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Technical & Regulatory Affairs



December 21, 2018

Jeanie Townsend, Clerk of the Board
sent via email: commentletters@waterboards.ca.gov
State Water Resources Control Board
1001 I Street
Sacramento, California 95814

Subject Line: Comment Letter – Toxicity Provisions

Dear Ms. Townsend and Board Members,

The Western States Petroleum Association (WSPA) appreciates this opportunity to provide feedback to the State Water Resources Control Board (SWRCBB) on its draft proposed amendments to the “Water Quality Control Plan for Inland and Surface Waters, Enclosed Bays, State Board 2018a). WSPA is a non-profit trade association representing companies that explore for, produce, refine, transport and market petroleum, petroleum products, natural gas and other energy supplies in California and four other western states. WSPA’s consultant, Exponent reviewed the Toxicity Provisions and accompanying Staff Report (Staff Report) (State Board 2018b) and provides the following general and specific technical comments on the documents and related data. General comments are summarized below while more specific, detailed comments are enclosed as Exponent’s letter.

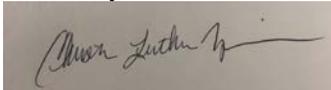
General Comments

1. The Toxicity Provisions should allow for dilution credits to be determined using tracer studies, dye studies, modelling studies, and/or monitoring upstream and downstream of the discharge, particularly for discharges to water bodies where methods employing the 1Q10 and 7Q10 are inappropriate.
2. The proposed language on dilution credits and mixing zones in the Toxicity Provisions is internally inconsistent and should be clarified.
3. The methods allowable for assessing storm water toxicity should be clarified in the Toxicity Provisions.
4. The Toxicity Provisions applicable to storm water should be revised to accommodate the irregular-frequency, short-duration nature of storm water events.
5. The Test of Significant Toxicity (TST) fails to consider the dose-response information from standard toxicity methods, and should be modified to allow that information to be considered in interpreting TST results.
6. Comments related to “test drive” dataset:
 - a. Test drive data used ambient samples of unknown toxicity rather than samples with known toxicity.
 - b. Response data should be expressed on a normalized or equivalent basis (e.g.,

- percent response) for ease of interpretation.
- c. Control and instream waste concentration (IWC) toxicity data from Source I are reported with unrealistically consistent high rates of survival and low rates of variability.
 - d. The number of data points and facilities in the test drive dataset are inconsistent.
 - e. *Ceriodaphnia dubia* reproduction tests were omitted from TST analysis.
 - f. The NOEC method appears sensitive to species factors unfamiliar to the air district or CARB to seek and be granted approval prior to reporting.
 - g. Additional time should be provided to evaluate the test drive data set.
7. It may not always be possible to fulfill the requirement for accelerated monitoring given laboratory analysis capacities and realistic turn-around times for decision making between the discharger and laboratory; extended timeframes should be allowed when necessary.
8. The Toxicity Provisions should direct the permitting authority to consider past toxicity data when evaluating reductions in toxicity monitoring frequency.
9. The Toxicity Provisions should clarify whether facilities with flow-through acute toxicity testing systems are exempt from additional acute toxicity testing including TST.
10. Rather than only using ambient receiving water for dilution to the IWC, SWRCB should allow for the use of laboratory water.
11. In the Toxicity Provisions, the reasonable potential procedures are flawed and give too much discretion to Regional Boards, which appears to be inconsistent with the State Board's aim of introducing a procedure that is consistent statewide and based on scientific data.
12. In the Toxicity Provisions, the discretion given to Regional Boards in the application of narrative toxicity water quality objectives is inconsistent with the State Board's aim of introducing consistent statewide application of toxicity objectives.

WSPA appreciates this opportunity to provide comments on the Toxicity Provisions and accompanying Staff Report. I welcome a response to this letter and can be reached at (661) 343-5753 or via e-mail at christine@wspa.org.

Sincerely,



enclosure

cc: Mr. Kevin Buchan, WSPA



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Dear Ms. Luther Zimmerman,

The California State Water Resources Control Board (State Board) recently issued draft proposed amendments to the “Water Quality Control Plan for Inland and Surface Waters, Enclosed Bays, and Estuaries of California” pertaining to aquatic toxicity (Toxicity Provisions) (State Board 2018a). Exponent reviewed the Toxicity Provisions and accompanying Staff Report (Staff Report) (State Board 2018b) and provides the following technical comments on the documents and related data:

1. The Toxicity Provisions should allow for dilution credits to be determined using tracer studies, dye studies, modelling studies, and/or monitoring upstream and downstream of the discharge, particularly for discharges to water bodies where methods employing the 1Q10 and 7Q10 are inappropriate.
2. The proposed language on dilution credits and mixing zones in the Toxicity Provisions is internally inconsistent and should be clarified.
3. The methods allowable for assessing storm water toxicity should be clarified in the Toxicity Provisions.
4. The Toxicity Provisions applicable to storm water should be revised to accommodate the irregular-frequency, short-duration nature of storm water events.
5. The Test of Significant Toxicity (TST) fails to consider the dose-response information from standard toxicity methods, and should be modified to allow that information to be considered in interpreting TST results.
6. Comments related to “test drive” dataset:
 - a. Test drive data used ambient samples of unknown toxicity rather than samples with known toxicity.
 - b. Response data should be expressed on a normalized or equivalent basis (e.g., percent response) for ease of interpretation.
 - c. Control and instream waste concentration (IWC) toxicity data from Source I are reported with unrealistically consistent high rates of survival and low rates of variability.
 - d. The number of data points and facilities in the test drive dataset are inconsistent.
 - e. *Ceriodaphnia dubia* reproduction tests were omitted from TST analysis.
 - f. The NOEC method appears sensitive to species.

- g. Additional time should be provided to evaluate the test drive data set.
7. It may not always be possible to fulfill the requirement for accelerated monitoring given laboratory analysis capacities and realistic turn-around times for decision making between the discharger and laboratory; extended timeframes should be allowed when necessary.
 8. The Toxicity Provisions should direct the permitting authority to consider past toxicity data when evaluating reductions in toxicity monitoring frequency.
 9. The Toxicity Provisions should clarify whether facilities with flow-through acute toxicity testing systems are exempt from additional acute toxicity testing including TST.
 10. Rather than only using ambient receiving water for dilution to the IWC, SWRCB should allow for the use of laboratory water.
 11. In the Toxicity Provisions, the reasonable potential procedures are flawed and give too much discretion to Regional Boards, which appears to be inconsistent with the State Board's aim of introducing a procedure that is consistent statewide and based on scientific data.
 12. In the Toxicity Provisions, the discretion given to Regional Boards in the application of narrative toxicity water quality objectives is inconsistent with the State Board's aim of introducing consistent statewide application of toxicity objectives.

Detailed comments are provided below.

- 1. The Toxicity Provisions should allow for dilution credits to be determined using tracer studies, dye studies, modelling studies, and/or monitoring upstream and downstream of the discharge, particularly for discharges to water bodies where methods employing the 1Q10 and 7Q10 are inappropriate.**

Page 20 of the Toxicity Provisions states that a dilution ratio—the physical parameter on the basis of which Regional Boards calculate dilution credits—“shall be determined using the parameters specified in Table 3.” Table 3 requires that dilution ratios pertaining to an acute toxicity objective be calculated using the “Lowest [receiving water] flow that occurs for one day with a statistical frequency of once every 10 years,”—the 1Q10—and those pertaining to a chronic toxicity objective be calculated using the “average [receiving water] low flow that occurs for seven consecutive days with a statistical frequency of once every 10 years”—the 7Q10.

However, these receiving water flow parameters would be inappropriate as the basis of a dilution ratio calculation in many of the state's waters. For example, in tidal estuaries, enclosed bays, and tidally-influenced rivers, the 1Q10 and 7Q10 are not the relevant parameters for characterizing available dilution for a discharge. Nevertheless, in many such cases the receiving water does provide substantial dilution potential that can be characterized in other ways, and the language on p. 20 of the provisions (regarding mixing

zone studies; see below) is consistent with proven, alternative methods for determining mixing zones and dilution credits. Although this language is included in the Toxicity Provisions, the provisions also state, “The DILUTION RATIO shall be determined using the parameters specified in Table 3” (i.e., the 1Q10 and 7Q10), which appears inconsistent with allowing studies for the calculation of mixing zones (State Board 2018a, p. 20). The language on p. 20 of the Toxicity Provisions should be harmonized with the use of alternate methods to determine mixing zones and dilution credits.

Similarly, dilution credits for storm water discharges—which should be allowed and included in the Toxicity Provisions, as they are for other kinds of discharges—cannot be calculated using the 1Q10 and 7Q10. By definition, dilution of storm water discharges occurs during high flow conditions.

Consistent with the provisions of U.S. Environmental Protection Agency (U.S. EPA) (1991), Exponent recommends the following modifications to the language on p. 20 of the Toxicity Provisions:

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 **and determining a dilution ratio**, including the calculations for deriving the appropriate receiving water and effluent flows, and/or the results of a MIXING ZONE study. MIXING ZONE studies **to characterize the mixing zone and dilution ratio** 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 (State Board 2018a, p. 20).

2. The proposed language on dilution credits and mixing zones in the Toxicity Provisions is internally inconsistent and should be clarified.

First, the Staff Report states, “a Regional Water Board may allow mixing zones and dilution credits for acute or chronic toxicity when sufficient capacity exists in the receiving waters for dilution and mixing zones” (State Board 2018b, p. 101), allowing that there exist *some* conditions under which a mixing zone for acute toxicity is permissible. The State’s SIP also allows for mixing zones for acute aquatic life criteria (State Board 2005 at p. 15). However, the Staff Report also states that mixing zones would not be allowed to cause “acutely toxic conditions to aquatic life passing through the mixing zone” (State Board 2018b, p. 101).

Exponent recommends that the provisions be clarified to allow the use of mixing zones for both acute and chronic toxicity (i.e., acute and chronic aquatic life criteria).

3. The methods allowable for assessing storm water toxicity should be clarified in the Toxicity Provisions.

Section IV.B.3 of the Toxicity Provisions describes requirements for applying the new provisions to storm water dischargers regulated under NPDES permits (State Board 2018a, p. 25). From that section, it is unclear whether the State Board plans to allow the use of non-40 CFR 136 methods for stormwater toxicity monitoring. If toxicity data are to be used to assess reasonable potential or permit compliance, 40 CFR 136-compliant methods should be used. In addition, the policy should be modified to allow the consideration of dose-response information in interpreting test results for storm water samples.

4. The Toxicity Provisions applicable to storm water should be revised to accommodate the irregular-frequency, short-duration nature of storm water events.

Storm water events in California typically occur with an irregular frequency. As a result, the type of planned regular-interval toxicity sampling and testing required of non-storm water discharges (e.g., described in section IV.B.2.c of the Toxicity Provisions) do not seem applicable to storm water toxicity sampling and testing. The State Board should provide additional clarity about the required methodology for storm water toxicity sampling and testing. Specifically, the State Board should provide guidance on what follow-up sampling may be required following a finding of toxicity in a storm water sample, as it may not be possible to collect follow-up sample(s) within 30 days of an exceedance.

This additional clarity should accommodate the fact that storm water events are typically relatively short in duration (e.g., on the order of hours). Specifically, Toxicity Provisions should clarify that if the discharge duration is shorter than the duration of a chronic exposure, chronic toxicity testing need not be performed.

5. The Test of Significant Toxicity (TST) fails to consider the dose-response information from standard toxicity methods, and should be modified to allow that information to be considered in interpreting TST results.

The Toxicity Provisions propose a statewide approach to analyzing Whole Effluent Toxicity (WET) data, including the TST method as developed by the U.S. EPA (U.S. EPA 2010). The TST method would take the place of the current methods (e.g., NOEC method, point estimation methods such as IC25).

Although the TST method would replace current statistical methods, dischargers would still be required to conduct toxicity tests following the methods in 40 CFR 136.3, which require that toxicity testing be performed using a dilution series (i.e., a control and a series of

samples of effluent at different levels of dilution). The 40 CFR 136.3 methods require testing on a dilution series because these methods employ the cornerstone of toxicological testing, which is the dose response relationship. The dose-response relationship provides data sufficient to characterize an organism's responses resulting from increasing concentrations. The dose-response methodology allows the establishment of sufficient trends and observations at intermediate concentrations and demonstrates their actual responses to the concentrations. In addition to providing an accurate endpoint for the toxicity testing, observing a consistent relationship trend between doses and responses provides a level of scientific quality assurance and offers the opportunity to assess aberrant responses that a single concentration can never provide.

U.S. EPA (2002a, 2002b, and 2002c), which are the toxicity test method manuals adopted at 40 CFR 136.3, give the following description of the methodology:

The tests recommended for use in determining discharge permit compliance in the NPDES program are multiconcentration, or definitive, tests which provide (1) a point estimate of effluent toxicity in terms of an IC₂₅, IC₅₀, or LC₅₀, or (2) a no-observed-effect-concentration (NOEC) defined in terms of mortality, growth, reproduction, and/or teratogenicity and obtained by hypothesis testing. The tests may be static renewal or static non-renewal.

The tests consist of a control and a minimum of five effluent concentrations. USEPA recommends the use of a 0.5 dilution factor for selecting effluent test concentrations. Effluent test concentrations of 6.25%, 12.5%, 25%, 50%, and 100% are commonly used, however, test concentrations should be selected independently for each test based on the objective of the study, the expected range of toxicity, the receiving water concentration, and any available historical testing information on the effluent. USEPA (2000a) provides additional guidance on choosing appropriate test concentrations. (U.S. EPA 2002c)¹

The method manual further explains the use of the instream waste concentration (IWC) in the testing strategy:

When these tests are used in determining compliance with permit limits, effluent test concentrations should be selected to bracket the receiving water concentration. This may be achieved by selecting effluent test concentrations in the following manner: (1) 100% effluent, (2) $[RWC + 100]/2$, (3) RWC, (4) $RWC/2$, and (5) $RWC/4$. For

¹ This language is from the marine/estuarine chronic toxicity method manual (USEPA 2002c). Similar language is for the acute toxicity and freshwater chronic toxicity method manuals (USEPA, 2002a, USEPA 2002b).

example, where the RWC = 50%, appropriate effluent concentrations may be 100%, 75%, 50%, 25%, and 12.5%.

In contrast, the TST method requires that the toxicity determination be made using test results for two treatments – a control and an effluent sample at the “instream waste concentration” (IWC). By only using a single concentration and a control, the results cannot be compared against the overall trend of the data to assess if the organism response is consistent with the observed effects from the changing test concentrations. Using the dose-response relationship is essential for evaluating the overall quality of the test responses and aids in a quality assurance review—e.g., determining that samples were prepared to the correct dilutions. Furthermore, should the sample be toxic, a single concentration treatment does not provide sufficient information for proceeding towards a successful Toxicity Reduction Evaluation (using the Toxicity Identification Evaluation tool).

For this reason, Exponent recommends that the policy be amended to allow the dose-response information from the full dilution series to be considered when evaluating toxicity test results using the TST. Specifically, Exponent recommends that language be added to the Toxicity Provisions at pp. 7-8 to incorporate the following concerns:

As currently written, the procedures require the use of these additional dilution treatments; however, the data are in effect discarded. It seems that the additional data are collected so that the testing procedures are in compliance with 40 CFR 136.3, though the failure to consider these data renders the method inconsistent (not in compliance) with these requirements. As presented in the Toxicity Provisions, “To the extent that U.S. EPA-approved methods require that observations should be made of organism RESPONSE 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.” (State Board 2018a, p. 7).

Section IV.B.1.c describes a testing methodology that does not incorporate any of the results from the use of multiple concentrations into the analysis steps. We recommend that Section IV.B.1.c incorporate language to allow and describe how these multiple concentrations will be used in the overall assessment of toxicity using the proposed TST. Exponent recommends that the results of dilution series testing be evaluated in addition to the TST to ensure that any discharge that has been deemed to be toxic (e.g., fail) using the TST incorporates the use of all data in this assessment, both from the TST and methods in 40 CFR 136.3 evaluation procedures.

6. Comments related to “test drive” dataset:

A dataset was compiled for use in comparing available methods and identifying advantages and disadvantages of the methods as provided in State Board (2018b) and U.S. EPA (2010) (U.S. EPA 2011). These “test drive” data are available for download in an Excel file (Appendix A) from the State Board website. Exponent obtained and reviewed the test drive data, and has the following comments on the test drive data and analysis:

6.a Test drive data used ambient samples of unknown toxicity rather than samples with known toxicity.

The test drive data used to evaluate the TST model employed samples of unknown toxicity. Thus, a level of variability that could not be adequately evaluated was introduced into the determination of the effectiveness of the TST. Furthermore, there was no round robin testing employed to determine inter- and intra-laboratory variability or the success of individual dischargers or laboratories in effectively evaluating tests using the TST method strategy for test performance and analysis. These are all methods of test validation that have been performed on other WET testing procedures historically to allow them to be adopted under 40 CFR 136.3 and should have been employed here.

6.b. Response data should be expressed on a normalized or equivalent basis (e.g., percent response) for ease of interpretation.

The Control Response and IWC Response data and the corresponding standard deviations (SDs) presented in Columns G through J of the test drive data Excel file are not expressed in consistent format across the various sources. For example, Source B larval development in *Haliotis rufescens* appears to be expressed as a fraction, Source D growth of *Macrocystis pyrifera* appears to be expressed as a percentage, and Source H growth of *Selenastrum capricornutum* appears to be expressed as cell counts (U.S. EPA 2011). Because it is not clear how the data are expressed, it is difficult to evaluate the test drive dataset.

Exponent requests that the raw data be provided and that the State Board/EPA standardize the data to allow further and transparent evaluation of the test data used.

6.c. Control and instream waste concentration (IWC) toxicity data from Source I are reported with unrealistically consistent high rates of survival and low rates of variability.

Source I has 29 tests for *Ceriodaphnia dubia* survival and 39 tests for *Daphnia pulex* survival, for a total of 68 acute tests. The survival rate of the controls in 60 tests was

100% with a standard deviation of zero. The survival rate of the IWC samples in 51 tests was 100% with a standard deviation of zero. These tests were conducted according to U.S. EPA methods for acute toxicity of effluents, which are multi concentration tests consisting of a control and five effluent concentrations to generate a dose-response (U.S. EPA 2002a, 2002b, 2002c). According to the method, replicates are performed for the control sample and each effluent concentration sample. The result of 100% survival with a standard deviation of zero suggests that all test species survived in every control and treatment sample tested, which is highly unlikely for laboratory tests. The U.S. EPA guidance document states that control survival must equal or exceed 90% for the test to be acceptable, thus acknowledging that a low level of mortality (<10%) can occur in these tests. Data from Source I account for 6.1% (68/1118) of the test drive data. Furthermore to be a true evaluation of the appropriateness of testing procedures, tests that failed the quality control metrics should also be included, so one of the initial evaluations would be determining the ability to perform the testing and meet the quality control objectives. Following that assessment, an evaluation of testing that passed the quality control objectives can be further evaluated.

Exponent recommends that the raw data be provided to the public and reviewed to confirm data used in the TST analysis. If raw data are not available, data from Source I must be considered unreliable and excluded from the test drive.

6.d. The number of data points and facilities in the test drive dataset are inconsistent.

In U.S. EPA (2011), which reports on analysis of the TST approach using test drive data from WET tests, the WET database is described as consisting of 837 data test sets, of which 775 were considered valid for use in the analysis (U.S. EPA 2011). On page 57 of the Staff Report, the 2011 TST test drive database is described as consisting of WET data from 890 tests provided from more than 25 dischargers in California and Washington. The Excel file containing the WET data itself reported 1118 individual tests. It is unclear why there is a discrepancy in the number of toxicity tests (775 vs 890 vs 1118) in the test drive data, and it is unclear which data were used in assessing the California proposal.

Exponent requests that the test drive data be provided in full, and that the SWRCB and/or USEPA clarify which data were used in the test drive and which data were excluded from the test drive.

6.e. *Ceriodaphnia dubia* reproduction tests were omitted from TST analysis.

In the draft Staff Report and U.S. EPA (2011), the TST test drive data were used to demonstrate that compared to the NOEC approach, the TST approach resulted in fewer tests declared toxic when the mean effect at the IWC was less-than-or-equal-to 25% for chronic tests and less-than-or-equal-to 20% for acute tests. In addition, these two reports claim that in the cases where the TST determined a sample to be toxic when the mean effect at the IWC was below the respective regulatory management decision (RMD) for the chronic and acute toxicity tests (i.e., 25% for chronic tests and 20% for acute tests), it was due to the high variability in the control and/or IWC replicates. U.S. EPA (2011) demonstrated that adding replicates to the test regime can correctly re-categorize these samples from toxic to non-toxic, because the addition of replicates to reduce the in-test variability results in higher quality data. A large number of *Ceriodaphnia dubia* reproduction tests from Source L are missing from this analysis. Table 3-17 of U.S. EPA (2011) indicates that 20 tests from Source L were included in the analysis and only one of these tests was found toxic with mean effects of the IWC less-than-or-equal-to 25%. Of the 126 tests from Source L for *Ceriodaphnia dubia* reproduction reported in “test_drive_data(1).xlsx” (sheet “Appendix A”), 13 samples were reported as toxic with mean effects of the IWC less-than-or-equal-to 25%. In the NOEC approach, only eight samples were reported as toxic when the RMDs were not met. The comparison of the TST and NOEC approaches should be performed using the entire database.

Exponent requests that the State Board/U.S. EPA clarify which data were used in the test drive and which data were excluded from the test drive, along with the rationale for these decisions.

6.f. The NOEC method appears sensitive to species.

The TST test drive data were analyzed according to methods in U.S. EPA (2011) to compare the number of pass/fail tests against the RMD. Table 1 of U.S. EPA (2011) provided a summary by species. Where samples were reported as “toxic” with an IWC mean effect below the RMD, the largest discrepancies between the NOEC and TST methods occurred for larval development in *Mytilis edulis* and *Haliotis rufescens* and fertilization in *Tripneustes gratilla*. For these three species, the NOEC method resulted in a finding of “toxic” with a corresponding low effects rate (in some cases less than 5% effects) and the TST method indicated a non-toxic result. The State Board should address the reasons for this discrepancy in the Staff Report, including why the NOEC method resulted in a finding of toxicity, and what could be done in the testing scheme to prevent or reduce the occurrences of this discrepancies.

6.g. Additional time should be provided to evaluate the test drive data set.

The test drive data set was provided to us in an email on 16 November 2018 (email from Jacob Iversen, SWRCB to Susan Paulsen), just 21 days before the original 7 December deadline for comments on the Toxicity Provisions. Given this short time between data release and the original comment deadline, the State Board should provide additional time for analysis of the data set, and should also provide the raw data for the data set, so that discrepancies and inconsistencies as identified above can be evaluated.

7. It may not always be possible to fulfill the requirement for accelerated monitoring given laboratory analysis capacities and realistic turn-around times for decision making between the discharger and laboratory; extended timeframes should be allowed when necessary.

The Toxicity Provisions state,

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 within the defined ROUTINE MONITORING period (e.g., a requirement to initiate test within five days of the start of the CALENDAR QUARTER, a requirement to sample between the 10th and the 15th of each month, etc.). (State Board 2018a, p. 17)

This provision, as well as the requirement to perform two repeated analyses for each failed test, raises the possibility that the permitting authority (most often, the Regional Board) might prescribe a monitoring schedule that cannot be met due to limited laboratory analysis capacities and the turn-around times necessary for laboratory determinations of whether the test failed and transmittal of that information to the discharger. The policy stipulates that these tests have to be performed within the calendar month. The Toxicity Provisions should include language specifying that the permitting authority will not penalize dischargers for failing to meet an accelerated monitoring schedule in cases where the failure is due to the inability of a laboratory to conduct tests and/or generate reports of results on the required schedule.

Additionally, the Toxicity Provisions should clarify the meaning of the term “calendar month” as used in the provisions or use a different term. In Appendix A of the Toxicity Provisions (the “Glossary”), “calendar month” is defined as follows:

A period of time from a day of one month to the day before the corresponding day of the next month if the corresponding day exists, or if not to the last day of the next

month (e.g., from January 1 to January 31, from June 15 to July 14, or from January 31 to February 28). (State Board 2018a, p. 27)

Exponent recommends that the definition and provisions be modified to clarify that the discharger has a total of 45 days to complete the required testing for each initial event (which could require three separate 7-to-8-day tests,² or up to 24 days of testing, without factoring in data analysis, reporting of results to the discharger, and logistical considerations for sample collection and transportation to the laboratory).

8. The Toxicity Provisions should direct the permitting authority to consider past toxicity data when evaluating reductions in toxicity monitoring frequency.

In addition to the discretion to prescribe *accelerated* toxicity monitoring, the Toxicity Provisions give the permitting authority the discretion to prescribe toxicity on a frequency *reduced* from the routine monitoring frequency for a given discharger. For example, the Toxicity Provisions state,

The PERMITTING AUTHORITY may approve a reduction in the frequency of ROUTINE MONITORING in accordance with 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. (State Board 2018a, p. 17)

When determining whether to reduce or increase the required monitoring frequency for a discharger, the permitting authority should consider past toxicity test results as well as the results from the performance of the toxicity reduction evaluation (if required). Furthermore, if analysis of the past test results yields a result from a discharge situation that was deemed to be from an upset condition, the permitting authority should have the ability to take these circumstances under consideration when monitoring frequency descisions are being made.

9. The Toxicity Provisions should clarify whether facilities with flow-through acute toxicity testing systems are exempt from additional acute toxicity testing including TST.

The Toxicity Provisions suggest that facilities employing flow-through acute toxicity testing are still subject to routine acute toxicity monitoring and testing. In the section titled, “Flow-Through Acute Toxicity Testing Systems,” the Toxicity Provisions state,

² The USEPA chronic Ceriodaphnia test requires an additional test day (up to 8 days) if less than 60% of the control females have not produced three broods of neonates.

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 amenable 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. (p. 23)

After describing, in the first two sentences, possible additional toxicity compliance requirements for facilities with flow-through systems, the Toxicity Provisions state that these additional requirements “do not substitute toxicity provisions in Section IV.B.2.” Exponent interprets this statement to mean that the toxicity provisions in Section IV.B.2 also apply to facilities with flow-through acute toxicity testing systems. Insofar as the provisions in Section IV.B.2 include the evaluation of reasonable potential for acute toxicity (pp. 14-15) and the possibility of routine acute toxicity monitoring and testing (pp. 18-19), it seems that the Toxicity Provisions do not exempt facilities that conduct flow-through acute toxicity testing from additional acute toxicity testing.

However, for facilities that employ them, the purpose of flow-through acute toxicity testing systems is to address the requirement for acute toxicity monitoring and testing. Thus, requiring additional acute toxicity monitoring and testing of these facilities seems inappropriate and contrary to the purpose of the systems.

Exponent suggests that the Toxicity Provisions be revised to clarify that facilities employing flow-through acute toxicity testing systems are exempt from any additional acute toxicity testing requirements.

10. Rather than only using ambient receiving water for dilution to the IWC, SWRCB should allow for the use of laboratory water.

At times, ambient waters upstream of the discharge location can be toxic, or may have a chemical composition (e.g., salinity) different from the laboratory waters used to raise and culture test organisms. The SWRCB should allow the use of laboratory water controls and use of laboratory water as the diluent water. In the alternative, if receiving waters are required to be used for dilution to the IWC, undiluted receiving water should also be tested in addition to a laboratory control in order to determine if the receiving water has the potential to cause toxicity or produce organism responses unassociated with the discharge. Exponent recommends that the SWRCB provide further clarity regarding how to address situations where ambient waters are toxic.

11. In the Toxicity Provisions, the reasonable potential procedures are flawed and give too much discretion to Regional Boards, which appears to be inconsistent with the State Board's aim of introducing a procedure that is consistent statewide and based on scientific data.

The reasonable potential procedures presented in the Toxicity Provisions are flawed. The Toxicity Provisions hold that if any acute or chronic toxicity test from the past five years (since permit renewal/establishment) results in a “fail” when evaluated using the TST or shows percent effects greater than 10%, then the discharge has reasonable potential (State Board 2018a, p. 15). However, the data in U.S. EPA (2000b; Table 3-7, p. 3-10) shows that 11 of the 33 laboratories exceeded the 10% PMSD upper bound for *C. dubia* (six of the laboratories were 20-50%) and nine of 19 laboratories exceeded this upper bound for fathead minnows (two of the laboratories were 20-50%). These results strongly suggest that an effect difference of “greater than 10%” is not a scientifically defensible metric for determining reasonable potential.

Furthermore, it is important to note that the TST RMD uses 20% for *Ceriodaphnia* chronic toxicity and 25% for fathead minnow, inland silversides, and algae as the false (negative) error rate which is considerably above the 10% rate used for reasonable potential in the Toxicity Provisions. Thus, use of the TST is expected to result in false negative rates considerably above the threshold for determining reasonable potential.

The Staff Report considers the question, “Which procedure should be used for determining reasonable potential?” (Issue E, State Board 2018b, p. 73). In articulating this issue, the Staff Report states,

There is no consistent procedure for reasonable potential analysis on a statewide level for addressing aquatic toxicity. Designation of new reasonable potential analysis procedures that are both consistent and simple to use would greatly aid the Regional Water Boards during permit writing and implementation (U.S EPA 2014a). The U.S. EPA Permit Quality Review also noted a lack of toxicity data being used in California when conducting a reasonable potential analysis for aquatic toxicity (U.S. EPA 2014a). Toxicity data is useful when determining if a water body or effluent may have reasonable potential, because such data allows for assessment of the water body's current conditions. As toxicity data considers the cumulative and synergistic effects of all toxicants on test organisms, such data can be used directly to evaluate the overall potential impact of the effluent on the biological integrity of the aquatic community in the receiving water. (State Board 2018b, p. 74)

In the statement above, the State Board evidences a concern to implement a procedure for determining reasonable potential that is (1) consistent on a statewide level, and (2) based on toxicity data.

However, at several points the Toxicity Provisions give considerable discretion to the Regional Boards to determine whether a discharge has reasonable potential. For example, a “lack of available dilution” can be used as a basis for determining that a discharge has reasonable potential to cause or contribute to an excursion above toxicity WQOs (State Board 2018a, p. 15). Allowing a “lack of available dilution” to be the basis for determining reasonable potential (in which case the IWC should be 100% effluent) allows a Regional Board to find reasonable potential even in cases where available toxicity data suggest no reasonable potential. Not only is a lack of available dilution, in itself, an inappropriate basis for determining reasonable potential—just because a non-toxic discharge is subject to minimal dilution does not thereby make it toxic—but this provision cedes too much discretion to Regional Boards by opening the way for reasonable potential determinations that are not based on toxicity data (e.g., impacts to the receiving waters).

As a second example, the Staff Report states,

If all valid chronic or acute aquatic toxicity tests at the IWC, analyzed using the TST approach, result in a ‘pass’ and no test has a mean percent effect of greater than 10 percent, as compared to the mean control response, then the toxicity test data does not indicate reasonable potential to cause or contribute to an excursion above the toxicity water quality objectives. However, other relevant information may still be used by the Regional Board to consider if reasonable potential exists. (State Board 2018b, p. 76)

Again, these provisions seem contrary to the SWRCB’s stated goals of statewide consistency and a clear basis in toxicity testing. Allowing “other relevant information” to overrule the determination of the toxicity data introduces the possibility of determinations of reasonable potential that are inconsistent across Regional Boards and that are not based on toxicity data—both of which are directly contrary to the State Board’s aims.

12. In the Toxicity Provisions, the discretion given to Regional Boards in the application of narrative toxicity water quality objectives is inconsistent with the State Board’s aim of introducing consistent statewide application of toxicity objectives.

The “Executive Summary” of the Staff Report makes the following statement:

Each Basin plan contains narrative toxicity objectives that require all waters to be maintained free of toxic substances in concentrations that produce detrimental responses in aquatic organisms, which are interpreted and implemented by the Regional Water Boards on a permit-by-permit basis. Such an approach has caused a lack of statewide consistency when addressing aquatic toxicity, and therefore new statewide aquatic toxicity water quality objectives are needed. (State Board 2018b, p. vii)

In short, the Staff Report states that the discretion afforded to Regional Boards in applying narrative toxicity objectives has produced a lack of statewide consistency. The statement suggests that the new Toxicity Provisions are aimed, at least in part, at producing statewide consistency in the way toxicity objectives (including narrative objectives) are applied going forward. Section 2.2 (“Project Goals”) of the Staff Report confirms this aim of the Toxicity Provisions:

The main goal of the Provisions is to provide consistent protection of aquatic life in all inland surface waters, enclosed bays, and estuaries of the state from the effects of toxicity. To achieve consistent protection of aquatic life, the specific project goals are: 1. Adopt consistent, statewide water quality objectives for acute and chronic toxicity that are protective of California’s waters from both known and unknown toxicants. (State Board 2018b, p. 8)

Thus, the State Board’s stated goal is that the Toxicity Provisions provide “consistent protection” of aquatic life from the effects of known and unknown toxicants.

However, Exponent is concerned that Section III.B.4 (p. 4) of the Toxicity Provisions seems to undermine this goal. For example, Section III.B.4 states the following:

Compliance with narrative toxicity water quality objectives is determined by use of indicator species, analysis of species diversity, pollution density, toxicity tests or other appropriate method as specified by the PERMITTING AUTHORITY. The PERMITTING AUTHORITY may also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by [various State and Federal agencies]. (State Board 2018a, p. 4)

The language in this statement is unclear at various points, leaving continued wide discretion to permitting authorities—typically the Regional Boards—in applying narrative toxicity water quality objectives. It is not clear how the Regional Boards would make “use of indicator species, analysis of species diversity, pollution density, [or] toxicity tests” in determining compliance with narrative toxicity objectives. Further, certain terms used in this

statement are unclear—e.g., it is not clear what the term “pollution density” means and it is undefined in the glossary. Additionally, the State Board’s use of “other appropriate method” in the first sentence of the statement leaves the door open for considerable discretion on the part of Regional Boards in applying narrative toxicity water quality objectives.

In addition to the implicit discretion granted to Regional Boards in Section III.B.4 as a result of broad and unclear language, Section III.B.4 explicitly gives the Regional Board discretion in applying narrative toxicity water quality objectives—for example:

The PERMITTING AUTHORITY shall have discretion regarding the application of narrative toxicity water quality objectives to derive chemical specific effluent limitations, receiving water limitations, targets, and other thresholds.

In addition to implementing the requirements of Section IV.B. using a species and endpoint identified in Table 1 of Section IV.B.1.b., the PERMITTING AUTHORITY shall have discretion regarding the application of narrative toxicity water quality objectives to derive effluent limitations for aquatic toxicity endpoints not addressed by any of the acute and chronic aquatic toxicity test methods identified in Table 1 of Section IV.B.1.b (e.g., endocrine disruption).

The PERMITTING AUTHORITY shall have discretion regarding the application of narrative or numeric toxicity water quality objectives to derive narrative effluent or receiving water limitations. (State Board 2018a, p. 4)

The discretion granted in Section III.B.4 appears to have the potential to undermine the State Board’s goal for the Toxicity Provisions of providing *consistent* protection of beneficial uses from the effects of known and unknown toxicants. The unclear language and discretion may lead Regional Boards to continue to develop and apply varied and inconsistent approaches to applying narrative toxicity water quality objectives, thereby continuing the problem that the Toxicity Provisions are meant to address.

Therefore, Exponent recommends that the State Board clarify the language of Section III.B.4 to provide clearer guidance regarding the interpretation and application of narrative toxicity water quality objectives, in order to ensure consistent application of the objectives across the state.

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Thank you for the opportunity to provide these comments.

Sincerely,

A handwritten signature in blue ink that reads "Susan C. Paulsen". The signature is written in a cursive style with a large initial 'S'.

Susan C. Paulsen, Ph.D., P.E.
Principal Scientist, Director of Environmental &
Earth Sciences Practice

REFERENCES

State Board. 2005. Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

State Board. 2018a. Draft Water Quality Control Plan for Inland and Surface Waters, Enclosed Bays, and Estuaries of California. October 19.

State Board. 2018b. Draft Staff Report, Including Substitute Environmental Documentation for the Proposed Establishment of the Water Quality Control Plan for Inland and Surface Waters, Enclosed Bays, and Estuaries of California; and Toxicity Provisions. October 19.

USEPA. 1991. Technical Support Document for Water Quality-based Toxics Control. Office of Water Enforcement and Permits, Office of Water Regulations and Standards. EPA/505/2-90-001. March.

U.S. EPA. 2000a. Method guidance and recommendations for whole effluent toxicity (WET) testing (40 CFR Part 136). U.S. Environmental Protection Agency, Office of Water. EPA/821/B00/004. Washington, DC.

U.S. EPA. 2000b. Understanding and accounting for method variability in whole effluent toxicity applications under the National Pollutant Discharge Elimination System. U.S. Environmental Protection Agency, Office of Water. EPA 833-R-00-003. Washington, DC.

U.S. EPA. 2002a. Methods for measuring acute toxicity of effluents and receiving waters to freshwater and marine organisms. Fifth Edition. US. EPA Office of Water EPA/821/R-02/012. Washington, DC.

U.S. EPA. 2002b. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. U.S. EPA Office of Water EPA-821-R-02-013. Washington, DC.

U.S. EPA. 2002c. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms. Third Edition, U.S. EPA Office of Water EPA-821-R-02-014. Washington, DC.

U.S. EPA. 2010. National Pollutant Discharge Elimination System Test of Significant Toxicity Technical Document. EPA 833-R-10-004. Office of Wastewater Management. Washington, DC.

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U.S. EPA. 2011. Whole effluent toxicity test drive analysis of the test of significant toxicity.
US. Environmental Protection Agency. Region 9. Sacramento, CA.