rate estimate. U.S. EPA's recommended risk level of 32 per 1,000 primary contact recreators is a more conservative estimate and is therefore more protective of public health than the 36 illness per 1,000 primary contact recreators. Site specific criteria could be developed for specific waters, but it would require potentially costly studies.

Staff could consider these options and/or others when developing the proposed amendment:

1. No action – If the State Water Board does not take action, Regional Water Boards will continue to specify water quality objectives for bacteria in their basin plans. They may adopt criteria reflecting risk levels recommended by the U.S. EPA or criteria based on other recommendations.
2. Use the U.S. EPA's estimated illness rate of 36 per 1,000.
3. **Use the U.S. EPA's estimated illness rate of 32 per 1,000.**

4. Use an alternative estimated illness rate.

Element 3: Address Natural Sources of Bacteria Levels

Natural bacteria levels often exceed bacteria objectives even in undeveloped areas. Without a means to address natural sources of bacteria, dischargers might be required to treat their discharges more than necessary. TMDLs have addressed this using a combination of Reference System/Antidegradation Approach and Natural Source Exclusion Approach, but there is no statewide framework that would provide efficient and consistent development.

Federal regulations (40 CFR § 130.7) require that TMDLs include load allocations (LAs) for nonpoint sources and natural background levels and waste load allocations (WLAs) for point sources, and that the individual sources for each must be identified and enumerated. The TMDL for a given pollutant and waterbody is the total amount of pollutant that can be assimilated by the receiving water while still achieving WQOs. The TMDL is equal to the sum of individual WLAs and LAs.

The Reference System/Antidegradation Approach has two implementation goals in the context of TMDL development: (1) bacteriological water quality is at least as good as that of a natural (reference) system, and (2) no degradation of existing water quality is allowed, where it is better than the natural system.

The Natural Source Exclusion Approach is an alternative to the Reference System/Antidegradation Approach. Natural sources include direct inputs from birds, terrestrial and aquatic animals, wrack line and aquatic plants, or other unidentified sources within the receiving waters. The Natural Source Exclusion Approach requires the control of all anthropogenic sources of bacteria and the identification and quantification of natural sources of bacteria. Exceedances are allowed based on residual exceedances of natural sources.

Staff could consider the following options and/or others when developing the proposed amendment:

1. No action – Existing basin plans with natural sources exclusion and reference beach/antidegradation approaches would remain.
2. **Allow reference system/antidegradation or natural sources exclusion approaches. Staff will develop guidance to aid Regional Water Boards implementing this option. A guidance document will be developed to provide help in measuring natural sources of bacteria and how to utilize this approach. This option will allow resources for “clean-up” to be directed to areas with anthropogenic sources instead of areas with natural sources of bacteria.**
3. Prohibit the use of reference system/antidegradation or natural sources exclusion approach. This option could require treatment of natural sources, in discharges having to treat bacteria from undeveloped areas. Such requirements, could adversely affect valuable aquatic life and wildlife beneficial uses supported by natural water bodies in the state by requiring the treatment of natural sources of bacteria. This would also lead to the expenditure of unnecessary resources and monies.

Element 4: High Flow Suspension of Objectives for Fresh Waters

This element would allow the suspension of bacteria objectives during high water flows that create conditions that are unsafe for REC 1 uses and create conditions when objectives are temporarily not attainable. Many areas of California have rivers and engineered channels that become unsafe for REC-1 uses during high flow conditions and as a result, the REC 1 use is limited or does not exist during those times. The suspension of the associated bacteria objectives during high flows could be allowed under specific conditions.

This element applies only to fresh waters.

Staff could consider the following options and/or others when developing the proposed amendment:

1. No action – The Los Angeles Water Board’s existing high flow suspension would remain. Regional Water Boards without a high flow suspension in their basin plans would have to adopt a basin plan amendment if they desire to adopt a high flow suspension policy.
2. **Allow high flow suspension of objectives for engineered and non-engineered channels. Develop guidance for high flow suspensions. The necessity of treatment of discharges during high flows to meet the REC 1 objective would be avoided with this option.**
3. Affirmatively prohibit high flow suspension but specifically provide that the Los Angeles Water Board’s may continue to use its existing high flow suspension policy for waters within its region. Under this option, treatment of discharges during high flows would occur, except not in the Los Angeles region consistent with its existing high flow suspension policy.

Element 5: Compliance Schedules and Interim Requirements

This element considers compliance schedules and interim requirements under conditions allowed by the Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits (Resolution No. 2008-0025). Under the current policy, compliance schedules may be granted for up to 10 years to allow dischargers the time needed to meet new objectives. For bacteria, many major publicly owned treatment works (POTWs) in California are already subject to existing CDPH guidelines for recycled wastewater effluent that are more stringent than the proposed REC1 bacteria water quality objectives being proposed. Therefore, these facilities may have little difficulty meeting permit conditions based on the selected criteria and the consideration of compliance schedules and interim requirements would not apply to POTWs.

Staff could consider the following options and/or others when developing the proposed amendment:

1. **No action – This option would result in compliance schedules and interim requirements being established by Regional Water Board permit writers in accordance with the Compliance Schedule Policy (Resolution No. 2008-0025).**
2. Provide that dischargers would be allowed up to a ten-year compliance schedule to meet the new objectives. All dischargers may not comply immediately with new or revised effluent limits based on the proposed bacteria objective. Up to a ten-year timeframe could be granted to implement the necessary controls to comply with new effluent limitations.

Element 6: Calculation of Effluent Limits for POTWs

This element considers the procedure for calculating effluent limits for bacteria indicators, with possible development of written guidance. This element applies only to POTWs.

The U.S. EPA 2012 RWQC recommends “that permitting authorities use an effluent limit derivations approach that considers both the geometric mean (GM) and statistical threshold value (STV) in the limit calculations, and which results in short- and long-term effluent limits that derive from and comply with all applicable criteria expressions.”

However, many POTWs permits contain effluent limits based on CDPH guidelines for indicator bacteria to protect designed beneficial uses for REC 1 or agriculture, including irrigation of food crops. These effluent limits are typically more stringent than limits based on existing basin plan receiving water objectives for bacteria indicators.

Presently there is no statewide policy for establishing effluent limits for indicator bacteria.

Staff could consider these options and/or others when developing the proposed amendment:

1. **No action – Allow Regional Water Boards to specify the permit limits based on CDPH guidelines for total coliform.**
2. Develop statewide guidance for calculating effluent limits based on effluent variability.
3. Develop a statewide guidance for applying the objective at the end of the pipe.

Element 7: Mixing Zones for Point Sources

A mixing zone is a volume of water allocated for mixing with a wastewater discharge where applicable water quality criteria or objectives can be exceeded without causing adverse effects to the overall water body. Mixing zones for bacteria could be allowed in situations where no potential for impairment exists (e.g., deep-water discharges).

This element will consider if mixing zones should be allowed for point source discharges and, if so, procedures for use. There is currently no statewide policy on the application of mixing zones for bacteria discharges.

Staff could consider these options and/or others when developing the proposed amendment:

1. **No action – With no statewide policy, existing Regional Water Board policies and procedures will apply. Four of the nine Regional Water Boards have mixing zone provisions in their basin plans. None of the Regional Water Boards specifically prohibit mixing zones.**
2. Allow mixing zones in a small area near an outfall. The mixing zone would allow the existing bacteria limits to be calculated taking into account dilution, if appropriate.
3. Do not allow mixing zones. Bacteria would be measured in the effluent at the end of pipe without any dilution due to mixing.

Element 8: Averaging Periods to Determine Compliance

This element will consider an averaging period for use in determining compliance with proposed bacteria objectives. Compliance is measured using a GM and a STV. U.S. EPA 2012 RWQC states that “The waterbody GM should not be greater than the selected GM magnitude in any 30-day interval. There should not be greater than a ten percent excursion frequency of the selected STV magnitude in the same 30-day interval.”

Staff could consider these options and/or others when developing the proposed amendment:

1. No action – Under this option, Regional Water Boards could specify the period of time (if any) over which data would be collected to calculate a geometric mean. This could lead to inconsistencies in the application of the geometric mean criteria across the state.
2. Specify the geometric mean as a rolling average. Potentially using the rolling average based on a specific number (e.g. 5) of samples. This option would lead to consistency.
3. **Specify the appropriate averaging period. Potentially using a minimum number of samples over a maximum period of time. This option would lead to consistency.**

Element 9: Effluent Monitoring and Reporting Frequency

This element will consider developing guidance regarding effluent monitoring and reporting, including discussion of monitoring frequency. There is currently no statewide policy for monitoring frequency for bacteria in facility discharges to fresh waters. Permit writers determine monitoring frequencies on a case-by-case basis, usually requiring larger dischargers to monitor more frequently than smaller dischargers.

Staff could consider these options and/or others when developing the proposed amendment:

1. **No action – Currently none of the Regional Water Boards have specific requirements for bacteria monitoring in their basin plans. Monitoring frequency could continue to be specified by their permit requirements.**
2. Establish monitoring frequency for all dischargers. The monitoring frequency could be a minimum number needed to monitor the average bacteria threshold. The guidance could allow for higher frequency to be specified in permits while not allowing any monitoring frequency below the minimum number.
3. Provide narrative guidance which can be used as guidelines to help establish monitoring frequency in NPDES permits.

Element 10: Analytical Methods to Measure Bacteria Indicators

This element will consider the need for analytical methods for monitoring ambient waters and effluent. The 2012 RWQC utilizes analytical methods for measuring indicator bacteria densities in ambient waters and for coastal waters (e.g. membrane filtration methods). The proposed amendment could specify some or all of these methods in effluent monitoring.

Staff could consider these options and/or others when developing the proposed amendment:

1. **No action – With this option, there would be no specified analytical measures for bacteria indicators. Therefore, any method of determining bacteria densities can be used, as approved by the Regional Water Boards for their waters. This option**

eliminates the need to update the statewide plans to accommodate new methods or U.S. EPA recommendations regarding best sampling procedures.

2. Specify analytical methods for receiving waters and various effluents. The statewide plan would list methods that are acceptable for measuring bacteria concentrations. To accommodate subsequently developed methods or a change in methods based on new information, the State Water Board would require an amendment to the statewide plans. The possible analytical methods that could be considered are:
 - a) U.S. EPA approved methods
 - b) Rapid Indicators, quantitative polymerase chain reaction (qPCR) on a site specific basis using U.S. EPA method 1611.

Element 11: Allow for a Variance, Seasonal Suspension or Limited REC 1

Allow the use of another beneficial use designation, such as Limited Water Contact Recreation (LREC 1), a variance, or a seasonal suspension for seasonal low flow or intermittent uses. This element would allow a discharger to apply for a variance from meeting the proposed bacteria objectives. Qualification for a variance would be based on a list of conditions that must first be met. Conditions could include such things as modified channel, limited access, seasonal or very limited flows, and required treatment before the water enter another water body.

Seasonal suspension or the designation of LREC 1 would require a Use Attainability Analysis.

Limited Water Contact Recreation is a beneficial use designation that recognizes body contact is limited in the waterbody due to physical conditions, such as restricted access and very low water depths. The state has waterbodies that in years past have been channelized, and/or lined with concrete or other materials that protect the channel from erosion, in order to provide flood protections. In some cases, these waterbodies have been fenced to limit contact during storm events to protect the public from drowning, while in most other instances the water flow is non-existent or very low. Due to these restrictions, contact with the water is minimal and the REC 1 beneficial use is not an accurate definition of the beneficial use of the waterbody. The Los Angeles Water Board presently has waters with the beneficial use designation of LREC 1.

Staff could consider the following options and/or others when developing the proposed amendment:

1. No Action – Under this option, no changes would occur in the designation of the LREC 1 beneficial use where appropriate.
2. Encourage the designation of LREC 1 waters where appropriate. Under this option, the Regional Water Boards could consider de-designation for appropriate waterbodies. Waterbodies with inaccurate beneficial use designation could be de-designated and the appropriate water quality objective applied. Less stringent water quality objectives would conserve limited resources of those agencies that discharge to these waterbodies.
3. **Allow the use of a variance, seasonal suspension or Limited REC 1.**