



October 2, 2020

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San Francisco Bay Region
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VIA EMAIL: Tong.Yin@waterboards.ca.gov

Subject: Proposed Basin Plan Amendment to Add Chlorine Water Quality Objectives and Total Residual Chlorine Water Quality-Based Effluent Limitations for Wastewater Discharges

Dear Dr. Yin:

The Bay Area Clean Water Agencies (BACWA) appreciate the opportunity to provide comments on the proposed amendment to the Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) to add chlorine Water Quality Objectives (WQOs) and Total Residual Chlorine (TRC) Water Quality-Based Effluent Limitations (WQBELs) for wastewater discharges. BACWA is a joint powers agency whose members own and operate publicly-owned treatment works and sanitary sewer systems that collectively provide sanitary services to over 7.1 million people in the nine-county San Francisco Bay (SF Bay) Area. BACWA members are public agencies, governed by elected officials and managed by professionals who protect the environment and public health.

BACWA closely collaborated with Regional Water Board staff during development of the proposed Basin Plan Amendment, and strongly supports its adoption. BACWA appreciates that Oil and Grease effluent limitations will no longer be needed for facilities that provided secondary or advanced-secondary treatment, as this will reduce the monitoring and reporting effort for our member agencies.

More importantly, the proposed Basin Plan Amendment will reduce the need for BACWA members to dose effluent with dechlorinating agents such as sodium bisulfite prior to discharging to receiving waters, providing an environmental benefit. Historically, BACWA members have used an overdosing strategy to guarantee compliance with effluent limitations for chlorine, which were expressed as an instantaneous maximum. The previous limitations did not allow consideration of time averaging or dilution in the receiving water. The new proposed

WQBELs allow consideration of both factors, allowing BACWA members to save up to \$1.2M per year on sodium bisulfite purchases. The change will also allow BACWA members to reduce loading of sodium bisulfite into San Francisco Bay and its tributaries, benefiting water quality and the environment.

BACWA encourages the Regional Water Board to move swiftly to implement the Basin Plan Amendment by preparing a regional permit amendment, rather than by implementing the amendment over the next five years on a drawn out, permit-by-permit basis. Several of our members that would benefit most from the amendment, such as Delta Diablo and East Bay Municipal Utility District, have NPDES permits that will not be reissued for four to five years. A regional permit amendment would streamline implementation and accelerate cost savings and reduction of chemical inputs to the Bay.

Besides these general comments, BACWA also has specific recommendations for language changes in the proposed Basin Plan Amendment, which are listed below.

1. Clarify that continuous monitoring is not required for discharge facilities that are seasonal or use natural dechlorination.

The proposed Basin Plan Amendment requires continuous monitoring, allowing an exception only for “smaller or intermittent discharge facilities.” (page A-8, Annotated Basin Plan Amendment). The text in the proposed Basin Plan Amendment does not match the draft Staff Report, which states that “seasonal or wet weather discharges” should also be considered for an exemption to the continuous monitoring requirement (page 13, Draft Staff Report).

The City of Petaluma’s Ellis Creek Water Recycling Facility (Order No. R2-2016-0014) is an example of a seasonal discharger using chlorine disinfection during the wet season of October to April. Natural dechlorination occurs by routing effluent through a constructed polishing wetland. City staff monitor for chlorine using grab samples. This is an example of a current facility that should qualify for an exemption to the continuous monitoring requirement, but there may be others in the future. Additional dischargers could install constructed wetlands designed for effluent polishing, for example to improve nutrient removal. BACWA is currently completing a study regarding the nutrient removal potential of natural systems like wetlands. Grab sampling may be appropriate for other future systems that rely on ponds or constructed wetlands for natural dechlorination. Site access can make continuous monitoring difficult in such situations.

BACWA recommends addition of the word “seasonal” and the phrase “facilities not using chemical addition for dechlorination” to proposed Footnote (f) to Table 4-2 of the Basin Plan, as shown in the markup below.

f. These effluent limitations apply to all treatment facilities with potential to discharge chlorine.

These effluent limitations may be adjusted to account for a mixing zone in a manner consistent with procedures in the Policy for Implementation of Toxics Standards for

Inland Surface Waters, Enclosed Bays, and Estuaries of California. Total residual chlorine should be monitored with a frequency of not less than one sample every five minutes. Less frequent sampling may be appropriate for smaller, [seasonal](#), or intermittent discharge facilities, [or for facilities not using chemical addition for dechlorination](#).

Additional information may also be needed in the Staff Report (page 13); suggested text is below.

We propose that TRC compliance monitoring samples be collected not less than once every five minutes; less frequent monitoring may be allowed for smaller facilities or intermittent discharges, such as seasonal or wet weather discharges, [or for facilities that rely on natural dechlorination in ponds or wetlands rather than chemical addition](#). For compliance determination, the TRC effluent limitations in Basin Plan Table 4-2 would be compared to the arithmetic mean of all TRC measurements collected during each hour. When computing the 1-hour arithmetic means, measured values below the ML would be treated as zero.

2. The electronic reporting requirement should be simplified from 24/day to 1/day.

The draft Staff Report (page 21) includes a description of expected reporting requirements, as shown below (emphasis added):

*Continuous on-line TRC effluent monitoring data is typically collected and stored by SCADA systems. TRC continuous monitoring data stored in the SCADA system at 5-minute intervals would be compiled and used to calculate the arithmetic averages over 60-minute periods. **Those 24 discrete 60-minute average values will be reported** and compared to the 1-hour average water quality-based effluent limitation for compliance determination purposes.*

Unlike the draft Staff Report, the proposed text of the Basin Plan Amendment does not mandate specific reporting requirements to be included in discharger permits. The proposed new Footnote (f) to Table 4-2 in the Basin Plan states the following regarding compliance determination:

The discharger shall calculate the arithmetic mean for each hour with all the readings within the hour and compare it with the 1-hour average effluent limitation.

BACWA proposes that the Regional Water Board implement the new WQBELs by requiring reporting of just one value per day (the daily maximum of the 24 hourly calculations), rather than 24 values per day. Any other hourly values exceeding the 1-hour average effluent limitation would also be reported. This approach is similar to the approach currently used for effluent pH reporting in the San Francisco Bay region; pH has instantaneous minimum and maximum effluent limitation, but dischargers only upload daily minima and maxima to CIWQS. It is also consistent with the current monitoring approach for TRC for dischargers with continuous monitoring; only the daily maximum is reported to CIWQS, along with any other excursions above the 1-hour average effluent limit (see, for example, Order No. R2-

2020-0001 for San José-Santa Clara Regional Wastewater Facility or Order No. R2-2020-0024 for East Bay Municipal Utility District).

Virtually all TRC values will be zeros, so the proposed approach will reduce the reporting burden and result in more manageable data sets. With hourly reporting, there would be 43,800 TRC values per 5-year permit cycle – yet the current version of CIWQS can only export 30,000 values at a time. The proposed change is shown below as a markup to page 21 of the draft Staff Report:

Continuous on-line TRC effluent monitoring data is typically collected and stored by SCADA systems. TRC continuous monitoring data stored in the SCADA system at 5-minute intervals would be compiled and used to calculate the arithmetic averages over 60-minute periods. Those 24 discrete 60-minute average values will be ~~reported and~~ compared to the 1-hour average water quality-based effluent limitation for compliance determination purposes. The daily maximum of the 24 discrete values, and any other hourly averages that exceed the 1-hour effluent limitation, will be reported to CIWQS.

3. The Staff Report should note that dilution ratios will be based on minimum initial dilution, and not limited to 10:1.

BACWA suggests adding language to the Staff Report to identify how dilution factors will be established. BACWA's understanding is that dilution factors will be established using the minimum initial dilution already identified in many discharger permits, which are periodically updated using new or revised dilution studies. Deep water discharger permits typically contain a Discharge Prohibition identifying the minimum initial dilution, which is often used to calculate the WQBEL for ammonia.

BACWA suggests adding this language to Section 4.1 of the draft Staff Report (pages 12-13). The markup below shows it at the end of Section 4.1 for context.

These water quality-based effluent limitations would replace the existing Residual Chlorine effluent limitation of 0.0 mg/L in Basin Plan Table 4-2. A footnote to these water quality-based effluent limitations would specify implementation provisions related to these effluent limitations that would:

- provide for establishment of 4-day average TRC water quality-based effluent limitations in NPDES permits using the procedures in the SIP at the discretion of the Water Board, for example, if there is a reasonable potential that the receiving water could exceed the 4-day objective while discharges comply with the 1-hour effluent limitations;*
- explain that water quality-based effluent limitations may be adjusted to account for a mixing zone in a manner consistent with procedures in the State Implementation Policy; and*
- indicate how compliance will be determined with the specified averaging period and analytical method minimum levels.*

Dilution factors (D) used to calculate water quality-based effluent limitations using the formulas above would be based on the minimum initial dilution available at each outfall, and would not be limited to D=9. This is similar to the approach currently used for ammonia in NPDES permits throughout the region. Like ammonia, chlorine is a non-persistent, non-bioaccumulative pollutant.

4. The Minimum Level for Total Residual Chlorine should be listed in Attachment G, not in the Basin Plan.

The draft Staff Report proposes a minimum level (ML) of 0.05 mg/L for residual chlorine to be included in proposed Footnote (f) to Table 4-2 of the Basin Plan. BACWA encourages the Regional Water Board to consider evidence that a higher ML of 0.1 mg/L is appropriate, as outlined below in Comment #5. BACWA also encourages the Regional Water Board to remove the ML from the markup of Basin Plan Table 4-2, and instead list it in Attachment G *Regional Standard Provisions, and Monitoring and Reporting Requirements (Supplement to Attachment D)*. Attachment G is included in each NPDES permit issued in the region.

Analytical methods change over time; as a result, Attachment G, rather than a policy document like the Basin Plan, is the appropriate location to list MLs. Table A of Attachment G lists MLs for dioxin and furan congeners, while Table B of Attachment G lists MLs for the 126 priority pollutants. This clearly demonstrates that Attachment G is the repository for MLs used in the region; chlorine should be no exception. Table B includes individual MLs depending on the specific analytical method used to analyze a given priority pollutant.

Based on a December 2019 survey of BACWA laboratory capabilities (cited as Fono 2020a in the draft Staff Report) there are at least four TRC analytical methods currently in use by those laboratories. For consistency, it is recommended that Attachment G be modified to include a default TRC ML of 0.1 mg/L (see Comment #5). BACWA also requests that narrative language be added to Attachment G to allow for dischargers to develop alternative MLs based on EPA approved MDL protocols (EPA 821-R-16-006, December 2016) and the 1994 EPA guidance described in the staff report and below. Attachment G can be administratively changed more easily than having to process a formal Basin Plan Amendment if there were to be technological, analytical, or other changes in the future that would justify modifying the ML(s).

5. BACWA suggests a technically achievable ML of 0.1 mg/L in lieu of the draft ML of 0.05 mg/L. The draft Basin Plan Amendment ML of 0.05 mg/L is not consistent with laboratory accreditation procedures.

BACWA has previously discussed with Regional Water Board staff members that the proposed ML of 0.05 mg/L is not consistent with the procedures for determining an appropriate Level of Quantitation (LOQ) as required by the TNI laboratory accreditation standards that were adopted by the State Water Board in May 2020 and are scheduled to go into effect January 2021. The TNI standard requires the LOQ to be higher than the detection limit by a wide enough margin that quantified sample results have a very low probability of actually being non-detects, and vice versa. If a verification sample fails this test, then the laboratory must raise the LOQ to a higher value. Normally, the ML, LOQ and lowest

calibration point are the same. However, in this case an ML of 0.05 mg/L is below most laboratories' achievable LOQ, indicating that the proposed ML does not have a sound technical basis and could have adverse unintended consequences on laboratories.

The underlying problem is that the laboratories of BACWA's member agencies cannot meet the "ideal conditions" MDL of 0.01 mg/L proposed in the draft Staff Report. As previously communicated to Regional Water Board Staff (cited as Fono 2020a in the draft Staff Report), a review of nine of the largest BACWA laboratories in December 2019 revealed the only MDLs as low as 0.01 mg/L used laboratory water, not effluent. Of the nine laboratories, the lowest MDL in effluent was 0.02 mg/L, and the median value was 0.07 mg/L.

As an example, one POTW following the December 2016 USEPA MDL protocol cited above (*Definition and Procedure for the determination of the Method Detection Limit, Revision 2*) developed an MDL of 0.04 mg/L in their laboratory for TRC in a deionized water matrix using EPA Method 4500-CI G. That POTW determined its TRC **LOQ to be 0.1 mg/L**. Its judgment was that an LOQ of 0.05 mg/L would eventually fail verification.

It is also worth noting that the MDLs discussed above were developed in the laboratory, using laboratory-maintained and calibrated instruments, and by trained laboratory technicians. The continuous monitoring on-line analyzer systems are typically calibrated by operators out in the plant near the dechlorination facility given the short hold time for TRC analyses. Grab samples are collected of the dechlorinated effluent stream going to the on-line analyzer and measured for TRC in a benchtop instrument; then the value is compared to the reading being shown by the on-line analyzer. These are considerably different conditions than "ideal" laboratory conditions cited in the draft Staff Report, with many more variables -- including the wastewater matrix itself.

The draft Staff Report's suggestion of 0.05 mg/L as an appropriate ML is based on a misreading of the 1998 U.S EPA response letter guidance (cited as U.S. EPA 1998 in the draft Staff Report). The letter does not recommend 0.05 mg/L as an appropriate ML for wastewater discharges. In fact, this document emphasizes that effluent conditions are typically not "ideal," "ideal" conditions being the basis for the stated 0.01 mg/L published detection limit for Standard Methods 4500 CI E and G. The 1998 letter states that "[i]n the absence of studies to establish effluent specific detection limits, EPA normally relies on the published test detection limits." However, EPA has regulations that specify the methodology for developing an effluent-specific detection limit. This is the appropriate approach to follow for developing MDLs and MLs for POTWs given as stated in that letter that:

The method detection limit is any one wastewater matrix could differ from the published detection limit established under ideal conditions," and "for any given wastewater matrix, the level of quantitation may be higher. It is acceptable for a Region or state permitting authority to establish a default level of quantitation for a given method. The permitting authority may adjust the level of quantitation for an individual discharger based upon a demonstration by the discharger of a higher or lower method detection limit or level of quantitation for its effluent.

The 1998 guidance also states that “Many [States and Regions] establish a minimum level of 0.1 mg/L when TRC limits are set at or below 0.1 mg/L.”

BACWA proposes an ML of 0.1 mg/L in lieu of an ML of 0.05 mg/L. As noted above, if laboratory methods for chlorine detection dramatically improve in the future, or if different MLs are appropriate for different analytical methods, then it could be appropriate to modify the ML by revising Attachment G. No Basin Plan Amendment would be required for this approach.

A markup of the draft staff report and Table 4-2 of the Basin Plan is shown below.

Pages 14-15, Draft Staff Report

To ensure dischargers use the most sensitive analytical methods, we propose a TRC ML of ~~0.1~~ 0.05 mg/L based on U.S. EPA recommendations described below.

To derive a ML where promulgated MLs are not available, U.S. EPA’s 1994 Draft National Guidance for Permitting, Monitoring, and Enforcement of Water Quality-Based Effluent Limitations recommends using a multiplication factor of 3.18 and the method detection limit (MDL). The lowest published MDL for chlorine residual analysis (Standard Methods 4500-Cl E and G) is 0.01 mg/L under ideal conditions. Therefore, an appropriate level of quantitation or ML under ideal conditions would be approximately 0.03 mg/L.

~~U.S. EPA permitting division (U.S. EPA 1998) recommended that 0.05 mg/L is the appropriate ML for wastewater discharges and pointed out that some states, like Tennessee and South Carolina, had already started using 0.05 mg/L as the TRC ML. An Ohio EPA general permit for discharges from sewage treatment systems (Ohio 2020) includes 0.05 mg/L as the ML. Massachusetts Town of Rockland’s 2006 NPDES permit (NPDES Permit No. MA0101923) has 0.02 mg/L as the ML.~~

We understand that some permits nationwide have lower ~~higher~~ MLs for TRC, for example, 0.05 ~~0.1~~ mg/L (U.S. EPA 1998) (~~Fono 2020a~~); ~~However, many of them are for facilities using handheld chlorine devices for compliance monitoring. In this region, since actual conditions in the laboratory do not reflect ideal conditions, some NPDES dischargers, especially shallow water dischargers, have stated that their laboratories cannot achieve a ML of 0.05 mg/L using TRC Methods 4500-Cl C, F, or G. Factors that affect a method’s ML include instrument sensitivity, instrumental precision, variability in extraction processes, and analyst’s performance (Chang 2011).~~

~~Dischargers that cannot achieve the ML of 0.05 mg/L will likely evaluate whether the cost savings from reducing sodium bisulfite overdosing justifies the cost of improving its laboratory performance in TRC analysis. We expect that many shallow water dischargers will continue sodium bisulfite overdosing to meet the TRC water quality based effluent limitations. Proposing a higher ML to accommodate dischargers with technical limitations is not appropriate because raising the ML would effectively allow these facilities to discharge chlorine at concentrations that are well above the water quality-~~

~~based effluent limitations. For discharges to shallow waters there is little assimilative capacity and these discharges could negatively impact beneficial uses.~~

Footnote (f), Table 4-2, Basin Plan

The Water Board will establish water quality-based effluent limitations based on the 4-day average chlorine water quality objective if it is deemed necessary to ensure receiving waters meet the 4-day average water quality objective.

The Water Board shall establish minimum levels within each permit. In most cases, the minimum level (which is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed) as included in Attachment G shall be no greater than 0.1 ~~0.05~~ mg/L and shall be reported along with the arithmetic mean of the total residual chlorine results. Higher minimum levels may be used where justified, for example, due to discharger-specific factors such as wastewater matrix interferences, analyses conducted under less than "ideal" conditions, or if a discharger must rely on field instruments.

Once again, BACWA would like to thank the Regional Water Board staff on its hard work to bring about this Basin Plan Amendment, which will allow agencies to reallocate resources to provide greater environmental benefits. We also appreciate your attention to our comments. Please do not hesitate to contact us with any questions or concerns.

Respectfully Submitted,



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