CITY OF SAN BERNARDINO
MUNICIPAL WATER DEPARTMENT

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August 21, 2012

Charles R. Hoppin, Chairman and Members
State Water Resources Control Board
1001 I Street
Sacramento, CA 95814

c/o Jeanine Townsend, Clerk to the Board
commentletters@waterboards.ca.gov

SUBJECT: **Comment Letter: Draft Policy for Toxicity Assessment and Control**

Dear Chairman Hoppin and Members:

The City of San Bernardino Water Department discharges highly-treated recycled water to the Santa Ana River in accordance with NPDES Permit No. CA8000304. We perform routine chronic toxicity testing every month and have demonstrated an outstanding record of consistent compliance for more than 16 years. Since 1996, when our tertiary treatment facility went on-line, San Bernardino's effluent has rarely failed a toxicity test and has never failed two consecutive tests. Thus, the following comments are submitted from our perspective as a permittee that is already producing a non-toxic effluent. We are deeply concerned that proposed procedures in the Draft Policy for Toxicity Assessment and Control will more frequently characterize San Bernardino's discharge as toxic when, in fact, it is not.

39.1 1) The proposed policy's null hypothesis-based numeric water quality objective initially presumes any effluent sample water is toxic, i.e., that organisms exposed to any given effluent sample will have less than 75% of the growth or reproduction of similar organisms exposed to a non-toxic control sample, until the WET test results prove otherwise. Such an assumption is completely inappropriate where a discharger has

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39.1 years of historical data indicating that its effluent is not toxic and that effluent-exposed organisms perform as well or better than the control. Such is the case in San Bernardino. This is precisely this pattern of consistent compliance that has enabled the Santa Ana Regional Board to conclude that San Bernardino had no reasonable potential for chronic toxicity and to issue San Bernardino a permit without an effluent limit for chronic toxicity. Therefore, we strongly object to any policy or test procedure that presumes San Bernardino's effluent is toxic until proven otherwise because such an assumption is inconsistent with the historical record and is contrary to EPA's guidance on how to properly assess reasonable potential.

39.2 2) Since San Bernardino's current permit was issued in December of 2006, San Bernardino has performed more than 70 chronic toxicity tests and observed only 3 failures. This failure rate is BELOW what one would expect to occur by random chance (<5% of all tests). We reanalyzed all of this data using EPA's TST procedure and found that the number of apparent test "failures" **more than doubles** under the SWRCB's proposed policy (see Appendix A). All of these additional "failures" would have been deemed to have passed both of the statistical endpoints (NOEC & IC25) currently authorized under EPA's regulations at 40 CFR Part 136. In each instance, reproduction among the effluent-exposed organisms was actually greater than 75% of that exhibited by the control group; nevertheless, under the TST procedure, San Bernardino's effluent would be declared toxic despite clear data indicating to the contrary.

Similar side-by-side comparisons performed by other NPDES permittees in the Santa Ana watershed identified similar problems. Inland Empire Utilities Agency and Yucaipa Valley Water District both found that the number of reported test failures increased using the proposed TST procedure compared to the existing NOEC or IC25 methods (see e.g., Appendix B). Results derived from the TST procedure are clearly not consistent with or comparable to those produced using the previously promulgated WET test methods.

39.3 3) The proposed TST method has not been approved under 40 CFR Part 136. Federal regulations require dischargers to perform tests using the standard methods promulgated under 40 CFR Part 136 when assessing compliance with effluent limitations in an NPDES permit.[1] Because the proposed TST procedure is not a promulgated method, it cannot be used in lieu of the currently recommended NOEC or IC25 endpoints.[2] 39.4 In addition, the TST procedure specifies that the toxicity test be performed using only two test concentrations: a control group and an effluent-exposed group. However, EPA's official promulgated WET method requires that tests used to determine compliance with an NPDES effluent limit consist of a control group and "a minimum of

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[1] See, for example, 40 CFR Part 136.1(b) and U.S. EPA. 64 FR 149, 42464 (Aug. 4, 1999)

[2] U.S. EPA. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms - 4th Ed. October, 2002. EPA-821-R-02-013. See §1.9 @ pg. 2.

39.4 five effluent concentrations" in order to evaluate the validity of the dose-response relationship.[3] EPA explains that:

> "The agency is concerned that single concentration, pass/fail, toxicity tests do not provide sufficient concentration-response information on effluent toxicity to determine compliance. It is the Agency's policy that all effluent toxicity tests include a minimum of five effluent concentrations and a control."[4]

Despite this admonition, the SWRCB is proposing that a single effluent concentration be used as a pass/fail test to determine compliance. According to EPA, additional concentrations are essential in order to reduce the number of false positives:

> "In today's action, EPA proposes to require the review of concentration-response relationships generated for all multi-concentration WET tests reported under the NPDES program. EPA proposes to modify section 10 of the two chronic method manuals and section 12 of the acute method manual to incorporate this required test review procedure...Use of the concentration-response review procedures would ensure that a valid concentration-response relationship is demonstrated prior to the determination of toxicity...the use of these review procedures reduced the rate of reported false positives in the WET Variability Study from 11.1% to 3.7% in the *Ceriodaphnia dubia* Survival and Reproduction Test and from 12.5% to 4.35% in the Fathead minnow Larval Survival and Growth Test."[5]

Since the TST procedure does not use multiple different effluent concentrations, the TST procedure produces insufficient data to evaluate the validity of the dose-response relationship. Without this important tool to identify anomalous results that frequently lead to false indications of toxicity, it is not surprising that the TST reports twice as many test failures as are observed when using the promulgated method. According to the two EPA scientists most directly responsible for developing the current WET test methods:

> "A predictable dose-response curve is one of the mandatory requirements for a valid toxicity test. We would never accept analytical results from an instrument producing an abnormal standard curve. The

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[3] U.S. EPA. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms - 4th Ed. October, 2002. EPA-821-R-02-013. See Table 1 @ pg. 76 and Table 3 @ pg. 165.

[4] U.S. EPA. Whole Effluent Toxicity: Guidelines Establishing Test Procedures for the Analysis of Pollutants - Supplementary Information Document (SID) Oct. 2, 1995; pg. 28.

[5] U.S. EPA. 66 FR 189, 49799-49800 (Sept. 28, 2001); For final rule confirming requirement to review concentration response relationship see U.S. EPA. 67 FR 223, 69962 (Nov. 19, 2002)

39.4 predictable dose-response curve, that is increasing toxicity with increasing concentration, is the analogue of the analytical standard curve and is of equal importance in toxicity testing."[6] (emphasis added)

> "The dose response curve is the basis for the validity of a toxicity test. The control serves as the starting point from which the dose response is evaluated. If a dose response is not obtained, then toxicity cannot be inferred."[7] (emphasis added)

The TST procedure fails to provide the necessary dose-response curve to ensure actual toxicity exists. This failure puts dischargers at risk of non-compliance without adequate justification.

39.5A ~~4)~~ The proposed TST procedure does not accurately identify non-toxic samples. When non-toxic method blank data from EPA's Interlaboratory WET Variability Study is re-evaluated using the TST procedure, the number of false positives increases dramatically. Nearly 15% of all non-toxic samples were declared "toxic" in the *Ceriodaphnia dubia* reproduction test - four times more than occurred when using either the NOEC or IC25 method. And, 7.4 % of all non-toxic samples were declared "toxic" using the TST procedure to evaluate Fathead minnow growth. This is double the rate at which similar false conclusions occurred when evaluating the same data with the traditional NOEC or IC25 methods (see Table 1 below and Appendix C).

Table 1: False Indications of Toxicity in Non-Toxic Method Blank Samples

Chronic Test Endpoint	TST	NOEC	IC25
C. dubia Reproduction	4 of 27 (14.8%)	1 of 27 (3.7%)	1 of 27 (3.7%)
C. dubia Survival	2 of 27 (7.4%)	0 of 27 (0%)	0 of 27 (0%)
Fathead minnow Growth	2 of 24 (8.3)	1 of 24 (4.2%)	1 of 24 (4.2%)
Fathead minnow Survival	0 of 24 (0%)	0 of 24 (0%)	0 of 24 (0%)

39.11 At a workshop before the SWRCB in November of 2010, numerous stakeholders throughout the state cited the above example and requested that the Board direct staff to conduct a new study designed to assess the TST error rate when evaluating known non-toxic (method blank) samples. However, the so-called "test drive" focused exclusively on assessing effluent samples where the true toxicity was unknown or where reference toxicant samples were already known to be toxic. No effort was made to assess the accuracy of the TST technique on method blanks as the State Board members

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[6] Dr. Donald Mount, National Effluent Toxicity Assessment Center, EPA Environmental Research Laboratory - Duluth, MN. NETACommunique, Jan., 1990

[7] Norberg-King, Teresa J., U.S. EPA Environmental Research Laboratory - Duluth, Memorandum to Rob Pederson, EPA Region X, *Review of the Toxicity Results from West Boise and Landers Street POTWs* (June 5, 1989).

39.11 promised in the workshop and as EPA had done in the Interlaboratory WET Variability Study to validate the NOEC and IC25. Since this problem has been brought to the Board's attention in previous testimony and numerous comment letters, it is incomprehensible that the issue continues to be ignored. In addition, the absence of 39.5B such essential information renders the peer review of the proposed policy both incomplete and biased. As a result, the Supplemental Environmental Documentation (SED) prepared by staff fails to meet the minimum standards necessary to adequately analyze the issues and demonstrate "functional equivalence" with CEQA requirements.

39.6 5) Because of the inherent uncertainties in WET tests and the additional problems with the TST procedures described in this letter, dischargers will be unable to certify TST results on the monthly Discharge Monitoring Reports (DMRs). In March of 2000, U.S. EPA published guidance regarding the certification of WET test results on the DMR wherein EPA stated:

> "When a person certifies that the submission of WET testing information is accurate to the best of their knowledge and belief, the person certifies that the results obtained using the WET testing procedures are faithfully and truthfully transcribed on the information submission, and that the results were, in fact results that were obtained using the specified testing procedures."[8]

Since the TST method has not been approved as part of a Part 136 method, dischargers cannot legally certify the results derived from this method. The fact that the TST procedure relies on only two rather than the minimum six test concentrations mandated in the promulgated method also makes it impossible to certify the results. And, finally, the City of San Bernardino would not and could not certify TST results as "true" or "accurate" where the conclusions were inconsistent with those reported using the IC25 procedure that EPA endorsed in the original rule promulgating the existing methods. This is particularly true in light of our inability to confirm the validity of the dose response relationship and the elevated incidence of false positive results observed when using the TST procedure to evaluate non-toxic method blank samples. The City's position is also consistent with the U.S. Court of Appeals finding in the *Amoco* case.[9]

39.7 6) The proposed requirement to perform two additional accelerated tests in the same calendar month that the original test failure occurred will be virtually impossible to implement. A minimum of 10 days is required to collect, deliver and analyze an effluent

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[8] U.S. EPA. Certification of Accuracy of Information Submissions of Test Results Measuring Whole Effluent Toxicity. Memorandum to Regional Water Management Division Directions, EPA Regions I-X and Regional Enforcement Division Directions, EPA Regions I-X. March 3, 2000.

[9] *Amoco Oil Co. v. EPA*, 501 F.2d 722 (D.C. Cir. 1974) stating in relevant part that the possibility of measurement error "deprives the agency of the power to find a violation of the standard, in enforcement proceedings, where the measured departure from them is within the boundaries of the probable measurement error."

39.7 sample. Most POTWs collect and ship the initial sample on the first Monday of the month. The lab initiates the chronic test the following day and the test will conclude 7-8 days later (usually a Tuesday or Wednesday of the following week). The lab will analyze the data and report preliminary results within a day or so. If the test fails, new sample containers must be prepared and new samples must be sent to the lab. This also requires just a day or two. However, the cumulative time that has elapsed is now nearly two weeks. It is difficult, but possible, to perform two tests in a single month. However, it is not possible to conduct three. This is especially true in January, July, November and December when national holidays severely restrict the normal testing schedule.

San Bernardino's existing permit specifies that we conduct regular monthly chronic toxicity testing and already requires us to initiate accelerated monitoring at the first indication of WET test failure. As with the proposed state policy, the City is required to pass the next two tests in order to resume the normal monitoring schedule. However, unlike the proposed policy, we are allowed two months rather than one month to gather the necessary data. This is a reasonable requirement and one we have been able to consistently meet regardless of when the first test is initiated or whether any national holidays occur during the same period.

The only way to comply with the accelerated sampling schedule set forth in the state's proposed policy would be to schedule weekly tests and pre-ship effluent samples in the event they "might" be needed if the initial test fails. Obviously, the follow-on tests could be cancelled if the initial test passes, but the expense of shipping contingency samples and the cancellation penalties imposed by the laboratory would impose unreasonable and unnecessary costs on dischargers. These contingency costs were not considered in the economic analysis commissioned by the SWRCB.

39.8 7) Like the previous analysis conducted by SAIC, the economic impact analysis prepared by ABT Associates contains numerous errors and severely underestimates the true cost of compliance with the SWRCB's proposed policy. ABT examined all of the WET test data reported on San Bernardino's DMR's between June of 2006 and June of 2008 to estimate the incremental costs likely to occur in the draft policy is approved. However, ABT made this comparison using the incorrect permit. Their analysis was based on NPDES No. CA0105392 not NPDES No. CA800034. The former is a rarely used permit that allows the City to (temporarily) discharge disinfected secondary effluent without Title-22 filtration only when there is 20-to-1 dilution available in the receiving water. The latter is the permit which governs the City's day-to-day discharges from the tertiary filtration facility known as "RIX." The City has only been able to effect discharges under the temporary permit about once in every 10 years when higher rainfall associated with an El Nino winter swell flows in the receiving water. And, even then, the City is rarely able to discharge for more than a week or two before river flows no longer provide the required 20-to-1 dilution. The terms and conditions of Permit No. CA0105392 bear little

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39.8 → relationship to those found in Permit No. CA800034. Thus, ABT's analysis and conclusions with respect to the costs likely to be incurred at San Bernardino are wholly invalid.

In addition, ABT's analysis was done by comparing the NOEC failure rate against the TST failure rate. However, San Bernardino uses IC25, not the NOEC, to calculate the Toxicity Units (TUc) value used to trigger accelerated testing or TIE requirements.[10] This distinction makes a great deal of difference because the final effluent has only failed the IC25 endpoint twice in the last five years, but would have failed five times during the same time period using the TST. The elevated failure rate, likely due to the increased incidence of false toxicity indications, greatly increases the City's total monitoring costs and exposure to enforcement actions and penalties.

ABT also assumed there would be considerable saving associated with running only two test concentrations rather than the six that are currently required. However, as previously noted, federal regulations <u>require</u> that at least five effluent dilutions be run even if the TST uses only data from the control group and the undiluted effluent to estimate compliance. Consequently, ABT was mistaken to assume that a more simplified test design might save the City money. They should have consulted with us prior to drawing such a conclusion from our historic data. We would have also provided them more accurate data on the true cost of WET testing. ABT's estimate is <u>less than half</u> of our actual expense for sample shipping and laboratory testing.

ABT's fundamental lack of understanding for how WET testing works in the real world, and other errors on the detailed requirements in our relevant existing permit, calls into question the validity of their conclusions. If ABT made the same mistakes calculating the incremental cost of compliance for other dischargers as were made when they evaluated San Bernardino's permit, then the analysis is severely flawed and lacks the credibility necessary to demonstrate that the SWRCB made a good faith effort to consider economics as required by §13241 of the California Water Code. At a minimum, ABT's analysis should be audited and peer-reviewed. Based on our direct review of ABT's false statements regarding San Bernardino's discharge, we believe the study should be discarded and redone.

39.9 ~~8)~~ → Many of the QA/QC procedures established by EPA to assure the accuracy and reliability of WET test results become obsolete and irrelevant if the TST method is mandated by the SWRCB. For example, laboratories routinely prepare control charts reporting the results of their reference toxicant tests based on the NOEC or IC25. Neither EPA or the State have established an equivalent control chart metric for the TST. Nor is it clear whether or how the discharger would demonstrate compliance with the existing

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[10] NPDES No. CA8000304. Monitoring and Reporting Program. See §V-A-5 @ pg. E-10 (R8-2006-0052)

39.9 requirement to calculate the PMSD (a mandatory measure of test sensitivity) once the TST is enacted.

39.10 ~~9)~~ To our knowledge, no field studies demonstrate that chronic WET test results derived using the TST procedure are well-correlated with actual instream conditions. Such studies are essential to prove the TST produces results "comparable" to the existing methods that have already been field-validated. Any claim that the TST is "at least as sensitive" as the NOEC or IC25 is based solely on the observation that the TST indicates the presence of toxicity more often than either of those previously promulgated methods. However, more frequent failure is only an indication of greater sensitivity if the results are accurate. As noted above, the TST procedure finds method blank samples to be "toxic" more than twice as often as the NOEC or IC25. Consequently, no reason exists to conclude the proposed method is better than (or even as good as) the current statistical measures. And, there is no basis to believe that TST results will correlate well with the richness and abundance of aquatic organisms downstream of any given discharge. This is particularly true when EPA has admitted that it lacks any field data on the predictive reliability of WET testing for effluent-dependent ecosystems such as the Santa Ana River.[11]

In addition, the correlation between WET test results and instream conditions in EPA's existing field validation studies is based almost entirely on failures induced by excess mortality. More recently, EPA has acknowledged that WET test failures caused solely by changes in growth or reproduction (not survival) may not accurately predict instream impairment.[12]

> "The U.S. EPA studies have been criticized for selecting sites with high instream toxicity and known biological impact. Further, none of these studies demonstrated predictive accuracy."[13]

Independent, peer-reviewed scientific studies clearly show that WET tests results are not correlated with the abundance or diversity of species found in aquatic ecosystems after properly controlling for other influential variables such as available habitat. The best such study was performed by the very same expert that developed the TST method for EPA - Dr. Jerry Diamond:

> "There is nearly a 50% probability that toxicity exhibited in WET tests may not be reflected instream, even for those effluents exhibiting a relatively

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[11] Letter from Gregory R. Grinder, U.S. EPA Office of Research and Development to Mark T. Pifher, counsel for the Western Coalition of Arid States dated Sept. 11, 1996 in response to FOIA request].

[12] U.S. EPA. A Review of Single Species Toxicity Tests: Are the Tests Reliable Predictors of Aquatic Ecosystem Responses? EPA/600/R-97/114. July, 1999 @ pg. 24

[13] Chapman, P.M. 2000. Whole effluent toxicity testing-usefulness, level of protection, and risk assessment. *Environ. Toxicol. Chem.* 19:3-13

39.10 high failure rate (>90%) ... A surprising result of this study was the lack of relationship between Ceriodaphnia acute or chronic WET endpoints and instream biological results."[14]

39.12 Therefore, unless the TST procedure can show nearly perfect consistency with the results reported using the NOEC or IC25, the method must be independently validated (in accordance with 40 CFR Part 136.5) before being used as a primary indicator of potential instream impairment. According to EPA's own Administrative Law Judge:

> "... the proposed [toxicity] tests must be reasonably related to determining whether the discharge could lead to 'real world' effects. The Clean Water Act objective to prohibit the discharge of 'toxic pollutants in toxic amounts' concerns toxicity in the receiving waters of the United States, not the laboratory tank"[15]

And, this obligation to more fully validate the TST procedure is entirely consistent with EPA's own guidance on the matter:

> "A fully validated and standardized method is a method that has been ruggedized by a systematic process and is applicable for its intended use. Ideally, only those methods that have been fully validated and standardized should be used for Agency [EPA] needs. However, due to resource and time constraints, it is not always possible to fully validate and standardization required for a given method depends to some extent on the intended use of the data. For example, methods which will be used extensively for regulatory purposes or where significant decision must be based on the quality of the analytical data normally require more extensive validation and standardization than methods developed to collect preliminary baseline data... Where possible, and in all cases for methods that will have extensive regulatory use, a method should be fully validated and standardized. This increased level of validation verifies that the method is suitable for its intended purpose."[16] *(emphasis added).*

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[14] Diamond, J. and C. Daley. 2000. What is the relationship between whole effluent toxicity and instream biological condition? *Environ. Toxicol. Chem.* 19:158-168 (emphasis added).

[15] Andrew S. Pearlstein. In the Matter of Metropolitan Dade County (Fla.), Miami-Date Water and Sewer Authority (NPDES Permit No. FL0224805), 1996 EPA ALJ Lexis 80 (Oct. 3, 1996). Also cited in Water Environment and Technology, May 1997, pg. 104) (emphasis added).

[16] Availability, Adequacy, and Comparability of Testing Procedures for the Analysis of Pollutants Established Under Section 304(h) of the Federal Water Pollution Control Act - Report to Congress; EPA/600/9-87/030; September, 1988; p. 3-5 & 3-6

39.12 → The TST procedure proposed in the SWRCB's draft Policy for Toxicity Assessment and Control has been subjected to only a small fraction of the validation efforts that EPA undertook for the NOEC and IC25. Until such time as EPA promulgates the TST as part of an approved Part 136 method, the SWRCB must provide the validation documentation normally prepared by EPA, or wait until EPA completes this validation. This includes appropriate interlaboratory studies, analysis of method blanks, and confirmation of a correlation to instream conditions. To date, none of this supplemental information has been compiled or submitted to formal Peer Review as required by both state and federal law. As such, the State Board lacks the authority to require use of the TST procedure in lieu of the promulgated methods (NOEC or IC25) for the purpose of imposing, and assessing compliance with, effluent limitations in an NPDES permit.

For the reasons set forth above, the City of San Bernardino encourages the SWRCB to reject the proposed policy as presently drafted.

Respectfully submitted,

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cc: David Aladjem and Melissa Thorme, Downey Brand LLP
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Appendix A:

Side-by-Side Comparison of TST vs. NOEC vs. IC25 Methods Using Historic WET Test Results for Discharges Made Pursuant to NPDES Permit No. CA CA8000304

Facility / Location	Date	Control Mean	Control STD	100% Mean	100% STD	NOEC	% Dif at IWC	NOEC	EC/IC25	TST Result	EPA WORKSHEET	b	$Y_t - b^*Y_c$	S_t^2	S_c^2	n_t	n_c	S_t^2/n_t	$b^2S_c^2/n_c$	SqRt of $[(S_t^2/n_t) + (b^2S_c^2/n_c)]$	Calc. t	$[(S_t^2/n_t) + (b^2S_c^2/n_c)]^2$	$[S_t^2/n_t]^2$	$[b^2S_c^2/n_c]^2$	$n_t - 1$	$n_c - 1$	Degrees of Freedom	Crit. t
RIX	May 2012	31.7	4.029	35.2	2.616	100	-11.04	Pass	Pass	Pass	Pass	0.75	11.43	6.84	16.23	10	10	0.68	0.91	1.26	9.0395	2.55	0.47	0.83	9	9	18	0.8662
RIX	Apr 2012	29.9	8.157	29.67	9.798	100	0.77	Pass	Pass	Pass	Pass	0.75	7.25	96.00	66.54	10	10	9.60	3.74	3.65	1.9834	178.03	92.16	14.01	9	9	15	0.8662
RIX	Mar 2012	25.1	7.81	32	3.018	100	-27.49	Pass	Pass	Pass	Pass	0.75	13.18	9.11	61.00	10	10	0.91	3.43	2.08	6.3228	18.85	0.83	11.77	9	9	13	0.8647
RIX	Feb 2012	28	7.601	29.8	9.897	100	-6.43	Pass	Pass	Pass	Pass	0.75	8.80	97.95	57.78	10	10	9.80	3.25	3.61	2.4365	170.17	95.94	10.56	9	9	14	0.8755
RIX	Jan 2012	28.67	4.387	25.9	10.071	100	9.66	Pass	Pass	Pass	Pass	0.75	4.40	101.43	19.25	10	9	10.14	1.20	3.37	1.3056	128.72	102.87	1.45	9	8	11	0.8662
RIX	Dec 2011	26.4	5.621	30	5.637	100	-13.64	Pass	Pass	Pass	Pass	0.75	10.20	31.78	31.60	10	10	3.18	1.78	2.23	4.5823	24.55	10.10	3.16	9	9	17	0.8647
RIX (MBC)	Nov 2011	23.4	2.413	22	5.437	100	5.98	Pass	Pass	Pass	Pass	0.75	4.45	29.56	5.82	10	10	2.96	0.33	1.81	2.4557	10.78	8.74	0.11	9	9	11	0.8702
RIX	Nov 2011	21.7	2.541	23.7	2.003	100	-9.22	Pass	Pass	Pass	Pass	0.75	7.43	4.01	6.46	9	9	0.45	0.40	0.92	8.0568	0.72	0.20	0.16	8	8	16	0.8662
RIX	Oct 2011	24.7	4.668	22.3	6.684	100	9.72	Pass	Pass	Pass	Pass	0.75	3.78	44.68	21.79	10	10	4.47	1.23	2.39	1.5821	32.41	19.96	1.50	9	9	14	0.8681
RIX	Sep 2011	29.6	3.893	28.9	3.414	100	2.36	Pass	Pass	Pass	Pass	0.75	6.70	11.66	15.16	10	10	1.17	0.85	1.42	4.7164	4.07	1.36	0.73	9	9	18	0.8681
RIX	Aug 2011	30	7.76	27	6.307	100	10.00	Pass	Pass	Pass	Pass	0.75	4.50	39.78	60.22	10	10	3.98	3.39	2.71	1.6582	54.24	15.82	11.47	9	9	18	0.8647
RIX	Jul 2011	29.3	4.27	30.4	7.427	100	-3.75	Pass	Pass	Pass	Pass	0.75	8.43	55.16	18.23	10	10	5.52	1.03	2.56	3.2940	42.79	30.43	1.05	9	9	12	0.8662
RIX	Jun 2011	22.8	2.098	24.7	1.947	100	-8.33	Pass	Pass	Pass	Pass	0.75	7.60	3.79	4.40	9	10	0.42	0.25	0.82	9.2933	0.45	0.18	0.06	8	9	15	0.8702
RIX	May 2011	30.7	6.019	29.3	2.627	100	4.56	Pass	Pass	Pass	Pass	0.75	6.28	6.90	36.23	10	10	0.69	2.04	1.65	3.7992	7.44	0.48	4.15	9	9	14	0.8647
RIX	Apr 2011	27.7	8.908	29.7	4.057	100	-7.22	Pass	Pass	Pass	Pass	0.75	8.93	16.46	79.35	10	10	1.65	4.46	2.47	3.6108	37.33	2.71	19.92	9	9	15	0.8702
RIX	Mar 2011	25.13	6.77	27.33	4.153	100	-8.75	Pass	Pass	Pass	Pass	0.75	8.48	17.25	45.83	10	10	1.72	2.58	2.07	4.0893	18.51	2.97	6.65	9	9	17	0.8755
RIX	Feb 2011	24.3	2.669	29	4.555	100	-19.34	Pass	Pass	Pass	Pass	0.75	10.78	20.75	7.12	10	10	2.07	0.40	1.57	6.8483	6.13	4.30	0.16	9	9	12	0.8662
RIX	Jan 2011	23.4	4.088	27.3	8.001	100	-16.67	Pass	Pass	Pass	Pass	0.75	9.75	64.02	16.71	10	10	6.40	0.94	2.71	3.5984	53.90	40.98	0.88	9	9	12	0.8662
RIX	Dec 2010	21	8.459	26.56	6.287	100	-26.48	Pass	Pass	Pass	Pass	0.75	10.81	39.53	71.55	10	10	3.95	4.02	2.82	3.8273	63.64	15.62	16.20	9	9	18	0.8662
RIX	Nov 2010	21	3.3	21.56	1.878	100	-2.67	Pass	Pass	Pass	Pass	0.75	5.81	3.53	10.89	10	10	0.35	0.61	0.98	5.9137	0.93	0.12	0.38	9	9	17	0.8662
RIX	Oct 2010	29.1	7.795	24.7	3.529	100	15.12	Pass	Pass	Pass	Pass	0.75	2.88	12.45	60.76	10	10	1.25	3.42	2.16	1.3314	21.75	1.55	11.68	9	9	15	0.8662
RIX	Sep 2010	34.1	3.984	32.5	2.068	100	4.69	Pass	Pass	Pass	Pass	0.75	6.93	4.28	15.87	10	10	0.43	0.89	1.15	6.0264	1.74	0.18	0.80	9	9	16	0.8647
RIX	Aug 2010	34.6	2.757	34.1	5.567	100	1.45	Pass	Pass	Pass	Pass	0.75	8.15	30.99	7.60	10	10	3.10	0.43	1.88	4.3398	12.44	9.60	0.18	9	9	11	0.8755
RIX	Jul 2010	19.556	7.368	23.2	4.104	100	-18.63	Pass	Pass	Pass	Pass	0.75	8.53	16.84	54.29	10	9	1.68	3.39	2.25	3.7869	25.78	2.84	11.51	9	8	15	0.8662
RIX	Jun 2010	29.7	3.623	28.1	1.969	100	5.39	Pass	Pass	Pass	Pass	0.75	5.83	3.88	13.13	10	10	0.39	0.74	1.06	5.4893	1.27	0.15	0.55	9	9	16	0.8647
RIX	May 2010	25.5	6.06	26	9.545	100	-1.96	Pass	Pass	Pass	Pass	0.75	6.88	91.11	36.72	10	10	9.11	2.07	3.34	2.0565	124.91	83.00	4.27	9	9	13	0.8702
RIX	Apr 2010	18.444	3.712	23.89	2.147	100	-29.52	Pass	Pass	Pass	Pass	0.75	10.06	4.61	13.78	9	9	0.51	0.86	1.17	8.5809	1.89	0.26	0.74	8	8	15	0.8662
RIX	Mar 2010	20.9	5.322	21.6	7.648	100	-3.35	Pass	Pass	Pass	Pass	0.75	5.93	58.49	28.32	10	10	5.85	1.59	2.73	2.1719	55.39	34.21	2.54	9	9	14	0.8681
RIX	Feb 2010	32.7	2.751	37.5	3.837	100	-14.68	Pass	Pass	Pass	Pass	0.75	12.98	14.72	7.57	10	10	1.47	0.43	1.38	9.4181	3.60	2.17	0.18	9	9	14	0.8681
RIX	Jan 2010	31.8	5.308	37	2.625	100	-16.35	Pass	Pass	Pass	Pass	0.75	13.15	6.89	28.17	10	10	0.69	1.58	1.51	8.7205	5.17	0.47	2.51	9	9	16	0.8647
RIX	Dec 2009	32.7	6.147	30.2	7.729	100	7.65	Pass	Pass	Pass	Pass	0.75	5.68	59.74	37.79	10	10	5.97	2.13	2.85	1.9941	65.60	35.69	4.52	9	9	15	0.8662
RIX	Nov 2009	29	12.101	35.44	4.187	100	-22.22	Pass	Pass	Pass	Pass	0.75	13.69	17.53	146.43	9	10	1.95	8.24	3.19	4.2910	103.73	3.79	67.85	8	9	13	0.8702
RIX (MBC)	Nov 2009	22.6	5.83	26	6.46	100	-15.04	Pass	Pass	Pass	Pass	0.75	9.05	41.73	33.99	10	10	4.17	1.91	2.47	3.6687	37.03	17.42	3.66	9	9	16	0.8647
RIX	Oct 2009	29	2.667	30.5	4.196	100	-5.17	Pass	Pass	Pass	Pass	0.75	8.75	17.61	7.11	10	10	1.76	0.40	1.47	5.9526	4.67	3.10	0.16	9	9	13	0.8702
RIX	Sep 2009	25.7	1.636	26.9	3.281	100	-4.67	Pass	Pass	Pass	Pass	0.75	7.63	10.76	2.68	10	10	1.08	0.15	1.11	6.8835	1.51	1.16	0.02	9	9	11	0.8755
RIX	Aug 2009	25.6	2.459	23.6	2.366	100	7.81	Pass	Pass	Pass	Pass	0.75	4.40	5.60	6.05	10	10	0.56	0.34	0.95	4.6382	0.81	0.31	0.12	9	9	17	0.8633
RIX	Jul 2009	26.9	3.604	11.7	8.341	90	56.51	Fail	Fail	Fail	Fail	0.75	-8.48	69.57	12.99	10	10	6.96	0.73	2.77	-3.0566	59.10	48.40	0.53	9	9	11	0.8755
RIX	7/20/2009	27.5	6.519	33.1	2.132	100	-20.36	Pass	Pass	Pass	Pass	0.75	12.48	4.55	42.50	10	10	0.45	2.39	1.69	7.3960	8.09	0.21	5.71	9	9	12	0.8726
RIX (MBC)	7/20/2009	36.2	5.47	30	4.32	100	17.13	Pass	Pass	Pass	Pass	0.75	2.85	18.66	29.92	10	10	1.87	1.68	1.88	1.5128	12.60	3.48	2.83	9	9	18	0.8620
RIX	Jun 2009	18	2.449	17	5.715	100	5.56	Pass	Pass	Pass	Pass	0.75	3.50	32.66	6.00	10	10	3.27	0.34	1.90	1.8438	12.99	10.67	0.11	9	9	11	0.8755
RIX (MBC)	Jun 2009	27	7.15	21.8	5.98	100	19.26	Pass	Pass	Fail	Fail	0.75	1.55	35.76	51.12	10	10	3.58	2.88	2.54	0.6102	41.62	12.79	8.27	9	9	18	0.8620
RIX	May 2009	25.3	5.964	21.9	7.852	100	13.44	Pass	Pass	Pass	Pass	0.75	2.93	61.65	35.57	10	10	6.17	2.00	2.86	1.0236	66.69	38.01	4.00	9	9	14	0.8681
RIX	Apr 2009	20.3	8.125	21	6.342	100	-3.45	Pass	Pass	Pass	Pass	0.75	5.78	40.22	66.02	10	10	4.02	3.71	2.78	2.0764	59.84	16.18	13.79	9	9	18	0.8620
RIX	Mar 2009	40.889	7.008	36.1	2.514	100	11.71	Pass	Pass	Pass	Pass	0.75	5.43	6.32	49.11	10	9	0.63	3.07	1.92	2.8240	13.70	0.40	9.42	9	8	11	0.8755
RIX	Feb 2009	32.7	2.751	37.5	3.837	100	-14.68	Pass	Pass	Pass	Pass	0.75	12.98	14.72	7.57	10	10	1.47	0.43	1.38	9.4181	3.60	2.17	0.18	9	9	14	0.8681
RIX	Jan 2009	20.8	5.0288	27.3	3.268	100	-31.25	Pass	Pass	Pass	Pass	0.75	11.70	10.68	25.29	10	10	1.07	1.42	1.58	7.4140	6.20	1.14	2.02	9	9	18	0.8620
RIX	Dec 2008	29.2	3.011	32.8	1.135	100	-12.33	Pass	Pass	Pass	Pass	0.75	10.90	1.29	9.07	10	10	0.13	0.51	0.80	13.6379	0.41	0.02	0.26	9	9	13	0.8702
RIX	Nov 2008	33.2	3.19	31.9	5.087	100	3.92	Pass	Pass	Pass	Pass	0.75	7.00	25.88	10.18	10	10	2.59	0.57	1.78	3.9377	9.99	6.70	0.33	9	9	13	0.8702
RIX	Oct 2008	28.3	4.99	22.7	5.478	100	19.79	Pass	Pass	Fail	Fail	0.75	1.48	30.01	24.90	10	10	3.00	1.40	2.10	0.7031	19.37	9.01	1.96	9	9	16	0.8647
RIX	Sep 2008	21	8.5115	25.1	2.558	100	-19.52	Pass	Pass	Pass	Pass	0.75	9.35	6.54	72.45	10	10	0.65	4.08	2.17	4.2994	22.37	0.43	16.61	9	9	12	0.8726
RIX	Aug 2008	22.8	5.493	25.4	2.989	100	-11.40	Pass	Pass	Pass	Pass	0.75	8.30	8.93	30.17	10	10	0.89	1.70	1.61	5.1567	6.71	0.80	2.88	9	9	16	0.8647
RIX	Jul 2008	28.2	2.7	31	3.528	100	-9.93	Pass	Pass	Pass	Pass	0.75	9.85	12.45	7.29	10	10	1.24	0.41	1.29	7.6572	2.74	1.55	0.17	9	9	14	0.8681
RIX (MBC)	Jul 2008	22.8	2.1	25.4	3.5	100	-11.40	Pass	Pass	Pass	Pass	0.75	8.30	12.25	4.41	10	10	1.23	0.25	1.21	6.8386	2.17	1.50	0.06	9	9	13	0.8702
RIX	Jun 2008	25.4	5.06	28.5	3.586	100	-12.20	Pass	Pass	Pass	Pass	0.75	9.45	12.86	25.60	8	10	1.61	1.44	1.75	5.4132	9.29	2.58	2.07	7	9	15	0.8662
RIX	May 2008	19.56	1.014	20.2	2.44	100	-3.27	Pass	Pass	Pass	Pass	0.75	5.53	5.95	1.03	10	9	0.60	0.06	0.81	6.8089	0.44	0.35	0.00	9	8	11	0.8755
RIX	Apr 2008	18.1	7.9506	27.9	5.131	100	-54.14	Pass	Pass	Pass	Pass	0.75	14.33	26.32	63.21	10	10	2.63	3.56	2.49	5.7587	38.29	6.93	12.64	9	9	18	0.8620
RIX	Mar 2008	23	1.7321	26.4	4.647	100	-14.78	Pass	Pass	Pass	Pass	0.75	9.15	21.60	3.00	10	9	2.16	0.19	1.53	5.9721	5.51	4.67	0.04	9	8	11	0.8755
RIX	Feb 2008	21.222	4.177	16.2	9.449	100	23.66	Pass	Pass	Fail	Fail	0.75	0.28	89.28	17.45	10	9	8.93	1.09	3.17	0.0896	100.38	79.72	1.19	9	8	11	0.8755
RIX	1/29/2008	30.2	3.393	30.4	4.351	100	-0.66	Pass	Pass	Pass	Pass	0.75	7.75	18.93	11.51	10	10	1.89	0.65	1.59	4.8621	6.46	3.58	0.42	9	9	15	0.8662
RIX	Jan 2008	20.9	5.3009	13.5	6.096	30	35.41	Fail	Fail	Fail	Fail	0.75	-2.18	37.17	28.10	10	10	3.72	1.58	2.30	-0.9450	28.06	13.81	2.50	9	9	15	0.8662
RIX	Dec 2007	21.1	2.5582	18.7	5.292	100	11.37	Pass	Pass	Pass	Pass	0.75	2.88	28.01	6.54	10	10	2.80	0.37	1.78	1.6150	10.04	7.85	0.14	9	9	11	0.8755
RIX	Nov 2007	24.1	4.4585	23.3	6.945	100	3.32	Pass	Pass	Pass	Pass	0.75	5.23	48.23	19.88	10	10	4.82	1.12	2.44	2.1436	35.30	23.26	1.25	9	9	13	0.8702
RIX	Oct 2007	23.4	3.3067	24.7	2.312	100	-5.56	Pass	Pass	Pass	Pass	0.75	7.15	5.34	10.93	10	10	0.53	0.62	1.07	6.6688	1.32	0.29	0.38	9	9	18	0.8620
RIX	Sep 2007	26.9	6.1905	25.4	6.687	100	5.58	Pass	Pass	Pass	Pass	0.75	5.23	44.71	38.32	10	10	4.47	2.16	2.57	2.0297	43.91	19.99	4.65	9	9	16	0.8647
RIX	Aug 2007	29.7	5.2079	26.6	9.732	100	10.44	Pass	Pass	Pass	Pass	0.75	4.33	94.71	27.12	10	10	9.47	1.53	3.32	1.3042	120.92	89.70	2.33	9	9	12	0.8726
RIX	Jul 2007	18.1	9.061	25.3	4.398	100	-39.78	Pass	Pass	Pass	Pass	0.75	11.73	19.34	82.10	10	10	1.93	4.62	2.56	4.5805	42.93	3.74	21.33	9	9	15	0.8662
RIX	Jun 2007	28	5.85	30.9	4.459	100	-10.36	Pass	Pass	Pass	Pass	0.75	9.90	19.88	34.22	10	10	1.99	1.93	1.98	5.0045	15.31	3.95	3.71	9	9	18	0.8620

Appendix B:

Side-by-Side Comparison of TST vs. NOEC vs. IC25 Methods Using Historic WET Test Results for Discharges Made Pursuant by Yucaipa Valley Water District And Inland Empire Utilities Agency

Facility / Location	Test ID#	Date	Species	Endpoint	Control Mean	Control STD	100% Mean	100% STD	NOEC	% Differnce at IWC	NOEC	EC/IC25	TST Result	b	$Y_t - b^*Y_c$	S_t^2	S_c^2	n_t	n_c	S_t^2/n_t	$b^2S_c^2/n_c$	SqRt of $[(S_t^2/n_t) + (b^2S_c^2/n_c)]$	Calc. t	$[(S_t^2/n_t) + (b^2S_c^2/n_c)]^2$	$[S_t^2/n_t]^2$	$[b^2S_c^2/n_c]^2$	$n_t - 1$	$n_c - 1$	Degrees of Freedom	Crit. t
YVWD effluent- outfall	11-003	10.04.10	C.dubia	Reproduction	25.33	11.39	26.3	4.498	100	-3.83	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.30	20.23	129.73	10	9	2.02	8.11	3.18	2.2942	102.65	4.09	65.74	9	8	12	0.6955
YVWD effluent- outfall	10-384	09.13.10	C.dubia	Reproduction	33	6.342	33.6	8.859	100	-1.82	Non-Toxic	Non-Toxic	Non-Toxic	0.75	8.85	78.48	40.22	10	10	7.85	2.26	3.18	2.7833	102.22	61.59	5.12	9	9	14	0.6924
YVWD effluent- outfall	10-373	08.23.10	C.dubia	Reproduction	25.5	2.369	25	6.799	100	1.96	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.88	46.23	5.61	10	10	4.62	0.32	2.22	2.6437	24.39	21.37	0.10	9	9	10	0.6998
YVWD effluent- outfall	10-352	08.09.10	C.dubia	Reproduction	25.7	4.24	0	0	30	100.00	Toxic	Toxic	Toxic	0.76	-19.28	0.00	17.98	10	10	0.00	1.01	1.01	-19.1676	1.02	0.00	1.02	9	9	9	0.7027
YVWD effluent- outfall	1008-S026	08.09.10	C.dubia	Reproduction	25.33	7.297	0	0	30	100.00	Toxic	Toxic	Toxic	0.75	-19.00	0.00	53.25	10	10	0.00	3.00	1.73	-10.9772	8.97	0.00	8.97	9	9	9	0.7027
YVWD effluent- outfall	10-324	07.12.10	C.dubia	Reproduction	22.6	6.995	27.8	6.909	100	-23.01	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.85	47.73	48.93	10	10	4.77	2.75	2.74	3.9551	56.64	22.79	7.58	9	9	17	0.6892
YVWD effluent- outfall	10-298	06.07.10	C.dubia	Reproduction	34.2	12.2	30.1	12	100	11.99	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.45	144.00	148.84	9	10	16.00	8.37	4.94	0.9014	594.01	256.00	70.09	8	9	15	0.6912
YVWD effluent- outfall	10-265	05.03.10	C.dubia	Reproduction	31.2	5.673	25.2	6.477	100	19.23	Non-Toxic	Non-Toxic	Non-Toxic	0.75	1.80	41.95	32.18	10	10	4.20	1.81	2.45	0.7345	36.07	17.60	3.28	9	9	16	0.6892
YVWD effluent- outfall	10-223	04.05.10	C.dubia	Reproduction	34.5	11.2	27.1	7.72	100	21.45	Non-Toxic	Non-Toxic	Toxic	0.75	1.23	59.60	125.44	10	10	5.96	7.06	3.61	0.3395	169.41	35.52	49.79	9	9	18	0.6884
YVWD effluent- outfall	10-200	03.08.10	C.dubia	Reproduction	28.6	8.07	26.1	2.71	100	8.74	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.65	7.34	65.12	9	10	0.82	3.66	2.12	2.1971	20.06	0.67	13.42	8	9	13	0.6938
YVWD effluent- outfall	10-181	02.22.10	C.dubia	Reproduction	32.7	8.54	25.4	8.69	100	22.32	Non-Toxic	Non-Toxic	Toxic	0.75	0.87	75.52	72.93	10	10	7.55	4.10	3.41	0.2563	135.82	57.03	16.83	9	9	17	0.6892
YVWD effluent- outfall	10-146	02.08.10	C.dubia	Reproduction	28.8	9.22	3.67	6.22	30	87.26	Toxic	Toxic	Toxic	0.75	-17.93	38.69	85.01	6	10	6.45	4.78	3.35	-5.3505	126.11	41.58	22.86	5	9	12	0.6955
YVWD effluent- outfall	10-082	01.04.10	C. dubia	Reproduction	21	4.031	24.22	5.54	100	-15.33	Non-Toxic	Non-Toxic	Non-Toxic	0.75	8.47	30.69	16.25	10	10	3.07	0.91	2.00	4.2439	15.87	9.42	0.84	9	9	14	0.6924
YVWD effluent- outfall	10-061	12.07.09	C. dubia	Reproduction	29.3	5.2	25.7	4.8	100	12.29	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.73	23.04	27.04	10	10	2.30	1.52	1.96	1.9046	14.63	5.31	2.31	9	9	17	0.6892
YVWD effluent- outfall	10-030	11.02.09	C.dubia	Reproduction	23.7	3.65	29.6	6.79	100	-24.89	Non-Toxic	Non-Toxic	Non-Toxic	0.75	11.83	46.10	13.32	10	10	4.61	0.75	2.32	5.1077	28.73	21.26	0.56	9	9	12	0.6955
YVWD effluent- outfall	10-004	10.05.09	C.dubia	Reproduction	29.5	5.82	27.9	10.2	100	5.42	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.78	104.04	33.87	9	10	11.56	1.91	3.67	1.5738	181.31	133.63	3.63	8	9	11	0.6974
YVWD effluent- outfall	0909-S028**	09.09.09	C.dubia	Reproduction	1.8	2.04	3.1	2.42	100	-72.22	Non-Toxic	Non-Toxic	Non-Toxic	0.75	1.75	5.86	4.16	10	10	0.59	0.23	0.91	1.9329	0.67	0.34	0.05	9	9	15	0.6912
YVWD effluent- outfall	0909-S028	09.21.09	C.dubia	Reproduction	31.4	3.69	35.7	13.2	100	-13.69	Non-Toxic	Non-Toxic	Non-Toxic	0.75	12.15	174.24	13.62	10	10	17.42	0.77	4.26	2.8488	330.87	303.60	0.59	9	9	10	0.6998
YVWD effluent- outfall	0908-S007	08.03.09	C.dubia	Reproduction	23.6	3.95	27.6	9.9	100	-16.95	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.90	98.01	15.60	10	10	9.80	0.88	3.27	3.0295	114.03	96.06	0.77	9	9	11	0.6974
YVWD effluent- outfall	0907-S010	07.06.09	C.dubia	Reproduction	25.5	4.48	27.7	3.64	100	-8.63	Non-Toxic	Non-Toxic	Non-Toxic	0.75	8.58	13.25	20.07	9	10	1.47	1.13	1.61	5.3168	6.77	2.17	1.27	8	9	16	0.6901
YVWD effluent- outfall	09-342	06.08.09	C.dubia	Reproduction	27.4	4.69	32.4	4.17	100	-18.25	Non-Toxic	Non-Toxic	Non-Toxic	0.75	11.85	17.39	22.00	10	10	1.74	1.24	1.73	6.8689	8.86	3.02	1.53	9	9	18	0.6884
YVWD effluent- outfall	0906-S046	06.08.09	C.dubia	Reproduction	20.9	8.9	23.2	13.7	100	-11.00	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.53	187.69	79.21	10	10	18.77	4.46	4.82	1.5615	539.38	352.28	19.85	9	9	13	0.6938
YVWD effluent- outfall	09-307	05.04.09	C.dubia	Reproduction	16.9	5.69	23	9.97	100	-36.09	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.33	99.40	32.38	10	10	9.94	1.82	3.43	3.0107	138.33	98.81	3.32	9	9	12	0.6955
YVWD effluent- outfall	09-271	04.13.09	C.dubia	Reproduction	22.1	3.89	22.6	4.16	100	-2.26	Non-Toxic	Non-Toxic	Non-Toxic	0.75	6.03	17.31	15.13	10	10	1.73	0.85	1.61	3.7497	6.67	2.99	0.72	9	9	16	0.6901
YVWD effluent- outfall	09-231	03.02.09	C.dubia	Reproduction	20.4	4.45	18.8	4.83	100	7.84	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.50	23.33	19.80	10	10	2.33	1.11	1.86	1.8852	11.88	5.44	1.24	9	9	16	0.6901
YVWD effluent- outfall	09-194	02.02.09	C.dubia	Reproduction	23.7	7.99	33.2	3.36	100	-40.08	Non-Toxic	Non-Toxic	Non-Toxic	0.75	15.43	11.29	63.84	10	10	1.13	3.59	2.17	7.1000	22.28	1.27	12.90	9	9	14	0.6924
YVWD effluent- outfall	09-154	01.05.09	C.dubia	Reproduction	30.1	5.238	30.11	6.679	100	-0.03	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.54	44.61	27.44	9	10	4.96	1.54	2.55	2.9555	42.25	24.57	2.38	8	9	13	0.6938
YVWD effluent- outfall	09-103	12.08.08	C.dubia	Reproduction	20.8	7.55	19.9	9.93	100	4.33	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.30	98.60	57.00	10	10	9.86	3.21	3.61	1.1895	170.74	97.23	10.28	9	9	14	0.6924
YVWD effluent- outfall	09-054	11.03.08	C.dubia	Reproduction	29.4	5.62	25	4.57	100	14.97	Non-Toxic	Non-Toxic	Non-Toxic	0.75	2.95	20.88	31.58	10	10	2.09	1.78	1.97	1.5005	14.94	4.36	3.16	9	9	18	0.6884
YVWD effluent- outfall	09-007	10.06.08	C.dubia	Reproduction	27.8	6.03	28.3	9.38	100	-1.80	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.45	87.98	36.36	10	10	8.80	2.05	3.29	2.2624	117.59	77.41	4.18	9	9	13	0.6938
YVWD effluent- outfall	08-292	09.08.08	C.dubia	Reproduction	25.2	3.33	24.6	2.84	100	2.38	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.70	8.07	11.09	10	10	0.81	0.62	1.20	4.7661	2.05	0.65	0.39	9	9	18	0.6884
YVWD effluent- outfall	08-247	08.04.08	C.dubia	Reproduction	19.1	5.4	19.6	6.26	100	-2.62	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.28	39.19	29.16	10	10	3.92	1.64	2.36	2.2373	30.90	15.36	2.69	9	9	15	0.6912
YVWD effluent- outfall	08-214	07.07.08	C.dubia	Reproduction	21.4	1.96	25.1	3.31	100	-17.29	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.05	10.96	3.84	10	10	1.10	0.22	1.15	7.9019	1.72	1.20	0.05	9	9	12	0.6955
YVWD effluent- outfall	08-191	06.02.08	C.dubia	Reproduction	21.4	3.978	25.3	4.55	100	-18.22	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.25	20.70	15.82	10	10	2.07	0.89	1.72	5.3761	8.76	4.29	0.79	9	9	16	0.6901
YVWD effluent- outfall	08-156	05.05.08	C.dubia	Reproduction	35.1	4.795	37.3	5.794	100	-6.27	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.98	33.57	22.99	10	10	3.36	1.29	2.16	5.0893	21.63	11.27	1.67	9	9	15	0.6912
YVWD effluent- outfall	08-125	04.07.08	C.dubia	Reproduction	32.6	8.8	32.2	8.99	100	1.23	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.75	80.82	77.44	10	10	8.08	4.36	3.53	2.1975	154.70	65.32	18.97	9	9	17	0.6892
YVWD effluent- outfall	08-116	03.03.08	C.dubia	Reproduction	23.9	1.97	24	3.23	100	-0.42	Non-Toxic	Non-Toxic	Non-Toxic	0.75	6.08	10.43	3.88	10	10	1.04	0.22	1.12	5.4086	1.59	1.09	0.05	9	9	13	0.6938
YVWD effluent- outfall	08-094	02.06.08	C.dubia	Reproduction	39.1	2.69	39.3	3.56	100	-0.51	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.97	12.67	7.24	10	10	1.27	0.41	1.29	7.7088	2.80	1.61	0.17	9	9	14	0.6924
YVWD effluent- outfall	08-074	01.14.08	C.dubia	Reproduction	35.8	6.51	31	3.61	100	13.41	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.15	13.03	42.38	9	9	1.45	2.65	2.02	2.0503	16.78	2.10	7.02	8	8	15	0.6912
YVWD effluent- outfall	08-057	12.03.07	C.dubia	Reproduction	31.3	7.24	30.1	5.44	100	3.83	Non-Toxic	Non-Toxic	Non-Toxic	0.75	6.63	29.59	52.42	9	10	3.29	2.95	2.50	2.6528	38.90	10.81	8.69	8	9	17	0.6892
YVWD effluent- outfall	08-020	11.05.07	C.dubia	Reproduction	30.6	6.55	28.2	3.68	100	7.84	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.25	13.54	42.90	10	10	1.35	2.41	1.94	2.7048	14.19	1.83	5.82	9	9	17	0.6892
YVWD effluent- outfall	08-003*	10.08.07	C.dubia	Reproduction	36.9	14.723	28.8	14.19	100	21.95	Non-Toxic	Non-Toxic	Toxic	0.75	1.13	201.21	216.77	10	10	20.12	12.19	5.68	0.1979	1044.23	404.87	148.67	9	9	17	0.6892
YVWD effluent- outfall	07-389	09.10.07	C.dubia	Reproduction	28.1	3.414	27.9	8.386	100	0.71	Non-Toxic	Non-Toxic	Non-Toxic	0.75	6.83	70.32	11.66	10	10	7.03	0.66	2.77	2.4615	59.11	49.46	0.43	9	9	11	0.6974
YVWD effluent- outfall	0708-S018	08.06.07	C.dubia	Reproduction	27.4	3.2	25.2	3.55	100	8.03	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.65	12.60	10.24	10	10	1.26	0.58	1.36	3.4315	3.37	1.59	0.33	9	9	16	0.6901
YVWD effluent- outfall	07-307	07.09.07	C.dubia	Reproduction	27.7	4.62	25.6	10.48	100	7.58	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.83	109.83	21.34	10	10	10.98	1.20	3.49	1.3823	148.44	120.63	1.44	9	9	11	0.6974
YVWD effluent- outfall	07-279	06.04.07	C.dubia	Reproduction	25.2	6.529	26	7.775	100	-3.17	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.10	60.45	42.63	10	10	6.05	2.40	2.91	2.4435	71.28	36.54	5.75	9	9	15	0.6912
YVWD effluent- outfall	07-242	05.07.07	C.dubia	Reproduction	28.1	5.043	25.6	10.6	100	8.90	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.53	112.28	25.43	10	10	11.23	1.43	3.56	1.2718	160.23	126.06	2.05	9	9	11	0.6974
YVWD effluent- outfall	07-208	04.02.07	C.dubia	Reproduction	25.5	6.451	22.5	11.18	100	11.76	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.38	124.95	41.62	10	10	12.49	2.34	3.85	0.8762	220.10	156.12	5.48	9	9	12	0.6955
YVWD effluent- outfall	07-189	03.05.07	C.dubia	Reproduction	28.9	6.707	25	2.906	100	13.49	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.33	8.44	44.98	10	10	0.84	2.53	1.84	1.8099	11.39	0.71	6.40	9	9	14	0.6924
YVWD effluent- outfall	07-151	02.05.07	C.dubia	Reproduction	27	5.497	29.8	4.077	100	-10.37	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.55	16.62	30.22	10	10	1.66	1.70	1.83	5.2085	11.30	2.76	2.89	9	9	18	0.6884

*analysis of report suggests seasonal occurance in lab cultures

Facility / Location	Test ID#	Date	Species	Endpoint	Control Mean	Control STD	100% Mean	100% STD	NOEC	% Differnce at IWC	NOEC	EC/IC25	TST Result	b	$Y_t - b*Y_c$	S_t^2	S_c^2	n_t	n_c	S_t^2/n_t	$b^2S_c^2/n_c$	SqRt of $[(S_t^2/n_t) + (b^2S_c^2/n_c)]$	Calc. t	$[(S_t^2/n_t) + (b^2S_c^2/n_c)]^2$	$[S_t^2/n_t]^2$	$[b^2S_c^2/n_c]^2$	$n_t - 1$	$n_c - 1$	Degrees of Freedom	Crit. t
IEUA 001	001Jan10	1/3/2010	C. dubia	Reproduction	25.1	2.726	20.2	3.19	80	19.52	Toxic	Non-Toxic	Non-Toxic	0.75	1.38	10.18	7.43	10	10	1.02	0.42	1.20	1.14758	2.06	1.04	0.17	9	9	15	0.8662
IEUA 001	2nd001Jan10	01/17/10	C. dubia	Reproduction	20.1	3.957	14.9	5.934	100	25.87	Non-Toxic	Toxic	Toxic	0.75	-0.18	35.21	15.66	10	10	3.52	0.88	2.10	-0.0834	19.38	12.40	0.78	9	9	13	0.8702
IEUA 001	001Feb10	2/5/2010	C. dubia	Reproduction	17.1	7.31	18.6	3.836	100	-8.77	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.78	14.71	53.44	10	10	1.47	3.01	2.12	2.72926	20.05	2.17	9.03	9	9	16	0.8647
IEUA 001	001Mar10	3/7/2010	C. dubia	Reproduction	24.9	3.348	19.4	4.526	90	22.09	Toxic	Non-Toxic	Toxic	0.75	0.73	20.48	11.21	10	10	2.05	0.63	1.64	0.44295	7.18	4.20	0.40	9	9	14	0.8681
IEUA 001	2nd001Mar10	3/21/2010	C. dubia	Reproduction	25.9	3.843	22.7	3.622	90	12.36	Toxic	Non-Toxic	Non-Toxic	0.75	3.28	13.12	14.77	10	10	1.31	0.83	1.46	2.23737	4.59	1.72	0.69	9	9	17	0.8633
IEUA 001	001Apr10	4/4/2010	C. dubia	Reproduction	25.9	9.374	30.7	6.183	100	-18.53	Non-Toxic	Non-Toxic	Non-Toxic	0.75	11.28	38.23	87.87	10	10	3.82	4.94	2.96	3.80822	76.84	14.61	24.43	9	9	18	0.862
IEUA 001	2nd001Apr10	4/18/2010	C. dubia	Reproduction	20.6	6.077	17.1	6.244	100	16.99	Non-Toxic	Non-Toxic	Toxic	0.75	1.65	38.99	36.93	10	10	3.90	2.08	2.44	0.67496	35.71	15.20	4.32	9	9	16	0.8647
IEUA 001	001May10	5/2/2010	C. dubia	Reproduction	22.1	3.315	28.1	1.912	100	-27.15	Non-Toxic	Non-Toxic	Non-Toxic	0.75	11.53	3.66	10.99	10	10	0.37	0.62	0.99	11.62	0.97	0.13	0.38	9	9	17	0.8633
IEUA 001	001Jun10	5/30/2010	C. dubia	Reproduction	23.2	6.179	25.6	3.893	100	-10.34	Non-Toxic	Non-Toxic	Non-Toxic	0.75	8.20	15.16	38.18	10	10	1.52	2.15	1.91	4.28435	13.42	2.30	4.61	9	9	17	0.8633
IEUA 002	002Jan10	1/9/2010	C. dubia	Reproduction	19	2.789	18.6	1.578	100	2.11	Non-Toxic	Non-Toxic	Non-Toxic	0.75	4.35	2.49	7.78	10	10	0.25	0.44	0.83	5.24993	0.47	0.06	0.19	9	9	17	0.8633
IEUA 002	002Feb10	2/14/2010	C. dubia	Reproduction	24.5	4.301	25.9	3.725	100	-5.71	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.53	13.88	18.50	10	10	1.39	1.04	1.56	4.82917	5.90	1.93	1.08	9	9	18	0.862
IEUA 002	002Mar10	2/28/2010	C. dubia	Reproduction	22	1.764	23.6	2.066	100	-7.27	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.10	4.27	3.11	10	10	0.43	0.18	0.78	9.15182	0.36	0.18	0.03	9	9	15	0.8662
IEUA 002	002Apr10	4/11/2010	C. dubia	Reproduction	28.2	3.155	19	6.11	80	32.62	Toxic	Toxic	Toxic	0.75	-2.15	37.33	9.95	10	10	3.73	0.56	2.07	-1.0377	18.43	13.94	0.31	9	9	12	0.8726
IEUA 002	002May10	5/9/2010	C. dubia	Reproduction	23.9	6.42	28.5	1.581	100	-19.25	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.58	2.50	41.22	10	10	0.25	2.32	1.60	6.59859	6.60	0.06	5.38	9	9	11	0.8791
IEUA 002	2nd002May10	5/23/2010	C. dubia	Reproduction	25.8	7.969	23.3	9.226	100	9.69	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.95	85.12	63.50	10	10	8.51	3.57	3.48	1.13629	146.02	72.45	12.76	9	9	15	0.8662
IEUA 002	002Jun10	6/6/2010	C. dubia	Reproduction	26.3	2.584	26	3.127	100	1.14	Non-Toxic	Non-Toxic	Non-Toxic	0.75	6.28	9.78	6.68	10	10	0.98	0.38	1.16	5.39388	1.83	0.96	0.14	9	9	15	0.8662
IEUA RP5	RP5Jan10	1/24/2010	C. dubia	Reproduction	16.1	4.508	15.6	4.169	100	3.11	Non-Toxic	Non-Toxic	Non-Toxic	0.75	3.53	17.38	20.32	10	10	1.74	1.14	1.70	2.0767	8.30	3.02	1.31	9	9	17	0.8633
IEUA RP5	RP5Feb10	2/21/2010	C. dubia	Reproduction	25.3	3.683	24	2.582	100	5.14	Non-Toxic	Non-Toxic	Non-Toxic	0.75	5.03	6.67	13.56	10	10	0.67	0.76	1.20	4.20259	2.04	0.44	0.58	9	9	18	0.862
IEUA RP5	RP5Mar10	3/14/2010	C. dubia	Reproduction	16.4	7.648	23.2	4.662	100	-41.46	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.90	21.73	58.49	10	10	2.17	3.29	2.34	4.66323	29.85	4.72	10.83	9	9	17	0.8633
IEUA RP5	RP2Apr10	4/25/1940	C. dubia	Reproduction	24.8	3.259	26.5	4.503	100	-6.85	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.90	20.28	10.62	10	10	2.03	0.60	1.62	4.87586	6.89	4.11	0.36	9	9	14	0.8681
IEUA RP5	RP5May10	5/16/2010	C. dubia	Reproduction	22	5.578	26.4	2.459	100	-20	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.90	6.05	31.11	10	10	0.60	1.75	1.53	6.45141	5.55	0.37	3.06	9	9	15	0.8662
IEUA RP5	RP5Jun10	6/13/2010	C. dubia	Reproduction	26.5	2.415	27.5	2.593	100	-3.77	Non-Toxic	Non-Toxic	Non-Toxic	0.76	7.63	6.72	5.83	10	10	0.67	0.33	1.00	7.62337	1.00	0.45	0.11	9	9	16	0.8647
IEUA CC	CCJan10	1/3/2010	C. dubia	Reproduction	19.9	5.763	16.2	6.529	100	18.59	Non-Toxic	Non-Toxic	Toxic	0.75	1.28	42.63	33.21	10	10	4.26	1.87	2.48	0.51493	37.59	18.17	3.49	9	9	16	0.8647
IEUA CC	CCFeb10	2/5/2010	C. dubia	Reproduction	21.1	4.149	17.7	6.667	100	16.11	Non-Toxic	Non-Toxic	Toxic	0.75	1.88	44.45	17.21	10	10	4.44	0.97	2.33	0.80589	29.30	19.76	0.94	9	9	13	0.8702
IEUA CC	CCMar10	3/7/2010	C. dubia	Reproduction	20.9	6.045	10.8	7.685	80	48.33	Toxic	Toxic	Toxic	0.75	-4.88	59.06	36.54	10	10	5.91	2.06	2.82	-1.7277	63.38	34.88	4.23	9	9	15	0.8662
IEUA CC	2ndCCMar10	3/21/2010	C. dubia	Reproduction	17.3	6.001	23.7	1.703	100	-36.99	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.73	2.90	36.01	10	10	0.29	2.03	1.52	7.04785	5.36	0.08	4.10	9	9	12	0.8726
IEUA CC	CCApr10	4/4/2010	C. dubia	Reproduction	14.4	7.691	27.9	6.367	100	-93.75	Non-Toxic	Non-Toxic	Non-Toxic	0.75	17.10	40.54	59.15	10	10	4.05	3.33	2.72	6.29411	54.48	16.43	11.07	9	9	18	0.862
IEUA CC	2ndCCApr10	4/18/2010	C. dubia	Reproduction	27.4	5.502	27.8	1.989	100	-1.46	Non-Toxic	Non-Toxic	Non-Toxic	0.75	7.25	3.96	30.27	10	10	0.40	1.70	1.45	5.00487	4.40	0.16	2.90	9	9	13	0.8702
IEUA CC	CCMay10	5/2/2010	C. dubia	Reproduction	23.2	3.994	28.3	2.163	100	-21.98	Non-Toxic	Non-Toxic	Non-Toxic	0.75	10.90	4.68	15.95	10	10	0.47	0.90	1.17	9.329	1.86	0.22	0.81	9	9	16	0.8647
IEUA CC	CCJun10	5/30/2010	C. dubia	Reproduction	17.1	4.228	22.4	2.119	100	-30.99	Non-Toxic	Non-Toxic	Non-Toxic	0.75	9.58	4.49	17.88	10	10	0.45	1.01	1.21	7.93918	2.12	0.20	1.01	9	9	16	0.8647

Appendix C:

Side-by-Side Comparison of TST vs. NOEC vs. IC25 Methods Using Historic WET Test Results for Non-Toxic Method Blanks from EPA's Interlaboratory WET Variability Study

Table 1. Summaries of *Ceriodaphnia dubia* reproduction "blank" data from the USEPA Inter-Laboratory Validation Study. Samples that were determined invalidate by USEPA were not included. Fourth or higher broods were excluded in counting.

Row #	Sample ID	Analysis Using the Proposed New TST Method					Current 40 CFR 136 Method	
		Mean Control Response	Mean Sample Response	% Effect	TST Results	Discharger has Reasonable Potential (RP) according to Draft Policy for Toxicity Assessment and Control	NOEC	IC 25
1	9330	25.4	25.0	1.5	Non-Toxic	No	100	>100
2	9332	16.6	16.3	1.8	Non-Toxic	No	100	>100
3	9337	20.1	19.4	3.5	Non-Toxic	No	100	>100
4	9338	24.2	21.3	12.0	Non-Toxic	Yes	100	>100
5	9340	15.3	19.8	-29.4	Non-Toxic	No	100	>100
6	9341	23.5	21.3	9.4	Non-Toxic	No	100	>100
7	9344	11.1	17.0	-53.2	Non-Toxic	No	100	>100
8	9349	30.8	30.3	1.6	Non-Toxic	No	100	>100
9	9350	29.5	22.9	22.4	Toxic	Yes	100	>100
10	9356	24.1	22.4	7.1	Non-Toxic	No	100	>100
11	9367	22.2	16.7	24.8	Non-Toxic	Yes	100	>100
12	9371	19.9	21.3	-7.0	Non-Toxic	No	100	>100
13	9376	20.4	17.8	12.7	Non-Toxic	Yes	100	>100
14	9379	24.9	26.8	-7.6	Non-Toxic	No	100	>100
15	9381	26.5	25.6	3.4	Non-Toxic	No	100	>100
16	9382	26.1	25.7	1.5	Non-Toxic	No	100	>100
17	9384	15.5	18.7	-20.6	Non-Toxic	No	100	>100
18	9402	16.0	16.2	-1.3	Non-Toxic	No	100	>100
19	9409	22.2	26.3	-18.6	Non-Toxic	No	100	>100
20	9410	24.8	22.8	8.1	Non-Toxic	No	100	>100
21	9429	31.0	31.1	-0.3	Non-Toxic	No	100	>100
22	9432	17.0	18.2	-7.1	Non-Toxic	No	100	>100
23	9436	28.1	31.8	-13.2	Non-Toxic	No	100	>100
24	9439	18.9	12.1	36.0	Toxic	Yes	100	>100
25	9445	23.6	22.4	5.1	Non-Toxic	No	100	>100
26	9446	22.2	18.3	17.6	Toxic	Yes	100	>100
27	9450	19.4	4.1	78.9	Toxic	Yes	25	15.9
Summary Statistics	N	27	27	27			27	27
	Min	11.10	4.10	-53.15			25	15.9
	Max	31.00	31.80	78.87			100	>100
	Median	22.20	21.30	1.81			100	>100
	Mean	22.20	21.17	3.29				>100
	# of Blank Samples Incorrectly Declared Toxic				4	7	1	1
	Error Rate for Non-Toxic Blank Samples				14.8	25.9	3.7	3.7

*Samples 9332, 9350, 9367, and 9450 were previously determined as toxic using data that contain either 4^{th} or higher broods.

Table 2. Summaries of *Ceriodaphnia dubia* survival "blank" data from the USEPA Inter-Laboratory Validation Study. Samples that were determined invalidate by USEPA were not included.

Row #	Sample ID	Analysis Using the Proposed New TST Method					Current 40 CFR 136 Method	
		Mean Control Response	Mean Sample Response	% Effect	TST Results	Discharger has Reasonable Potential (RP) according to Draft Policy for Toxicity Assessment and Control	NOEC	LC50
1	9330	1.0	1.0	0.0	Non-Toxic	No	100	>100
2	9332	0.8	1.0	-25.0	Non-Toxic	No	100	>100
3	9337	1.0	1.0	0.0	Non-Toxic	No	100	>100
4	9338	1.0	1.0	0.0	Non-Toxic	No	100	>100
5	9340	0.8	0.9	-12.5	Non-Toxic	No	100	>100
6	9341	1.0	1.0	0.0	Non-Toxic	No	100	>100
7	9344	1.0	0.9	10.0	Non-Toxic	No	100	>100
8	9349	1.0	1.0	0.0	Non-Toxic	No	100	>100
9	9350*	1.0	1.0	0.0	Non-Toxic	No	100	>100
10	9356	0.9	1.0	-11.1	Non-Toxic	No	100	>100
11	9367	1.0	0.8	20.0	**Toxic**	**Yes**	100	>100
12	9371	1.0	1.0	0.0	Non-Toxic	No	100	>100
13	9376	1.0	1.0	0.0	Non-Toxic	No	100	>100
14	9379	1.0	1.0	0.0	Non-Toxic	No	100	>100
15	9381	1.0	1.0	0.0	Non-Toxic	No	100	>100
16	9382	1.0	1.0	0.0	Non-Toxic	No	100	>100
17	9384	0.9	0.8	11.1	**Toxic**	**Yes**	100	>100
18	9402	1.0	1.0	0.0	Non-Toxic	No	100	>100
19	9409	0.9	1.0	-11.1	Non-Toxic	No	100	>100
20	9410	1.0	1.0	0.0	Non-Toxic	No	100	>100
21	9429	1.0	1.0	0.0	Non-Toxic	No	100	>100
22	9432	0.9	0.9	0.0	Non-Toxic	No	100	>100
23	9436	1.0	1.0	0.0	Non-Toxic	No	100	>100
24	9439*	1.0	0.9	10.0	Non-Toxic	No	100	>100
25	9445	1.0	1.0	0.0	Non-Toxic	No	100	>100
26	9446*	1.0	1.0	0.0	Non-Toxic	No	100	>100
27	9450*	0.9	1.0	-11.1	Non-Toxic	No	100	>100
Summary Statistics	N	27	27	27			27	27
	Min	0.80	0.80	-25.00			100	>100
	Max	1.00	1.00	20.00			100	>100
	Median	1.00	1.00	0.00			100	>100
	Mean	0.97	0.97	-0.73			100	>100
	# of Blank Samples Incorrectly Declared Toxic				**2**	**2**	**0**	**0**
	Error Rate for Non-Toxic Blank Samples				**7.4**	**7.4**	**0.0**	**0.0**

Note: Mean response is a survival rate (e.g., 1 = 100% survival).
Samples 9350, 9439, 9446, and 9450 were determined toxic for "reproduction endpoint."

Table 3. Summary of USEPA Inter-laboratory Variability Study for Fathead Minnow Larval Growth Chronic 7-day Test.

Row #	Sample ID	Analysis Using the Proposed New TST Method					Current 40 CFR 136 Method	
		Mean Control Response	Mean Sample Response	% Effect	TST Results	Discharger has Reasonable Potential (RP) according to Draft Policy for Toxicity Assessment and Control	NOEC	IC25
1	9113	0.38	0.42	-11	Non-Toxic	No	100	>100
2	9114	0.36	0.46	-27	Non-Toxic	No	100	>100
3	9117	0.37	0.45	-22	Non-Toxic	No	100	>100
4	9119	0.51	0.46	10	Non-Toxic	No	100	>100
5	9123	0.79	0.83	-6	Non-Toxic	No	100	>100
6	9131	0.38	0.42	-9	Non-Toxic	No	100	>100
7	9135	0.47	0.53	-12	Non-Toxic	No	100	>100
8	9136	0.51	0.56	-10	Non-Toxic	No	100	>100
9	9138	0.38	0.22	43	Toxic	Yes	100	>100
10	9142	0.36	0.39	-10	Non-Toxic	No	100	>100
11	9143	0.38	0.35	7	Non-Toxic	No	100	>100
12	9145	0.29	0.34	-16	Non-Toxic	No	100	>100
13	9151	0.81	0.77	5	Non-Toxic	No	100	>100
14	9152	0.38	0.39	-5	Non-Toxic	No	100	>100
15	9158	0.39	0.29	27	Toxic	Yes	50	94
16	9160	0.38	0.47	-23	Non-Toxic	No	100	>100
17	9182	0.66	0.66	0	Non-Toxic	No	100	>100
18	9186	0.37	0.42	-13	Non-Toxic	No	100	>100
19	9188	0.77	0.72	7	Non-Toxic	No	100	>100
20	9192	0.50	0.46	8	Non-Toxic	No	100	>100
21	9196	0.60	0.64	-6	Non-Toxic	No	100	>100
22	9197	0.69	0.64	8	Non-Toxic	No	100	>100
23	9198	0.26	0.29	-9	Non-Toxic	No	100	>100
24	9209	0.64	1.33	-107	Non-Toxic	No	Inconclusive[1]	>100
Summary Statistics	N	24	24	24		24	23	24
	Min	0.26	0.22	-107			50	93.6
	Max	0.81	1.33	43			100	>100
	Median	0.39	0.46	-8			100	>100
	Mean	0.49	0.52	-7				99.7
	# of Blank Samples Incorrectly Declared Toxic				2	2	1	1
	Error Rate for Non-Toxic Blank Samples				8.3	8.3	4.3	4.2

[1] Results were excluded from summary statistics.

Table 4. USEPA blank data from USEPA Inter-laboratory Variability Study (Fathead Minnow Larval Survival Chronic 7-day Test).

Row #	Sample ID	Analysis Using the Proposed New TST Method					Current 40 CFR 136 Method	
		Mean Control Response	Mean Sample Response	% Effect	TST Results	Discharger has Reasonable Potential (RP) according to Draft Policy for Toxicity Assessment and Control	NOEC	IC25
1	9113	1	0.95	5.0	Non-Toxic	No	100	>100
2	9114	0.95	0.95	0.0	Non-Toxic	No	100	>100
3	9117	0.975	0.975	0.0	Non-Toxic	No	100	>100
4	9119	1	0.975	2.5	Non-Toxic	No	100	>100
5	9123	1	1	0.0	Non-Toxic	No	100	>100
6	9131	1	1	0.0	Non-Toxic	No	100	>100
7	9135	0.9	0.95	-5.6	Non-Toxic	No	100	>100
8	9136	0.925	1	-8.1	Non-Toxic	No	100	>100
9	9138	0.966667	0.9	6.9	Non-Toxic	No	100	>100
10	9142	0.975	0.975	0.0	Non-Toxic	No	100	>100
11	9143	0.975	0.925	5.1	Non-Toxic	No	100	>100
12	9145	0.95	0.95	0.0	Non-Toxic	No	100	>100
13	9151	1	1	0.0	Non-Toxic	No	100	>100
14	9152	1	0.925	7.5	Non-Toxic	No	100	>100
15	9158	0.95	0.825	13.2	Non-Toxic	**Yes**	100	>100
16	9160	0.925	0.9	2.7	Non-Toxic	No	100	>100
17	9182	0.975	0.975	0.0	Non-Toxic	No	100	>100
18	9186	0.95	0.975	-2.6	Non-Toxic	No	100	>100
19	9188	1	1	0.0	Non-Toxic	No	100	>100
20	9192	1	1	0.0	Non-Toxic	No	100	>100
21	9196	0.975	1	-2.6	Non-Toxic	No	100	>100
22	9197	0.95	0.975	-2.6	Non-Toxic	No	100	>100
23	9198	0.9	1	-11.1	Non-Toxic	No	100	>100
24	9209	1	1	0.0	Non-Toxic	No	100	>100
Summary Statistics	N	24	24	24	24	24	24	24
	Min	0.90	0.83	-11			100	>100
	Max	1.00	1.00	13			100	>100
	Median	0.98	0.98	0			100	>100
	Mean	0.97	0.96	0			100	>100
	# of Blank Samples Incorrectly Declared Toxic				**0**	**1**	**0**	**0**
	Error Rate for Non-Toxic Blank Samples				**0.0**	**4.2**	**0.0**	**0.0**