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TO: Jonathan Bishop
Los Angeles River Nitrogen Compounds and Effects TMDL File

FROM: Samuel Unger
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DATE: September 30, 2003

SUBJECT: MEMORANDUM FOR THE REVISION OF THE INTERIM EFFLUENT LIMITS FOR AMMONIA IN THE BASIN PLAN AMENDMENT, RESOLUTION 03-009, LOS ANGELES RIVER NITROGEN COMPOUNDS AND RELATED EFFECTS TOTAL MAXIMUM DAILY LOAD (TMDL)

This memorandum is a supporting document providing the data used in determination of revised interim effluent limits for ammonia in Los Angles River in consideration of the effects of pilot testing at the Los Angeles-Glendale (LAG) and Donald C. Tillman (DCT) Water Reclamation Plan (WRP) in the last five years. Additionally, this memorandum outlines the methods that have been used by the Regional Board and the Larry Walker Association (LWA) representing the City of Los Angeles (the City) in determining the interim effluent limits for ammonia. The work represented herein was performed by the Regional Board staff in Permitting and TMDL sections in corporation with LWA and the City of Los Angeles.

1. SUMMARY

- This re-calculation is based on **the most representative data sets** and **appropriate calculation methods** for determining the interim effluent limits for the DCT and LAG WRPs.

- The ammonia effluent updated data used for the analysis were provided by LA City Regulatory Affairs Division. The data set include two kinds of data, one is the data without pilot plant adjustment and the other is the data with adjustment due to the NDN pilot facilities.

- The methodology employed in the analysis is based on the *Technical Support Document for Water Quality-based Toxics Control* protocol (is called TSD) published by U.S. EPA (EPA/505/2-90-001) in March 1991. In the TSD protocol, EPA recommends that 99th percentile level be used as maximum daily permit limit (MDL) and 95th percentile level be

used as average monthly permit limit (AML**). For AML derivation, the statistical procedure should be employed using as assumed number of samples of at least four for a situation where monitoring frequency is once per month or less.**

- In the calculation, PLIMIT program was used for the data set in 1998 through 2002. PLIMIT program was developed by State Board using the TSD protocol. It was found that if we use the monthly or weekly data set, the MDL results obtained from PLIMIT will be beyond the range of data, which is not appropriate for interim limit.

- Regional Board staff have been working with the discharger and have held two meeting with the LA City on July 25 and September 25, 2003 to discuss the method used for determining interim effluent limits.

- The interim effluent limits are re-calculated by the method described above and are summarized as follows:
  For LA Glendale: AML: 18.8 mg/L; MDL: 24.2 mg/L
  For D.C. Tillman: AML: 20.5 mg/L; MDL: 24.7 mg/L

2. BACKGROUND

The Los Angeles River flows for 55 miles from the Santa Monica Mountains at the western end of the San Fernando Valley to the Pacific Ocean at San Pedro Bay. It drains a watershed with an area of 834 square miles. Many segments of the Los Angeles River and its tributaries contain elevated levels of nutrients that adversely impact the water and contribute to odors, scum, foam, and algae. These impaired segments exceed water quality objectives (WQOs) for ammonia, pH, nutrients (including nitrogen compounds such as nitrite and nitrate), odors, scum/foam, and algae, which appears to be primarily related to ammonia. Impaired segments (i.e. reaches) of the Los Angeles River were included on the 1998 and 2002 California 303(d) list of impaired waterbodies.

Regional Board staff had prepared a staff report containing all the elements of a TMDL described in 40 CFR 130.2 and 130.7 and section 303(d) of the CWA, as well as in USEPA guidance documents (e.g., USEPA, 1991). The Basin Plan Amendment contained an implementation plan to achieve the wasteload allocations necessary to meet water quality objectives. Among the tasks of the Implementation Plan, the plan requires load reductions from major POTWs that discharge to the Los Angeles River. The Cities of Los Angeles and Burbank, owners of the major POTWs that discharge to the Los Angeles River, will achieve the nitrogen source reductions required by the TMDL by construction of nitrification and denitrification facilities to treat effluent from the POTWs before its discharge to the Los Angeles River. The Implementation Plan included interim effluent limits for discharge of effluent from the Donald C. Tillman and Los Angeles Glendale Water Reclamation Plants during the period when the plants are constructing

nitrification and denitrification facilities. The interim effluent limits proposed by Regional Board staff were based on the POTW performance over the previous 4 years.

At a public hearing on July 10, 2003, the Regional Board considered amending the Basin Plan to include a TMDL for nitrogen compounds and their effects in the Los Angeles River. At the hearing, representatives from the City of Los Angeles, owners and operators of the Donald C. Tillman and Los Angeles-Glendale Water Reclamation Plants, requested that the Regional Board consider different interim effluent limits than those provided by Regional Board staff. The discharger proposed a different data set from that used by Regional Board staff as more representative of the anticipated performance of the WRPS during the period of time when the nitrification and denitrification facilities will be constructed.

Resolution No. 03-009 was adopted by the Regional Board on July 10, 2003. The resolution served to set waste load allocations (WLAs) to major POTWs, minor point sources, and MS4s permittees discharging to specified reaches of the Los Angeles River. The Regional Board directed staff to consider alternative interim effluent limits proposed by the dischargers.

3. DISCUSSION

The thirty-day average and daily maximum interim effluent limits for total ammonia as nitrogen in the adopted Resolution 03-009 are based on the 95th and 99th percentiles of effluent performance data reported by dischargers from 1998 to 2001 without consideration of the pilot testing effects on the data set are list in Table 1 below.

Table 1. Interim Effluent Limits for Total Ammonia as Nitrogen (NH_3-N) listed in the Resolution 03-009

POTWs	Daily Maximum Interim Effluent Limits (mg/l)	Monthly Average Interim Effluent Limits (mg/l)
Donald C. Tillman WRP	21.7	21.0
Los Angeles-Glendale WRP	19.4	16.5
Burbank WRP	24.1	22.7

The City has stated that the data set submitted to the Regional Board to be used for developing interim limit included the operation of the City's nitrification/denitrification pilot facilities. Nitrification /denitrification pilot facilities were placed in operation at both plants in year 2000. The City has requested that the interim effluent limits for ammonia should be based on the data adjusted to remove the impact of pilot testing during this period. LWA has submitted a set of percentile distributions for the data with adjustment which took out the effects of pilot testing at the two plants, LAG and DCT using probability analysis. Table 2 provides the summary of probability analysis of effluent NH_3-N for LAG and DCT preformed by LWA.

Table 2: Summary of Probability Analysis of effluent NH_3-N for LAG and DCT WRPs Performed by LWA

POTWs	99% Probability (mg/l)	95% Probability (mg/l)
Donald C. Tillman WRP	25.22	23.04
Los Angeles-Glendale WRP	24.30	21.04

Regional Board staff have been working with the City and LWA for the purpose of evaluating the most representative data set and appropriate calculation methods for determining the interim effluent limits for DCT and LAG WRPs base on the same data set provided by the City with and without pilot plant adjustment due to the NDN pilot facilities. The methodology employed in the analysis is based on the *Technical Support Document for Water Quality-based Toxics Control* protocol (is called TSD) published by U.S. EPA (EPA/505/2-90-001) in March 1991. In the TSD protocol, EPA recommends that 99th percentile level be used as maximum daily permit limit (MDL) and 95th percentile level be used as average monthly permit limit (AML**).** For AML derivation, the statistical procedure should be employed using as assumed number of samples of at least four for a situation where monitoring frequency is once per month or less. In the calculation, PLIMIT program which was developed by State Board using the TSD protocol was used to calculate the interim effluent limits for ammonia. However, the data set in the analysis is a monthly data set. If we use the monthly data set for MDL calculation, the resulting MDL will exceed the maximum data point. Best Professional Judgment indicates this is not appropriate for interim limit. The discharger agreed that the TSD approach used for AML is an appropriate method and the Regional Board staffs agreed that the performance base approach is an appropriate alternative method for MDL interim limit. Thus, the AML was calculated using PLIMIT and the MDL was obtained using performance base statistical approach with 99 percentile level.

The proposed interim effluent limits for ammonia have been thoroughly reviewed and considered by staff and are listed in Table 3. These interim effluent limits will be considered at the Regional Board meeting on December 4, 2003.

Table 3: Proposed Interim Effluent Limits for Ammonia at Donald C. Tillman, Los Angeles-Glendale, and Burbank WRPs

POTWs	Daily Maximum Interim Effluent Limits (mg/l)	Monthly Average Interim Effluent Limits (mg/l)
Donald C. Tillman WRP	24.7	20.5
Los Angeles-Glendale WRP	24.2	18.8
Burbank WRP	24.1	22.7