California Regional Water Quality Control Board
San Francisco Bay Region

RESPONSE TO WRITTEN COMMENTS
on October 2011 Tentative Order for
Vallejo Sanitation and Flood Control District Wastewater Treatment Plant, Solano County

The Regional Water Board received written comments on a tentative order distributed for public comment from the following parties:

1. Vallejo Sanitation and Flood Control District (District)
2. San Luis & Delta-Mendota Water Authority, Metropolitan Water District of Southern California, Westlands Water District, Santa Clara Valley Water District, Tulare Lake Basin Water Storage District, Alameda County Flood Control and Water Conservation District, Zone 7, Coachella Valley Water District, and Alameda County Water District (Water Agencies)
3. Regional Water Board Staff-Initiated Revisions

This response to the above comments summarizes each comment in *italics* (paraphrased for brevity) followed by the staff response. For the full context and content of each comment, refer to the comment letters.

Staff also initiated some revisions to the tentative order. These changes (1) provide additional information about the outfall diffusers, (2) summarize all monitoring requirements in a single table, and (3) clarify the District's permit compliance over the term of the previous Order (Fact Sheet section II.D). The first two revisions are show as part of responses to related comments, and the third is shown in the Regional Water Board Staff-Initiated Revisions section. Revisions are shown in ~~strikeout~~ for deletions and <u>underline</u> for additions.

Vallejo Sanitation and Flood Control District (District)

District Comment 1.
The District requests clarification of the minimum dilution requirement. *The District requests several revisions to the tentative order to clarify that (1) the minimum initial dilution requirement of 26:1 is consistent with the District's estimate of the dilution achieved at the Mare Island Strait outfall and would not necessarily apply under all possible conditions, and (2) although the Carquinez Strait outfall is estimated to have a 44:1 initial dilution, the 26:1 dilution estimated for Mare Island Strait is being used for both outfalls for simplicity. Also, the District requests revisions to correct typographical errors.*

Response to District Comment 1.
We mostly agree and revised the tentative order. We used the dilution ratio achieved at Mare Island Strait because treated wastewater discharged at both the Carquinez Strait and Mare Island Strait outfalls is subject to the same treatment process; thus, the limits are based on the lowest of the two dilution ratios to ensure protection of water quality, rather than for simplicity.

We revised section III.B as follows:

III. Discharge Prohibitions

⋮

B. Discharge at any point at which the treated wastewater does not receive an initial dilution of at least 26:1 (nominal) ~~as described in Fact Sheet section IV.C.4.b(2)(d)~~ is prohibited. Compliance shall be achieved by proper operation and maintenance of the discharge outfalls to ensure that they (or any replacements, in whole or in part) are in good working order and are consistent with or can achieve better mixing than that described in the Fact Sheet (Attachment F). The Discharger shall address measures taken to ensure this in its application for permit reissuance.

This text preserves the intent of the prohibition while addressing the concern that the District could not comply with the prohibition as previously written because no discharge receives its nominal dilution one hundred percent of the time.

We also revised Fact Sheet sections II.B.1 and 2 as follows to include more information about the outfall diffusers:

1. **Discharge Point No. 001, Carquinez Strait.** Treated municipal wastewater is discharged to Carquinez Strait year-round through a submerged diffuser 400 feet from the north shore of Carquinez Strait and about 75 feet below the water surface near the north end of the Carquinez Bridge. The diffuser includes eight 16-inch diameter discharge ports spaced seven feet apart, angled 0 degrees from the vertical and 20 degrees from the horizontal, alternating on opposite sides of the diffuser. The dilution achieved by the diffuser was estimated using a default diffuser port contraction coefficient of 1.0 at a flow rate of 30 MGD. The discharge receives an initial dilution of approximately 41:1. The Facility discharged an average of 11 MGD of treated wastewater to Discharge Point No. 001 between October 2006 and December 2010. The maximum average daily discharge over this same period was 31 MGD.

2. **Discharge Point No. 002, Mare Island Strait.** Secondary-treated, disinfected, and dechlorinated wastewater is discharged to Mare Island Strait when wet weather peak flows are greater than 30 MGD, when the hydraulic capacity of Discharge Point No. 001 has been exceeded, or as approved by the Executive Officer. The discharge is through a submerged diffuser about 100 feet from the east shore of Mare Island Strait at a depth of 3 feet one hour after low slack tide, and receives an initial dilution of at least 26:1. The diffuser includes three 12-inch diameter discharge ports fitted with variable-width port valves; the effective port diameter at the 99th percentile flow rate of 3.07 MGD through this outfall from 2005 through 2010 is 5.8 inches. The ports are spaced 5 feet apart, angled 11.5 degrees downward from the horizontal, and oriented perpendicular to the current direction. The dilution achieved by the diffuser was estimated using a default diffuser port contraction coefficient of 1.0. During the period from October 2006 through December 2010, 18 discharge events occurred from Discharge Point No. 002. The following table presents the dates on which the discharges occurred and the volume of effluent discharged.

We revised Fact Sheet section IV.A.2, Discharge Prohibition III.B, as follows:

2. **Discharge Prohibition III.B (~~Discharge of treated wastewater that does not receive a Minimum initial dilution of 26:1 is prohibited~~):** ~~The ammonia WQBELs in this Order are based on a conservative estimate of actual initial~~ This Order allows a dilution credit of 26:1 ~~(see Fact Sheet section IV.C.4.b(2)(d))~~ in the calculation of one or more WQBELs, based on information of dilution achieved by the Discharger's current outfall to Mare Island Strait. This prohibition is necessary to ensure that the assumptions used to derive the dilution credit remain substantially the same so that the limitations are protective of water quality. ~~These WQBELs would not be protective of water quality if the discharge did not actually achieve at least a 26:1 minimum initial dilution.~~

We revised Fact Sheet section IV.C.4.b(3), Ammonia, as follows to correct the flow rate at which discharge from Discharge Point 002 occurs:

(3) Ammonia. For ammonia, a conservative estimated actual initial dilution was used to calculate the effluent limitations. This is justified because ammonia, a non-persistent pollutant, quickly disperses and degrades to a non-toxic state, and cumulative toxicity effects are unlikely. In the Mixing Zone Study Report (Vallejo Sanitation and Flood Control District, 2011), the Discharger developed dilution estimates for the Facility's discharges from Discharge Point Nos. 001 and 002. The Facility has a dry weather design capacity of 15.5 MGD with an average dry weather discharge rate of 10.8 MGD. Flows are discharged from Discharge Point No. 001 until wet weather flows exceed ~~35~~ 30 MGD. When wet weather flows exceed ~~35~~ 30 MGD, the excess flow is discharged from Discharge Point No. 002. The study estimated the actual initial dilution ratio at Discharge Point No. 001 to be 41:1 (D = 40), and at Discharge Point No. 002 to be 26:1 (D = 25). Therefore, this Order establishes the more conservative dilution of 26:1 to achieve compliance with water quality objectives.

District Comment 2.
The District requests revisions to the total ammonia effluent limits based on corrected background concentrations. *The District points out that data collected at the Napa River RMP station (BD50) located in Mare Island Strait were used to calculate water quality objectives for total ammonia, but background concentration data from the Yerba Buena RMP station (BC10) were used to calculate the effluent limits. The District requests that we recalculate the total ammonia effluent limits using background concentration data from station BD50.*

Response to District Comment 2.
We agree that background data from station BD50 should have been used. In reviewing the calculations, we found that we had also inadvertently used incorrect total ammonia acute and chronic water quality objectives of 4.5 mg/L and 1.1 mg/L, respectively. The correct ones are 4.9 mg/L and 1.6 mg/L. We therefore recalculated the ammonia limits and revised the tentative order.

We revised Table 7, Effluent Limitations for Toxic Pollutants, as follows:

Parameter	Units	Final Effluent Limitations[1]	
		Average Monthly Effluent Limit (AMEL)	Maximum Daily Effluent Limit (MDEL)
⋮	⋮	⋮	⋮
Total Ammonia, as N	**mg/L**	**~~43~~ 44**	**~~85~~ 86**

We revised Fact Sheet Table F-8, Summary of RPA Results, as follows:

CTR #	Priority Pollutants	MEC or Minimum DL [(1),(2)] (µg/L)	Governing Water Quality Objective (WQO)/WQC (µg/L)	Maximum Background or Minimum DL [(1),(2)] (µg/L)	RPA Results [(3)]
⋮	⋮	⋮	⋮	⋮	⋮
	Total Ammonia (mg/L N)	**32**	**1.7**	**~~0.43~~ 0.19**	**Yes**

We revised Fact Sheet section IV.C.4.c(3)(c) as follows:

(c) WQBELs. The most stringent total ammonia WQBELs, calculated according to SIP procedures using a CV of 0.38 and a dilution of 26:1 (D = 25), are an AMEL of ~~43~~ 44 mg/L and an MDEL of ~~85~~ 86 mg/L. Statistical adjustments were made to the WQBEL calculations because:

We revised Fact Sheet Table F-9, WQBEL Calculations, as follows:

PRIORITY POLLUTANTS	⋮	Total Ammonia (acute)	Total Ammonia (chronic)
Units	⋮	**mg/L as N**	**mg/L as N**
Basis and Criteria type	⋮	Basin Plan Aquatic Life	Basin Plan Aquatic Life
Criteria -Acute	⋮	4.9	-----
Criteria -Chronic	⋮	-----	1.7
SSO Criteria –Acute	⋮	-----	-----
SSO Criteria –Chronic	⋮	-----	-----
Water Effects ratio (WER)	⋮	1	1
Lowest Water Quality Objective	⋮	4.9	1.7
Site Specific Translator – MDEL	⋮	-----	-----
Site Specific Translator – AMEL	⋮	-----	-----
Dilution Factor (D) (If Applicable)	⋮	20	20
No. Of Samples Per Month	⋮	4	30
Aquatic Life Criteria Analysis Required? (Y/N)	⋮	Y	Y
HH Criteria Analysis Required? (Y/N)	⋮	N	N
	⋮		
Applicable Acute Water Quality Objective	⋮	~~4.53~~ 4.9	-----
Applicable Chronic Water Quality Objective	⋮	-----	~~1.10~~ 1.7
HH criteria	⋮	-----	-----
Background (Maximum Conc. for Aquatic Life calc)	⋮	~~0.43~~ 0.19	~~0.14~~ 0.12
Background (Average Conc. for Human Health calc)	⋮	-----	-----
Is the pollutant on the 303d list and/or bioaccumulative (Y/N)?	⋮	N	N
	⋮		
ECA acute	⋮	~~117~~ 123	-----
ECA chronic	⋮	-----	41
ECA HH	⋮	-----	-----
	⋮		

PRIORITY POLLUTANTS	⋮	Total Ammonia (acute)	Total Ammonia (chronic)
Units	⋮	**mg/L as N**	**mg/L as N**
No. of data points <10 or at least 80 percent of data reported non-detect? (Y/N)	⋮	N	N
Avg of effluent data points	⋮	12	12
Std Dev of effluent data points	⋮	4.6	4.6
CV calculated	⋮	0.38	0.38
CV (Selected) – Final	⋮	0.38	0.38
	⋮		
ECA acute mult99	⋮	0.46	-----
ECA chronic mult99	⋮	-----	0.96
LTA acute	⋮	~~53~~ 56	-----
LTA chronic	⋮	-----	39
minimum of LTAs	⋮	~~53~~ 56	39
	⋮		
AMEL mult95	⋮	1.3	1.1
MDEL mult99	⋮	2.2	2.2
AMEL (aq life)	⋮	~~71~~ 75	~~43~~ 44
MDEL(aq life)	⋮	~~117~~ 123	~~85~~ 86
	⋮		
MDEL/AMEL Multiplier	⋮	1.6	2.0
AMEL (human hlth)	⋮	----	----
MDEL (human hlth)	⋮	----	----
	⋮		
minimum of AMEL for Aq. life vs. HH	⋮	~~71~~ 75	~~43~~ 44
minimum of MDEL for Aq. Life vs. HH	⋮	~~117~~ 123	~~85~~ 86
Current limit in permit (30-day average)	⋮	-----	-----
Current limit in permit (daily)	⋮	-----	-----
	⋮		
Final limit – AMEL	⋮	~~71~~ 75	~~43~~ 44
Final limit – MDEL	⋮	~~117~~ 123	~~85~~ 86
Max Effl Conc (MEC)	⋮	32	32

District Comment 3.
The District requests inclusion of the Monitoring and Reporting Program's (MRP's) chronic toxicity monitoring requirements in the enforceable part of the permit. *The District requests inclusion, in section IV.D, Whole Effluent Chronic Toxicity, the MRP's routine and accelerated chronic toxicity monitoring requirements.*

Response to District Comment 3.
We did not revise the tentative order. We find it more appropriate to include the requirements for accelerated chronic toxicity monitoring and reporting in Attachment E, Monitoring and Reporting Program, with the other monitoring and reporting requirements. Keeping these requirements in the MRP is consistent with most other NPDES permits in this region. The permit at section IV.D incorporates by reference the MRP's chronic toxicity monitoring requirements.

District Comment 4.
The District requests deletion of requirements in Attachment G, Regional Standard Provisions, that no longer apply. *The District notes that it is unable to follow Attachment G's outdated requirements to submit reports of sanitary sewer overflows to www.wbers.net and to provide 2-hour notification of unauthorized discharges separate from that provided to the California Emergency Management Agency. Therefore, the District requests revisions to Attachment G.*

Response to District Comment 4:
We did not revise Attachment G because of the administrative burden of doing so, since it is a set of standard provisions applicable to all wastewater NPDES permits in the region. Instead, we provide the updates in the MRP, which supersedes the relevant provisions of Attachment G.

We revised MRP section VIII.A, General Monitoring and Reporting Requirements, as follows:

A. General Monitoring and Reporting Requirements
The Discharger shall comply with all Federal Standard Provisions (Attachment D) and Regional Standard Provisions (Attachment G) related to monitoring, reporting, and recordkeeping, with modifications shown in MRP section VIII.D below.

We added section VIII.D, Modifications to Attachment G, to the MRP after MRP section VIII.C, Discharge Monitoring Reports, as follows (changes to Attachment G are shown in *underlined italics* or ~~*strikeout italics*~~):

D. Modifications to Attachment G

1. Sections V.C.1.f and V.C.1.g are revised as follows, and V.C.1.h (Reporting data in electronic format) is deleted.

f. Annual self-monitoring report requirements

By the date specified in the MRP, the Discharger shall submit an annual report to the Regional Water Board covering the previous calendar year. The report shall contain the following:

1) Annual compliance summary table of treatment plant performance, including documentation of any blending events *(this summary table is not required if the Discharger has submitted the year's monitoring results to CIWQS in electronic reporting format by EDF/CDF upload or manual entry);*

[Section V.C.1.f.2 is unchanged from Attachment G.]

3) Both tabular and graphical summaries of the monitoring data for the previous year if parameters are monitored at a frequency of monthly or greater *(this item is not required if the Discharger has submitted the year's monitoring results to CIWQS in electronic reporting format by EDF/CDF upload or manual entry);*

[Sections V.C.1.f.4 through V.C.1.f.7 are unchanged from Attachment G.]

g. Report submittal

The Discharger shall submit SMRs addressed as follows, unless the Discharger submits SMRs electronically to CIWQS:

California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612
Attn: NPDES Wastewater Division

h. Reporting data in electronic format – *Deleted*

2. Sections V.E.2.a and V.E.2.c are revised as follows, and sections V.E.2.b (24-hour Certification) and V.E.2.d (Communication Protocol) are deleted:

2. Unauthorized Discharges from Municipal Wastewater Treatment Plants[2]

The following requirements apply to municipal wastewater treatment plants that experience an unauthorized discharge at their treatment facilities and ~~*are consistent with and*~~ supersede requirements imposed on the Discharger by the Executive Officer by letter of May 1, 2008~~, *issued pursuant to California Water Code Section 13383*~~.

a. Two (2)-Hour Notification

For any unauthorized discharges that ~~*result in a discharge to*~~ *enter* a drainage channel or a surface water, the Discharger shall, as soon as possible, but not later than two (2) hours after becoming aware of the discharge, notify the ~~*State Office of*~~ *California* Emergency ~~*Services*~~ *Management Agency (CalEMA, currently* 800-852-7550), the local health officers or directors of environmental health with jurisdiction over the affected water bodies, and the Regional Water Board. ~~*The*~~ *Timely notification by the Discharger to CalEMA also satisfies* notification to the Regional Water Board~~*'s online reporting system at www.wbers.net, and*~~. *Notification* shall include the following:

[Sections V.E.2.a.1 through V.E.2.a.6 are unchanged from Attachment G.]

b. 24-hour Certification – *Deleted*

c. 5-day Written Report

Within five business days, the Discharger shall submit a written report~~, *via the Regional Water Board's online reporting system at www.wbers.net,*~~ that includes, in addition to the information required above, the following:

[Sections V.E.2.c.1 through V.E.2.c.7 are unchanged from Attachment G.]

d. Communication Protocol – *Deleted*

District Comment 5

The District requests replacement of the term "spills" with "sanitary sewer overflows." *The District points out that "sanitary sewer overflow" is used throughout most of the tentative order, but "spills" and "sewage spills" are used in section VI.C.4.c, Sanitary Sewer Overflows and Sewer System Management Plan. The District requests the following revisions for consistency:*

c. Sanitary Sewer Overflows and Sewer System Management Plan

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Implementation of the General Collection System WDRs requirements for proper operation and maintenance and mitigation of ~~spills~~ sanitary sewer overflows will satisfy the corresponding federal NPDES requirements specified in Attachment D (as supplemented by Attachment G) of this Order. Following notification and reporting requirements in the General Collection System WDRs will satisfy NPDES reporting requirements specified in Attachment D (as supplemented by Attachment G) of the Order for ~~sewage~~ ~~spills from the collection system~~ sanitary sewer overflows upstream of the Plant boundaries. Attachments D and G of this Order specify reporting requirements for unauthorized discharges from anywhere within the Plant downstream of the Plant boundaries.

Response to District Comment 5.

We agree and revised the tentative order.

District Comment 6.

The District requests deletion of redundant bypass monitoring requirements from MRP Table E-3. *The District requests deletion of bypass monitoring requirements from Table E-3 because they are already required by Attachment G, Section IV.B.5. The District requests the following revisions to Table E-3:*

Table E-3. Effluent Monitoring, EFF-001

Parameter	*Units*	*Sample Type*	*Minimum Sampling Frequency*
Flow Rate(1)	*MGD*	*Continuous*	*Continuous*
~~*Volume of Wastewater that bypasses biological treatment (1a)*~~	~~*MG*~~	~~*n/a*~~	~~*Each bypass event*~~
~~*Start Time and Date of Biological Treatment Bypass(1a)*~~	~~*n/a*~~	~~*n/a*~~	~~*Each bypass event*~~
~~*End Time and Date of Biological Treatment Bypass*~~	~~*n/a*~~	~~*n/a*~~	~~*Each bypass event*~~
⋮	⋮	⋮	⋮

Footnotes to Table E-3:

⋮

~~(1a) During Blending: Volume of primary treated wastewater that bypasses biological treatment (MG)~~
~~During Blending: Start time and date of biological treatment bypass~~
~~During Blending: End time and date of biological treatment bypass~~

Response to District Comment 6.

We agree and revised the tentative order as follows:

Table E-3. Effluent Monitoring, EFF-001

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow Rate[1, 1a]	MGD	Continuous	Continuous
~~Volume of Wastewater that bypasses biological treatment~~ [~~1a~~]	~~MG~~	~~n/a~~	~~Each bypass event~~
~~Start Time and Date of Biological Treatment Bypass~~[~~1a~~]	~~n/a~~	~~n/a~~	~~Each bypass event~~
~~End Time and Date of Biological Treatment Bypass~~	~~n/a~~	~~n/a~~	~~Each bypass event~~
⋮	⋮	⋮	⋮

Footnotes to Table E-3:

⋮

(1a) During blending events the Discharger shall monitor flows, volume blended, TSS, bacteria, and other limited pollutants as required by Attachment G, section III.A.3.b(6), at monitoring point EFF-001b.
~~During Blending: Volume of primary treated wastewater that bypasses biological treatment (MG)~~
~~During Blending: Start time and date of biological treatment bypass~~
~~During Blending: End time and date of biological treatment bypass~~

We also revised Table E-1 to define monitoring point E-001b, as follows:

Table E-1. Monitoring Station Locations

Discharge Point No.	Monitoring Location Name	Monitoring Location Description
⋮	⋮	⋮
001	EFF-001b	At a point in the treatment facility at which all blended fully treated and primary treated waste tributary to the discharge outfall into Carquinez Strait is present (may be the same location as EFF-001).
⋮	⋮	⋮

District Comment 7.
The District requests revision of the oil and grease monitoring frequency to once per quarter, consistent with requirements for other similar agencies. *The District bases this request in part on its plant's performance: 94% of its effluent oil and grease results are below the reporting level of 5 mg/L, and all are well below the maximum daily effluent limitation of 20 mg/l. The District points out that recent NPDES permits for the Napa Sanitation District and Fairfield-Suisun Sewer District, agencies that operate with permitted flows similar to the District, require quarterly effluent monitoring for oil and grease.*

The revisions the District requests are as follows:

MRP Table E-3:

Table E-3. Effluent Monitoring, EFF-001

Parameter	*Units*	*Sample Type*	*Minimum Sampling Frequency*
⋮	⋮	⋮	⋮
Oil and Grease[3]	*mg/L*	*Grab*	~~*1/Month*~~ *1/Quarter*
⋮	⋮	⋮	⋮

Response to District Comment 7.
We agree and revised the tentative order. We also revised Fact Sheet section VII.B, MRP Requirements (Provision VI.B), and added Table F-10, Monitoring Requirements Summary, to summarize all monitoring requirements in a single table, as follows:

B. MRP Requirements (Provision VI.B)

The Discharger is required to monitor the permitted discharges in order to evaluate compliance with permit conditions. Monitoring requirements are contained in the MRP (Attachment E), Federal Standard Provisions (Attachment D), and Regional Standard Provisions (Attachment G). This provision requires compliance with these provisions and is authorized by 40 CFR 122.41(h) and (j) and CWC sections 13267 and 13383.

The table below summarizes routine monitoring requirements. This table is for informational purposes only. Actual requirements are specified in the MRP and other applicable provisions of this Order.

Table F-10. Monitoring Requirements Summary

Parameter	Influent INF-001	Effluent EFF-001, EFF-001b, or EFF-002	Sludge and Biosolids	Receiving Water
Flow	Continuous	Continuous		Support RMP
CBOD	2/Week	2/Week		
TSS	2/Week	2/Week		
Oil and Grease		1/Quarter		
pH		Continuous		Support RMP
Chlorine, Total Residual		Continuous		
Acute Toxicity		1/Month		Support RMP
Chronic Toxicity		1/Quarter		Support RMP
Enterococcus		2/Week		Support RMP
Dissolved Oxygen		1/Day		Support RMP
Temperature		1/Day		Support RMP
Copper		1/Month		Support RMP
Cyanide	1/Month	1/Month	2/Year	Support RMP
Ammonia		1/Month		Support RMP
2,3.7,8-TCDD & Congeners		2/Year		Support RMP
1,2-Diphenylhydrazine		1/5 Years		
Standard Observations		1/Month		Support RMP
All other priority pollutants		1/permit term		Support RMP
Volatile Organic Compounds	2/Year	2/Year	2/Year	
Base/Neutrals and acids extractable organic compounds (BNA)	2/Year	2/Year	2/Year	
Hexavalent Chromium	1/Month	1/Month	2/Year	
Metals	1/Month	1/Month	2/Year	
Mercury	1/Month	1/Month	2/Year	

Parameter	Influent INF-001	Effluent EFF-001, EFF-001b, or EFF-002	Sludge and Biosolids	Receiving Water
Metric tons/year			See p. G-14	
Paint filter test			See pp. G-14 & 15	

District Comment 8.
The District requests revision of the Chronic Toxicity Reduction Evaluation (TRE) Work Plan requirements for clarity and consistency. *The District comments that the TRE Work Plan in the MRP is unclear and impractical to implement. A TRE is required to detect persistent toxicity, but it can take longer than the 30 days allowed in the tentative order for a chronic toxicity test to be completed and for the District to receive the results. The District requests the following revisions to MRP section V.B.3:*

3. Chronic Toxicity Reduction Evaluation (TRE)

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b. Specific TRE Work Plan. Within 30 days of ~~the date of completion of the~~ receiving results of an accelerated monitoring test that shows continued exceedance of ~~tests exceeding~~ either trigger for accelerated monitoring, the Discharger shall submit a specific TRE work plan to the Regional Water Board, which shall be the generic work plan revised as appropriate for the toxicity event after consideration of available discharge data.

c. Initiate TRE. Within 30 days ~~the date of completion of the~~ receiving results of an accelerated monitoring test~~s~~ that shows continued exceedance of ~~observed to exceed~~ either trigger, the Discharger shall initiate a TRE in accordance with a TRE work plan that addresses any and all comments from the Executive Officer.

Response to District Comment 8.
We agree and revised the tentative order.

District Comment 9.
The District requests revision of Table E-5's pretreatment monitoring requirements to allow grab samples for most constituents, consistent with the District's current practices. *The District currently collects grab samples for pretreatment monitoring, consistent with the requirements of Attachment G and the Mercury and PCBs Watershed Permit. The District requests that pretreatment monitoring sampling requirements be revised as follows:*

Table E-5. Pretreatment and Biosolids Monitoring Requirements

Constituents	*Sample Locations and Frequencies*[(1)]			*Sample Type*	
	INF-001	*EFF-001*	*Biosolids*	*INF-001*	*Biosolids*
Volatile Organic Compounds (VOC)	*2/Year*	*2/Year*	*2/Year*	*~~multiple~~ grab~~s~~* [~~(3a)~~]	*grabs* [~~(3b~~ 2a)]
Base/Neutrals and acids extractable organic compounds (BNA)	*2/Year*	*2/Year*	*2/Year*	*~~multiple~~ grab~~s~~* [~~(2a)~~]	*grabs* [(2a~~b~~)]
Hexavalent Chromium[(3)]	*1/Month*	*1/Month*	*2/Year*	*~~multiple~~ grab~~s~~* [~~(2a)~~]	*grabs* [(2a~~b~~)]

Metals[4]	*1/Month*	*1/Month*	*2/Year*	~~*multiple grabs*~~ *24-hr Composite* (2~~b~~e)	*grabs* (2~~a~~b)
Mercury	*1/Month*	*1/Month*	*2/Year*	*grab*	*grabs* (2a)
Cyanide	*1/Month*	*1/Month*	*2/Year*	~~*multiple*~~ *grabs* ~~(2c)~~	*grabs* (2~~a~~b)

(1) *The Discharger may elect to use the influent, and effluent monitoring conducted in accordance with Tables E-2, E-3, and E-4 to satisfy these pretreatment requirements, and sampling shall be conducted at whichever frequency is greater.*

(2) ~~*Sample types:*~~

~~*a. Multiple grab samples for VOC, BNA, hexavalent chromium, and cyanide must consist of a minimum of four discrete grab samples, collected at equal intervals spaced over the course of a 24-hour period, with each grab sample analyzed separately and the results mathematically flow-weighted, or with all grab samples combined (volumetrically flow-weighted) prior to analysis.*~~

~~*b*~~ *a. The biosolids sample shall be a composite of the biosolids to be disposed. Biosolids collection and monitoring shall comply with the requirements specified in Attachment H, Appendix H-4. The Discharger shall also comply with the biosolids monitoring requirements of 40 CFR 503.*

~~*c*~~ *b. If an automatic compositor is used, the Discharger shall obtain 24-hour composite samples through flow-proportioned composite sampling. Alternatively, 24-hour composite samples may consist of discrete grab samples combined (volumetrically flow-weighted) prior to analysis or mathematically flow-weighted.*

(3) *The Discharger may elect to report total chromium instead of hexavalent chromium. Samples collected for total chromium measurements shall be 24-hour composites.*

(4) *The metals are arsenic, cadmium, copper, lead, ~~mercury,~~ nickel, silver, zinc, and selenium.*

Response to District Comment 9.
We agree and revised the tentative order. Composite sampling, as called for in footnote 2a, is required to obtain a representative sample of biosolids, but grab samples are representative for most pollutants subject to pretreatment monitoring in influent wastewater.

District Comment 10.
The District comments that the requirement to include "Estimated Concentration" with estimated laboratory results is unnecessary and impractical. *The District is already required to report sample results less than the reporting level as "Detected, but Not Quantified" or "DNQ." Adding "Estimated Concentration" or "Est. Conc." next to the chemical concentration is redundant and burdensome. Therefore, the District requests that we delete this requirement from MRP section VIII.B.4, ML and MDL Reporting.*

Response to District Comment 10.
We agree and revised the tentative order.

District Comment 11.
The District requests consistency in the references to approval of the Mare Island Strait outfall for year-round use. *The Fact Sheet's references to approval of the Mare Island Strait outfall differ from those in other sections of the tentative order. The District requests the following revisions:*

Fact Sheet section II.E, Planned Changes:

E. Planned Changes

The Discharger plans to investigate the possibility of ~~changing their main discharge point from the Carquinez Strait outfall (Discharge Point 001)~~ discharging to the Mare Island Strait outfall (Discharge Point 002) under year-round conditions. This would require improvement of the Mare Island Strait outfall to continue to achieve a dilution ratio of 26:1 at design effluent flows.

Approval of the Executive Officer ~~*A permit modification*~~ *would be required to begin discharging to Mare Island Strait year-round. The Discharger plans to study the technical and financial feasibility of this project further before implementing it.*

Fact Sheet section VII.C.2, Special Studies and Additional Monitoring Requirements:

2. ***Special Studies and Additional Monitoring Requirements***

   ⋮

   c. ***Mare Island Strait Diffuser Upgrade.*** *This provision is required to support the Discharger possibly using the Mare Island Strait outfall (Discharge Point 002)* ~~*as its main*~~ *for discharges under year-round conditions* ~~*point*~~ *(currently allowed only for Discharge Point 001 at Carquinez Strait). This would require improving the Mare Island Strait outfall to achieve an initial dilution of at least 26:1 at the Plant's design flow. The Discharger plans to do further analysis of the technical and financial feasibility of this project before proceeding. This provision requires the Discharger to submit documentation demonstrating the following:*

Response to District Comment 11.
We agree and revised the tentative order.

District Comments 12 through 29.
The District identified typographical errors.

Response to District Comments 12 through 29.
We revised the tentative order; however, we did not make all the changes suggested in Comments 13 and 19.

In Comment 13, regarding Table 10, Cyanide Action Plan, the District requests that we revise Task 1 to refer to subsequent Tasks 2 and 3, rather than Tasks 2 and 4. The original references are correct, not typographical errors.

In Comment 19, regarding Fact Sheet section II.A, Description of Wastewater and Biosolids Treatment, the District requested that we revise the number of pump stations from 36 to 26. Based on subsequent email communication with Mr. Ron Matheson, District Manager, the correct number of domestic sewage pump stations is 36.

Water Agencies

Water Agencies Introductory Comments

The Water Agencies request designated party status. *The Water Agencies request designated party status, claiming they have a direct interest in the tentative order. They also summarize the state of knowledge regarding potential ammonia impacts on Suisun Bay and offer three remedies they hope the Water Board will consider. These remedies are discussed further in Water Agencies Comments IV.A, IV.B, and IV.C.*

Response to Water Agencies Introductory Comments

We are not formally designating parties for this tentative order because doing so will not limit or enhance any party's rights under these proceedings. Designating parties is normally unnecessary for NPDES hearings; it is more common for enforcement hearings. A designated party has the right to submit evidence, is allowed to cross-examine during hearings, and is subject to the same time limits during hearings as other parties, such as the discharger (in contrast, "interested" parties can only make policy comments and cannot offer evidence). However, our standard NPDES hearing practices provide all these rights anyway, even without formal designation. The Water Agencies have had the same opportunity to submit written comments and evidence as all other parties, will be offered the same amount of time for oral comments at the hearing, and will have the same ability to cross-examine (if they so choose) as everyone else.

Regarding the three remedies the Water Agencies ask the Water Board to consider, see our responses to Water Agencies Comments IV.A, IV.B, and IV.C, below.

Water Agencies Comment I

The tentative order does not address ammonium discharges. *The Water Agencies contend that the tentative order does not address ammonium discharges. The Water Agencies contend that, because some other wastewater treatment plants remove ammonia, requiring this plant to remove ammonia would not require a new or unproven technology.*

Response to Water Agencies Comment I

We agree that the tentative order did not explicitly address ammonium discharges. We revised the tentative order (Fact Sheet section IV.C.4.c(3), Ammonia) to include findings related to ammonium (see our response to Comment II.B). The ammonia limits proposed in the tentative order were based only on the Basin Plan's un-ionized ammonia objective. These limits were based on water quality requirements, not the actual discharge or current performance. We agree that technology for additional ammonia removal is available. However, U.S. EPA's technology-based requirements for municipal wastewater treatment plants (i.e., the secondary treatment standards) do not require ammonia removal.

Water Agencies Comment II

Uncontrolled ammonia discharges could adversely affect beneficial uses. *The Water Agencies call on the Water Board to review available scientific information and contend that available information points to the need for ammonia removal. Essentially, the Water Agencies contend that there is reasonable potential for the discharge to cause or contribute to violations of water quality*

standards; therefore, effluent limits are necessary to address ammonium discharges. The Water Agencies note that (1) excessive ammonium is toxic to copepods, (2) excess ammonium inhibits nitrogen uptake by diatoms and reduces diatom primary production, (3) nutrient discharges affect algal communities by changing nutrient ratios to favor harmful species, and (4) nutrient removal at wastewater treatment plants improves ecosystems and aquatic life where implemented.

Response to Water Agencies Comment II

We do not agree that the District's discharges to Carquinez Strait and Mare Island Strait are likely to substantially affect Suisun Bay. The outfalls are over six miles downstream of Suisun Bay. Treated domestic wastewater is fresh and therefore less dense than salt or brackish water; the discharges are also warmer than the receiving water and are discharged from the outfalls as multiple jets. These factors result in buoyant plumes with significant mixing. The Carquinez Strait discharge rises toward the surface of Carquinez Strait. Typical peak near-surface tidal velocities in deep channels of San Francisco Bay, such as Carquinez Strait, are about 3.0 feet per second (D. Schoellhamer and D. Buchanan, http://sfbay.wr.usgs.gov/sediment/cont_monitoring/background.html, December 2007). An expected average flood (i.e., landward) tide near-surface velocity would be approximately 1.5 feet per second, which would result in a travel time from Carquinez Bridge to Benicia Bridge of approximately 6 hours (D. Schoellhamer, U.S. Geological Survey, telephone conversation, December 7, 2011). Carquinez Strait is also characterized by a gravitational circulation cell: saltier, colder, denser water flows landward near the bottom of Carquinez Strait, and fresher, less dense water flows seaward (D. Schoellhamer and J. Burau, 1998). The average near-surface current direction is therefore seaward and tends to push the discharge away from Suisun Bay (D. Schoellhamer, December 7, 2011).

The discharge to Mare Island Strait is also not expected to substantially affect Suisun Bay. Mare Island Strait is farther from Suisun Bay, and although surface flow in Mare Island Strait tends toward Carquinez Strait, it is then subject to Carquinez Strait's flow characteristics.

Nevertheless, we agree that available scientific information provides cause for concern. We do not agree that existing information is sufficient to require additional ammonia removal from the District's discharge at this time. Available information may not be as conclusive as the Water Agencies suggest. Copepod ammonium toxicity is not an issue for Suisun Bay because the ammonia concentrations observed in Suisun Bay are well below the low observed effect concentration derived in the studies. The potential for ammonium to inhibit phytoplankton productivity in Suisun Bay exists, but needs to be evaluated in the context of other possible factors that could also affect productivity. Finally, scientists disagree about whether changing nutrient ratios are harming Suisun Bay algal communities. More information is needed to understand the relative contributions of the various Suisun Bay ammonia sources to Suisun Bay ammonia concentrations and their impacts.

Water Agencies Comment III.A

The tentative order should not provide a dilution credit for ammonium. *The Water Agencies contend that the tentative order is flawed in providing a dilution credit for ammonium. They make six points:*

1. *They assert that the tentative order says a mixing zone cannot be evaluated due to the complex hydrology of San Francisco Bay, and further assert that it is illogical to provide full dilution credit such that calculated limits are less stringent than current performance.*

2. *They point out that, when the Basin Plan states, "…ammonia will be diluted or degraded to a nontoxic state fairly rapidly," it refers to un-ionized ammonia, not ammonium.*

3. *They note that the Basin Plan cautions against providing a dilution credit for a discharge to a tidal zone. They then object to there being no finding justifying proposed effluent limits greater than those calculated from water quality objectives.*

4. *They mention that the dilution study indicates that mixing does not persist in the far field, beyond the zone of initial dilution. Therefore, the study only presents findings for initial dilution.*

5. *They say the Basin Plan cautions against relying on models because they only estimate initial dilution. None accounts for tidal currents.*

6. *They argue that the tentative order does not address ammonium concentrations found to be toxic to copepods and to inhibit diatom productivity; therefore, the tentative order is insufficiently protective.*

Response to Water Agencies Comment III.A

We disagree that the ammonia dilution credit in the tentative order is unjustified. The Water Agencies' concerns regarding the ammonia dilution credit appear to be misplaced since, as the Water Agencies correctly point out, the tentative order's ammonia limits are based solely on the Basin Plan's un-ionized ammonia objective. They do not address ammonium concerns and were not intended to do so. Dilution credit may be appropriate for un-ionized ammonia, but it may or may not be appropriate for ammonium. See our response to Water Agencies Comment IV.C regarding revisions to the tentative order that address ammonium. Our responses to the Water Agencies' six points are as follows:

1. The tentative order does *not* say a mixing zone cannot be evaluated. It describes the challenges in establishing a mixing zone and estimating dilution, and considering these challenges, it justifies limiting dilution credits to reflect only initial dilution or even more so in some circumstances. The proposed dilution credits are based on the properties of the outfall and conservatively account for uncertainties regarding mixing within receiving waters.

2. We agree that the quoted Basin Plan text regarding ammonia dilution and degradation pertains to un-ionized ammonia. Since the tentative order only addressed un-ionized ammonia, it was consistent with this portion of the Basin Plan. Nevertheless, we note that un-ionized ammonia and ammonium always exist together in equilibrium; as one form degrades, so does the other.

3. The Basin Plan describes challenges related to estimating dilution for discharges to tidal waters; it does not prohibit doing so. Moreover, it does not prohibit limiting dilution credits to reflect only initial dilution, as the tentative order does. By not accounting for dilution by tidal action, the proposed ammonia dilution credit is more conservative than it would otherwise be.

   Contrary to the Water Agencies' comment, the ammonia limits in the tentative order are based on un-ionized ammonia water quality objectives; therefore, no special findings are necessary. Providing a dilution credit does not mean a resulting limit is not based on water quality objectives. The Basin Plan allows higher limits than those based on water quality objectives if justified to encourage water recycling, but that is not the case here.

4. We agree that the dilution study only presents findings for initial dilution. It does not account for far-field mixing. Therefore, the proposed dilution credit conservatively reflects only initial dilution. It does not, as the Water Agencies imply, reflect any additional far-field dilution.

5. The Basin Plan describes challenges related to modeling discharges to tidal waters. It does not prohibit far-field dilution modeling that incorporates tidal mixing. However, since such models are not readily available, most dilution studies (including the one cited in this tentative order) are limited to initial dilution, which is more conservative.

6. We agree that Suisun Bay ammonium concentrations provide cause for concern and that the tentative order did not address these concerns. We address them in our responses to Water Agencies Comment II, above, and Comments IV.A, IV.B, and IV.C, below. We have also added the following findings to Fact Sheet section IV.C.4.c(3), Ammonia:

   In water, ammonia exists in two forms: un-ionized ammonia (NH_3) and ammonium (ionized ammonia, NH_4^+). Together, these forms are referred to as "total ammonia." The relative proportion between the two forms depends on pH, temperature, and salinity. The Basin Plan contains WQOs for un-ionized ammonia, but there are no numeric WQOs for ammonium. The potential impacts of Suisun Bay ammonium are of increasing concern but not well understood. Recent studies indicate that ammonium may affect Suisun Bay through at least two mechanisms: effects on diatoms and effects on copepods. Diatoms are single-cell algae that significantly contribute to primary production in Suisun Bay (the base of the food web). Copepods are important secondary producers, providing food for many fish.

   The discharge is unlikely to contribute significant amounts of ammonia to Suisun Bay. The discharge is buoyant and tends toward the surface. The typical near-surface tidal current velocity in deep San Francisco Bay channels, such as Carquinez Strait, is approximately 1.5 feet per second (average). This would result in an expected travel time from Carquinez Strait Bridge to Benicia Bridge of approximately 6 hours under the most extreme conditions (D. Schoellhamer, U.S. Geological Survey, telephone conversation, December 7, 2011). In addition, residual currents in Carquinez Strait, mainly due to a gravitational circulation cell in the Strait, are seaward at the surface (D. Schoellhamer and J. Burau, 1998); thus, the average current direction in Carquinez Strait is seaward, away from Suisun Bay (D. Schoellhamer, December 7, 2011).

   For these reasons, the total ammonia WQBELs described below implement only un-ionized ammonia WQOs. They do not directly address ammonium.

Water Agencies Comment III.B
The tentative order does not comply with anti-backsliding and antidegradation policies. *The Water Agencies object to the tentative order's conclusion that, because the previous permit did not contain ammonia limits, the proposed new limits comply with anti-backsliding requirements. The Water Agencies also object to the tentative order's conclusion that the proposed ammonia limits comply with antidegradation requirements.*

The Water Agencies cite antidegradation policies that apply when allowing waste flows or concentrations to increase in high quality waters and require effluent limits based on best

practicable treatment or control (BPTC). The Water Agencies claim the tentative order would increase Suisun Bay ammonia concentrations because its limits are higher than the maximum observed effluent concentration. They also claim it would allow a 48 percent increase over existing discharge flows, thus increasing ammonia loads.

The Water Agencies warn against relying on prior California Environmental Quality Act (CEQA) documentation to comply with antidegradation policies. They call for revising the antidegradation analysis and recirculating the tentative order for public comment.

Response to Water Agencies Comment III.B

We disagree. The tentative order complies with anti-backsliding and antidegradation requirements. Anti-backsliding requirements relate to changing effluent limits from one permit to the next. Reissued permits may not contain less stringent effluent limits than those in the permits they replace, except under specific circumstances. Because the previous permit did not contain ammonia effluent limits, this tentative order could not possibly contain less stringent ammonia effluent limits. Therefore, it complies with anti-backsliding requirements.

Antidegradation requirements relate to changes in receiving water quality. Water Board actions, such as issuing permits, cannot result in water quality degradation, except under specific circumstances. The baseline water quality condition for comparison purposes is the water quality that reflects all past regulatory and permitting actions approved in accordance with antidegradation policies. In this case, the ammonia baseline is the condition that reflects the previous permit, which the Water Board issued in accordance with antidegradation policies.

When compared to the previous permit, the tentative order could not possibly degrade Suisun Bay water quality with respect to ammonia. Contrary to the Water Agencies' claim, the tentative order does not authorize any increase in effluent flow or ammonia concentrations beyond those the previous permit allowed. The Water Agencies incorrectly compare the permitted flow to the actual existing flow. The permitted flow in the tentative order is the same as it was in the previous permit. The Water Agencies also incorrectly compare the proposed ammonia limits to actual effluent concentrations. The previous permit contained no ammonia effluent limit. Therefore, by imposing an ammonia limit for the first time, the tentative order is more stringent than the previous permit and could only improve water quality, not degrade it. No CEQA document is necessary to support this conclusion. For these reasons, no findings justifying degradation are necessary and there is no need to recirculate the tentative order for further comment.

The Vallejo Sanitation and Flood Control District proposes to begin discharging most of its effluent to its Mare Island Strait outfall (Discharge Point 002) instead of its Carquinez Strait outfall (Discharge Point 001) sometime during the term of this permit (if adopted). This would further reduce the likelihood of ammonium impacts to Suisun Bay because the Mare Island Strait outfall is farther away.

Antidegradation policy set forth in State Water Board Resolution 68-16 requires that effluent limits be based on best practicable treatment or control (BPTC) to ensure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of California will be maintained. U.S. EPA specifies technology-based limitations for municipal wastewater treatment plants. These "secondary treatment standards" do not require ammonia

removal, and other municipal treatment plants in our region that discharge into deep water do not routinely treat to a higher standard.

Water Agencies Comment IV.A

The Water Board should reduce ammonium discharges by requiring nitrification. *The Water Agencies ask the Water Board to set final effluent limits that require nitrification (and possibly denitrification) and provide a compliance schedule for designing and building the additional treatment. They call for interim limits based on the maximum observed ammonia discharge concentration. The Water Agencies assert that, because other municipal wastewater treatment plants provide nitrification, feasible technologies are practicable and must be required as BPTC pursuant to antidegradation policies.*

Response to Water Agencies Comment IV.A

We disagree. Although we may require some plants to provide nitrification (and possibly denitrification) in the future, requiring such treatment would be a big step and should be undertaken only after gaining a better understanding of the water quality benefits. Nitrification is also costly and consumes substantial energy, resulting in significant air emissions and other environmental impacts. While we agree that there are good reasons to be concerned about Suisun Bay ammonium concentrations, we do not believe available information is yet sufficient to require nitrification of this discharge (see response to Water Agencies Comment II).

As discussed in our response to Water Agencies Comment III.B, we do not believe antidegradation policies necessarily require nitrification as BPTC at all municipal wastewater treatment plants. U.S. EPA's technology-based limitations for municipal wastewater treatment plants do not require ammonia removal.

Water Agencies Comment IV.B

The Water Board should defer permit reissuance until pending studies are completed. *The Water Agencies suggest, as an alternative to requiring nitrification now, delaying permit reissuance until pending studies are completed and ammonia effluent limits may be established with more certainty.*

Response to Water Agencies Comment IV.B

We disagree. NPDES permits are to be reissued every five years. The existing permit expired on September 30, 2011. Postponing adoption is unnecessary because the five-year permit term ensures that the entire permit will be reconsidered within about five years.

Water Agencies Comment IV.C

The Water Board should more effectively address ammonium. *The Water Agencies' offer a third suggestion for reducing ammonium discharges if the Water Board decides to reissue the permit on time and is not yet prepared to require nitrification. In this case, the Water Agencies urge the Water Board to adopt findings acknowledging that ammonium could be harming Suisun Bay and describing studies underway to address these concerns. They ask the Water Board to establish a schedule for completing the studies and to ensure the funding necessary to complete them. They also ask the Water Board to commit to reconsidering the ammonia issue within 12 months and provide opportunities for public participation. Finally, they ask the Water Board to impose effluent limits based on actual treatment performance.*

Response to Water Agencies Comment IV.C
We disagree. Nevertheless, we revised the tentative order (Fact Sheet section IV.C.4.c.(3), Ammonia) to include findings related to ammonium. See our responses to comments II, III.A, and IV.A.

Staff-Initiated Revisions

Revision 1.
In addition to making minor editorial and formatting edits, we revised Fact Sheet section II.D.1, Compliance with Numeric Effluent Limitations, as follows to better describe the District's compliance over the term of the previous Order.

> **1, Compliance with Numeric Effluent Limitations.**
>
> ⋮
>
> The Discharger started accelerated monitoring consisting of weekly acute toxicity bioassays after the initial bioassay failure, continuing through February 5, 2007, before returning to routine monthly bioassays. The Discharger also contracted Pacific Ecorisk laboratory to do a Toxicity Identification Evaluation (TIE) after the December 18, 2006, bioassay. The TIE ended when bioassay results returned to normal, and the Discharger submitted a final report on March 20, 2007. The TIE concluded that the toxicity was mainly due to ammonia, although another toxicant may have been present. Ammonia levels were higher than normal over this period, but still within permit limitations. CBOD and TSS levels were also ~~Higher~~higher than normal, but still within permit limitations, and~~CBOD and TSS levels over this period~~ may also have contributed. The Discharger's analyses for priority and CTR pollutants found nothing unusual. The Discharger reported no impacts to the receiving waters as a result of the increased ammonia, CBOD, and TSS levels.
>
> In its final report, the Discharger attributed the higher than normal ammonia, CBOD, and TSS levels to modifications made to the biotowers from May to August 2006. The biotower modifications included new top layers of biotower media, new distribution arms, and domed covers. After the modifications were completed, the biotowers took several months to redevelop a microorganism population adequate for normal CBOD, TSS, and ammonia removal. The report indicated that CBOD and TSS levels decreased at the end of December 2006, while ammonia levels decreased in January 2007, consistent with bioassay results returning to compliance.

~~The State Water Board took enforcement action to address the acute toxicity effluent violations on July 24, 2008, through a Notice of Violation (Order No. SWB-2008-2-0034).~~ The acute toxicity effluent violations are not subject to mandatory minimum penalties because the previous Order included pollutant-specific water quality-based effluent limitations for toxic pollutants. No further enforcement action was taken because the Discharger's response to the acute toxicity episode was appropriate and timely.