



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION III  
1650 Arch Street  
Philadelphia, Pennsylvania 19103-2029  
5/9/2005

Dr. Richard Eskin, PhD., Director  
Technical & Regulatory Services Administration  
1800 Washington Boulevard  
Baltimore, Maryland 21230

Dear Dr. Eskin:

The United States Environmental Protection Agency (EPA) has reviewed Maryland Department of the Environment's (MDE) *Water Quality Analysis of Eutrophication for the Tidal Bird River, Baltimore County, Maryland*. Bird River was initially listed as impaired by sediments and nutrients on Maryland's 1996 Section 303(d) List. As stated in the aforementioned report, "Maryland's water quality standards presently do not impose a limit on the concentration of nutrients in the water column. Rather, Maryland manages nutrients indirectly by limiting their effects in terms of excess algal growth and dissolved oxygen (DO)."

Nutrients are vital for a waterbody to host a viable biologic assemblage, primary producers use sun light and nutrients to grow and create biomass which is consumed by higher organisms. However, if delivered to a waterbody in excessive concentrations, nutrients create an unstable system causing primary production to explode. Primary producers feed oxygen into the system during daylight hours through photosynthesis. When daylight ceases, these same organisms respire and consume oxygen. In systems with high concentrations of algae the DO concentrations in the evening can plummet to concentrations unable to support a healthy aquatic community. The die-off of these organisms further depletes oxygen. This process is known as eutrophication and the measure of algae and DO levels can determine if a waterbody exhibits these conditions.

MDE collected water quality data from Bird River from November 1999 through August 2000. The DO concentrations in all of the samples collected from Bird River exceeded the water quality criteria for DO of 5.0 milligrams per liter (mg/l). Since DO concentrations are typically collected during daylight hours when primary producers are producing oxygen, relying on DO concentrations alone may not be enough to determine if eutrophication is occurring. A DO saturation rate documents whether the waterbody is holding a DO concentration greater than its capacity. The DO concentrations and water column temperatures were plotted on a DO monogram to determine the DO saturation rate. Waters with DO concentrations above 110 percent are viewed as supersaturated and may suffer from eutrophication. Bird River was not found to exhibit DO at these levels.



Chlorophyll *a* concentrations measure algal growth and were collected from Bird River as well. The chlorophyll *a* concentrations were all below 35 micrograms per liter (ug/l) which is below the state criteria of 50 ug/l. Based upon the information contained in MDE's report, EPA concurs that a TMDL for nutrients on Bird River is not necessary. A sediment TMDL on Bird River would still be required. Please feel free to contact Mr. Thomas Henry at 215-814-5752 or [henry.thomas@epa.gov](mailto:henry.thomas@epa.gov) if you have any questions or comments.

Sincerely,

Signed

Jon Capacasa, Director  
Water Protection Division

