

**ALTERNATIVE NO. 1
APPLICABILITY OF ALUMINUM CRITERIA**

**CITY OF AUBURN
WASTEWATER TREATMENT PLANT
PLACER COUNTY
PROPOSED WASTE DISCHARGE REQUIREMENTS AND
PROPOSED CEASE AND DESIST ORDER
NPDES PERMIT No. CA0077712**

At the May 2010 Central Valley Water Board meeting, the Central Valley Water Board continued the item for the Placer County Department of Facility Services, Placer County Sewer Maintenance District 1 Wastewater Treatment Plant (Placer County) allowing Placer County and other interested parties to submit compelling evidence regarding the applicability of the appropriate criteria for the establishment of final aluminum effluent limitations for their discharge. The following tentative alternative is based on the applicability of the USEPA National Ambient Water Quality Criteria (NAWQC), specifically the acute aluminum criteria of 750 µg/L and the Department of Public Health’s Secondary Maximum Contaminant Level of 200 µg/L. This alternative does not apply the NAWQC chronic aluminum criteria of 87 µg/L. Information supporting this tentative alternative includes a 14 June 2010 letter submitted by Placer County. Although the information submitted by Placer County pertains specifically to their discharge, the issue of whether applicability of the chronic criterion should be based on upstream or downstream receiving water conditions is an issue that affects determinations for other discharges to similar types of receiving waters, including the discharge from the City of Auburn’s (Discharger) Wastewater Treatment Plant (Facility).

NPDES Permit

1. *Modify section IV.A.1.a, Table 6 of the Effluent Limitations as follows:*

Table 6. Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
<i>Non-Conventional Pollutants</i>						
Aluminum, Total Recoverable	µg/L	70	--	146	--	--

2. *Add section IV.A.1.k of the Effluent Limitations as follows:*

k. Aluminum, Total Recoverable. For a calendar year, the annual average effluent aluminum concentration shall not exceed 200 µg/L.

3. *Modify the Fact Sheet, Attachment F, section IV.C.2.d.i as follows:*

~~i. **Aluminum.** USEPA developed National Recommended Ambient Water Quality Criteria (NAWQC) for protection of freshwater aquatic~~

~~life for aluminum. The recommended 4-day average (chronic) criterion for aluminum is 87 µg/L for waters with a pH of 6.5 to 9.0. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The chronic criterion of 87 µg/L is based on studies conducted on waters with low pH (6.5 to 6.8 pH units) and hardness (<10 mg/L as CaCO₃). The receiving stream has been measured to have a low hardness—typically between 10 mg/L and 110 mg/L as CaCO₃. This condition is supportive of the applicability of the NAWQC chronic criteria for aluminum, according to USEPA's development document. USEPA advises that a WER may be appropriate to better reflect the actual toxicity of aluminum to aquatic organisms.~~

~~The Discharger submitted a *City of Auburn Wastewater Treatment Plant Technical Memorandum, Aluminum Water-Effects Ratio Study Initial Results (ECO:LOGIC)* dated 12 July 2010. The Discharger's study followed the *Interim Guidance on Determination and Use of Water-Effect Ratios for Metals*, USEPA, February 1994. Following the guidance, a sampling event was conducted on 15/16 June 2010 to assess ambient conditions and to calculate a freshwater aluminum WER using the primary test species, *Ceriodaphnia dubia*. Results of the toxicity testing showed 100 percent survival at the highest spiked aluminum concentration of 5,000 µg/L. Based on the results of the initial study, the Discharger concluded that a WER for aluminum of >19.3, based on effluent data to represent low flow, zero-dilution discharge conditions, is applicable to the discharge to Auburn Ravine. Application of a WER of 19.3 to the chronic criterion of 87 µg/L results in a chronic criterion 1,679 µg/L.~~

~~USEPA guidance recommends a minimum of three sampling events and confirmation testing using a secondary species. Although the initial testing indicates that application of a WER resulting in a chronic criterion less than the applicable Secondary MCL or acute criterion is unlikely, a complete study with a minimum of three sampling events and confirmation testing using a secondary species is necessary to adjust the chronic criterion. Application of a WER greater than 1 would result in less stringent effluent limitations for aluminum than those contained in the existing Order. Therefore, documentation of consistency with State and federal antidegradation and anti-backsliding policies must be provided in addition to a complete WER study. A reopener has been included in section VI.C.1.e of this Order to modify effluent limitations for aluminum based on submission of a complete WER study and satisfaction of State and federal antidegradation and anti-backsliding policies.~~

4. *Modify the Fact Sheet, Attachment F, section IV.C.3.d.i as follows:*

i. Aluminum

(a) WQO. USEPA developed National Recommended Ambient Water Quality Criteria (NAWQC) for protection of freshwater aquatic life for aluminum. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The most stringent of these criteria, the chronic criterion of 87 µg/L, is based on studies conducted on waters with low pH (6.5 to 6.8 pH units) and hardness (<10 mg/L as CaCO₃). The upstream receiving water pH ranged from 6.3 to 7.4. The upstream receiving stream has been measured to have a low hardness—typically between 10 mg/L and 110 mg/L as CaCO₃. This condition is supportive of the applicability of the NAWQC chronic criteria for aluminum, according to USEPA's development document. The minimum observed effluent hardness was 70 mg/L. The high hardness of the effluent is due to the addition of lime to the secondary treatment process via a new automatic feed system to enhance denitrification. The effluent hardness increases the downstream hardness, therefore the downstream receiving water hardness is supportive of the non-applicability of the NAWQC chronic criterion for aluminum.

In the absence of the chronic criterion for aluminum, the most stringent water quality criterion applicable to the discharge is the Secondary MCL of 200 µg/L.

(b) RPA Results. The maximum annual average receiving water and effluent concentrations were used to evaluate reasonable potential to exceed the Secondary MCL based on input from DPH and the fact that MCLs are designed to protect human health over long exposure periods. The MEC for aluminum was 720 µg/L. The maximum annual average effluent concentration was 232 µg/L, which was observed during the 2008 calendar year. Background receiving water monitoring for aluminum is not available. Therefore, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective chemical constituents objective for the protection of the MUN beneficial use.

(c) WQBELs. This Order contains a final annual average effluent limitation AMEL and maximum daily effluent limitation (MDEL) for

aluminum as shown in Table F-9 of this Fact Sheet based on protection of the Basin Plan's narrative ~~toxicity objective~~ chemical constituents objective for the protection of the MUN beneficial use.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 720 µg/L and the maximum observed annual average effluent concentration of 232 µg/L are ~~greater than the applicable WQBELs annual average effluent limitation.~~ CDO No. R5-2008-0010 provides a compliance schedule to achieve compliance with the final effluent limitations for aluminum by 16 March 2011. Consistent with CDO No. R5-2008-0010, a compliance time schedule for compliance with the aluminum effluent limitations is established in CDO No. R5-2010-XXXX, with compliance with final effluent limitations required by 16 March 2011, in accordance with CWC section 13300, that requires preparation and implementation of a pollution prevention plan in compliance with CWC section 13263.3.

5. *Modify the Fact Sheet, Attachment F, section IV.D, Table F-9 as follows:*

D. Final Effluent Limitations

Table F-9. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
<i>Non-Conventional Pollutants</i>							
Aluminum, Total Recoverable	µg/L	70 <u>200</u> ¹⁰	--	146 <u>--</u>	--	--	NAWQC <u>SEC</u> <u>MCL</u>

¹⁰ Applied as an annual average effluent limitation.

6. *Modify the Fact Sheet, Attachment F, section IV.D.2 as follows:*

2. Averaging Periods for Effluent Limitations

40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. "First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed." (TSD, pg. 96) This Order utilizes MDELs in lieu of average weekly effluent limitations for

~~aluminum, ammonia, chlorodibromomethane, dichlorobromomethane, and lead~~ as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for BOD₅, TSS, pH, chlorine residual, and total coliform organisms, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in section IV.C.3 of this Fact Sheet.

For effluent limitations for aluminum, this Order includes annual average effluent limitations. Secondary MCLs are drinking water standards contained in Title 22 of the California Code of Regulations. Title 22 requires compliance with these standards on an annual average basis, when sampling at least quarterly. Since it is necessary to determine compliance on an annual average basis, it is impracticable to calculate average weekly and average monthly effluent limitations.

7. *Modify the Fact Sheet, Attachment F, section IV.D.3 as follows:*

3. Satisfaction of Anti-Backsliding Requirements

The CWA specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in CWA sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(l).

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 aluminum, chloroform, copper, methyl tertiary butyl ether, methylene blue active substances, nickel, oil and grease, persistent chlorinated hydrocarbon pesticides (except beta-endosulfan, endrin aldehyde, and heptachlor), settleable solids, silver, and zinc. The effluent limitations for these pollutants have been relaxed or have not been retained from Order No. R5-2005-0030. Based on updated monitoring data and information for aluminum regarding the applicability of the chronic criterion, reasonable potential to cause or contribute to an exceedance of water quality objectives was evaluated using the Secondary MCL which resulted in less stringent effluent limitations. Based on updated monitoring data that was not available at the time Order No. R5-2005-0030 was issued, these remaining parameters do not exhibit reasonable potential to cause or contribute to an exceedance of water quality objectives in the receiving water. Removal Relaxation of the WQBELs in the previous permit is in accordance with CWA sections 303(d)(4) and 402(o), which allow for the removal relaxation of WQBELs for attainment waters where antidegradation requirements are satisfied. Removal of the WQBELs is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Therefore, the modifications to these effluent limitations do not violate anti-backsliding requirements.

8. Modify Attachment G as follows:

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum, Total Recoverable	µg/L	720	NA	87200	750 ¹	87 ² --	--	--	--	200	Yes

9. Modify Attachment H as follows:

ATTACHMENT H – CALCULATION OF WQBELS

Parameter	Units	Most Stringent Criteria			Human Health Calculations ¹			Aquatic Life Calculations ¹										Final Limitations		
		HH	CMC	CCC	ECA _{HH} = AMEL _{HH}	AMEL/MDEL Multiplier _{HH}	MDEL _{HH}	ECA _{acute}	ECA Multiplier _{acute}	LTA _{acute}	ECA _{chronic}	ECA Multiplier _{chronic}	LTA _{chronic}	Lowest LTA	AMEL Multiplier ₉₅	AMEL _{AL}	MDEL Multiplier ₉₉	MDEL _{AL}	AMEL	MDEL
Aluminum, Total Recoverable	µg/L	200	750	87	200	2.08	415	750	0.30	226	87	0.51	44	44	1.60	70	3.32	146	70	146

Cease and Desist Order

1. *Modify Finding 2 as follows:*

2. Order No. R5-2005-0030 included final effluent limitations for ~~aluminum~~, ammonia, nitrate plus nitrite, and nitrite which required, in part:

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
Aluminum ¹	µg/L	74	--	140	--
	lbs/day ²	0.99	--	2.0	--

¹ ~~Acid-soluble or total~~

² ~~Based upon a design treatment capacity of 1.67 mgd [x µg/l X (1 mg/1000 µg) X 8.345 X 1.67 mgd = y lbs/day]~~

³ Based upon a design treatment capacity of 1.67 mgd (x mg/l X 8.345 X 1.67 mgd = y lbs/day)

⁴ The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 1.67 mgd and the unit conversion factor of 8.345 (see footnote 2 for equation).

2. *Modify Finding 5 as follows:*

5. CDO No. R5-2005-0031 included a schedule for achieving compliance with the effluent limitations for ~~aluminum~~, ammonia, nitrate plus nitrite, and nitrite by 1 December 2009.

3. *Modify Finding 6 as follows:*

6. On 25 January 2008, the Central Valley Water Board rescinded CDO No. R5-2005-0031 and adopted CDO No. R5-2008-0010, which retained the 1 December 2009 compliance date for ammonia and extended the time schedules for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrite, and nitrate plus nitrite. The extended compliance schedules allowed additional time for the Discharger to either upgrade its existing facility to meet all effluent limitations or to participate in a regionalization project and decommission its existing treatment facility, thus ceasing its current surface water discharge. CDO No. R5-2008-0010 required the Discharger to submit a formal decision regarding which option the Discharger had selected to achieve compliance with these constituents by 1 June 2008. If the formal decision included onsite improvements, the CDO required compliance with the final effluent limitations in Order No. R5-2005-0030 by 16 March 2011. If the formal decision included regionalization, the CDO required compliance with the final effluent limitations in Order No. R5-2005-0030 by 31 January 2013. The Discharger submitted a letter dated 30 May 2008 to the Central Valley Water Board providing a formal decision to construct improvements to the existing Facility; therefore, compliance with final effluent limitations is required by 16 March 2011.

4. *Modify Finding 7 as follows:*

7. On **<DATE>**, the Central Valley Water Board adopted Order No. R5-2010-XXXX rescinding Order No. R5-2005-0030 and prescribing renewed WDRs for the Facility. Order No. R5 2010-XXXX section IV.A.1.a contains Final Effluent Limitations for Discharge Point No. 001 which read, in part, as follows:

"Table 6. Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Non-Conventional Pollutants						
Aluminum, Total Recoverable	µg/L	70	--	146	--	--

5. *Modify Finding 9 as follows:*

9. The Central Valley Water Board finds that the Discharger is not able to consistently comply with the effluent limitations for ~~aluminum~~, ammonia, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite. The schedules for completing the actions necessary to achieve full compliance exceed the adoption date of this Order. Additional time is necessary to provide the necessary treatment to comply with the requirements of Order No. R5-2010-XXXX. New time schedules are necessary in a CDO for all the constituents listed above. These limitations were new requirements that became applicable to the Order after the effective date of adoption of the WDRs, and after 1 July 2000, for which new or modified control measures are necessary in order to comply with the limitation, and the new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days.

6. *Modify Finding 10 as follows:*

10. Immediate compliance with the effluent limitations for ~~aluminum~~, ammonia, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite is not possible or practicable. The Clean Water Act and the California Water Code authorize time schedules for achieving compliance.

Consistent with CDO No. R5-2008-0010, the Regional Water Board is providing no later than 16 March 2011 for the Discharger to comply with the requirements for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite.

7. *Modify Finding 15 as follows:*

15. Because CDO Nos. R5-2005-0031 and R5-2008-0010 provided the Discharger with five years to comply with effluent limitations for ~~aluminum~~, nitrate plus nitrite,

and nitrite, the exception from mandatory minimum penalties pursuant to CWC section 13385(j)(3) does not apply for these parameters. Pursuant to CWC section 13263.3(d)(1)(D), this Order requires the Discharger to update and implement the existing pollution prevention plans for these parameters.

8. *Modify Finding 17 as follows:*

17. The compliance time schedule in this Order includes interim effluent limitations for ~~aluminum~~, ammonia, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite. In developing the interim limitations for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite, 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 percent 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, 3rd Edition, January 1986). Where actual sampling shows an exceedance of the proposed mean plus 3.3-standard deviation interim limit, the maximum detected concentration has been established as the interim limitation. In developing the interim limitations, when there are less than 10 sampling data points available, the USEPA 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, an interim limitation is based on 3.11 times the maximum observed effluent concentration to obtain the daily maximum interim limitation (TSD, Table 5-2). The following table summarizes the calculations of the interim performance-based effluent limitations for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite:

Interim Effluent Limitation Calculation Summary

Parameter	Units	MEC	Mean	Std. Dev.	# of Samples	Interim Maximum Daily Effluent Limitation
Aluminum, Total Recoverable	µg/L	720	492	424	53	720 ¹

9. *Modify Provision 1 as follows:*

1. The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations in R5-2010-XXXX for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite:

Task

Date Due

- | | |
|--|--|
| i. Update and implement Pollution Prevention Plan ¹ as specified in CWC Section 13263.3 for aluminum , chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite | Within 90 days after adoption of this Order |
| ii. Progress Report ² | 1 December 2010 |
| iii. Full compliance with aluminum , chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite effluent limitations | 16 March 2011 |

¹ The pollution prevention plan shall be updated and implemented for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite, as appropriate, and shall meet the requirements specified in CWC section 13263.3.

² The progress report 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.

10. Modify Provision 3 as follows:

3. The following interim effluent limitations for ~~aluminum~~, chlorodibromomethane, dichlorobromomethane, nitrate plus nitrite, and nitrite shall be effective immediately, and shall remain in effect through **15 March 2011**, or when the Discharger is able to come into compliance with the final effluent limitations, whichever is sooner.

Parameter	Units	Maximum Daily Effluent Limitation
Aluminum, Total Recoverable	µg/L	720