

DISINFECTION BY-PRODUCT PRECURSORS AND FORMATION POTENTIALS OF MISSOURI RESERVOIRS

Kristen S. Veum

Dr. John R. Jones, Thesis Supervisor

ABSTRACT

Dissolved organic carbon (DOC) in surface water affects the formation of halogenated disinfection by-products (DBP) in drinking water. Both the quality and quantity of DOC impact DBP formation. Allochthonous DOC is more reactive with chlorine than autochthonous DOC and our goal was to determine the relative influence of allochthonous and autochthonous inputs on the DBP precursor pool in Missouri. Samples were collected from 76 reservoirs spanning a 12 month period from January 2004 through December 2004 and regression models were developed for DBP surrogates. DOC, hydraulic flushing rate and total phosphorus were the best explanatory variables. Additionally, plots of stream discharge coincided well with UV₂₅₄ absorbance peaks. Chlorophyll was only weakly correlated with the DBP surrogates. These results indicate that watershed hydrology controlled the DBP precursor pool in Missouri reservoirs in 2004 and that hydraulic flushing rate may have more predictive value than chlorophyll when modeling DBP formation.