**The Colorado Nitrogen Removal Program**

The Colorado Department of Health manages the NPDES surface water discharge program. The Colorado Department of Health in 2012 through the Water Quality Control Commission adopted Colorado Regulation 85. Under regulation 85 Colorado adopted a phased approach to establishing numeric nutrient standards throughout Colorado. These regulations set total phosphorus (TP) and total inorganic nitrogen (TIN) permit limits for the largest wastewater dischargers and set phosphorus and nitrogen interim values for both lakes and reservoirs and rivers and streams.

The first phase is implementation of Colorado Department of Health Regulation 85 set interim effluent standards for total inorganic nitrogen (TIN) of 15 mg/L. Regulation 85 established permit limits for new dischargers and existing dischargers however, excluded existing dischargers’ of less than 2 million gallons per day. The permit limits for nitrogen are incorporated into NPDES permits at the next five year renewal and compliance schedules will be used to allow the permittee time to come into compliance with the nitrogen limits.

The second phase of the State’s roll-out of nutrient quality criteria is implementation of Regulation 31. This regulation sets interim annual median in-stream nutrient quality values, and the rule was approved with the presumption that these values would not be established as definitive water quality criteria until 2022 except in very limited cases. The in-stream total nitrogen values for warm water streams are 2.01 mg/l. The low level total nitrogen in stream limit will have an effect on future discharge permits where total nitrogen limits could be less than 3 mg/l or below the current limit of technology.

Presently there are 40 municipal and 6 industrial wastewater treatment plants that have total inorganic nitrogen limits in NPDES permits of 15 mg/l (TIN). Of the facilities with the current 15 mg/ TIN limit there is one large methanol user and a number of intermittent or back up acetic acid users along with several facilities that are using waste products such beer wort and cheese whey. Glycerin is only used a one small facility. Five of the industrial users are classified as food processing facilities or breweries and none are currently using a supplemental carbon source. There is also one digital medical imaging company that currently has an ammonia nitrogen limit that will have a future TIN limit that may require a supplemental carbon source.

Discussion with largest municipal wastewater discharger in Colorado, The Denver Metro Water Reclamation District operation staff indicate that if the future limits under the Regulation 31 for instream nitrogen levels may require each of their two treatment facilities to treat to less than 3 mg/l total nitrogen. In this case each facility would most likely use methanol as the preferred supplemental carbon source for low level denitrification. The two Denver Metro Water Reclamation facilities, the Robert Hite Plant with a design flow of 220 million gallons per day and the Northern Treatment Plant with a design flow of 29 million gallon represent greater that 50% of all wastewater discharged in Colorado. Given the large size of the treatment facilities the quantity of methanol used would be very large or in excess several thousand gallons per day if required under Regulation 31.