Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California

DIVISION OF WATER QUALITY

STATE WATER RESOURCES CONTROL BOARD

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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I. INTRODUCTION

This Water Quality Control Plan for INLAND SURFACE WATERS, ENCLOSED BAYS, and ESTUARIES of California (Plan) was adopted by the State Water Resources Control Board (State Water Board) under authority provided by Water Code sections 13140 and 13170. This plan establishes provisions for water quality and sediment quality that apply to all INLAND SURFACE WATERS, ENCLOSED BAYS, and ESTUARIES of the state, including both waters of the United States and surface waters of the state. These provisions do not apply to OCEAN WATERS, including Monterey Bay and Santa Monica Bay. All terms in capital letters are defined in Appendix A.

In accordance with Water Code section 13170, except where otherwise noted, this Plan supersedes any Regional Water Quality Control Plans (Basin Plans) for the same waters to the extent of any conflict. This Plan supersedes section 4 of the Policy for Implementation of Toxics Standards for INLAND SURFACE WATERS, ENCLOSED BAYS, and ESTUARIES of California (SIP).

II. BENEFICIAL USES

Water body-specific beneficial use designations contained in the Basin Plans and other statewide plans, including future amendments to those plans, are incorporated by reference into this Plan.

III. WATER QUALITY OBJECTIVES

A. Sediment

B. Toxicity

1. Applicable Beneficial Uses

The following water quality objectives for chronic and acute toxicity establish minimum requirements to protect AQUATIC LIFE beneficial uses including, but not limited to, warm freshwater habitat (WARM), cold freshwater habitat (COLD), WILDLIFE habitat (WILD), estuarine habitat (EST), preservation of rare, threatened, or endangered species (RARE), migration of aquatic organisms (MIGR), spawning reproduction and/or early development (SPWN), marine habitat (MAR), inland saline water habitat (SAL), and wetland habitat (WET).

2. Toxicity Water Quality Objectives

a. Chronic Toxicity Objective

The chronic toxicity water quality objective is expressed as a NULL HYPOTHESIS with a REGULATORY MANAGEMENT DECISION (RMD) of 0.75, where the following NULL HYPOTHESIS shall be used:

H_o: Mean RESPONSE (ambient receiving water) ≤ 0.75 • mean RESPONSE (control)

In general terms, the NULL HYPOTHESIS is the following statement: the ambient receiving water is toxic because the test organism RESPONSE in the ambient receiving water sample is greater than or equal to 25 percent compared to the test organism RESPONSE in the control water sample.

And where the following ALTERNATIVE HYPOTHESIS shall be used:

H_a: Mean RESPONSE (ambient receiving water) > 0.75 • mean RESPONSE (control)

In general terms, the ALTERNATIVE HYPOTHESIS is the following statement: the ambient receiving water is not toxic because the test organism RESPONSE in the ambient receiving water sample is less than 25 percent compared to the test organism RESPONSE in the control water sample.

Attainment of the water quality objective is demonstrated by conducting CHRONIC TOXICITY TESTING as described in Section IV.B.1.b and rejecting this NULL HYPOTHESIS in accordance with the TEST OF SIGNIFICANT TOXICITY (TST) statistical approach described in Section IV.B.1.c. When the NULL HYPOTHESIS is rejected, the ALTERNATIVE HYPOTHESIS is accepted in its place, and there is no exceedance of the chronic toxicity water quality objective. Failing to reject this NULL HYPOTHESIS (referred to as a "fail") is equivalent to an exceedance of the chronic toxicity water quality objective.

b. Acute Toxicity Objective

The acute toxicity water quality objective is expressed as a NULL HYPOTHESIS with a RMD of 0.80, where the following NULL HYPOTHESIS shall be used:

H_o: Mean RESPONSE (ambient receiving water) ≤ 0.80 • mean RESPONSE (control)

In general terms, the NULL HYPOTHESIS is the following statement: the ambient receiving water is toxic because the test organism RESPONSE in the ambient receiving water sample is greater than or equal to 20 percent compared to the test organism RESPONSE in the control water sample.

And where the following ALTERNATIVE HYPOTHESIS shall be used:

H_a: Mean RESPONSE (ambient receiving water) > 0.80 • mean RESPONSE (control)

In general terms, the ALTERNATIVE HYPOTHESIS is the following statement: the ambient receiving water is not toxic because the test organism RESPONSE in the ambient receiving water sample is less than 20 percent compared to the test organism RESPONSE in the control water sample.

Attainment of the water quality objective is demonstrated by conducting ACUTE TOXICITY TESTING as described in Section IV.B.1.b and rejecting this NULL HYPOTHESIS in

accordance with the TST statistical approach described in Section IV.B.1.c. When the NULL HYPOTHESIS is rejected, the ALTERNATIVE HYPOTHESIS is accepted in its place, and there is no exceedance of the acute toxicity water quality objective. Failing to reject this NULL HYPOTHESIS (referred to as a "fail") is equivalent to an exceedance of the acute toxicity water quality objective.

3. Interaction of Toxicity Provisions with Basin Plans

The toxicity provisions in Section III.B.2, and Section IV.B, except as defined in this section, supersede Basin Plan toxicity provisions to the extent that:

1) The Basin Plan provisions specify methods of assessing compliance with any numeric or narrative water quality objectives for acute and chronic toxicity, and
2) The Basin Plan provisions regard toxicity testing and/or interpretation of toxicity testing results.

The toxicity provisions in Section III.B.2, and Section IV.B, notwithstanding the above, do not supersede:

1) The narrative toxicity water quality objectives (e.g. 'no toxic POLLUTANTS in toxic amounts'). (Note: The PERMITTING AUTHORITY may include receiving water limitations in permits that implement the narrative portion of toxicity water quality objectives. However, the PERMITTING AUTHORITY shall not include effluent limitations to implement that narrative portion except as indicated in Section IV.B)
2) Any Basin Plan provisions regarding the application of narrative toxicity water quality objectives to derive chemical specific limits, targets, and other thresholds; and
3) Any site-specific toxicity water quality objectives established in the Basin Plans. In addition, the toxicity provisions in Section III.B.2, and Section IV.B, do not apply to that water body.

Any total maximum daily loads (TMDL), including their implementation provisions, adopted by a Regional Water Board prior to the effective date of these toxicity provisions, remain in effect, and do not require reconsideration (for purposes of compliance with the toxicity provisions).

IV. IMPLEMENTATION OF WATER QUALITY OBJECTIVES

A. Sediment

B. Numeric Aquatic Toxicity Water Quality Objective

The following sections shall be used to assess whether ambient receiving water meets the numeric water quality objectives, whether a PERMITTING AUTHORITY shall require effluent limitations for non-storm water National Pollutant Discharge Elimination System (NPDES)

dischargers, and whether discharger effluent complies with applicable permit terms. Specific requirements for NON-STORM WATER NPDES DISCHARGERS, storm water dischargers, and NONPOINT SOURCE dischargers are described, respectively, in Section IV.B.2, IV.B.3, and IV.B.4.

1. Required Toxicity Testing Methods and Analysis

a. Toxicity Testing Sample and Location

To determine if ambient water meets the water quality objective (non-specific to a discharger), the ambient water sample shall be a representative sample of the waterbody.

For compliance with a receiving water limitation for a specific discharger, the ambient water sample shall be from a location specified by the PERMITTING AUTHORITY.

For compliance with an effluent limitation for a specific discharger, effluent samples shall be from a location specified by the PERMITTING AUTHORITY. Dilution and control waters should be obtained from an area unaffected by the discharge in the receiving waters. For rivers and streams, dilution water should be obtained immediately upstream of the wastewater outfall. Standard dilution water can be used if the above sources exhibit toxicity or if approved by the PERMITTING AUTHORITY.

b. Toxicity Test Methods

CHRONIC TOXICITY TESTS shall be conducted using one or more of the test species in Table 1 selected by the PERMITTING AUTHORITY in accordance with this plan, and shall follow methods established in the following United States Environmental Protection Agency (U.S. EPA) method manuals: Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition (EPA-821-R-02-013); Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms, Third Edition (EPA-821-R-02-014); and Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms, First Edition (EPA-600-R-95-136).

ACUTE TOXICITY TESTS shall be conducted using one or more of the test species in Table 1 selected by the PERMITTING AUTHORITY in accordance with this plan, and shall follow methods established in Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition (EPA-821-R-02-012).

These methods specify a minimum number of REPLICATES. However, additional test REPLICATES may be conducted to increase test sensitivity and confidence in the results.

Test method selection is determined by salinity and tier classification (refer to Table 1 in this section). Freshwater test methods shall be used for receiving waters with salinity less than 1,000 mg/L, and marine test methods shall be used for receiving waters with salinity equal to or greater than 1,000 mg/L. However, the PERMITTING AUTHORITY may require use of

freshwater test methods for dischargers that discharge freshwater effluent to marine waters. Tier I test species shall be used unless Tier I species are not readily available, in which case the PERMITTING AUTHORITY may allow the use of Tier II test species.

Test results shall be analyzed using the TEST OF SIGNIFICANT TOXICITY (TST) as described in Section IV.B.1.c. To the extent that U.S. EPA-approved methods require that observations should be made of organism RESPONSES in multiple concentrations of effluent or receiving water, the INSTREAM WASTE CONCENTRATION (IWC) shall be included as one of the selected concentrations, and the TST shall be conducted using the IWC and control as described in Section IV.B.1.c.

Table 1. Bioequivalence Values (b), Test Species Tier Classification, and False Negative Rate (α error) for toxicity test methods.

EPA Toxicity Test Method	Bioequivalence Value (b)	Tier	False Negative (α Error)
Chronic Freshwater Methods			
Ceriodaphnia dubia (water flea) survival and reproduction	0.75	I	0.20
Pimephales promelas (fathead minnow) survival and growth	0.75	I	0.25
Selenastrum capricornutum (green alga) Growth	0.75	I	0.25
Chronic West Coast Marine Methods			
Atherinops affinis (topsmelt) survival and growth	0.75	I	0.25
Dendraster excentricus (sand dollar); *Strongylocentrotus purpuratus* (purple urchin) fertilization	0.75	I	0.05
Dendraster excentricus (sand dollar); *Strongylocentrotus purpuratus* (purple urchin) larval development	0.75	I	0.05
Haliotis rufescens (red abalone) larval development	0.75	I	0.05
Mytilus sp. (mussels); *Crassostrea gigas* (oyster) larval development	0.75	I	0.05
Macrocystis pyrifera (giant kelp) germination and germ-tube length	0.75	I	0.05
Chronic East Coast Marine Methods			
Menidia beryllina (inland silverside) survival and growth	0.75	II	0.25
Americamysis bahia (mysid) survival and growth	0.75	II	0.15

EPA Toxicity Test Method	Bioequivalence Value (b)	Tier	False Negative (α Error)
Acute Freshwater Methods			
Ceriodaphnia dubia (water flea); *Daphnia magna* (water flea); *Daphnia pulex* (water flea); *Hyalella azteca* (amphipod) Survival	0.80	I	0.10
Pimephales promelas (fathead minnow); *Oncorhynchus mykiss* (rainbow trout); *Salvelinus fontinalis* (brook trout) Survival	0.80	I	0.10
Acute Marine Methods			
Atherinops affinis (topsmelt) Survival	0.80	I	0.10
Americamysis bahia (mysid) Survival	0.80	II	0.10
Menidia beryllina (inland silverside) Survival	0.80	II	0.10

Note: The false positive rate (β error) is set at 0.05 for all test methods

c. Test of Significant Toxicity (TST)

Aquatic toxicity test results shall be analyzed using the TEST OF SIGNIFICANT TOXICITY (TST) as described below in Steps 1 through 7, except for the survival ENDPOINT specified in the *Ceriodaphnia dubia* test method. For the survival ENDPOINT specified in the *Ceriodaphnia dubia* test method, calculate the PERCENT EFFECT as described in Section IV.B.1.d, and skip steps 1-7.

The TST is applicable for a data analysis of an IWC compared to a control. For assessing whether receiving waters meet the water quality objectives, the undiluted ambient water shall be used as the IWC.

Step 1: Conduct the aquatic toxicity test according to procedures in the appropriate test method manual, as described in Section IV.B.1.b.

Step 2: Determine if there is no variance in the ENDPOINT (i.e., determine if all REPLICATES in each concentration have the same exact RESPONSE).

If there is no variance in the ENDPOINT in both concentrations being compared, compute the PERCENT EFFECT, as described in Section IV.B.1.d.

If the PERCENT EFFECT at the IWC is $\geq$ the RMD, the sample is declared toxic and the test result is "*Fail.*" If the PERCENT EFFECT at the IWC is < the RMD, the sample is declared non-toxic and the test result is "*Pass.*" Skip steps 3-7.

If there is variance in the ENDPOINT in both concentrations being compared, follow Steps 3-7.

Step 3: Use the data to calculate the mean RESPONSE for the control and IWC. If the data consists of proportions from a binomial response variable (response/no response; live/dead), transform the data using the arcsine square root transformation before calculating the mean RESPONSE for the control and IWC.

The arcsine square root transformation is used for such data to stabilize the variance and satisfy the normality requirement. To conduct the arcsine square root transformation, the response proportion (RP) for each REPLICATE (e.g., percent survival, percent fertilization), expressed as a decimal fraction (where 1.00 = 100 percent) for each treatment, is first calculated:

$$RP = \frac{\text{Number of Organisms with Response}}{\text{Number of Organisms Exposed}}$$

The square root value of the response proportion is then arcsine transformed before calculating the mean RESPONSE and analysis in Step 4. Note: Excel and most statistical software packages can calculate arcsine square root values.

For $0 < RP < 1$

$$\text{Angle (in radians)} = \arcsin\left(\sqrt{(RP)}\right)$$

For $RP = 0$

$$\text{Angle (in radians)} = \arcsin\left(\sqrt{1/4n}\right)$$

Where n = number of ORGANISMS used for each REPLICATE

For $RP = 1$

$$\text{Angle} = \arcsin\left(\sqrt{1-(1/4n)}\right)$$

Where n = number of ORGANISMS used for each REPLICATE

Step 4: Conduct Welch's t-test (Zar 1996) using the following equation to obtain the calculated *t* value:

$$t = \frac{\overline{Y}_t - b \bullet \overline{Y}_c}{\sqrt{\frac{S_t^{\ 2}}{n_t} + \frac{b^2 S_c^{\ 2}}{n_c}}}$$

where:

$\overline{Y}_c$	=	Mean RESPONSE for the control
$\overline{Y}_t$	=	Mean RESPONSE for the IWC
S_c^2	=	Estimate of the variance for the control
S_t^2	=	Estimate of the variance for the IWC
n_c	=	Number of REPLICATES for the control
n_t	=	Number of REPLICATES for the IWC
b	=	0.75 for chronic tests; 0.80 for acute tests

(Note: b is equivalent to the RMD)

Note on the use of Welch's t-test: Welch's t-test is appropriate to use when there are an unequal number of REPLICATES between control and the IWC. When sample sizes of the control and treatment are the same (i.e., $n_t = n_c$), Welch's t-test is equivalent to the Student's t-test (Zar 1996).

Step 5: Adjust the degrees of freedom using the following equation:

$$v = \frac{\left(\frac{S_t^{\ 2}}{n_t} + \frac{b^2 S_c^{\ 2}}{n_c}\right)^2}{\frac{\left(\frac{S_t^{\ 2}}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^{\ 2}}{n_c}\right)^2}{n_c - 1}}$$

Using Welch's t-test, the degrees of freedom is the value obtained for *v* in the equation above. When *v* is a non-integer, round *v* to the next smallest integer, and that number is used as the degrees of freedom.

Step 6: Compare the calculated *t* value from Step 4 with the critical *t* value in Table 2 using the test method-specific alpha values shown in Table 1. To obtain the critical *t* value, look across the table for the alpha value that corresponds to the toxicity test method and then look down the table for the appropriate degrees of freedom.

Step 7: If the calculated *t* value is less than the critical *t* value, the NULL HYPOTHESIS is not rejected, and the test result is "fail." If the calculated *t* value is greater than the critical *t* value, the NULL HYPOTHESIS is rejected, and the test result is "pass".

Table 2. Critical values of the t-distribution; one tail probability is assumed.

α Error					
Degrees of Freedom (v)	0.25	0.20	0.15	0.10	0.05
1	1	1.3764	1.9626	3.0777	6.3138
2	0.8165	1.0607	1.3862	1.8856	2.92
3	0.7649	0.9785	1.2498	1.6377	2.3534
4	0.7407	0.941	1.1896	1.5332	2.1318
5	0.7267	0.9195	1.1558	1.4759	2.015
6	0.7176	0.9057	1.1342	1.4398	1.9432
7	0.7111	0.896	1.1192	1.4149	1.8946
8	0.7064	0.8889	1.1081	1.3968	1.8595
9	0.7027	0.8834	1.0997	1.383	1.8331
10	0.6998	0.8791	1.0931	1.3722	1.8125
11	0.6974	0.8755	1.0877	1.3634	1.7959
12	0.6955	0.8726	1.0832	1.3562	1.7823
13	0.6938	0.8702	1.0795	1.3502	1.7709
14	0.6924	0.8681	1.0763	1.345	1.7613
15	0.6912	0.8662	1.0735	1.3406	1.7531
16	0.6901	0.8647	1.0711	1.3368	1.7459
17	0.6892	0.8633	1.069	1.3334	1.7396
18	0.6884	0.862	1.0672	1.3304	1.7341
19	0.6876	0.861	1.0655	1.3277	1.7291
20	0.687	0.86	1.064	1.3253	1.7247
21	0.6864	0.8591	1.0627	1.3232	1.7207
22	0.6858	0.8583	1.0614	1.3212	1.7171
23	0.6853	0.8575	1.0603	1.3195	1.7139
24	0.6849	0.8569	1.0593	1.3178	1.7109
25	0.6844	0.8562	1.0584	1.3163	1.7081
26	0.684	0.8557	1.0575	1.315	1.7056
27	0.6837	0.8551	1.0567	1.3137	1.7033
28	0.6834	0.8546	1.056	1.3125	1.7011
29	0.683	0.8542	1.0553	1.3114	1.6991
30	0.6828	0.8538	1.0547	1.3104	1.6973
inf	0.6745	0.8416	1.0364	1.2816	1.6449

d. Percent Effect

The PERCENT EFFECT at the IWC shall be calculated for each ENDPOINT in an aquatic toxicity test. Calculate the PERCENT EFFECT at the IWC using untransformed data and the following equation:

$$\text{Percent Effect at the IWC} = \frac{\text{Mean Control Response} - \text{Mean IWC Response}}{\text{Mean Control Response}} \bullet 100$$

e. Reporting

Results obtained from toxicity tests shall be reported to the PERMITTING AUTHORITY as either a "pass" or a "fail," and the PERCENT EFFECT at the IWC. As provided in Section IV.B.1.c, the survival ENDPOINT for *Ceriodaphnia dubia* shall not be analyzed using the TST. Therefore, the results for the survival ENDPOINT for *Ceriodaphnia dubia* shall be reported only as a PERCENT EFFECT at the IWC, and not as a "pass" or a "fail."

The results and any required supporting data shall be submitted in the format specified by the PERMITTING AUTHORITY.

2. Implementation for Non-Storm Water NPDES Dischargers

The PERMITTING AUTHORITY shall include the requirements specified in this section (Section IV.B.2) for NPDES permits issued, reissued, or reopened after the effective date of these provisions for NON-STORM WATER NPDES DISCHARGERS. NON-STORM WATER NPDES DISCHARGERS that do not have an effluent discharge prior to permit issuance, renewal, or reopening (to address toxicity provisions) that is representative of the quality of the proposed discharge shall comply with the requirements in Section IV.B.2.j.

a. Species Sensitivity Screening

i. Non-Storm Water NPDES Dischargers Required to Conduct Species Sensitivity Screening for Chronic Toxicity

All NON-STORM WATER NPDES DISCHARGERS shall conduct a SPECIES SENSITIVITY SCREENING for chronic toxicity, prior to the first issuance, reissuance, or reopening (to address toxicity requirements) of the permit after the effective date of these toxicity provisions. The PERMITTING AUTHORITY may require a SPECIES SENSITIVITY SCREENING for chronic toxicity prior to every subsequent issuance, reissuance, or reopening (to address toxicity requirements) of the permit. At a minimum, a SPECIES SENSITIVITY SCREENING shall be conducted no less than once every ten years.

ii. Non-Storm Water NPDES Dischargers Required to Conduct Species Sensitivity Screening for Acute Toxicity.

Except for PUBLICLY OWNED TREATMENT WORKS (POTW) dischargers, all NON-STORM WATER NPDES DISCHARGERS shall conduct a SPECIES SENSITIVITY SCREENING for acute toxicity, prior to the first issuance, reissuance, or reopening (to address toxicity requirements) of the permit after the effective date of these toxicity provisions. The PERMITTING AUTHORITY may require a SPECIES SENSITIVITY SCREENING for acute toxicity prior to every subsequent issuance, reissuance, or reopening (to address toxicity requirements) of the permit. At a minimum, a SPECIES SENSITIVITY SCREENING shall be conducted no less than once every ten years.

For POTW dischargers, the PERMITTING AUTHORITY may, in its discretion, require a SPECIES SENSITIVITY SCREENING for acute toxicity. This determination must be documented in the NPDES fact sheet (or equivalent document).

iii. Type and Frequency of Testing in a Species Sensitivity Screening

A SPECIES SENSITIVITY SCREENING for chronic toxicity includes four sets of testing conducted within one year, each set of testing consisting of, at a minimum, one vertebrate, one invertebrate, and one aquatic plant. For CONTINUOUS DISCHARGERS, the four sets of testing shall be conducted over four consecutive quarters. For NON-CONTINUOUS DISCHARGERS, the four sets of testing shall be evenly distributed across the CALENDAR YEAR to the extent feasible.

A SPECIES SENSITIVITY SCREENING for acute toxicity includes four sets of testing conducted within one year, each set of testing consisting of, at a minimum, one vertebrate and one invertebrate. For CONTINUOUS DISCHARGERS, the four sets of testing shall be conducted over four consecutive quarters. For NON-CONTINUOUS DISCHARGERS, the four sets of testing shall be evenly distributed across the CALENDAR YEAR to the extent feasible.

For seasonal and intermittent dischargers, testing in a specific SPECIES SENSITIVITY SCREENING can be conducted using effluent that is not discharged into surface waters (e.g., effluent discharged onto land because of summer prohibition on discharges into surface waters, etc.) as long as the effluent is representative of the effluent that will be discharged to surface waters.

iv. Determination of the Most Sensitive Species

The PERMITTING AUTHORITY should generally select the species exhibiting the highest PERCENT EFFECT at the IWC as the MOST SENSITIVE SPECIES. The PERMITTING AUTHORITY may specify a different species as the MOST SENSITIVE SPECIES including for example when the discharger encounters unresolvable test interference or cannot secure a reliable supply of test organisms.

For dischargers granted a MIXING ZONE, the PERMITTING AUTHORITY may direct that a higher concentration of effluent than the IWC be used for SPECIES SENSITIVITY SCREENING to increase the likelihood that potential effects might be observed.

The PERMITTING AUTHORITY shall specify the MOST SENSITIVE SPECIES and IWC in the NPDES permit. The selection of the MOST SENSITIVE SPECIES must be documented in the NPDES fact sheet (or equivalent document).

b. Reasonable Potential

If a REASONABLE POTENTIAL analysis is required pursuant to this section, a REASONABLE POTENTIAL analysis shall be conducted prior to every permit issuance, reissuance, or reopening (to address toxicity requirements).

i. Non-Storm water NPDES Dischargers Required to Conduct Reasonable Potential Analysis for Chronic Toxicity.

Except for POTW dischargers authorized to discharge at a rate equal to or greater than 5.0 MGD, all NON-STORM WATER NPDES DISCHARGERS shall conduct a REASONABLE POTENTIAL analysis for chronic toxicity, pursuant to the procedures specified in Section IV.B.2.b.iii. A REASONABLE POTENTIAL analysis for chronic toxicity is not required for POTW dischargers authorized to discharge at a rate equal to or greater than 5.0 MGD, because the PERMITTING AUTHORITY shall include an effluent limitation for these dischargers pursuant to Section IV.B.2.e.

ii. Non-Storm Water NPDES Dischargers Required to Conduct Reasonable Potential Analysis for Acute Toxicity.

Except for POTW dischargers, all NON-STORM WATER NPDES DISCHARGERS shall conduct a REASONABLE POTENTIAL analysis for acute toxicity, pursuant to the procedures in Section IV.B.2.b.iii. The PERMITTING AUTHORITY may require POTW dischargers to conduct a REASONABLE POTENTIAL analysis for acute toxicity, pursuant to the procedures in Section IV.B.2.b.iii.

iii. Reasonable Potential Analysis

All toxicity test data generated within five years prior to permit issuance, renewal, or reopening (to address toxicity provisions) that is representative of effluent quality during discharge conditions shall be evaluated in determining REASONABLE POTENTIAL. Data generated within those five years from a minimum of four tests conducted at the IWC must be analyzed using the TST. If this minimum data is unavailable, the PERMITTTING AUTHORITY shall require the discharger to conduct additional toxicity tests at the IWC and analyze the results using the TST. The PERMITTING AUTHORITY may also evaluate older toxicity test data to determine REASONABLE POTENTIAL.

A discharge has REASONABLE POTENTIAL to cause or contribute to an excursion above the chronic toxicity water quality objectives specified in Section III.B.2.a, if any of the CHRONIC

TOXICITY TESTS result in a “fail” at the IWC, or if any of the CHRONIC TOXICITY TESTS have a PERCENT EFFECT at the IWC greater than 10 percent.

A discharge has REASONABLE POTENTIAL to cause or contribute to an excursion above the acute toxicity water quality objectives specified in Section III.B.2.b, if any of the ACUTE TOXICITY TESTS result in a “fail” at the IWC, or if any of the ACUTE TOXICITY TESTS have a PERCENT EFFECT at the IWC greater than 10 percent.

Furthermore, other information or data, including, but not limited to, fish die off observation, lack of available dilution, or existing data on toxic POLLUTANTS, may be used by the PERMITTING AUTHORITY to determine if there is REASONABLE POTENTIAL to cause or contribute to an excursion above the toxicity water quality objectives specified in Section III.B.2.

The PERMITTING AUTHORITY’S determination that there is or is no REASONABLE POTENTIAL must be documented in the NPDES fact sheet (or equivalent document).

If a REASONABLE POTENTIAL analysis indicates no REASONABLE POTENTIAL for either chronic or acute toxicity, the PERMITTING AUTHORITY may include a reopener clause in the permit authorizing the PERMITING AUTHORITY to reopen the permit, reevaluate REASONABLE POTENTIAL, and add MAXIMUM DAILY EFFLUENT LIMITATIONS (MDEL) and MEDIAN MONTHLY EFFLUENT LIMITATIONS (MMEL), if warranted, after the evaluation of new data and information.

If a REASONABLE POTENTIAL analysis indicates there is REASONABLE POTENTIAL for the discharge to cause or contribute to an exceedance of either the chronic or the acute toxicity water quality objective, then the PERMITTING AUTHORITY shall include the corresponding MDEL and MMEL in the NPDES permit.

c. MDEL and MMEL Compliance Monitoring

All NON-STORM WATER NPDES DISCHARGERS that demonstrate REASONABLE POTENTIAL for chronic toxicity and all POTW dischargers that are authorized to discharge at a rate equal to or greater than 5.0 MGD shall conduct monitoring for compliance with the chronic toxicity MDEL and MMEL. All NON-STORM WATER NPDES DISCHARGERS that demonstrate REASONABLE POTENTIAL for acute toxicity shall conduct monitoring for compliance with the acute toxicity MDEL and MMEL. The compliance monitoring for the MDEL and MMEL includes ROUTINE MONITORING and MMEL COMPLIANCE MONITORING.

Toxicity tests of the MOST SENSITIVE SPECIES conducted at the IWC and analyzed using the TST shall be used to determine compliance with the MDEL and MMEL. The PERMITTING AUTHORITY shall specify in the permit the specific type of testing (e.g. the MOST SENSITIVE SPECIES and the concentration of the IWC) that will be used to determine compliance with the chronic toxicity MDEL and MMEL and acute toxicity MDEL and MMEL, as applicable. The toxicity test in ROUTINE MONITORING and MMEL COMPLIANCE TESTS shall be the MOST SENSITIVE SPECIES toxicity test and shall be analyzed using the TST at the IWC.

The PERMITTING AUTHORITY shall specify the day of the month that corresponds to the start of a CALENDAR MONTH, and the day of the month and the month(s) that correspond to the start of the CALENDAR QUARTER, AND CALENDAR YEAR in a NPDES permit or Water Code section 13383 Order.

ROUTINE MONITORING and MMEL COMPLIANCE TESTS shall be conducted in accordance with this section. ROUTINE MONITORING and MMEL COMPLIANCE TESTS continues during any required TOXICITY REDUCTION EVALUATION (TRE). When there is no effluent available to initiate a ROUTINE MONITORING test or MMEL COMPLIANCE TEST(s), the test is not required and ROUTINE MONITORING continues in the frequency specified in the permit.

i. Routine Monitoring for Chronic Toxicity

(A) Routine Monitoring Schedule for Chronic Toxicity

For NON-STORM WATER NPDES DISCHARGERS authorized to discharge, at a rate equal to or greater than 5.0 MGD, the frequency of ROUTINE MONITORING shall be specified in the NPDES permit as follows:

"The discharger shall conduct at least one CHRONIC TOXICITY TEST every CALENDAR MONTH during which there is expected to be at least 15 days of continuous discharge. A sample for the ROUTINE MONITORING test shall be taken at a time that would allow corresponding MMEL COMPLIANCE TESTS to be initiated within the same CALENDAR MONTH as the ROUTINE MONITORING test. "

For NON-STORM WATER NPDES DISCHARGERS authorized to discharge at a rate less than 5.0 MGD, the frequency of ROUTINE MONITORING shall be specified in the NPDES permit as follows:

"The discharger shall conduct at least one CHRONIC TOXICITY TEST each CALENDAR QUARTER during which there is expected to be at least 15 days of continuous discharge. A sample for the ROUTINE MONITORING test shall be taken at a time that would allow corresponding MMEL COMPLIANCE TESTS to be initiated within the same CALENDAR MONTH as the ROUTINE MONITORING test. "

The PERMITTING AUTHORITY shall have the discretion to require NON-STORM WATER NPDES DISCHARGERS with MDEL and MMEL in their permit to conduct more frequent chronic toxicity ROUTINE MONITORING than that which is prescribed in this subsection. The PERMITTING AUTHORITY may approve a reduction in the frequency of ROUTINE MONITORING according to the requirements in Section IV.B.2.c.i.(B). At a minimum, a chronic toxicity ROUTINE MONITORING test shall be conducted at least once per CALENDAR YEAR. The rationale for requiring more frequent or reduced ROUTINE MONITORING must be documented in the NPDES fact sheet (or equivalent document) or Water Code section 13383 Order.

Consistent with the required frequency, the PERMITTING AUTHORITY has discretion to or not to specify the exact dates or time period in which a sample for ROUTINE MONITORING shall be taken (e.g. requirement to initiate test within five day of the start of the CALENDAR QUARTER, requirement to sample on the 15th of each month, etc.). To the extent feasible, ROUTINE MONITORING test shall be evenly distributed across the CALENDAR YEAR or period of seasonal or intermittent discharge.

(B) Reduced Routine Monitoring Schedule for Chronic Toxicity

The PERMITTING AUTHORITY may approve a reduction in the frequency of the ROUTINE MONITORING specified in Section IV.B.2.c.i.(A) for eligible dischargers upon reissuance, renewal, or reopening (to address toxicity requirements) of an NPDES permit when in the prior five consecutive years the following conditions have been met:

1) The MDEL and MMEL has not been exceeded;
2) The toxicity provisions in the NPDES Permit have been followed;
3) A treatment process change or facility upgrade has not occurred; and,
4) An additional industrial user, as defined in Code of Federal Regulations, title 40, section 403.3(j), has not been added to an approved wastewater treatment facility Pretreatment Program, as defined in Code of Federal Regulations, title 40, section 403.3(d) (as amended 70 FR 60191, Oct. 14, 2005).

The PERMITTING AUTHORITY may approve a reduced frequency ROUTINE MONITORING schedule from one CHRONIC TOXICITY TEST per CALENDAR MONTH, as required in Section IV.B.2.c.i.(A) to one per CALENDAR QUARTER. The PERMITTING AUTHORITY may approve a reduced frequency ROUTINE MONITORING schedule from one CHRONIC TOXICITY TEST per CALENDAR QUARTER, as required in Section IV.B.2.c.i.(A), to two CHRONIC TOXICITY TESTS per CALENDAR YEAR.

The PERMITTING AUTHORITY shall require eligible dischargers on an approved reduced frequency ROUTINE MONITORING schedule to return to a ROUTINE MONITORING schedule, as described in Section IV.B.2.c.i.(A), if the requirements listed above are not met. Upon returning to a ROUTINE MONITORING schedule described in Section IV.B.2.c.i.(A), eligible dischargers will need to, once again, meet the conditions 1-4 listed in this section to be granted another discretionary chronic toxicity ROUTINE MONITORING reduction.

The PERMITTING AUTHORITY may also approve a temporary reduction in the frequency of the ROUTINE MONITORING specified in Section IV.B.2.c.i.(A) for eligible dischargers conducting a TRE. When a discharger is conducting a TRE, the PERMITTING AUTHORITY may temporarily reduce ROUTINE MONITORING frequency to two CHRONIC TOXICITY TESTS per CALENDAR YEAR. The PERMITTING AUTHORITY shall require eligible dischargers under a temporary reduced frequency to return to a ROUTINE MONITORING schedule, as described in Section IV.B.2.c.i.(A), at the conclusion of the TRE or after one CALENDAR YEAR, whichever occurs sooner. Upon returning to a ROUTINE MONITORING

schedule described in Section IV.B.2.c.i.(A), eligible dischargers will need to meet the conditions 1-4 listed in this section to be granted a discretionary monitoring reduction.

ii. Routine Monitoring for Acute Toxicity

If REASONABLE POTENTIAL is demonstrated for acute toxicity, in accordance with the provisions specified in Section IV.B.2.b, the discharger shall conduct acute toxicity ROUTINE MONITORING in addition to any other required chronic toxicity ROUTINE MONITORING.

The monitoring period shall be specified in the NPDES permit and be at a frequency determined by the PERMITTING AUTHORITY but no less than once per CALENDAR YEAR. A ROUTINE MONITORING test shall be initiated at a time that would allow corresponding MMEL COMPLIANCE TESTS to be initiated within the same CALENDAR MONTH as the ROUTINE MONITORING test. The PERMITTING AUTHORITY has discretion to or not to specify the exact dates or time period in which a sample for ROUTINE MONITORING shall be taken (e.g. requirement to initiate test within five day of the start of the CALENDAR QUARTER, requirement to sample on the 15th of each month, etc.). To the extent feasible, ROUTINE MONITORING tests shall be evenly distributed across the CALENDAR YEAR or period of seasonal or intermittent discharge.

iii. Additional Routine Monitoring Tests for TRE Determination and Compliance

An additional ROUTINE MONITORING test shall be required when there is one violation of the MDEL or MMEL, but not two in a single CALENDAR MONTH. This additional ROUTINE MONITORING test is not required if the discharger is already conducting a TRE, or if the discharger is required to conduct ROUTINE MONITORING at a monthly frequency.

This additional ROUTINE MONITORING test is used to determine if a TRE is necessary. This additional ROUTINE MONITORING test is also used for compliance purposes, and could require MMEL COMPLIANCES TESTS.

This additional ROUTINE MONITORING test shall be conducted in the successive CALENDAR MONTH after the CALENDAR MONTH in which the MMEL or MDEL violation occurred.

When there is no effluent available to initiate this additional ROUTINE MONITORING test, this additional ROUTINE MONITORING test shall not be required, ROUTINE MONITORING continues in the frequency specified in the permit, and the PERMITTING AUTHORITY shall have discretion to require a TRE.

iv. MMEL Compliance Tests

If an acute or chronic toxicity ROUTINE MONITORING test results in a “fail” at the IWC, then NON-STORM WATER NPDES DISCHARGERS shall conduct a maximum of two MMEL COMPLIANCE TESTS. The MMEL COMPLIANCE TESTS shall be initiated within the same CALENDAR MONTH that the first ROUTINE MONITORING test was initiated that resulted in

the “fail” at the IWC. If the first chronic MMEL COMPLIANCE TEST results in a “fail” at the IWC, then the second MMEL COMPLIANCE TEST is waived.

d. Mixing Zones and Dilution Credits

The PERMITTING AUTHORITY may grant MIXING ZONES and DILUTION CREDITS to dischargers in accordance with the provisions of this section. The allowance of MIXING ZONES is discretionary and shall be determined on a discharge-by–discharge basis. A PERMITTING AUTHORITY may consider allowing MIXING ZONES and DILUTION CREDITS only for discharges with a physically identifiable point of discharge that are regulated through an NPDES permit issued by the PERMITTING AUTHORITY. The following conditions must be met in allowing a MIXING ZONE:

A MIXING ZONE shall not:

1) compromise the integrity of the entire water body;
2) cause lethality to AQUATIC LIFE passing through the MIXING ZONE;
3) restrict the passage of AQUATIC LIFE;
4) adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;
5) produce undesirable or nuisance AQUATIC LIFE;
6) result in floating debris, oil, or scum;
7) produce objectionable color, odor, taste, or turbidity;
8) cause OBJECTIONABLE BOTTOM DEPOSITS;
9) cause nuisance;
10) dominate the receiving water body or overlap a MIXING ZONE from different outfalls; or
11) be allowed at or near any drinking water intake. A MIXING ZONE is not a SOURCE OF DRINKING WATER. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (SWRCB Resolution No. 88-63), this determination supersedes the provisions of that policy.

If a PERMITTING AUTHORITY allows a MIXING ZONE and DILUTION CREDIT, the permit shall specify the method by which the MIXING ZONE was derived, the DILUTION RATIO calculated, the IWC granted, and the point(s) in the receiving water where the applicable objectives must be met. The application for the permit shall include, to the extent feasible, the information needed by the PERMITTING AUTHORITY to make a determination on allowing a MIXING ZONE, including the calculations for deriving the appropriate receiving water and effluent flows, and/or the results of a MIXING ZONE study. MIXING ZONE studies may include, but are not limited to, tracer studies, dye studies, modelling studies, and monitoring upstream and downstream of the discharge that characterize the extent of actual dilution.

When a MIXING ZONE and DILUTION CREDIT is granted by the PERMITTING AUTHORITY, the IWC is the concentration of effluent in the receiving water after mixing (the inverse of the DILUTION RATIO) as determined by the PERMITTING AUTHORITY. The PERMITTING AUTHORITY may set the IWC at a concentration of effluent greater than the inverse of the DILUTION RATIO in order to protect beneficial uses, or because of site-specific conditions. In no case, should the IWC be less than the inverse of the DILUTION RATIO. If no DILUTION CREDIT is granted for toxicity, then the undiluted effluent shall be used as the IWC.

The DILUTION RATIO shall be determined using the parameter specified in Table 3.

Table 3: Parameters for Calculating a Dilution Ratio

In Calculating A DILUTION RATIO For:	Use The Critical Low Flow Of The Upstream Receiving Water Of:	Use The Discharge Effluent Flow Of:
Acute Toxicity Objective	Lowest flow that occurs for one day with a statistical frequency of once every 10 years.	Maximum daily flow (i.e., the maximum flow sample of all samples collected in a calendar day) during period of discharge.
Chronic Toxicity Objective	The average low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years.	Four-day average of daily maximum flows (i.e., the average of daily maximums taken from the data set in four-day intervals.) during period of discharge.

e. Effluent Limitation Provisions

i. Chronic Toxicity Effluent Limitations

(C) Chronic Toxicity MDEL

Except when the MOST SENSITIVE SPECIES does not include the survival ENDPOINT or when *Ceriodaphnia dubia* is the MOST SENSITIVE SPECIES, the PERMITTING AUTHORITY shall include the following MDEL in the NPDES permit if REASONABLE POTENTIAL is demonstrated for chronic toxicity in accordance with the provisions specified in Section IV.B.2.b, or if a POTW is authorized to discharge at a rate equal to or greater than 5.0 MGD:

"No {MOST SENSITIVE SPECIES} CHRONIC TOXICITY TEST may result in a "fail" at the IWC for the survival ENDPOINT and a PERCENT EFFECT for the survival ENDPOINT greater than or equal to 50 percent."

If the MOST SENSITIVE SPECIES CHRONIC TOXICITY TEST does not include the survival ENDPOINT, then the PERMITTING AUTHORITY shall include the following MDEL:

"No {MOST SENSITIVE SPECIES} CHRONIC TOXICITY TEST may result in a "fail" at the IWC for any ENDPOINT measured in the test and a PERCENT EFFECT for that ENDPOINT greater than or equal to 50 percent."

If *Ceriodaphnia dubia* is the MOST SENSITIVE SPECIES, then the PERMITTING AUTHORITY shall include the following MDEL:

"No *Ceriodaphnia dubia* CHRONIC TOXICITY TEST may result in PERCENT EFFECT for the survival ENDPOINT greater than or equal to 50 percent."

The PERMITTING AUTHORITY shall specify the MOST SENSITIVE SPECIES and the IWC in the NPDES permit. A MDEL violation may require the implementation of a TRE in accordance with the provisions of Section IV.B.2.f.

(D) Chronic Toxicity MMEL

The PERMITTING AUTHORITY shall include the following MMEL in the NPDES permit if REASONABLE POTENTIAL is demonstrated for chronic toxicity in accordance with the provisions specified in Section IV.B.2.b, or if a POTW is authorized to discharge at a rate equal to or greater than 5.0 MGD:

"No more than one {MOST SENSITIVE SPECIES} CHRONIC TOXICITY TEST initiated in a CALENDAR MONTH may result in a "fail" at the IWC for any ENDPOINT.

Two or more MOST SENSITIVE SPECIES CHRONIC TOXICITY TESTS initiated in a CALENDAR MONTH resulting in a "fail" at the IWC for any ENDPOINT is a violation of the MMEL."

The PERMITTING AUTHORITY shall specify the MOST SENSITIVE SPECIES and the IWC in the NPDES permit. A MMEL violation may require the implementation of a TRE, in accordance with the provisions of Section IV.B.2.f.

ii. Acute Toxicity Effluent Limitations

(E) Acute Toxicity MDEL

THE PERMITTING AUTHORITY shall include the following MDEL in the NPDES permit if REASONABLE POTENTIAL is demonstrated for acute toxicity:

"No {MOST SENSITIVE SPECIES} ACUTE TOXICITY TEST may result in a "fail" at the IWC for the survival ENDPOINT and a PERCENT EFFECT for the survival ENDPOINT greater than or equal to 50 percent."

The PERMITTING AUTHORITY shall specify the MOST SENSITIVE SPECIES and the IWC in the NPDES permit. A MDEL violation may require the implementation of a TRE in accordance with the provisions of Section IV.B.2.f.

(F) Acute Toxicity MMEL

THE PERMITTING AUTHORITY shall include the following MMEL in the NPDES permit if REASONABLE POTENTIAL is demonstrated for acute toxicity in accordance with the provisions specified in Section IV.B.2.b:

"No more than one {MOST SENSITIVE SPECIES} ACUTE TOXICITY TEST initiated in a CALENDAR MONTH may result in a "fail" at the IWC for the survival ENDPOINT.

Two or more MOST SENSITIVE SPECIES ACUTE TOXICITY TESTS initiated in a CALENDAR MONTH resulting in a "fail" at the IWC for the survival ENDPOINT is a violation of the MMEL."

The PERMITTING AUTHORITY shall specify the MOST SENSITIVE SPECIES and the IWC in the NPDES permit. An MMEL violation may require the implementation of a TRE, in accordance with the provisions of Section IV.B.2.f.

f. Toxicity Reduction Evaluation

A TRE is required when a NON-STORM WATER NPDES DISCHARGER has any combination of two or more MDEL or MMEL violations within a single CALENDAR MONTH or within two successive CALENDAR MONTHS. In addition, if other information indicates toxicity (e.g., results of additional monitoring, fish kills, or intermittent recurring toxicity, etc.), then the PERMITTING AUTHORITY shall have discretion to require a TRE.

The discharger shall conduct a TRE in accordance with a TRE Work Plan as approved by the PERMITTING AUTHORITY. When TREs are required of multiple dischargers, the dischargers may coordinate the TREs with the approval of the PERMITTING AUTHORITY. ROUTINE MONITORING, as specified in Section IV.B.2.c, shall continue during a TRE.

g. Flow-Through Acute Toxicity Testing Systems

The PERMITTING AUTHORITY may require additional toxicity compliance provisions in the NPDES permit specific to FLOW-THROUGH ACUTE TOXICITY TESTING SYSTEMS, including but not limited to additional effluent limitations or additional monitoring requirements. For existing flow through systems that are not amendable to use of the TST, the PERMITTING AUTHORITY shall specify the statistical analysis and ENDPOINT (e.g., fail/pass, no observed effect concentration (NOEC), etc.). These additional requirements do not substitute toxicity provisions in Section IV.B.2.

If the PERMITTING AUTHORITY requires monitoring with FLOW-THROUGH ACUTE TOXICITY TESTING SYSTEMS constructed after the effective date of these toxicity provisions, those FLOW-THROUGH ACUTE TOXICITY TESTING SYSTEMS shall be designed to facilitate analysis of results using the TST, and the PERMITTING AUTHORITY shall require analysis of results to be conducted using the TST.

h. Additional Monitoring

In addition to effluent limitation compliance monitoring and monitoring specific to FLOW-THROUGH ACUTE TOXICITY TESTING SYSTEMS, the PERMITTING AUTHORITY has the discretion to require dischargers to conduct additional toxicity testing. This testing can include, but is not limited to the following, special studies, additional test species, testing with additional dilutions or higher concentrations of effluent than the IWC, or using test species not included in Table 1 of Section IV.B.1.b The PERMITTING AUTHORITY can require this testing in an NPDES permit or a Water Code section 13383 Order. The rationale for requiring additional monitoring must be documented in the NPDES fact sheet (or equivalent document) or Water Code section 13383 Order.

The PERMITTING AUTHORITY shall specify in the permit the specific type of testing (e.g. the MOST SENSITIVE SPECIES and the concentration of the IWC) that will be used to determine compliance with the MDEL and MMEL. To the extent any of the additional monitoring described above requires the use of receiving water, different species, different effluent concentrations than the IWC, or different test methods, that monitoring cannot be used to determine compliance with toxicity effluent limitations.

i. Violation Reporting

All toxicity tests of the MOST SENSITIVE SPECIES at the IWC shall be used for determining compliance with any toxicity MDEL or MMEL contained in the discharger's permit. NON-STORM WATER DISCHARGERS shall notify the PERMITTING AUTHORITY of a violation of a toxicity MDEL or MMEL as soon as the discharger learns of the violation but no later than 24 hours of the discharger receiving the monitoring results.

j. Non-Storm Water NPDES Dischargers with Non-Representative Effluent Discharge Prior To Permit Issuance, Renewal, or Reopening

NON-STORM WATER NPDES DISCHARGERS that do not have an effluent discharge prior to permit issuance, renewal, or reopening (to address toxicity provisions) that is representative of the quality of the proposed discharge shall conduct a SPECIES SENSITIVITY SCREENING, as described in Section IV.B.2.a, within the first CALENDAR YEAR of effluent discharge. The PERMITTING AUTHORITY shall include a reopener clause in the permit requiring the PERMITTING AUTHORITY to reopen the permit after the first CALENDAR YEAR, to add ROUTINE MONITORING, in accordance with Section IV.B.2.c, of the MOST SENSITIVE SPECIES test as determined in the SPECIES SENSITIVITY SCREENING. The reopener clause shall also require the PERMITTING AUTHORITY to evaluate REASONABLE POTENTIAL. The PERMITTING AUTHORITY shall otherwise include the requirements in Section IV.B.2 when the NPDES permit is reopened.

k. Toxicity Provisions Exceptions

i. Small Disadvantaged Communities

The PERMITTING AUTHORITY is authorized to exempt POTWs only serving SMALL DISADVANTAGED COMMUNITIES from some or all of the provisions of Section IV.B.2 if the PERMITTING AUTHORITY makes a finding that the discharge will have no REASONABLE POTENTIAL to cause or contribute to an exceedance of the toxicity water quality objectives. The REASONABLE POTENTIAL conclusion necessary to exempt INSIGNIFICANT DISCHARGES need not be based on the REASONABLE POTENTIAL analysis methods set forth in Section IV.B.2.b. For POTWs only serving SMALL DISADVANTAGED COMMUNITIES that do not have an effluent discharge prior to permit issuance, renewal, or reopening (to address toxicity provisions) that is representative of the quality of the proposed discharge, the PERMITTING AUTHORITY is authorized to make this determination and exempt the POTW only after the first year of effluent discharge.

If exempt, the PERMITTING AUTHORITY shall include the water quality objectives in Section III.B.2 as a receiving water limitation in the NPDES permit and the PERMITTING AUTHORITY shall have the discretion to assign ROUTINE MONITORING as necessary. ROUTINE MONITORING schedules for POTWs only serving SMALL DISADVANTAGED COMMUNITIES shall not exceed the applicable frequency specified in Section IV.B.2.c for the discharger's authorized rate of discharge.

ii. Insignificant Discharges

The PERMITTING AUTHORITY is authorized to exempt certain NON-STORM WATER NPDES DISCHARGERS from some or all of the provisions of Section IV.B.2 if the PERMITTING AUTHORITY makes a finding that the discharge will have no REASONABLE POTENTIAL to cause or contribute to an exceedance of the toxicity water quality objectives. The REASONABLE POTENTIAL conclusion necessary to exempt INSIGNIFICANT DISCHARGES need not be based on the REASONABLE POTENTIAL analysis methods set forth in Section IV.B.2.b.

If exempt, the PERMITTING AUTHORITY shall include the water quality objectives in Section III.B.2 as a receiving water limitation in the NPDES permit and the PERMITTING AUTHORITY shall have the discretion to assign ROUTINE MONITORING as necessary. ROUTINE MONITORING schedules for INSIGNIFICANT DISCHARGES shall not exceed the applicable frequency specified in Section IV.B.2.c for the discharger's authorized rate of discharge.

3. Implementation for Storm water Dischargers Regulated Pursuant to NPDES Permits

For all storm water dischargers with existing chronic or acute toxicity monitoring requirements with test methods described in Section IV.B.1.b, the PERMITTING AUTHORITY shall issue Water Code section 13383 Orders within one year of the effective date of these toxicity

provisions that requires the toxicity testing, analysis, and reporting to be conducted in accordance with Section IV.B.1.c, IV.B.1.d, & IV.B.1.e commencing within one year from the date of the Order.

If, after the effective date of these toxicity provisions, the PERMITTING AUTHORITY issues new or reissued chronic or acute toxicity monitoring requirements with test methods described in Section IV.B.1.b then the PERMITTING AUTHORITY shall require the toxicity testing, analysis, and reporting to be conducted in accordance with Section IV.B.1.c, IV.B.1.d, & IV.B.1.e.

The PERMITTING AUTHORITY shall have discretion to require tests methods not described in Section IV.B.1.b, to the extent not required by federal law. This determination must be documented in the NPDES fact sheet (or equivalent document) or Water Code section 13383 Order. Multi-concentration testing is not required except to the extent required by federal law or specified by the PERMITTING AUTHORITY.

4. Implementation for Nonpoint Source Dischargers Required to Monitor Toxicity

For all NONPOINT SOURCE dischargers with existing chronic or acute toxicity monitoring requirements with test methods described in Section IV.B.1.b, the PERMITTING AUTHORITY shall issue a Water Code section 13267 Order within one year of the effective date of these toxicity provisions that requires the toxicity testing, analysis, and reporting to be conducted in accordance with Section IV.B.1.c, IV.B.1.d, and IV.B.1.e, commencing within one year from the date of the Order.

If, after the effective date of these toxicity provisions, the PERMITTING AUTHORITY issues new or renewed chronic or acute toxicity monitoring requirements with test methods described in Section IV.B.1.b, then the PERMITTING AUTHORITY shall require the toxicity testing, analysis, and reporting to be conducted in accordance with Section IV.B.1.c, IV.B.1.d, & IV.B.1.e.

The PERMITTING AUTHORITY shall have discretion to require tests methods not described in Section IV. B.1.b, to the extent not required by federal law. This determination must be documented in the WDR (or equivalent document) or Water Code section 13267 Order. Multi-concentration testing is not required except to the extent required by federal law or specified by the PERMITTING AUTHORITY.

5. Variances and Exceptions to the Toxicity Water Quality Objectives

a. Waters of the U.S.

The PERMITTING AUTHORITY may, in compliance with CEQA, and subsequent to a public hearing, grant a variance to the numeric and narrative water quality objectives for toxicity. Water quality standard variances are subject to review and approval of the U.S. EPA, in accordance

with Code of Federal Regulations, Title 40, section 131.14. {Note: This paragraph or similar provision may be added as part of an earlier amendment to the ISWEBE}

b. Waters of the State (That are not also Waters of the U.S.)

The PERMITTING AUTHORITY may, after compliance with CEQA, allow short-term or seasonal exceptions from meeting numeric and narrative water quality objectives for toxicity if determined to be necessary to implement control measures for resource or pest management (i.e., vector or weed control, pest eradication, or fishery management) conducted by public entities.

The discharger shall notify potentially affected members of the public and governmental agencies. Also, the discharger shall submit to the PERMITTING AUTHORITY all of the following:

1) A detailed description of the proposed action, including the proposed method of completing the action;
2) A time schedule;
3) A discharge and receiving water quality monitoring plan (before project initiation, during the project, and after project completion, with the appropriate quality assurance and quality control procedures);
4) CEQA documentation;
5) Contingency plans;
6) Identification of alternate water supply (if needed); and
7) Residual waste disposal plans.

Additionally, upon completion of the project, the discharger shall provide certification by a QUALIFIED BIOLOGIST that the receiving water beneficial uses have been restored.

APPENDIX A: Glossary

ACUTE TOXICITY TEST: A test to determine an adverse effect (usually lethality) on a group of test organisms during a short-term exposure (e.g. 24, 48, or 96 hours).

ALTERNATIVE HYPOTHESIS: A statement used to propose a statistically significant relationship in a set of given observations. Under the TST approach, when the NULL HYPOTHESIS is rejected, the ALTERNATIVE HYPOTHESIS is accepted in its place, indicating a relationship between variables and an acceptable level of toxicity.

AQUATIC LIFE: Aquatic life refers to aquatic organisms such as BENTHIC invertebrates, shellfish, sport fish, and finfish.

CALENDAR MONTH: A period of time from a day of one month to the corresponding day of the next month if such exists, or if not to the last day of the next month (as from January 3 to February 3 or from January 31 to February 29). For purposes of measuring compliance with the MMEL only (Section IV.B.2.e), for dischargers that conduct ROUTINE MONITORING at a less than monthly frequency, CALENDAR MONTH means 30 days from the initiation of the ROUTINE MONITORING test.

CALENDAR QUARTER: A period of time defined as three successive CALENDAR MONTHS.

CALENDAR YEAR: A period of time defined as twelve consecutive CALENDAR MONTHS.

CHRONIC TOXICITY TEST: A test to determine an adverse effect (sub-lethal or lethal) on a group of test organisms during an exposure of duration long enough to assess sub-lethal effects.

CONTINUOUS DISCHARGERS: Facilities that discharge without interruption throughout its operating hours, except for infrequent shutdowns for maintenance, process changes, or other similar activities, and that discharge throughout the CALENDAR YEAR.

DILUTION RATIO: The critical low flow of the upstream receiving water divided by the flow of the effluent discharged.

DILUTION CREDIT: The amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified MIXING ZONE. It is calculated from the DILUTION RATIO or determined through conducting a MIXING ZONE study or modeling of the discharge and receiving water.

ENCLOSED BAYS: Indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. ENCLOSED BAYS include all bays where the narrowest distance between headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. This definition includes, but is not limited to:

Humboldt Bay, Bodega Harbor, Tomales Bay, Drakes Estero, San Francisco Bay, Morro Bay, Los Angeles Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay.

ENDPOINT: An effect that is measured in a toxicity study or field survey. These particular effects are selected because they are biologically significant. ENDPOINTs in toxicity tests may include, but are not limited to, survival, reproduction, and growth.

ESTUARIES: Waters at the mouths of streams that serve as MIXING ZONES for fresh and OCEAN WATERS during a major portion of the year. Mouths of streams that are temporarily separated from the ocean by sandbars shall be considered as ESTUARIES. Estuarine waters will generally be considered to extend from a bay or the open ocean to the upstream limit of tidal action, but it may be considered to extend seaward if significant mixing of fresh and salt water occurs in the open coastal waters. The waters described by this definition include, but are not limited to, the Sacramento-San Joaquin Delta as defined by Water Code section 12220, Suisun Bay, Carquinez Strait downstream to Carquinez Bridge, and appropriate areas of the Smith, Klamath, Mad, Eel, Noyo, and Russian Rivers.

FLOW-THROUGH ACUTE TOXICITY TESTING SYSTEMS: A toxicity testing system where an effluent sample is either pumped continuously from the sampling point directly to a dilutor system, or collected and placed in a tank adjacent to the test laboratory and pumped continuously from the tank to a dilutor system.

INLAND SURFACE WATERS: All surface waters of the state (including waters of the United States) that do not include the ocean, ENCLOSED BAYS, or ESTUARIES.

INSIGNIFICANT DISCHARGES: NPDES discharges that are determined to be a very low threat to water quality by the PERMITTING AUTHORITY.

INSTREAM WASTE CONCENTRATION (IWC): The concentration of effluent in the receiving water after mixing (the inverse of the dilution ratio) as determined by the PERMITTING AUTHORITY. If no MIXING ZONE is allocated, then the undiluted effluent shall be used as the IWC. For assessing whether receiving waters meet the water quality objectives, the undiluted ambient water shall be used as the IWC in the TEST OF SIGNIFICANT TOXICITY (TST) as indicated in Section IV.B.1.c.

MAXIMUM DAILY EFFLUENT LIMITATIONS (MDEL): For the purposes of chronic and acute aquatic toxicity, an MDEL is an effluent limit based on the outcome of the TEST OF SIGNIFICANT TOXICITY (TST) approach and the resulting PERCENT EFFECT at the IWC, as described in Section IV.B.2.e.

MEDIAN MONTHLY EFFLUENT LIMITATIONS (MMEL): For the purposes of chronic and acute aquatic toxicity, an MMEL is an effluent limit based on a maximum of three independent toxicity tests, analyzed using the TST, as described in Section IV.B.2.e.

MMEL COMPLIANCE TESTS: For the purposes of chronic and acute aquatic toxicity, MMEL COMPLIANCE TESTS are a maximum of two tests that are used in addition to the ROUTINE MONITORING test to determine compliance with the chronic and acute toxicity MMEL.

MIXING ZONE: A limited zone within a receiving water that is allocated for mixing with a wastewater discharge where a water quality objective can be exceeded without causing adverse effects to the overall water body.

MOST SENSITIVE SPECIES: The single species from an array of test organisms to be used in a single species laboratory test series to determine toxic effects of effluent or ambient water.

NON-CONTINUOUS DISCHARGERS: Facilities that do not discharge in a continuous manner or do not discharge throughout the CALENDAR YEAR (e.g. intermittent and seasonal dischargers).

NON-STORM WATER NPDES DISCHARGERS: Dischargers that are regulated pursuant to one or more NPDES permit(s), but excluding any discharges subject to 33 U.S.C. §1342(p).

NONPOINT SOURCES: Sources that do not meet the definition of a POINT SOURCE, as defined below.

NULL HYPOTHESIS: A statement used in statistical testing that has been put forward either because it is believed to be true or because it is to be used as a basis for argument, but has not been proved.

OBJECTIONABLE BOTTOM DEPOSITS: An accumulation of materials or substances on or near the bottom of a water body, which creates conditions that adversely impact AQUATIC LIFE, human health, beneficial uses, or aesthetics. These conditions include, but are not limited to, the accumulation of POLLUTANTS in the sediments and other conditions that result in harm to BENTHIC organisms, production of food chain organisms, or fish egg development. The presence of such deposits shall be determined by the PERMITTING AUTHORITY on a case-by-case basis.

OCEAN WATERS: Territorial marine waters of the state, as defined by California law, to the extent these waters are outside of ENCLOSED BAYS, ESTUARIES. Discharges to OCEAN WATERS are regulated in accordance with the State Water Board's California Ocean Plan.

PERCENT EFFECT: The value that denotes the difference in RESPONSE between the test concentration and the control, divided by the mean control RESPONSE, and multiplied by 100.

PERMITTING AUTHORITY: The State Water Board or a regional water board that issues a permit, waste discharge requirements, water quality certification, or other authorization for the discharge or proposed discharge of waste.

POINT SOURCE: Any discernible, confined and discrete conveyance including, but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which

POLLUTANTS are or may be discharged. This term does not include agricultural storm water discharges and return flows from irrigated agriculture.

POLLUTANT: Defined in section 502(6) of the CWA as "dredged spoil, solid waste, incinerator residue, filter backwash, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt and industrial, municipal, and agricultural waste discharged into water."

PUBLICLY OWNED TREATMENT WORKS (POTW): Facilities owned by a state or municipality that store, treat, recycle, and reclaim municipal sewage or industrial wastes of a liquid nature. Similar facilities that are privately, instead of publicly owned, are included in this definition for purposes of Section IV.B.

QUALIFIED BIOLOGIST: A biologist who has the knowledge and experience in the ecosystem where the resource or pest management control measure is implemented so that he or she can adequately evaluate whether the beneficial uses of the receiving waters have been protected and/or restored upon completion of the project.

REASONABLE POTENTIAL: A designation used for a waste discharge that is projected or calculated to cause or contribute to an excursion above a water quality standard.

REGULATORY MANAGEMENT DECISION (RMD): The decision that represents the maximum allowable error rates and thresholds for chronic and acute aquatic toxicity (and non-toxicity) that would result in an acceptable risk to AQUATIC LIFE.

REPLICATES: Two or more independent organism exposures of the same treatment (i.e. effluent concentration) within an aquatic toxicity test. REPLICATES are typically conducted with separate test chambers and test organisms, each having the same effluent concentration.

RESPONSE: The measured change in biological ENDPOINT(s) (e.g. survival, growth, and reproduction) to a stimulus as determined in a toxicity test method. RESPONSES from the control and the IWC are quantified using statistical approaches to determine if toxicity is present.

ROUTINE MONITORING: Required monitoring that occurs during a permit term. For purposes of Section IV.B.2, ROUTINE MONITORING refers to the required toxicity testing described in Section IV.B.2.c, and is used to determine violations of the MDEL, and is used with MMEL COMPLIANCE TESTS to determine violations of the MMEL.

SMALL DISADVANTAGED COMMUNITIES: Municipalities with populations of 20,000 persons or less, or a reasonably isolated and divisible segment of a larger municipality encompassing 20,000 persons or less, with an annual median household income that is less than 80 percent of the statewide annual median household income.

SPECIES SENSITIVITY SCREENING: An analysis to determine the single MOST SENSITIVE SPECIES from an array of test organisms to be used in a single species laboratory test series.

SOURCE OF DRINKING WATER: Any water designated as municipal or domestic supply (MUN) in a RWQCB basin plan.

STORM WATER: Same meaning set forth in 40 Code of Federal Regulations section 122.26(b)(13) (Nov. 16, 1990).

TEST OF SIGNIFICANT TOXICITY (TST): A statistical approach used to analyze aquatic toxicity test data, as described in Section IV.B.1.c.

TOXICITY REDUCTION EVALUATION (TRE): A study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. A TIE may be required as part of the TRE, if appropriate.

WILDLIFE: All tetrapod vertebrates, including amphibians, reptiles, birds, and mammals, (inclusive of marine mammals).

APPENDIX B: Examples of Compliance Determination for Toxicity Effluent Limitations

Chronic *Ceriodaphnia dubia* reproduction test

Replicate/Statistic	Control	IWC
1	29	31
2	38	28
3	31	25
4	34	28
5	36	22
6	35	21
7	30	27
8	31	26
9	36	29
10	34	30
Mean	33.4	26.7
Standard Deviation	2.989	3.268
# of REPLICATES (n)	10	10

Step 1: Transform data with arcsine square root transformation if applicable (not necessary for this type of data).

Step 2: Conduct Welch's t-test.

$$t = \frac{\overline{Y_t} - b \times \overline{Y_c}}{\sqrt{\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}}} = \frac{26.7 - (0.75 \times 33.4)}{\sqrt{\frac{10.68}{10} + \frac{(0.75)^2\ (8.93)}{10}}} = 1.32$$

Step 3: Adjust the degrees of freedom.

$$v = \frac{\left(\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}\right)^2}{\frac{\left(\frac{S_t^2}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^2}{n_c}\right)^2}{n_c - 1}} = \frac{\left(\frac{10.68}{10} + \frac{(0.75)^2 (8.93)}{10}\right)^2}{\frac{\left(\frac{10.68}{10}\right)^2}{10 - 1} + \frac{\left(\frac{(0.75)^2\ (8.93)}{10}\right)^2}{10 - 1}} = 15$$

Step 4: Compare the calculated t-value with the critical t-value:

Given 15 degrees of freedom and an alpha level set at 0.20, the critical t-value = 0.87 (obtained from Table 2 in this Policy).

Step 5: 1.32 > 0.87 = pass

Step 6: Calculate the PERCENT EFFECT at the IWC

$$\%\,\text{Effect at IWC} = \frac{33.4 - 26.7}{33.4} \bullet 100 = 20.1\%$$

Conclusion: This test result would be in compliance with the MDEL and the MMEL.

Acute fish survival test

Replicate/Statistic	Control	IWC

1	10	10
2	10	8
3	10	9
4	10	8
Mean	10	8.75
Standard Deviation	0.000	0.958
# of REPLICATES (n)	4	4

Step 1: Transform data with arcsine square root transformation if applicable.

Replicate/Statistic	Control	Treatment
1	1.412	1.412
2	1.412	1.107
3	1.412	1.249
4	1.412	1.107
Mean	1.412	1.219
Standard Deviation	0.000	0.145
# of REPLICATES (n)	4	4

Step 2: Conduct Welch's t-test.

$$t = \frac{\overline{Y_t} - b \times \overline{Y_c}}{\sqrt{\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}}} = \frac{1.219 - (0.80 \times 1.412)}{\sqrt{\frac{0.021}{4} + \frac{(0.80)^2\ (0.00)}{4}}} = 1.23$$

Step 3: Adjust the degrees of freedom.

$$v = \frac{\left(\frac{S_t^2}{n_t} + \frac{b^2 S_c^2}{n_c}\right)^2}{\frac{\left(\frac{S_t^2}{n_t}\right)^2}{n_t - 1} + \frac{\left(\frac{b^2 S_c^2}{n_c}\right)^2}{n_c - 1}} = \frac{\left(\frac{0.021}{4} + \frac{(0.80)^2 (0.00)}{4}\right)^2}{\frac{\left(\frac{0.021}{4}\right)^2}{4 - 1} + \frac{\left(\frac{(0.80)^2\ (0.00)}{4}\right)^2}{4 - 1}} = 3$$

Step 4: Compare the calculated t-value with the critical t-value:

Given 3 degrees of freedom and an alpha level set at 0.10, the critical t-value = 1.64 (obtained from Table 2in this Policy).

Step 5: 1.23 < 1.64 = fail

Step 6: Calculate the PERCENT EFFECT at the IWC.

$$\%\,\text{Effect at IWC} = \frac{10 - 8.75}{10} \bullet 100 = 12.5\%$$

Conclusion: This test result did not exceed the MDEL, but the discharger would need to conduct two additional tests to determine compliance with the MMEL. Dischargers that do not conduct these two additional tests would be in violation of the MMEL.