

# **Regulatory Update**

## **The AMMTOX Model: What it means for Colorado dischargers**

### **Colorado Adoption of National Criteria**

In June of 2005, the Water Quality Control Commission (WQCC) adopted the Environmental Protection Agency (EPA) 1999 Update of Ambient Water Quality Criteria for Ammonia, modifying the current ammonia water quality standards in Colorado. The new ammonia standards will be adopted into each basin within the state during the triennial review process. Future effluent limits will be based on the AMMTOX model for 30-day chronic limits and daily maximum limits.

### **What is the AMMTOX Model?**

The AMMTOX model is a new model developed for determining ammonia permit limits for Colorado dischargers. This new model will replace the Colorado Ammonia Model (CAM) which has been the primary tool in determining permit limits.

One of the changes made to the model is the use of Total Ammonia in determining water quality standards. The CAM model used un-ionized ammonia, which is the most toxic form of ammonia, and was the parameter regulated under Colorado's past water quality standards. The proportion of total ammonia present in un-ionized form in the receiving stream is a function of the combined upstream and effluent ammonia concentration along with the pH and temperature of the effluent and receiving stream. The AMMTOX model takes all of these variables into account.

The model also uses the presence of Salmonids and the Early Life Stages (ELS) of other aquatic species to determine effluent standards. The default for the model is to show Salmonids present in cold water streams and absent in warm water streams. The model also defaults to show ELS during all months in cold water streams, and between September 1 and March 31 for warm water streams.

### **What does this mean for the dischargers?**

Facilities discharging into cold water streams can expect little change in their permits. However, facilities discharging into warm water streams can expect to have their limits reduced significantly.

Facilities that are currently providing nitrification will likely be ok. Most are already discharging ammonia below their current limits or have the capacity built in to their system to do so. Facilities that are not nitrifying will have more to worry about. Lagoon systems in particular will see the worst of this change. Many lagoon systems will need to make the transition to mechanical plants to meet the new requirements.

## **What can you do?**

Start planning now. Begin data collection to protect yourself from conservative default values that are built into the model. Temperature, pH, presence of ELS and Salmonids, and other parameters all go into the AMMTOX model to determine discharge limits. If adequate data is not available, then these default values are used. These values are designed to be conservative, so having real data available will likely be beneficial.

If you have a utility that does not nitrify as a part of its current treatment process take a hard look at options for expansion or retrofitting. The new model is not a guarantee that your current facility will not work, but especially for dischargers to warm water streams, it is a very real possibility.

## **References/Links**

1999 Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update), U.S. Environmental Protection Agency, Office of Water, EPA-823-F-99-024, Washington, D.C. 20460.

CDPHE WQCC Regulation No. 31: The Basic Standards and Methodologies for Surface Water (5CCR 1002-31). A copy of this regulation can be found at CDPHE's website at: [www.cdphe.state.co.us/op/wqcc/WQClassandStandards/Reg31/Reg31.html](http://www.cdphe.state.co.us/op/wqcc/WQClassandStandards/Reg31/Reg31.html) .

Comparison of Current Standards with USEPA Criteria for Ammonia As Shown By Calculation of Effluent Limits for Three Dischargers in the Colorado Front Range

If you would like a copy of the model or have any further questions about the model or this article please contact Jamie Eichenberger at:

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