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January 5, 2011

Charles R. Hoppin, Chairman and Members
State Water Resources Control Board
c/o Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

Dear Chairman Hoppin and Members:

COMMENT LETTER – POLICY FOR TOXICITY ASSESSMENT AND CONTROL

The City of Los Angeles Bureau of Sanitation (Bureau) thanks the State Water Resources Control Board (SWRCB) for the opportunity to comment on the "Draft Policy for Toxicity Assessment and Control." The Bureau has been very effective and successful in reducing toxicity from all Bureaus' treatment and reclamation facilities. The Bureau's efforts over the years have resulted in a substantial toxicity reduction at the City's treatment plants.

Although the Bureau appreciates SWRCB staff's efforts in developing a comprehensive Toxicity Policy, the Bureau has a number of serious concerns regarding the Draft Policy that are discussed in detail within the enclosed attachment:

- The rate of false positive and false negative errors is not correctly assessed. The Draft Policy will result in false exceedance determinations and trigger unnecessary follow up work, wasting resources on non-existent water quality problems.
- The Draft Policy increases the likelihood that water bodies will be inappropriately added to the 303(d) List. With a 5% false positive rate, there is a 20% chance that a completely non-toxic waterbody will be placed on the 303(d) list. And once on the list, it will be almost impossible to delist because of the false positive rate.
- The Draft Policy does not consider the overall implications of the alternatives selected, resulting in an overly stringent toxicity policy and does not fully evaluate all available alternatives as a result.

- The goals of the Draft Policy can be achieved through the use of consistent and enforceable narrative objectives and effluent limits rather than the numeric objectives and effluent limits currently included in the Draft Policy.
- The inclusion of State and Regional Water Board discretion for setting acute effluent limitations and numeric effluent limitations for stormwater discharges contradicts the stated policy goal of developing a consistent statewide policy for toxicity.
- The Draft Policy does not include sufficient compliance schedule provisions.
- The Draft Policy contains methods that are not approved for Whole Effluent Toxicity (WET) testing in 40 CFR Part 136 and the Draft Policy has not been sufficiently peer reviewed.

We feel that the issues with the Draft Policy are significant and all of the comments included in the attachment need to be addressed to make the Draft Policy workable. The Bureau again thanks the State Water Board for this opportunity to provide input on the Draft Policy. If you have any questions regarding the Bureau's comments, please contact Dr. Gerald McGowen at (310) 648-5611 of the Environmental Monitoring Division.

Sincerely,

ENRIQUE C. ZALDIVAR, Director
Bureau of Sanitation

ECZ:HA

Attach: Attachment A - Detailed Discussion of Major Issues

cc: Sam Unger, Regional Water Quality Control Board – Los Angeles Region
Cynthia M. Ruiz, Board of Public Works
Michael Mullin, Mayor's Office
Rafael Prieto, Chief Legislative Analyst Office
Traci Minamide, Bureau of Sanitation/EXEC
Varouj Abkian, Bureau of Sanitation/EXEC
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Shahram Kharaghani Bureau of Sanitation/WPD
Steven Fan, Bureau of Sanitation, HTP
Hiddo Netto, Bureau of Sanitation/DCT/LAG
Masahiro Dojiri, Bureau of Sanitation/EMD
Roshanak Aflaki, Bureau of Sanitation/TIWRP

ATTACHMENT A
City of Los Angeles, Bureau of Sanitation
Detailed Technical Comments Regarding Policy for Toxicity Assessment and Control

1. The Rate of False Positive and False Negative Errors are Not Correctly Assessed

The Test of Significant Toxicity (TST) method utilized in the Draft Policy does not meet the stated goals for low false positive and false negative decision rates. To be identified as non-toxic, samples must be significantly greater than 80% of control performance for acute tests and 75% of control performance for chronic tests. False positive decisions occur when samples are incorrectly identified as toxic when the true sample condition is non-toxic as defined by the Policy. False negative decisions occur when samples are incorrectly identified as non-toxic when the true sample condition is toxic as defined by the Draft Policy. The Draft Policy states that false positives (samples incorrectly identified as toxic) are controlled by setting a low β value (0.05), equivalent to a 5% false positive error rate. However, the Draft Policy does not achieve this goal and in fact does not control or balance the false positive rate with the false negative rate. It appears that the Draft Policy incorrectly estimates or misrepresents the actual false positive and false negative rates achieved by the method.

The actual rate of false positives resulting from the Draft Policy was evaluated by conducting Monte-Carlo simulations of the results of *Ceriodaphnia* acute toxicity tests and calculating the number of tests with a "pass" result and a "fail" result based on the methods outlined in the Draft Policy. The assumptions of the evaluation presented herein were as follows:

- Acute *Ceriodaphnia* test conditions consisted of 10 replicates each for controls and test samples, and 10 individual organisms per replicate.
- Organism response was modeled as a random binomial distribution with survival frequency estimated as the true average sample response.
- Average survival for controls was set to 97.5%.
- Average survival for test or effluent samples was set at 74%-90%.

Simulations were conducted consisting of 1,000 trials for each "true" average sample survival response rate, and the number of "Fail" and "Pass" decisions were recorded. "Fail" decisions for samples with an average survival of >80% of control were counted as false positives. "Pass" decisions for samples with an average survival of ≤80% of control were counted as false negatives.

The results of the simulations are provided in Table 1 and Table 2. False positive decision rates are illustrated in Figure 1 and decision error rates are also summarized in Table 3 and compared to stated goals for the method. These results for *Ceriodaphnia* acute tests document that false positive error rates are much higher than the stated goal of 5%, and are actually approximately 23% for all samples with a mean survival response >80% of the controls. For samples with a response close to the 80% criterion, false positive rates are as high as 86%, and for samples with responses from 81-90% of the control, the overall false positive error rate is approximately 49%.

In addition to the statistical analysis conducted to evaluate the actual false positive rate for the TST method, the rate at which the Draft Policy determines non-toxic samples to be toxic was evaluated by using the TST calculation procedures to evaluate the results of toxicity tests conducted on totally non-toxic, clean water blank samples. In 2000, EPA conducted an extensive inter-laboratory WET

study[1]. As part of this study, EPA prepared and distributed a number of non-toxic clean water "blank" samples and sent them out to laboratories for WET analysis. The raw results from this study were obtained for the blanks that were analyzed for *Ceriodaphnia dubia* chronic toxicity. Since all these samples were known non-toxic blank samples, any identification of toxicity would be a "false determination of toxicity". When the raw results were evaluated using the TST procedures 15% of the EPA clean water, non-toxic samples tested with *Ceriodaphnia* were incorrectly identified as toxic using the TST.

Since the 2000 EPA study was not designed to specifically evaluate the TST method false positive rate, we recognize that it is not possible to determine the actual false positive error rate for the Draft Policy through evaluation of this data. However, the evaluation of the data combined with the statistical analysis shown below indicates that the actual false positive rate for the Draft Policy would be greater than the stated 5%.

These high rates of false positives will translate into many incorrect determinations of non-compliance with NPDES permit limits and exceedances of other regulatory triggers for non-NPDES discharges. Assuming a 15% false positive rate, the probability of a wastewater discharger failing at least one chronic toxicity test is 86% over the course of one year and more than 99.9% over the course of a five-year permit cycle even if the discharge was actually non-toxic. Even using the inherent 5% false positive rate in the Draft Policy, a wastewater discharger would have over a 50% change of having at least three violations over a 5-year permit cycle even with a completely non-toxic discharge. Incorrect determinations of non-compliance have a number of adverse consequences, including triggering unnecessary management actions and expending limited public resources to address non-existent water quality problems. Non-toxic discharges will be perceived to be toxic, resulting in false public perception of discharge and receiving water quality, and the expenditure of limited public resources in attempts to find the cause of "toxicity." Additionally, the Draft Policy will result in significant Water Board resources being put into enforcing violations with no corresponding environmental benefit.

To address the false positives in wastewater permits, the Bureau recommends that a monthly median be used as the trigger for accelerated monitoring and that a TRE be triggered after two or more exceedances of the objective during the accelerated monitoring. This approach will significantly reduce the chance that a false positive result will trigger violations and TRE requirements, but still ensure that persistent toxicity in discharges is addressed.

Bureau Request: Modify the Draft Policy to reduce the false positive rate.

[1] U.S. EPA. Final Report: Interlaboratory Variability Study of EPA Short-term Chronic and Acute Whole Effluent Toxicity Test Methods-Vol. 1 & 2; EPA-821-B-01-004; September, 2001.

Table 1. Monte Carlo Simulation Results for *Ceriodaphnia* tests of non-toxic samples.

Avg Sample Response (% Survival)	Avg Percent of Control (Based on average control survival of 97.5%)	Number Passing TST (1000 trials)	Number Failing TST	% Passing (Correct Decision)	% Failing (False Positive)
79%	81%	139	861	14%	86%
80%	82%	177	823	18%	82%
81%	83%	270	730	27%	73%
82%	84%	362	638	36%	64%
83%	86%	504	496	50%	50%
84%	86%	568	432	57%	43%
85%	87%	640	360	64%	36%
86%	88%	745	255	75%	26%
87%	89%	834	166	83%	17%
88%	90%	894	106	89%	11%
89%	91%	934	66	93%	7%
90%	92%	968	32	97%	3%
91-100%	>93%	10,000	0	100%	0.0%
Totals for all non-toxic samples		*17,035*	*4,965*	*77%*	*23%*

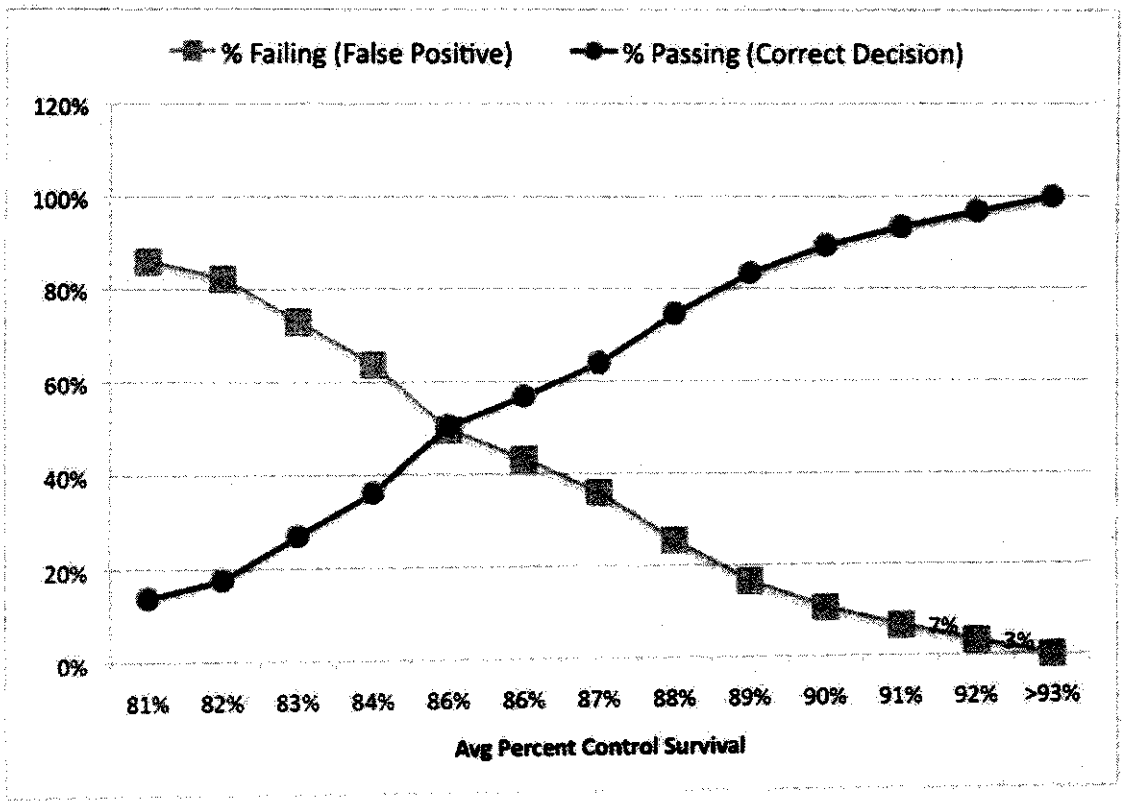
Table 2. Monte Carlo Simulation Results for *Ceriodaphnia* tests of toxic samples.

Avg Sample Response (% Survival)	Avg Percent of Control (Based on average control survival of 97.5%)	Number Passing TST (1000 trials)	Number Failing TST	% Passing (False Negative)	% Failing (Correct Decision)
74%	76%	24	976	2.4%	97.6%
75%	77%	32	968	3.2%	96.8%
76%	78%	44	956	4.4%	95.6%
77%	79%	63	937	6.3%	93.7%
78%	80%	91	909	9.1%	90.9%
Totals for all non-toxic samples		*254*	*4746*	*5.1%*	*94.9%*

Table 3. Summary of desired and actual decision error rates for assessment of *Ceriodaphnia* acute toxicity tests using the Draft Policy method.

	True Condition	
Draft Policy Decision	**Null Hypothesis** Sample Mean ≤0.8*Control Mean **Sample is Toxic**	**Alternative Hypothesis** Sample Mean >0.8*Control Mean **Sample is non-Toxic**
Sample Mean ≤0.8*Control Mean **Sample is Toxic**	Correct decision (1-α); ***Desired rate is 90%*** **Actual rate is >90% when sample mean ~80% of control mean, and much higher below 80%**	False Positive (β); **Desired rate is 5%** **Actual rate is ~23% when sample mean >80% of control mean, and 51% between 81-90% of control**
Sample Mean >0.8*Control Mean **Sample is non-Toxic**	False Negative (α); **Desired rate = 10%** (*Ceriodaphnia* acute test α = 0.1) **Actual rate is ~9% when true sample mean is ~80% of control mean, and much lower below 80%**	Correct decision (1-*β*, (power)); **Desired rate is 90%** **Actual rate is ~77% when sample mean >80% of control mean, and only 49% between 81-90% of control**

Figure 1. Monte Carlo Simulation Results: Correct and False Positive TST Decision Rates for Acute Ceriodaphnia Toxicity Tests of Non-Toxic Samples



2. The Draft Policy increases the likelihood that water bodies will be inappropriately added to the 303(d) List

Notwithstanding the previous comment related to the false positive rate being underestimated, the Draft Policy has an inherent false positive rate of 5%, meaning 1 out of every 20 non toxic samples will be identified as toxic. As presented in Table 3.1 of the State Listing Policy, waterbodies must be added to the 303(d) List if 2 out of 24 samples exceed water quality objectives for toxicants. With a 5% (1 out of every 20) set false positive rate, the Draft Policy results in a 20% chance of a non-toxic waterbody being added to the 303(d) list for toxicity. If the actual false positive rate is closer to 15%, as discussed above, the probability increases to 99%. The Draft Policy would result in tens to hundreds of listings necessitating the development of TMDLs by the Regional Boards and/or USEPA for completely non-toxic waterbodies.

Conversely, the false positive rate would make it nearly impossible to delist a waterbody once it was listed, even if the waterbody were non-toxic. The delisting requirement for toxicants (Table 4.1 of the State Listing Policy) requires that no more than 2 out of 28-36 exceed objectives for toxicants. With the 5% false positive rate and a sample size of 28-36, at least 1 and likely 2 samples are expected to be false positives, making it unlikely that a waterbody could meet the delisting requirements regardless of the absence of toxicity. As a result, even if implementation measures were installed to successfully address toxicity, additional resources would be required in attempts to address false toxicity determinations on a non-toxic waterbody.

Bureau Request: Modify the approach to address concerns related to false positives and modify the State Listing Policy to address the conflicts with the Draft Toxicity Policy.

3. The Draft Policy does not consider the overall implications of the alternatives selected, resulting in an overly stringent toxicity policy

In the Draft Policy Staff Report, alternatives are evaluated for each decision; such as the use of the TST method, the method of determining reasonable potential, the use of numeric objectives and effluent limits, etc. However, the Draft Policy does not consider the impacts of all of the individual decisions. For example, the use of the TST method and the assumption of a 5% false positive rate are discussed, but the implications of these choices are not considered along with the selected alternative to use a numeric objective and numeric effluent limits. Additionally, the Draft Policy assumes that all major wastewater dischargers have reasonable potential. As a result, all major wastewater dischargers will be required by the Draft Policy to have numeric effluent limits for toxicity. Finally, the Draft Policy requires a daily maximum effluent limit and the requirement that accelerated monitoring be triggered by one failed test.

Although justifications are provided for all of the policy choices outlined above, no consideration is given to the fact that requiring numeric effluent limits for all dischargers (even those who would not demonstrate reasonable potential because they have non-toxic discharges), combined with a daily maximum limit, accelerated monitoring after one failed test, and an assumed 5% false positive rate results in guaranteeing that all dischargers will have to, at a minimum, expend resources on accelerated monitoring for non-toxic discharges and be subject to enforcement action and third

party lawsuits. The combined assumptions result in an overly stringent policy without any corresponding environmental benefit.

Bureau Request: Evaluate impacts of Policy as a whole rather than simply evaluating each individual decision.

4. The Draft Policy does not effectively evaluate alternatives to numeric toxicity objectives and limits

Because the Draft Policy does not consider the overall implications of the individual policy decisions, alternatives that are broader in scope than one individual decision were not considered. For example, narrative objectives were evaluated as compared to numeric objectives in the Staff Report (Issue 2C, alternative 2 on page 44) and rejected because "Narrative objectives, however, do not provide a clear measurement of compliance and thus represent resources that would be required to ensure water quality objectives are met under such a policy would deplete the Regional Water Boards' resources, and the potential for ecological harm would likely increase as a result of these vague objectives." Absent consistent implementation procedures, narratives may be difficult to interpret. However, when narrative objectives are considered in the context of the entire policy, alternatives exist that may address the concerns of the current narrative approach and be less problematic than the proposed numeric approach in the Draft Policy.

The Bureau strongly supports the continued use of narrative limits with accelerated monitoring and toxicity reduction evaluation (TRE) triggers, and feels they can be effectively and consistently implemented through a properly designed State Policy. This step-wise approach is consistent with guidance from the USEPA, both at the national[2] and regional[3] levels, supported by a diverse national expert advisory panel[4] formed by SETAC and funded by the USEPA to provide guidance on WET issues, and by the State Water Board Toxicity Task Force[5] specifically assembled to provide guidance on the regulatory use of toxicity test within the State. The Bureau feels it is not necessary to include numeric toxicity objectives and effluent limits at this time and that narrative objectives and effluent limits provide sufficient protection of the environment if implemented in a consistent manner.

The Bureau feels that the issues identified with narrative objectives in the Staff Report can be addressed by implementing a modified narrative objective through the Draft Policy. The modified narrative would consist of the following:

1. Statewide narrative toxicity objective that supersedes the narrative objectives in the Basin Plans.

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[2] Technical Support Document for Water Quality-Based Toxics Control, EPA Office of Water, March 1991, EPA/505/2-90-001, p. 62, Section 3.3.7.
[3] EPA Regions 9 and 10 Guidance for Implementing Whole Effluent Toxicity Testing Programs, EPA, May 31, 1996, pp. 2-1, 4-1, and 5-2.
[4] Society of Environmental Toxicology and Chemistry (SETAC) WET Expert Advisory Panels, http://www.setac.org/wettre.html, Sections 1 and 4.
[5] Memo to Members of the State Water Resources Control Board from the Toxicity Task Force, September 27, 1995. Recommendations 2, 5, 9, and 10.

2. Specific monitoring program (such as the one already outlined in the Draft Policy).
3. Prescriptive numeric triggers for accelerated monitoring and conducting TREs. As recommended above, these triggers would be set equal to a monthly median to start accelerated monitoring and two or more exceedances of the numeric trigger during the accelerated monitoring would require a TRE.
4. Compliance approach that specifies the actions that result in violations. Examples include, failure to prepare and submit a TRE work plan, failure to report toxicity testing results, failure to conduct required routine or accelerated monitoring, failure to initiate a TRE when triggered, failure to conduct the specific steps in the TRE work plan.
5. Process for determining numeric effluent limits for toxicants identified during TRE.

This objective approach would address the goal of the Draft Policy to provide statewide consistency in toxicity monitoring and enforcement. Additionally, by outlining the specific actions that result in violations, the Draft Policy would provide a clear measurement of compliance and reduce the potential for ecological harm, while recognizing the inherent variability of biological systems and the challenges associated with identifying the cause of intermittent toxicity in wastewater discharges.

Bureau Request: Revise the Draft Policy to include a consistent narrative objective for implementation throughout the state with a consistent monitoring program and compliance determination provision.

5. Imposition of more stringent requirements by Regional Boards, particularly without justification, appears to contradict the goal of a statewide toxicity policy

As discussed in the Draft Policy, the Policy will supersede the State Implementation Plan (SIP) toxicity control and toxicity testing procedures, but not the narrative objectives established in Basin Plans. Additionally, the Draft Policy gives the State and Regional Boards the discretion to:

- establish acute toxicity limitations and monitoring requirements
- apply numeric effluent limitations for toxicity in MS4 and individual industrial stormwater permits and in Conditional Waivers or WDRs for agricultural dischargers
- apply "remediation measures established in Part III, Section A-7, or other remediation measures as appropriate" for stormwater and agricultural dischargers

If the Draft Policy truly supersedes the SIP, the resulting water quality objectives are protective of beneficial uses of receiving waters. Additionally, the purpose and intent of the Draft Policy as well as the justification for many of the decisions made in developing the Draft Policy (as stated in the Staff Report) is the development of statewide consistency in addressing water column toxicity. If the State and Regional Boards are given the discretion to impose more stringent requirements, thereby conflicting with the apparent intent of the Draft Policy, it suggests that the Policy itself has failed to establish appropriately protective objectives and that a consistent statewide approach was not appropriate.

Bureau Request: Modify the Draft Policy to remove State and Regional Board discretion in assigning numeric effluent limits and applying remediation measures to stormwater and agricultural dischargers and establishing acute toxicity limitations.

6. Compliance schedule should be included to allow time to identify and address causes of toxicity

The compliance schedule provisions of the Draft Policy appear to only apply to implementation of toxicity monitoring programs and are not allowed for NPDES wastewater or point source WDRs that already contain toxicity monitoring requirements. Without a compliance schedule provision, dischargers would be subject to violations and fines even while making significant efforts to comply by conducting additional toxicity testing, working through the Toxicity Reduction Evaluation (TRE) and Toxicity Identification Evaluation (TIE) processes, and upon completion, planning and building additional treatment, if necessary. The Draft Policy proposes to require numeric effluent limits for toxicity for wastewater discharges even though, as stated in the Staff Report (page 45), a "noncompliant discharger continues to accrue violations despite aggressively pursing the necessary steps to identify and reduce the source(s) of the observed toxicity." The combination of numeric effluent limits and the lack of a compliance schedule provision for addressing the identification of the causes and the implementation of solutions to address toxicity results in a policy that could significantly harm agencies that are actively trying to reduce toxic discharges.

Bureau Request: Modify the Policy to include a compliance schedule provision that allows dischargers to submit an investigation schedule to implement and complete the TRE/TIE processes and a separate implementation schedule to be submitted once the TRE/TIE process has been completed that outlines the steps to address the identified cause(s) of toxicity.

7. The TST procedure contained in the Draft Policy is not an approved method

The federal regulations specify approved methods for toxicity in 40 CFR part 136. Three method manuals (WET method manuals) were incorporated by reference into 40 CFR part 136 in the 1995 federal rule including the NOEC and/or point estimates (i.e., EC/IC25) exclusively. These methods do not include the TST or EPA's TST guidance as referenced in the Draft Policy. The Staff Report states that the numeric objectives and the test methods upon which they rely are "simply a concise statement of several elements in U.S. EPA's test of significant toxicity (TST) document." (See Staff Report p. 65.) However, the EPA guidance document was never released for public comment and EPA has not approved the TST as an Alternate Test Procedure (ATP) as required by 40 CFR 136.5.

Additionally, neither the TST method nor EPA's TST guidance as referenced in the Draft Policy have been formally peer reviewed. State Water Board staff contends that since this Draft Policy is just a "new application of the earlier, adequately peer-reviewed work products, specifically, U.S. EPA's TST", no further peer review is necessary. However, it is important to note that although the basic "alternative null hypothesis" statistical procedures have been peer reviewed as part of their publication, specific details crucial to the Draft Policy, such as the 10% and 25% regulatory management decisions, have not.