CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services Department
DIRECTOR'S OFFICE

August 20, 2012

VIA EMAIL: commentletters@waterboards.ca.gov

Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
1001 I Street,
Sacramento, CA 95814

Re: Comment Letter - Policy for Toxicity Assessment and Control

Dear Mrs. Townsend:

The City of San José (City) appreciates the opportunity to submit comments on the State Water Resources Control Board's (State Water Board) draft Policy for Toxicity Assessment and Control (Draft Policy) on behalf of the City and the San José/Santa Clara Water Pollution Control Plant (San Jose/Santa Clara Plant). The City supports and incorporates by reference comments provided by the Bay Area Clean Water Agencies (BACWA) and the "clean water associations" represented by the California Association of Sanitation Agencies, Central Valley Clean Water Association, and others.

The San Jose/Santa Clara Plant maintains a full-service environmental laboratory that includes dedicated staff, equipment, and space for performing acute and chronic Whole Effluent Toxicity (WET) testing on site. The Plant laboratory has been ELAP certified to perform toxicity testing for over 20 years. Our Plant is one of very few agencies in the State that maintains a full-time Aquatic Toxicologist to oversee all toxicity testing. This level of commitment is necessary given the size of our discharge, roughly 100 million gallons per day on average, and our geographic location in the environmentally sensitive lower South San Francisco Bay. We have conducted both chronic and acute toxicity tests each month since the late 1980s. It is against this history and experience that we evaluate the Draft Policy.

A. **The San Jose/Santa Clara Water Pollution Control Plant should see a slight reduction in routine monitoring costs under the Draft Policy.** According to a paper prepared and submitted by BACWA titled "Summary of Estimated Cost Impacts of Proposed WET Policy on Region 2 POTWs," the routine monitoring provisions in the Draft Policy will save the San Jose/Santa Clara Plant between $2,000 to $10,000 per year. The BACWA paper determined that the San Jose/Santa Clara Plant was one of 3 agencies out of 42 in the San Francisco Bay Area that would reliably save money under the routine monitoring procedures in the Draft Policy. The Draft Policy requires that treatment plants conduct monthly chronic toxicity monitoring. Large plants like the San Jose/Santa Clara Plant already meet that requirement. Smaller agencies, that currently are not required to perform monthly monitoring, will see their routine monitoring costs increase substantially. While the estimated savings to the Plant is small compared to the Plant's annual operating budget of around $70 million, San Jose, like all public agencies, is currently faced with budgetary difficulties. Any cost savings are appreciated and greatly desired.

B. **The San Jose/Santa Clara Water Pollution Control Plant does not support the numeric toxicity objectives and effluent limits proposed in the Draft Policy.** Numeric toxicity objectives and effluent

200 East Santa Clara Street, San José, CA 95113 *tel* (408) 535-8550 *fax* (408) 292-6211 www.sanjoseca.gov/esd

limits are inappropriate. Toxicity testing methods are not always reliable, and municipal wastewater treatment plants cannot predict and control all sources of toxicity entering their plants. The inclusion of numeric chronic toxicity objectives and effluent limits in NPDES permits will merely result in more permit violations and potential enforcement actions rather than an improvement in water quality.

Two decades of acute and chronic toxicity testing at the San Jose/Santa Clara Plant indicate that toxicity testing is uncertain and, at times, unreliable. Plant monthly acute toxicity tests, using fathead minnows, three-spined sticklebacks, and larval Rainbow Trout, have not detected toxicity in Plant effluent since 1994. Plant history with respect to the more sensitive chronic toxicity test is mixed. Plant monthly chronic toxicity tests, using *Ceriodaphnia dubia* (water flea) generally do not detect toxicity. However, since 1994 there have been a total of 22 occasions in which chronic toxicity tests indicated minor (> 1 TUc <2; n=8) or significant (> 2 TUc; n=14) chronic toxicity effects. The Plant investigated these sporadic toxic events but was not able to determine either cause(s) or source(s) of the observed toxicity.

In 2009 and 2010, as part of our largest investigation, the Plant ran parallel chronic toxicity tests with certified contract laboratories on 10 occasions. Toxicity was detected during parallel laboratory analyses on five occasions. However, during three of those events, the laboratories' testing results did not agree using either IC25 or TST evaluation methods. On each occasion, one lab's results indicated no toxicity in effluent, while another lab's results indicated toxicity. This experience alone strongly suggests that chronic WET testing is not sufficiently reliable to be used as an enforcement tool.

One of our parallel testing events further illustrates this problem. On April 27th, 2010, the Plant evaluated identical final effluent samples for chronic toxicity using three different ELAP certified analytical labs. The TST results were: Fail at 16.9%, Fail at 24%, and Pass with negative % effect (in other words, the third lab detected a stimulatory effect in the same effluent sample). Under the Draft Policy, this scenario could have been considered an exceedance of the MMEL even though none of the samples exceeded the Regulatory Management Decision (RMD) for chronic toxicity. These same tests, when evaluated using the IC25 method, were evaluated as: non-toxic, toxic at 1.8 TUc, and non-toxic. Therefore, if the IC25 point estimation technique was employed, this example was not an exceedance of the MMEL. The broader point is that this was a single split sample. Regardless of statistical evaluation method, this single sample was evaluated as either slightly toxic or non-toxic depending on which ELAP certified lab performed the analysis. Clearly, the analytical variability is too great for this test to be used as a basis for numeric effluent limits.

If the Draft Policy had been in effect since 1994, the San Jose/Santa Clara Plant would have exceeded the Maximum Daily Effluent Limit (MDEL) on up to 12 occasions (only 10 occasions if we exclude two contradictory parallel lab testing results, mentioned above.) This suggests that going forward the San Jose/Santa Clara Plant would exceed the MDEL two to three times per 5-year permit cycle. This is an unacceptable compliance criterion for a parameter that in almost 20 years of investigation has proven to be unpredictable, uncertain in at least three instances, and presents significant challenges when trying to identify the toxicant or toxicants causing the observed effect. The trivial amount of money the San Jose/Santa Clara Plant would save under the routine monitoring procedures outlined in this Draft Policy is inconsequential compared to the additional time and resources that will be required to report and respond to violations over which the Plant has demonstrated no reasonable ability to control. A municipal treatment plant, receiving wastewater from a densely populated area of 1.4 million residents and workers, and over 200 square miles, cannot reasonably predict and control all sources of toxicity, particularly residential sources. On the other hand, as an agency we can take steps to investigate and eliminate sources of toxicity if and when they are found.

It is also important to point out that throughout the Plant's extensive experience testing and investigating possible toxic events, there were never any indications of toxicity in the receiving waters of Artesian Slough, Coyote Creek, or the lower South San Francisco Bay downstream of the Plant. In fact, the roughly 2 mile stretch of Artesian Slough is substantially influenced by Plant effluent. The slough also provides habitat for dense bulrush thickets and numerous species of fish and migratory birds. The Don Edwards Wildlife Visitor Center (1751 Grand Boulevard, Alviso, CA) is located on the west bank of Artesian Slough immediately downstream of the Plant. If the Plant had ever caused a toxic effect in the downstream waters, it almost certainly would have been witnessed and reported. Therefore, if the receiving water is not affected, the cause(s) and source(s) of toxicity cannot be identified, and the toxicity test itself can be unreliable, it is not likely that establishment of numeric effluent limits would improve water quality.

Specific comments:

1. Numeric Effluent Limitations in Permits:

The Draft Policy establishes a Maximum Daily Effluent Limitation (MDEL) and Median Monthly Effluent Limitation (MMEL) for chronic and acute toxicity based on TST percent effect. Under current toxicity testing policy, there are no numeric effluent limits. Rather, detection of toxicity triggers additional actions, including accelerated monitoring and an investigation if the detections continue. Failure to report and adequately respond to detections of toxicity is the basis for an NPDES permit violation. The current policy is reasonable considering the uncertainty in accurately identifying toxicity and the inherent variability of results in a toxicity bioassay test that is expected over the course of many tests. Until an investigation is performed, it is not possible to determine what, if any, toxic compound was present. In fact, more often than not, Toxicity Reduction Evaluation/Toxicity Identification Evaluation (TRE/TIE) investigations are inconclusive, or eventually indicate that the test organisms were inhibited by some condition other than a toxic pollutant of relevance in the receiving water (e.g. bacterial contamination of test equipment, ionic imbalance in test water, absence of nutrients, etc.) The City summarized the San Jose/Santa Clara Plant's experience performing a recent TRE/TIE investigation in a January 2011comment letter to previous version of the Draft Policy:

"From July 2009 to September 2010, the Plant experienced chronic toxicity in its treated effluent on seven occasions. The toxicity was detected measuring Ceriodaphnia dubia (water flea) reproduction using the IC25 (Inhibition Concentration 25%) endpoint. In accordance with the Plant's NPDES permit and EPA guidelines, the Plant conducted accelerated toxicity testing and drafted a Toxicity Reduction Evaluation (TRE) workplan that was implemented over a period of several months. The toxicity was generally low and not persistent. Several TIEs were performed. None of the TIE manipulations removed all of the toxicity, and the TIE manipulations provided mixed and sometimes conflicting results for different, or even the same, toxic events. The City made a sustained effort to identify the toxicant(s) responsible for the observed chronic toxicity. For example, the City spent in excess of $125,000 to contract labs for chronic testing and TIE investigations in addition to its own in-house testing. Additional chemical and bioassay analyses were performed by both in-house and contract laboratories. A team of Plant and toxicity experts was assembled to guide the TRE/TIE process. Collection system agencies, source control inspectors and pollution prevention experts assisted in the investigation. The City estimates that this effort cost in excess of $200,000 not including staff time to meet and confer regularly during periods of observed chronic toxicity. Despite considerable time and expense, the Plant was not able to identify the cause(s) of the observed chronic toxicity and the toxicity has not been detected since. In short, the City took all available steps to identify the cause(s) and source(s) of the observed chronic toxicity, but no pollutant(s) or source(s) were ever identified."

Under the previous version of the Draft Policy, the Plant would have exceeded the proposed numeric chronic toxicity effluent limitations at least 4 times in 2009 and 2010. The current version of the Draft Policy would soften the impact a bit by adding a provision (Part III.A.7 on page 10) that "A TRE period shall not constitute additional violations provided that … the accelerated monitoring and TRE are completed within six months of the initial exceedance." However, as seen from our experience described above, TRE investigations often last more than six months because indications of toxicity are intermittent and unpredictable and Toxicity Identification Evaluation oftentimes yield inconclusive, enigmatic, and even conflicting results. When an effluent is determined to be toxic, investigative procedures can be conducted, but when effluent tests cease to indicate toxicity, the investigation must be postponed and at some point terminated. Ideally, the TRE would always result in identification, or at least elimination, of the toxic effect within six months. In practice, however, and based on our experience, this is not likely to happen. Therefore, it is inappropriate to include provisions that would result in NPDES violations solely based on the results of toxicity tests or the speed and results of TRE investigations. The analytical uncertainty inherent in toxicity testing simply does not support this type of enforcement scheme.

Recommendation: Delete the numeric toxicity objectives and the provisions in the Draft Policy requiring the inclusion of numeric effluent limits for toxicity. Instead, include narrative toxicity objectives and a tiered approach based on magnitude of toxicity with numeric triggers for accelerated monitoring and toxicity investigation similar to that currently in use in San Francisco Bay Region 2.

2. Reasonable Potential Analyses:

Part III.A.1., on page 2 of the Draft Policy states, "a discharger has reasonable potential to cause or contribute to an excursion above the toxicity objectives established in Part II if the effluent at the IWC produces a test result of "fail," or if the percent effect at the IWC is greater than 0.10 (10 percent). But, the toxicity objectives described in Part II translate to a percent effect of 20 percent for acute tests and 25 percent for chronic tests. The Draft Policy does not explain how 10 percent was determined to be the threshold for Reasonable Potential (RP).

The Draft Policy diverges from accepted methodology for determining RP. For priority pollutants, RP is demonstrated by discharge values that exceed Ambient Water Quality Objectives using the appropriate dilution estimates, conversion factors, translators, etc. The Draft Policy, however, establishes the acute and chronic toxicity Water Quality Objectives as 20 and 25 percent effect. Passing the TST at the numeric toxicity objective(s) is a direct demonstration that toxic pollutants have not been discharged in toxic amounts. Therefore, there is no precedence for establishing RP for toxicity at a 10% effect, which is well below proposed acute and chronic objectives. The RP methodology in the Draft Policy should be revised to be consistent with established methodology for determining RP.

The fact that the San Jose/Santa Clara Plant has not failed an acute toxicity test since 1994 suggests that continued acute toxicity testing is unnecessary. The Plant is concerned, however, that the lower 10 percent threshold for RP could require it to conduct acute testing in the future. The Plant is also concerned about how the lower threshold would impact evaluation of receiving waters across the state. Many of the toxicity tests, depending on the test animals and toxic endpoints, demonstrate variability that can be close to 10 percent, i.e. if several tests are performed, one is likely to indicate toxicity as a result of random error. Eventually, all dischargers and most receiving waters could be arbitrarily determined to have RP. Again, as with discharges, a 10% effect in the receiving water does not demonstrate the presence of toxins in toxic amounts. This threshold for RP is not reasonable and should be reevaluated.

Recommendation: If numeric effluent limitations are retained in the Draft Policy, the Draft Policy should be revised to state that a discharger has a reasonable potential to cause or contribute to an excursion above the toxicity objectives only if the effluent at the IWC exceeds the toxicity objectives stated in the Draft Policy.

3. Compliance Determination for MMEL:

Part III.A.6.b. of the Draft Policy states "If an initial toxicity test … results in a "fail" but the percent effect is below the MDEL, the discharger shall conduct two additional toxicity tests within the same calendar month in order to determine compliance with the MMEL." For many dischargers, conducting up to three toxicity tests within a 30-day calendar month would be a logistical challenge. Some tests and test species, such as urchin fertilization or larval development tests can be performed over hours or a few days. However, other tests, such as the *Ceriodaphnia* reproduction test require a week to set up and another week to perform. Performing three *Ceriodaphnia* tests within 30 days would require pre-planning and overlap of individual brood tracking. The San Jose/Santa Clara Plant performs the 6-8 day *Ceriodaphnia* test. Our monthly test is performed in-house, so the logistical challenge would not be as great for us as it would be for dischargers that routinely ship their chronic testing off site to contract laboratories. Nonetheless, the 30-day MMEL limit would require that all chronic toxicity tests be initiated as close to the first day of the month as possible. This time-limit would also require set up for the second and third tests to be initiated immediately upon failure of the first test. There would be practically no time for error or false starts.

The use of a rolling 30-day period instead of a conventional calendar month would slightly alleviate the time-crunch. Dischargers would not have to be concerned with the day of the month they initiate routine testing. But, dischargers still have to routinely plan for the possibility of performing three tests within a 30-day period

Recommendation:

a. Change the second paragraph of Part III.A.6.b. to read: "If an initial toxicity test (i.e. not a verification test) results in a "fail" but the percent effect is below the MDEL, the discharger shall conduct two additional toxicity tests within the same ~~calendar month~~ 30-day period in order to determine compliance with the MMEL. If either of these two additional tests results in a "fail", the median monthly result is "fail" and the discharger will be in exceedance of the MMEL.

b. The Draft Policy should be revised to state that "Reference Toxicant tests for quality control purposes need only be performed concurrently with one toxicity test during a month." This would alleviate some of the difficulty in performing three toxicity tests within a 30-day period. This guidance would be consistent with the EPA 2002 guidance manuals for acute and chronic toxicity testing for both freshwater and marine species. Clearly adopting this guidance in the Draft Policy would also alleviate inconsistent guidance found in other documents such as the EPA TST Implementation Document (June 2010) and the EPA Chronic Toxicity, West Coast Marine guidance document (August 1995). Both require that Reference Toxicant tests be performed concurrent with each bioassay test except when the test organisms are cultured in-house. Modifying this provision as recommended above would reduce some of the lab set-up and staff time for the second and third Reference Toxicant tests conducted in the same month and would not require Labs to culture organisms in house in order to avoid additional, unnecessary Reference Toxicant test in a month where three tests are conducted.

4. Accelerated Monitoring:

Part III.A.6.c. of the Draft Policy states: "…an accelerated monitoring schedule shall consist of four, five-concentration chronic toxicity tests, conducted at approximately two-week intervals … All toxicity tests conducted during an accelerated monitoring schedule shall, at a minimum, include the IWC and four additional

concentrations. The additional effluent concentrations are to provide useful information regarding the intensity of the toxic effect(s), should the discharger progress to a TRE."

This language seems to have been added in response to earlier comments from Region 2 dischargers regarding the superiority of the IC25 method for evaluating magnitude of toxicity over the TST. Unlike the TST method, the IC25 determines a concentration-response curve by evaluating a five-concentration dilution series through interpolation methods. If the intent is to switch to the IC25 method for evaluation of accelerated test results, this should be clearly stated in the Draft Policy and appropriate EPA guidance documents and test methods need to be referenced. If the intent is to evaluate the five-concentration dilution series using the "Pass" or "Fail" TST methodology, then this paragraph does not make sense. How would an agency evaluate an IWC (100% effluent) concentration that passed, when most, or all, of the other dilution concentrations failed? Furthermore, the Draft Policy may be assuming that the percent effect determined by the TST method bears some relationship to the magnitude of toxicity that is determined from the IC25 method. This is not the case. Over roughly a 5-year comparison analysis, the San Jose/Santa Clara Plant determined that TST percent failures, at IWC only, ranged from 16.9% to as high as 94.2%. Over the same test results, the Toxic Units (TUs) as determined from the IC25 evaluation could be as low as 1.6 TUs with a 40.8% effect, or 1.8 TUs with 24% effect, or 8.47 TUs with 40.3%. There are many reasons why TUs as determined from the IC25 method do not correlate with percent effect evaluated by the TST method. The five-concentration requirement for accelerated testing either needs to be removed or much more carefully explained.

Recommendation: Remove the words "five-concentration" from the second sentence of paragraph A.6.c. Remove the words "and four additional concentrations" from the third sentence. Remove the fourth sentence.

Overall, the City continues to have serious concerns about the numeric Water Quality Objectives and numeric effluent limits for toxicity proposed in the Draft Policy. State Water Board staff has made some adjustments to the Draft Policy that alleviated a few minor issues, but the overriding issue remains: the Draft Policy will establish numeric objectives and effluent limitations for a parameter that cannot be reliably identified or measured. Toxic compounds can be controlled, but only after they are identified. That is why numeric limits are established for toxic pollutants. Establishing numeric objectives for toxicity, as if unidentified biological inhibition was itself a toxic pollutant, is effectively an end-run around the regulatory guidance and rules that are employed to establish numeric limits for specific pollutants.

As always, the City looks forward to working with the State Water Board staff to develop a clear, effective policy for assessing and implementing toxicity objectives in NPDES Permits in California.

Sincerely,

Kerrie Romanow
Director, Environmental Services
City of San José