

DILUTION ALTERNATIVE NO. 2

SACRAMENTO COUNTY SANITATION DISTRICT SACRAMENTO REGIONAL WASTEWATER TREATMENT PLANT SACRAMENTO COUNTY

Proposed Waste Discharge Requirements Renewal and Time Schedule Order (NPDES No. CA0077682)

Regional Water Quality Control Board, Central Valley Region Board Meeting – 9 December 2010 ITEM # 6

State and Federal regulations allow consideration of dilution in establishing effluent limits. If dilution is allowed, the discharge does not have to meet water quality standards at the point of discharge, but water quality standards must be met in the river after some mixing of effluent and river water has occurred. The part of the river where mixing occurs and water quality objectives are not met is termed the “mixing zone”. Within the mixing zone water quality standards are not met, so there could be an impact to organisms if the organisms stayed in the mixing zone long enough. Effluent limitations and the size and shape of the mixing zone are set to prevent impacts on aquatic life and other beneficial uses. There are several criteria that must be met before a mixing zone can be granted, as described in the Fact Sheet. SRCSD has conducted extensive studies of dilution available in the Sacramento River and the size and shape of the possible mixing zones. Central Valley Water Board staff believe the alternative mixing zones being considered in this permit renewal meet the required technical criteria, however, granting of mixing zones is discretionary and need not be granted even if all technical criteria are met.

DILUTION ALTERNATIVE No. 2

DILUTION GRANTED FOR HUMAN HEALTH CRITERIA ONLY NO DILUTION FOR AQUATIC LIFE CRITERIA

Due to concerns with the health of the Delta ecosystem (e.g., the pelagic organism decline) it may be appropriate to not allow dilution for aquatic life criteria. In this alternative, dilution is only granted for human carcinogen criteria. There are a number of chemicals in the effluent that are considered to be human carcinogens, including chemicals that are formed during the chlorine disinfection process. Water quality criteria for these chemicals protect against a one-in-one-million risk of developing cancer if a person consumes two liters of water per year containing that concentration of the chemical for 70 years. Not granting this dilution would require the SRCSD to change from chlorine disinfection to another non-chlorine disinfection technology – probably disinfection with Ultraviolet light (UV), which may also require installation of tertiary filtration to ensure the effluent turbidity is low enough to allow the UV disinfection process to work properly. The proposed mixing zone for human carcinogens is approximately three miles long, but there are no drinking water intakes within the mixing zone, so there are no expected human health impacts from granting this dilution. Under this alternative, no dilution is allowed for chemicals that could impact aquatic life.

This permit alternative results in the following changes to the NPDES Permit and Time Schedule Order:

1. NPDES Permit. Modify Table 6 of the Limitations and Discharge Requirements as shown in underline/strikeout format below:

Table 6. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
pH	standard units	--	--	--	6.5 <u>0</u>	8.0
Priority Pollutants						
Cyanide	µg/L	-- <u>4.3</u>	--	14 <u>8.3</u>	--	--

2. NPDES Permit. Modify section VI.C.2.a.iii of the Limitations and Discharge Requirements as shown in underline/strikeout format below:

iii. Numeric Toxicity Monitoring Trigger. The numeric toxicity monitoring trigger to initiate a TRE is ~~8~~ 1 TU_C (where TU_C = 100/NOEC). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE when the effluent exhibits toxicity.

3. NPDES Permit. Modify section IV.C.2.d.iv of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

iv. Evaluation of Available Dilution for Chronic Aquatic Life Criteria. The chronic aquatic life mixing zone is sized to protect the water body as a whole and is generally larger than the acute mixing zone. The SRCSD has requested a chronic mixing zone for compliance with chronic aquatic life water quality criteria for ammonia, copper, cyanide, and chlorpyrifos. A mixing zone for chronic aquatic life criteria has been allowed in this Order for development of the WQBELs for cyanide.

The requested chronic aquatic life mixing zone is 400 feet wide and extends 350 feet downstream of the diffuser. The proposed chronic mixing zone meets the requirements of the SIP as follows:

(1) Shall not compromise the integrity of the entire waterbody - The TSD states that, "If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a waterbody (such as a river segment), then mixing zones are likely to have little effect on the integrity of the waterbody as a whole, provided that the mixing zone does not impinge on unique or critical habitats."¹ The Sacramento River is approximately 600 feet wide at the surface. The chronic mixing zone is approximately 400 ft x 350 ft. The Sacramento River is a very large

¹ TSD, pg. 33

waterbody. Except as noted for ammonia in subsection vi., below, the chronic mixing zone would not compromise the integrity of the entire waterbody.

(2) *Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone* – The chronic mixing zone does not allow acute aquatic life criteria to be exceeded and this Order requires acute bioassays to be conducted using 100% effluent. Compliance with these requirements ensures that acutely toxic conditions to aquatic life passing through the chronic mixing zone do not occur.

(3) *Shall not restrict the passage of aquatic life* – The SRCSD developed a dynamic model to evaluate the near-field effects of the discharge. The dynamic model was used to evaluate the zone of passage around the mixing zone where water quality objectives are met. The dynamic model indicates there is a zone of passage for aquatic life, which was verified through dye testing. The size of the zone of passage varies on either side of the river depending on the river geometry². The surface of the river is approximately 600 feet across and the bottom of the river is approximately 400 feet across. Based on the model the zone of passage at the surface of the river is generally at least 100 feet on both sides of the river, while the zone of passage at the bottom of the river is greater than 40 feet from both sides of the river.

(4) *Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws* – The chronic mixing zone will not cause acutely toxic conditions, allows adequate zones of passage, and, except as noted for ammonia in subsection vi., below, is sized appropriately to ensure that there will be no adverse impacts to biologically sensitive or critical habitats.

(5) *Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; cause nuisance* – The current discharge has not been shown to result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance. This Order requires the discharge meets Title 22 (or equivalent) tertiary filtration, which will ensure continued compliance with these mixing zone requirements. There is concern that the high ammonia concentrations in the discharge create undesirable or nuisance aquatic life (see subsection vi. for ammonia, below), therefore, a chronic mixing zone for ammonia is not allowed. With these requirements the chronic mixing zone will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.

2 Model Verification Results for FLOWMOD Simulations of SRCSD Effluent Discharge to the Sacramento River at Freeport, November 2007 Field Study, Flow Science

(6) *Shall not dominate the receiving water body or overlap a mixing zone from different outfalls* – The chronic mixing zone is small relative to the water body, so it will not dominate the water body. Furthermore, the mixing zone does not overlap mixing zones from other outfalls. There are no outfalls or mixing zones in the vicinity of the discharge.

(7) *Shall not be allowed at or near any drinking water intake* – The chronic mixing zone is not near a drinking water intake. The nearest downstream drinking water intake is the Barker Slough Pumping Plant, which is approximately 40 miles downstream of the discharge.

~~Although the chronic aquatic life mixing zone therefore complies with the SIP and. The mixing zone also complies with the Basin Plan, which requires that the mixing zone not adversely impact beneficial uses, due to concerns with aquatic toxicity in the Delta, the Central Valley Water Board has denied the allowance of a chronic aquatic life mixing zone in this Order. Section 1.4.2 of the SIP states, in part, "...The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis." In this case, the Delta is impaired for unknown toxicity and has experienced a significant pelagic organism decline. Therefore, the Central Valley Water Board finds that the allowance of a chronic aquatic life mixing zone is not acceptable for this discharge. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Central Valley Water Board considered the procedures and guidelines in the EPA's Water Quality Standards Handbook, 2d Edition (updated July 2007), Section 5.1, and Section 2.2.2 of the Technical Support Document for Water Quality-based Toxics Control (TSD). The SIP incorporates the same guidelines.~~

4. NPDES Permit. Modify section IV.C.2.d.vi of the Fact Sheet (Attachment F) as shown in underline/strikeout format below for cyanide:

Cyanide – Table F-12, below, shows the WQBELs for cyanide calculated using SRCSD's dynamic model with the allowance of acute and chronic aquatic life dilution, WQBELs calculated using SRCSD's dynamic model with the allowance of only chronic aquatic life dilution, end-of-pipe effluent limitations using a reasonable worst-case steady-state approach, and the Facility's performance. This information demonstrates the Facility cannot meet end-of-pipe effluent limits, but can meet WQBELs calculated with the allowance of chronic aquatic life dilution. Acute aquatic life dilution is not needed for cyanide. Assimilative capacity is available for cyanide in the receiving water, and, as discussed above, the If a chronic aquatic life mixing zone is authorized meets the requirements of the SIP and Basin Plan. Therefore, the WQBELs for cyanide ~~have been~~ could be developed considering the allowance of chronic aquatic life dilution.

5. NPDES Permit. Modify section IV.C.3.d.ii.(c) of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

(c) Dilution Considerations. As discussed in Section IV.C.2.d of the Fact Sheet, an allowance for acute and chronic aquatic life dilution may have not been granted. Therefore, WQBELs for ammonia have been calculated without the allowance for dilution. However, In addition, based on the considerations below and discussed in more detail in Attachment J, support the finding of no dilution has been allowed for ammonia. The Central Valley Water Board determines that Discharger must fully nitrify and denitrify its wastewater to reduce ammonia and nitrogen for the following reasons:

6. NPDES Permit. Modify section IV.C.3.d.xiv.(c) and (d) of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

(c) WQBELs. As discussed in Section IV.C.3.d.vi of the Fact Sheet, dilution has not been granted in this Order for acute and chronic aquatic life criteria. Therefore, based on Facility performance acute aquatic life dilution is not needed and has not been allowed for cyanide. However, chronic aquatic life dilution may be allowed for cyanide. Based on results of the Discharger's dynamic model for compliance with the CTR criteria for cyanide at the edge of the chronic aquatic life mixing zone, MDEL of 22 µg/L, and an AMEL of 11 µg/L is calculated. The Central Valley Water Board finds that granting of this dilution credit could allocate an unnecessarily large portion of the receiving water's assimilation capacity of cyanide and could violate the Antidegradation Policy. For this reason, a performance-based effluent limitation is calculated (See Table F-20. Performance-based Effluent Limitations Statistics). This Order contains a maximum daily effluent limitation (MDEL) for cyanide of 8.344 µg/L and an average monthly effluent limitation (AMEL) of 4.3 µg/L.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 10 µg/L is less than exceeds the MDEL. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for cyanide are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, a compliance time schedule for compliance with the cyanide effluent limitations is established in TSO No. R5-2010-XXXX in accordance with CWC section 13300 that requires preparation and implementation of a pollution prevention plan in compliance with CWC section 13263.3. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

7. NPDES Permit. Modify Table F-16 of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

**Summary of Final Effluent Limitations
 Discharge Point No. EFF- 001**

Table F-16. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
pH	standard units	--	--	--	6.9 <u>5</u>	8.0
Priority Pollutants						
Cyanide	µg/L	-- <u>4.3</u>	--	14 <u>8.3</u>	--	--

8. NPDES Permit. Modify section IV.D.3 of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

3. Satisfaction of Anti-Backsliding Requirements

The effluent limitations in this Order are at least as stringent as the effluent limitations in the existing Order, with the exception of effluent limitations for chloroform, lindane, silver, lead, and zinc ~~and cyanide~~. The effluent limitations for these pollutants are less stringent than those in Order No. 5-00-188. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

Order No. 5-00-188 included effluent limitations for chloroform, lindane, silver, lead, and zinc ~~and cyanide~~. Based on monitoring data collected from June 2005 – July 2008, the discharge does not indicate reasonable potential to exceed water quality objectives for chloroform, lindane, silver, lead and zinc. Therefore, effluent limitations for these parameters were not included in this Order. The lack of effluent limitations in this Order does not constitute backsliding.

~~Order No. 5-00-188 established effluent limitations for cyanide of 10.8 µg/L as a daily average with a trigger of 6.1 µg/L. The cyanide limitation of 10.8 µg/L was based on the MEC of 9.0 µg/L times a safety factor of 1.2 (which was proposed by the Discharger and accepted by the Central Valley Water Board). A trigger concentration exceedance results in an investigation and Central Valley Water Board notification with the Central Valley Water Board may require an action plan to address the cause of the exceedance. The Central Valley Water Board found that the trigger concentration would be protective and appropriate if established as the 95th percentile value assuming that historical data follows a lognormal probability distribution which was 6.1 mg/L. The Discharger performed a dynamic model for cyanide which resulted in a chronic LTA of 13.9 mg/L. The calculated limit is 11.0 mg/L as an AMEL with a MDEL of 22.0 mg/L. As discussed in Section IV.C.2.d, the dynamic model represents a more accurate picture of the mixing zone concentrations. This Order relaxes the effluent limitation for cyanide from Order No.~~

~~5-00-188. The dynamic model data submitted by the Discharger is considered new information by the Central Valley Water Board.~~

Order No. 5-00-188 established effluent limitations for oil and grease. As discussed further in section IV.C.3, monitoring data over the term of Order No. 5-00-188 indicated that the discharge no longer exhibits reasonable potential to exceed water quality objectives for oil and grease. Therefore, the effluent limitation is not retained in this Order. The monitoring data submitted by the Discharger is considered new information by the Central Valley Water Board.

~~The revision of the cyanide limitation and the removal of effluent limitations for oil and grease, chloroform, lindane, silver, lead and zinc are consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Any impact on existing water quality will be insignificant.~~

9. NPDES Permit. Modify section VII.B.2.a of the Fact Sheet (Attachment F) as shown in underline/strikeout format below:

Monitoring Trigger. As discussed in Section IV.C.2.d, above, this Order does not allow a chronic aquatic toxicity mixing zone. ~~The mixing zone extends 350 feet downstream of the outfall. A numeric toxicity monitoring trigger of > 81 TUc (where TUc = 100/NOEC) is applied in the provision. Therefore, a TRE is triggered when the effluent exhibits toxicity at 42.5100% effluent. The numeric monitoring trigger represents the in-stream waste concentration at the edge of the chronic mixing zone. The in-stream waste concentration is the concentration of the effluent in the receiving water after mixing (i.e., inverse of the dilution factor). The Discharger has conducted extensive modeling of the discharge and has estimated the 4-day average dilution at the edge of the chronic mixing zone. Table F-20, below, shows modeling results for the percent effluent 350 feet from the diffuser that was provided by the Discharger as part of its comments on the Tentative Order.~~

Table F-20. ~~Dyntox Model Results for Percent Effluent 350 Feet from the SRWTP Diffuser at 181 mgd~~

Statistic	4-Day Average 350 Feet from Diffuser	
	Percent Effluent	Dilution
<i>Mean</i>	3.93	25.5
<i>Median</i>	3.94	25.4
<i>95%-ile</i>	6.35	15.8
<i>99.91%-ile</i>	7.50	13.3
<i>5%-ile</i>	1.91	52.4

~~Based on the results of the modeling shown in Table F-20, above, the 4-day average effluent concentration at the edge of the chronic mixing zone, with a one-in-three year exceedance (i.e., 99.91 percentile), is 7.5 percent. This~~

~~corresponds to a toxicity trigger of 13.3 TUC. Although the modeling demonstrates a chronic toxicity trigger of 13.3 TUC at the edge of the chronic mixing zone, the toxicity trigger has been set at 8 TUC, which is the toxicity trigger in Order 5-00-188 (previous Order). The Discharger has shown consistent compliance with this trigger and it will require proactive efforts to evaluate effluent toxicity before chronic toxicity is experienced outside the chronic toxicity mixing zone.~~

10. Time Schedule Order. Modify Finding 2 as shown in underline/strikeout format below:

2. WDR Order No. R5-2010-XXXX, contains Final Effluent Limitations IV.A.1, which reads, in part, as follows:
 - a. The Discharger shall maintain compliance with the effluent limitations specified in Table 6:

Table 6. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
<u>Cyanide</u>	<u>µg/L</u>	<u>4.3</u>	--	<u>8.3</u>	--	--
N-nitrosodimethylamine	µg/L	0.00069	--	0.0014	--	--
Dibenzo(a,h)anthracene	µg/L	0.2 <u>0.004</u>	--	0.4 <u>0.01</u>	--	--
<u>pH</u>	<u>su</u>	--	--	--	<u>6.5</u>	<u>8.0</u>

11. Time Schedule Order. Modify Finding 4 as shown in underline/strikeout format below:

3. The effluent limitations at Discharge Point No. 001 specified in Order No. R5-2010-XXXX for cyanide, N-nitrosodimethylamine, and dibenzo(a,h)anthracene are based on implementation of the California Toxics Rule (CTR). The effluent limitations for pH are based on water quality objective for pH contained in the *Water Quality Control Plan, Fourth Edition (Revised September 2009)*, for the Sacramento and San Joaquin River Basins (hereinafter Basin Plan). The effluent limitations for cyanide, pH, N-nitrosodimethylamine, dibenzo(a,h)anthracene, chlorpyrifos and diazinon are new limitations, which were not prescribed in previous WDR Order No. 5-00-188, adopted by the Central Valley Water Board on 4 August 2000.

12. Time Schedule Order. Modify Finding 8 as shown in underline/strikeout format below:

8. In accordance with CWC section 13385(j)(3), the Central Valley Water Board finds that, based upon results of effluent monitoring, the Discharger is not able to consistently comply with the new water quality-based effluent limitation for cyanide, pH, N-nitrosodimethylamine, dibenzo(a,h)anthracene, chlorpyrifos and diazinon.

These limitations are new requirements that become applicable to WDR Order No. R5-2010-XXXX after the effective date of adoption of the waste discharge requirement for which new or modified control measures are necessary in order to comply with the limitations, and the new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days.

13. Time Schedule Order. Modify Finding 9 as shown in underline/strikeout format below:

9. Immediate compliance with the new effluent limitations for cyanide, pH, N-nitrosodimethylamine, dibenzo(a,h)anthracene, chlorpyrifos and diazinon is not possible or practicable. The Clean Water Act and the California Water Code authorize time schedules for achieving compliance.

14. Time Schedule Order. Modify Finding 11 as shown in underline/strikeout format below:

11. By statute, a Time Schedule Order may provide protection from MMPs for no more than five years. Compliance with this Order only exempts the Discharger from mandatory penalties for violations of the final effluent limitations for cyanide, pH, N-nitrosodimethylamine, and dibenzo(a,h)anthracene in accordance with CWC section 13385(j)(3). Protection from MMPs for the final effluent limitations for cyanide, pH, N-nitrosodimethylamine, and dibenzo(a,h)anthracene begins immediately, and may not extend beyond 1 December 2015. Protection from MMPs for the final effluent limitations for chlorpyrifos and diazinon begins immediately, and may not extend beyond 1 December 2015.

15. Time Schedule Order. Modify Finding 12 as shown in underline/strikeout format below:

12. CWC section 13385(j)(3) requires the Discharger to submit and implement its pollution prevention plans for cyanide, pH, N-nitrosodimethylamine, dibenzo(a,h)anthracene, chlorpyrifos and diazinon pursuant to section 13263.3 of the California Water Code.

16. Time Schedule Order. Modify Finding 13 as shown in underline/strikeout format below:

13. Since the time schedule for completion of action necessary to bring the waste discharge into compliance exceeds 1 year, this Order includes an interim requirement and date for achievement. The time schedule does not exceed 5 years.

The compliance time schedule in this Order includes an interim maximum daily effluent limitations for cyanide, N-nitrosodimethylamine, dibenzo(a,h)anthracene, chlorpyrifos. Interim instantaneous minimum effluent limits are included for pH.

In developing the performance-based effluent limitation, where there are 10 sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row). Therefore, the interim limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. However, if the maximum effluent concentration (MEC) exceeds the mean plus 3.3 standard deviation, then the MEC is the used for the interim limitation. When there are less than 10 sampling data points available, the EPA *Technical Support Document for Water Quality-based Toxics Control* ((EPA/505/2-90-001), TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of 10 data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than 10 sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed effluent concentration to obtain the daily maximum interim limitation (TSD, Table 5 2).

Where a dataset includes data reported below the laboratory detection limits (non-detects) the statistics, described above, becomes uncertain. In these situations, the regression on order statistics (ROS) technique was used to develop summary statistics and probability distribution functions. The ROS method was chosen because numerous studies have found that substituting one-half the reporting limit “results in substantial bias unless the proportion of missing data is small, 10 percent or less”³. This technique is often used with water quality data and is a useful tool for evaluating data sets with at least 40% detected data⁴. Furthermore, the ROS method was chosen because imputation methods, such as ROS, depend less on assumptions of distributional shape than the maximum likelihood estimation (MLE) method⁵. The ROS technique develops probability plotting positions for each detected and non-detect data point based on the ordering of all data. A least squares line is fit by regressing the log transformed concentrations to the detected probability plotting positions. Fill-in concentrations are assigned to the non-detect data points for calculation of summary statistics based on the detected data probability plotting positions and the ordered statistics regression line equation. The summary statistics are calculated from the detected data points and the fill-in values for non-detect data. An estimated mean and standard deviation are used to calculate the 99.9th percentile performance-based effluent limitation, as described above. The ROS method was used to calculate in the interim effluent limit for cyanide.

³ Dennis R. Helsel, “More Than Obvious: Better Methods for Interpreting Nondetect Data.” *Environmental Science and Technology* (15 October 2005): 419A

⁴ Robert H. Shumway, Rahman S. Azari, and Masoud Kayhanian, “Statistical Approaches to Estimating Mean Water Quality Concentrations with Detection Limits,” *Environmental Science and Technology* 36, no. 15 (2002): 3345-3353.

⁵ Dennis R. Helsel, “More Than Obvious: Better Methods for Interpreting Nondetect Data.” *Environmental Science and Technology* (15 October 2005): 420A

The data set are based on data collected between 12 June 2005 and 10 October 2009. All the data collected for N-nitrosodimethylamine, dibenzo(a,h)anthracene, and chlorpyrifos had less than 20 percent detection. When at least 80% of the data points are reported as non detected values, interim limitations are based on 3.11 times the maximum observed effluent concentration (MEC) to obtain the daily maximum interim limitation. The interim limitations for pH are set as the existing final instantaneous minimum effluent limitation prescribed in the previous WDR Order No. 5-00-188. The following table summarizes the calculations of the daily maximum interim effluent limitation for these constituents:

Parameter	Units	MEC	Mean (x)	Std. Dev. (sd)	Formula Used	Interim Limitation Maximum Daily
<u>pH</u>	<u>su</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>--</u>	<u>6.0¹</u>
Chlorpyrifos	µg/L	0.039	--	--	3.11*MEC	0.12
N-nitrosodimethylamine	ng/L	0.082	--	--	3.11*MEC	0.26
Dibenzo(a,h)anthracene	µg/L	0.51	--	--	3.11*MEC	1.6
<u>Cyanide</u>	<u>µg/L</u>	<u>10</u>	<u>4.85</u>	<u>1.89</u>	<u>Mean + 3.3*SD²</u>	<u>11</u>

¹ Instantaneous minimum effluent limit.

² Regression on order statistics (ROS) method used.

17. Time Schedule Order. Modify Hereby Ordered #1 as shown in underline/strikeout format below:

- The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations for cyanide, pH, N-nitrosodimethylamine, and dibenzo(a,h)anthracene, chlorpyrifos and diazinon contained in WDR Order No. R5-2010-XXXX as described in the above Findings:

<u>Task</u>	<u>Date Due</u>
Submit Method of Compliance Workplan/Schedule.	Within 6 months of adoption of this Order
Submit and implement an updated, or new as appropriate, Pollution Prevention Plan (PPP) pursuant to CWC section 13263.3.	Within 6 months of adoption of this Order
Annual Progress Reports ¹	1 December, annually, after approval of workplan until final compliance
Full compliance with the final effluent limitations for <u>cyanide, pH,</u> N-nitrosodimethylamine and dibenzo(a,h)anthracene.	1 December 2015
Full compliance with the final effluent limitations for chlorpyrifos and diazinon.	1 December 2015

¹ The progress reports shall detail what steps have been implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final date.

18. Time Schedule Order. Modify Hereby Ordered #2 as shown in underline/strikeout format below:

2. The following interim effluent limitations shall be effective immediately and until the date specified in the table for applicable parameter, or when the Discharger is able to come into compliance, whichever is sooner.

Effective immediately and until:	Parameter	Maximum Daily Effluent Limitation (µg/L)
<u>1 December 2015</u>	<u>Cyanide</u>	<u>11</u>
<u>1 December 2015</u>	<u>pH</u>	<u>6.0¹</u>
1 December 2015	N-nitrosodimethylamine (µg/L)	0.00026
1 December 2015	Dibenzo(a,h)anthracene (µg/L)	1.6
1 December 2015	Chlorpyrifos	0.12
¹ Instantaneous minimum effluent limit.		