March 9, 2015

Marcia Liao
Water Resources Control Engineer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, 14th Floor
Oakland, CA 94612

Via email: mliao@waterboards.ca.gov

Subject: Comment Letter – Tentative Order for Las Gallinas Valley Sanitary District Sewage Treatment Plant (LGVSD) (NPDES No. CA0037851)

Dear Ms. Liao:

The Bay Area Clean Water Agencies (BACWA) appreciates the opportunity to comment on the Tentative Order for reissuance of the Las Gallinas Valley Sanitary District Sewage Treatment Plant (LGVSD) NPDES Permit. BACWA is a joint powers agency whose members own and operate publicly-owned treatment works (POTWs) and sanitary sewer systems that collectively provide sanitary services to over 6.5 million people in the nine county San Francisco Bay Area. BACWA members are public agencies, governed by elected officials and managed by professionals charged with protecting the environment and public health.

BACWA's comments pertain to the new numeric chronic toxicity limits in LGVSD's Tentative Order. LGVSD's current permit contains narrative toxicity limits, and numeric triggers that if exceeded lead to accelerated monitoring as well as a toxicity investigation/reduction evaluation (TIE/TRE). LGVSD periodically measures toxicity up to 2 TUc, exceeding its 3-sample median trigger of 1 TUc, and measured a single sample that was 8 TUc on November 13, 2013. LGVSD has been engaged in an ongoing TIE/TRE which has not yielded any actionable results, although LGVSD has detected low levels of a pesticide, permethrin, in its effluent. The Regional Water Board, at the behest of the USEPA[1], used the exceedance of its chronic toxicity triggers as a justification to find reasonable potential and establish numeric effluent limits. Because these numeric chronic toxicity limits are precedential in our Region, BACWA strongly recommends the Regional Water Board reconsider their adoption pending further discussion about the appropriate standards setting processes identified in this letter. BACWA's concerns and recommendations are described below.

1. **There is no regulation that establishes a methodology for reasonable potential determination and calculation of effluent limits for chronic toxicity.**

[1] Per the January 15, 2015 Pre-notice draft permit initial objection letter (Objection Letter) – NPDES permit for Las Gallinas Valley Sanitary District Sewage Treatment Plant (LGVSD) (NPDES No. CA0037851) sent to Bruce Wolfe, Regional Water Quality Control Board Executive Officer, from Jane Diamond, USEPA Region IX Water Division Direction

At this time there is no specific guidance on establishing numeric chronic toxicity limits in the San Francisco Bay Region. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) states, "Chronic toxicity effluent limits are derived for individual dischargers based upon Best Professional Judgment," and is silent on how to determine reasonable potential. The State Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP) lays out a methodology for determining reasonable potential and calculating effluent limits for priority pollutants, but does not address methodologies for toxicity.

In the absence of regulation, which should be developed through a transparent public process, the USEPA is requiring the Regional Water Board to develop an *ad hoc* methodology for determining reasonable potential and setting chronic toxicity effluent limits in this permit. BACWA objects to this development of "policy by permit" and instead requests that the Regional Water Board work with stakeholders to develop a technically sound and robust approach for findings of reasonable potential and calculation of effluent limits.

BACWA RECOMMENDATION: Because of the precedential nature of these numeric chronic toxicity limits, BACWA urges the Regional Water Board to take this opportunity to develop a Regional toxicity strategy through a collaborative stakeholder process. BACWA encourages the Regional Water Board to consider a toxicity watershed permit which would holistically consider toxicity in effluent and receiving waters, set achievable limits and management objectives, and provide guidance for investigating measured toxic effects and conducting toxicity reduction evaluations. The Watershed Permit approach for monitoring potential toxicity of POTW discharges seems like a viable strategy given the robust whole effluent toxicity (WET) data from more than 25 years of effluent monitoring combined with receiving water WET monitoring under the Regional Monitoring Program (RMP) and the Surface Water Ambient Monitoring Program (SWAMP).

2. **Reasonable potential should not be based on trigger exceedances, since triggers do not constitute water quality objectives**

The LGVSD Tentative Order qualitatively determines reasonable potential based on exceedances of trigger levels set to initiate an investigation (not a limit based on a water quality objective). This action represents an *ad hoc* treatment of the triggers as established water quality objectives that are used for compliance purposes. If the Regional Water Board wishes to adopt chronic toxicity water quality objectives, it should be done officially, per Water Code Section 13241. Ideally, reasonable potential determinations should also consider whether measured toxic effect represents real toxicity or is related to the inherent variability of the test method.

BACWA RECOMMENDATION: The Regional Water Board should work with stakeholders to develop appropriate criteria for establishing reasonable potential to prompt setting of numeric chronic toxicity limits, and this process should also address removing these limits in subsequent permits when reasonable potential is not demonstrated.

3. **Where imposed, numeric chronic toxicity limits should replace triggers.**

If dischargers that are found to have reasonable potential are given numeric effluent limits, there is no longer a need for the triggers that are currently used in permits. The triggers, which are set

to lower levels since they do not incorporate dilution for shallow water dischargers, are an unnecessary level of protection when combined with numeric limits. Including both triggers and numeric limits would cause dischargers to waste resources on TIE/TRE investigations for a measured toxic effect that is low level, often nonpersistent and set at a level below the compliance threshold that is presumably protective of the Bay.

BACWA RECOMMENDATION: When dischargers are given numeric chronic toxicity limits, the triggers requiring TIE/TRE investigations should be removed from their permits.

4. **Calculation of effluent limits for toxicity do not make sense using the SIP procedure**

The approach to calculating chronic toxicity effluent limits in the Tentative Order, which closely follows the SIP and the other effluent limitations, is not appropriate for a statistical construct such as chronic toxicity units (TUc). By definition, the lowest observable value is "< 1 TUc," which corresponds to no effect at an effluent concentration of 100%. The background receiving waters cannot have a toxicity of "0.0 TUc" as listed in Table F-8, which mathematically corresponds to an effluent concentration of infinity. Unfortunately, the EPA's Technical Support Document for Water Quality-based Toxics Control contains the same logical error, and assigns "0 TUc" to receiving waters. Following the SIP methodology and using a value of 1.0 TUc as a background concentration produces a final average monthly effluent limit (AMEL) of 0.8 TUc, which is nonsensical.

BACWA RECOMMENDATION: Limits should be calculated using an approach that is consistent with how existing chronic toxicity monitoring triggers are calculated based on dilution in NPDES permits throughout the Region: Simply multiply the water quality objective by an applicable dilution factor. This approach is implied by the Basin Plan's use of 10 TUc as a monitoring trigger for chronic toxicity for deep water dischargers; deep water dischargers have dilution of 10:1 or greater. Using this approach for the LGVSD permit, combined with an assumed water quality objective of 1.0 TUc (actual WQO to be established per Water Code Section 13241) and a MDEL/AMEL multiplier of 2.0 results in an AMEL of 3.25 TUc and an MDEL of 6.5 TUc.

5. **Toxicity testing measures an effect, rather than a toxicant, and is inherently variable. Dischargers should be given the opportunity to investigate results and invalidate a spurious toxicity test result when identified.**

Toxicity testing measures a biological response, rather than directly measuring the presence of a toxicant. While biological inhibition may occur in response to a toxicant, it can also occur due to problems with the organisms' food or with the health of the organisms themselves. Other factors such as pathogens can influence organisms' response during toxicity testing. As such, measurements of toxic effect are inherently variable and subject to noise at low levels.

In Region 2, shallow water dischargers' chronic toxicity triggers do not account for dilution. Because of the lower validity of WET data when measured at low levels, over the past five years, several dischargers have exceeded their triggers and were required to conduct toxicity reduction

evaluations (TRE) (see Attachment 1). Of the six shallow water dischargers who have conducted TREs in the past five years, only one has identified a probable toxicant. The other TREs were either inconclusive or showed pathogen interference was the cause of the observed toxic effect. The total cost of these efforts has been upwards of $1.3 million for this five year period.

Between August 2009 and May 2010, San Jose/Santa Clara Regional Wastewater Facility sent fifteen split samples to different labs for chronic toxicity testing (see Attachment 2). In four of these fifteen occasions, the results from the two labs were sufficiently different that one of the results would have contributed to a trigger exceedance and the other would not. In two cases, one lab showed relatively high levels of toxic effect (>5 TUc) while the other showed none (<1 TUc). They also found that when some of their effluent samples that showed toxic effect upon initial testing were later retested, the toxic effect had disappeared.

This experiment demonstrates the inherent variability of chronic toxicity testing, as well as the measured toxic effects are transient or not persistent. The results illustrate the need for a minimum detection limit for toxicity testing, as well as the development of quality assurance/quality control (QA/QC) procedures for invalidating the results of a given toxicity test when warranted.

Another approach to avoid requiring agencies to inefficiently direct resources investigating low level, nonpersistent toxic effect is to give dischargers appropriately sized mixing zones. Mixing zones are justifiable for both deep water dischargers and shallow water dischargers like LGVSD, since there has been no evidence that toxic effects detected in dischargers' effluent has an impact on surface waters. The San Francisco Bay receiving water has been shown by the SWAMP and RMP to be non-toxic, with exceptions where waters are impacted by pesticide runoff[2,3] from land. No receiving water toxicity has been attributed to POTW discharges. A secondary mixing zone can be defined to increase agencies' dilution credit, where they have not observed acute toxicity.

BACWA RECOMMENDATION: Toxic effect as measured by WET testing is highly variable and often nonpersistent. Toxicity has not been observed in the receiving waters of the San Francisco Bay. To avoid spurious findings of toxicity and the resulting violations, dischargers should also be given the opportunity to invalidate findings of toxicity if the test results do not meet robust QA/QC standards. Numeric effluent limits should be developed using the maximum feasible mixing zone. A Toxicity Watershed Permit could establish standards for WET monitoring in the Bay, thresholds for conducting effective TIE/TRE in response to validated WET monitoring results, and appropriate numeric chronic toxicity effluent limits.

6. **Chronic toxicity testing is more conservative than acute testing, so dischargers should have the opportunity to have their acute toxicity limits and monitoring requirements removed.**

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[2] Toxicity in San Francisco Bay Waters, 2012 SWAMP Report, found at http://www.swrcb.ca.gov/water_issues/programs/swamp/docs/reglrpts/rb2_toxicity_2012.pdf

[3] TOXICITY TESTING: Ten Years of Testing for the Effects of Estuary Contamination, 2003 Pulse of the Estuary, pg. 27, found at http://www.sfei.org/sites/default/files/rmp/pulse/2003/pulse2003.pdf

Currently, all dischargers in the San Francisco Bay Region have acute toxicity numeric limits and monitoring requirements. Chronic toxicity endpoints are more sensitive than acute toxicity endpoints (i.e., an organisms will fail to grow, germinate, etc., at lower levels of a toxicant than are lethal). Therefore, it is unnecessary to have both chronic and acute toxicity numeric limits and monitoring requirements.

BACWA RECOMMENDATION: Dischargers who are given numeric chronic toxicity limits should be given the opportunity to do a reasonable potential analysis for acute toxicity, and to drop their acute toxicity limits and monitoring requirements if no reasonable potential is found.

BACWA would be happy to meet with Regional Water board staff to discuss ways to implement these recommendations.

Respectfully,

David R. Williams

David R. Williams
BACWA Executive Director

CC:

Mr. Bruce Wolfe, Regional Water Board
Mr. Thomas Mumley, Regional Water Board
Ms. Lila Tang, Regional Water Board
Mr. William Johnson, Regional Water Board
Mr. Ray Goebel, Las Gallinas Sanitary District
BACWA Executive Board
Ms. Meg Herston, BACWA Permits Committee Chair

ATTACHMENT 1

Summary of Chronic Toxicity Testing by Region 2 Shallow Dischargers

Discharger	Timeframe	Number of Samples	Number between 1 and 2 Tuc	Percentage between 1 and 2 Tuc	Number ≥ 2 Tuc	Percentage ≥ 2 Tuc	TRE Notes (see sheets for details)
Palo Alto	June 2009 - December 2014	72	5	7%	10	14%	TRE Feb-Jul 2012, concluded cause was pathogen interference. Cost approximately **$100K**.
San Jose	July 2009 - December 2014	101	10	10%	12	12%	TRE/TIEs Oct 2009 - June 2010, and June 2013- August 2014, both inconclusive. Total cost above **$250K**.
Sunnyvale	January 2010 - December 2014	85	4 (survival) 14 (Growth)	5% (survival) 16% (growth)	2 (survival) 12 (Growth)	2% (survival) 14% (growth)	Three successive TREs, all inconclusive - ammonia, unidentified organic and polymer, respectively, were suspected. Total cost approximately **$750K**.
Novato	October 2010 - October 2014	25	2	8%	13	52%	TRE Feb 2011 - May 2012, found pathogen interference. Total cost approximately **$100K.**
Sonoma	March 2006 - January 2015	53	6	11%	9	17%	Ongoing TIE indicates that zinc may be toxicant. Total cost **$73K.**
Petaluma	December 2011 - November 2014	10	0	0%	0	0%	N/A
Fairfield Suisun	July 2009 - October 2014	22	0	0%	0	0%	N/A
Las Gallinas	April 2009 - December 2014	32	19 (survival) 20 (Growth)	59% (survival) 62% (growth)	1 (survival) 2 (Growth)	3% (survival) 6% (growth)	TIE work since 2011 is inconclusive, but pyrethroids are suspected. Total cost approximately **$50K**.

Notes: Napa data not tabulated in CIWQS, Yountville and St. Helena have no chronic toxicity testing requirements

ATTACHMENT 2

San Jose-Santa Clara Regional Wastewater Facility

Chronic Toxicity Test Results 2009-Dec 2014 **Test Species: *Ceriodaphnia dubia (May 2009- October 2014 Permit)***

Start Date	NOEC (Survival)	TUc (Reproduction)	NOEC % (Reproduction)	EC or IC 25 (Reproduction)	TST (Reproduction)
7/18/09	100%	33.5	<32% effluent	2.99% effluent	Fail 67.7%
8/1/09	100%	<1	100% effluent	>100% effluent	Pass
8/17/2009 (TSI)	100%	1.17	100% effluent	85.4% effluent	Fail 25%
8/19/2009 (PERL)	100%	2.49	56% effluent	40.2% effluent	Fail 36%
9/14/2009 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
9/15/2009 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
10/4/2009 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
10/4/2009 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
11/7/2009 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
11/28/2009 (TSI)	100%	<1	100% effluent	>100% effluent	Pass
11/29/2009 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
12/18/2009 (ESD)	100%	5.78	<32% effluent	17.3% effluent	Fail 41.9%
12/20/2009 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
1/9/2010 (TSI)	100%	<1	100% effluent	>100% effluent	Pass
1/10/2010 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
1/20/2010 (TSI)	100%	<1	100% effluent	>100% effluent	Pass
1/21/2010 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
1/30/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
1/31/2010 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
2/8/2010 (AS)	75%	5.2	<32% effluent	19.1% effluent	Fail 75.5%
2/8/2010 (ESD)	100%	8.5	<32% effluent	11.8% effluent	Fail 40.3%
2/26/2010 (AS)	100%	<1*	100% effluent	>100% effluent	Pass
2/27/2010 (ESD)	100%	7.5	<32% effluent	13.3% effluent	Fail 70.7%
3/13/2010 (AS)	100%	<1	100% effluent	>100% effluent	Pass
3/13/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
3/27/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
3/28/2010 (AS)	100%	<1	100% effluent	>100% effluent	Pass
4/17/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Fail 16.9%
4/17/2010 (AS)	100%	No Result**	NA	NA	NA

October 2009-June 2010: SJSC conducted TRE/TIE investigations. TIE costs estimated ~ $200,000 - 250,000. Toxicity Identification Evaluation (TIE) manipulations were performed on samples from two confirmed toxic events in February with support from Aqua-Science Laboratories in Davis, CA. The TIE studies could only confirm that toxicity was present, was only slightly ameliorated by EDTA (not a metal or only slight effect from a metal), was more ameliorated by Solid Phase Extraction (SPE) columns (likely organic), was substantially ameliorated by Organophosphate (OP) enzyme and piperonyl butoxide (PBO) (indicating possibility of an OP pesticide or some organic compound that behaves similarly), was exacerbated by filtration (not particle-bound) and was exacerbated by sodium thiosulfate (STS) (not an oxidizer). Unfortunately, attempts to elute and recover the toxicity captured on SPE columns were unsuccessful. For this reason, the TIE investigations were of limited value.

Start Date	NOEC (Survival)	TUc (Reproduction)	NOEC % (Reproduction)	EC or IC 25 (Reproduction)	TST (Reproduction)
5/1/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
5/2/2010 (AS)	100%	1.8	42% effluent	55.6% effluent	Fail 24%
5/2/2010 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
5/21/2010 (ESD)	100%	<1	100% effluent	>100% effluent	Pass
5/21/2010 (PERL)	100%	<1	100% effluent	>100% effluent	Pass
6/14/10	100%	<1	100% effluent	>100% effluent	Pass
6/26/10	100%	<1	100% effluent	>100% effluent	Pass
7/17/10	100%	<1	100% effluent	>100% effluent	Pass
8/13/10	100%	<1	100% effluent	>100% effluent	Pass
9/19/10	100%	10.4	6.25% effluent	9.63% effluent	Fail 84.8%
10/4/10	100%	<1	100% effluent	>100% effluent	Pass
10/24/10	100%	<1	100% effluent	>100% effluent	Pass
11/13/10	100%	<1	100% effluent	>100% effluent	Pass
12/11/10	100%	No Result**	100% effluent	>100% effluent	Pass
12/19/2010 (TSI)	100%	<1	100% effluent	>100% effluent	Pass
1/10/11	100%	<1	100% effluent	>100% effluent	Pass
2/21/11	100%	<1	100% effluent	>100% effluent	Pass
3/7/11	100%	<1	100% effluent	>100% effluent	Pass
4/21/11	100%	<1	100% effluent	>100% effluent	Pass
5/10/11	100%	5.46	25% effluent	18.3% effluent	Fail 51.8%
6/9/11	100%	<1	100% effluent	>100% effluent	Pass
6/21/11	100%	1.4	50% effluent	71% effluent	Fail 34.6%
7/23/11	100%	<1	100% effluent	>100% effluent	Pass
8/8/11	100%	<1	100% effluent	>100% effluent	Pass
8/22/11	100%	1.7	25% effluent	58.9% effluent	Fail 62.9%
9/13/11	100%	<1	100% effluent	>100% effluent	Pass
10/3/11	100%	<1	100% effluent	>100% effluent	Pass
11/2/11	100%	<1	100% effluent	>100% effluent	Pass
12/5/11	100%	<1	100% effluent	>100% effluent	Pass
1/10/12	100%	1.6	50% effluent	61.7% effluent	Fail 40.8%
2/6/12	100%	<1	100% effluent	>100% effluent	Pass
3/5/12	100%	<1	100% effluent	>100% effluent	Pass

Start Date	NOEC (Survival)	TUc (Reproduction)	NOEC % (Reproduction)	EC or IC 25 (Reproduction)	TST (Reproduction)
4/16/12	100%	<1	100% effluent	>100% effluent	Pass
5/7/12	100%	<1	100% effluent	>100% effluent	Pass
6/11/12	100%	<1	100% effluent	>100% effluent	Pass
7/16/12	100%	<1	100% effluent	>100% effluent	Pass
8/13/12	100%	<1	100% effluent	>100% effluent	Pass
9/11/12	100%	<1	100% effluent	>100% effluent	Pass
10/16/12	100%	4.1	12.5% effluent	24.5% effluent	Fail 24.5%
11/2/12	100%	<1	100% effluent	>100% effluent	Pass
11/8/12	100%	<1	100% effluent	>100% effluent	Pass
12/3/12	100%	<1	100% effluent	>100% effluent	Pass
1/19/13	100%	1.7	25% effluent	58.1% effluent	Fail 63.3%
2/4/13	100%	<1	100% effluent	>100% effluent	Pass
3/4/13	100%	10.1	6.25% effluent	9.88% effluent	Fail 44.2%
4/2/13	100%	<1	100% effluent	>100% effluent	Pass
4/12/13	100%	1.2	100% effluent	84.5% effluent	Fail 27%
5/6/13	100%	2.3	50 % effluent	42.7% effluent	Fail 67.6%
6/10/13	100%	<1	100% effluent	>100% effluent	Pass
7/12/13	100%	<1	100% effluent	>100% effluent	Pass
8/1/13	100%	1.1	50% effluent	90.7% effluent	Fail 27.1%
8/5/13	100%	<1	100% effluent	>100% effluent	Pass
9/12/13	100%	2.9	25% effluent	34.6% effluent	Fail
10/4/13	100%	<1	100% effluent	>100% effluent	Pass
11/19/13	100%	1.2	50% effluent	86.1% effluent	Fail
12/9/13	100%	<1	100% effluent	>100% effluent	Pass
1/10/14	100%	<1	100% effluent	>100% effluent	Pass
2/3/14	100%	1.6	100% effluent	>100% effluent	Fail
3/3/14	100%	<1	100% effluent	>100% effluent	Pass
4/8/14	100%	<1	100% effluent	>100% effluent	Pass
5/5/14	100%	<1	100% effluent	>100% effluent	Pass
6/9/14	100%	<1	100% effluent	>100% effluent	Pass
7/14/14	100%	<1	100% effluent	>100% effluent	Pass
8/11/14	100%	<1	100% effluent	>100% effluent	Pass

June 2013-August 2014: TRE/TIE initiated in response to permit triggers being exceeded. TIE studies were unsuccessful in confirming toxicity or identifying potential toxicants. The frequency and magnitude of the observed paralysis (a sub-chronic effect) in RWF effluent have also declined.

Start Date	NOEC (Survival)	TUc (Reproduction)	NOEC % (Reproduction)	EC or IC 25 (Reproduction)	TST (Reproduction)
9/12/14	100%	<1	100% effluent	>100% effluent	Pass
10/3/14	100%	<1	100% effluent	>100% effluent	Pass
11/3/14	100%	<1	100% effluent	>100% effluent	Pass
12/8/14	100%	<1	100% effluent	>100% effluent	Pass

Note: SJSC uses a TRE/TIE trigger of 2 TUc calculated as 100/EC50 or IC50 or three sample median of >1 as recommended in the 2009 TRE Workplan submitted to Regional Water Board

* <1 - This result was rejected due to an anomolous dose response inversion.

** Test Failed Quality Control