

Executive Summary

Chapter 95; Wastewater Treatment Requirements

Total dissolved solids (TDS) are comprised of inorganic salts, organic matter and other dissolved materials in water. They can be naturally present in water or the result of runoff, mining or industrial or municipal treatment of water. TDS contain minerals and organic molecules that provide benefits such as nutrients, but also may contain contaminants such as toxic metals and organic pollutants.

TDS cause toxicity through increases in salinity, changes in the ionic composition of the water, and toxicity of individual ions. The composition of specific ions determines toxicity of elevated TDS in natural waters. Also, as the hardness increases, TDS toxicity may decrease. The major concern associated with high TDS concentrations relates to direct effects of increased salinity on the health of aquatic organisms.

Water quality analyses performed for the major watersheds of the Commonwealth to date show that many of the rivers and streams of Pennsylvania have a very limited ability to assimilate additional TDS, sulfates and chlorides because of elevated levels from historic practices. This phenomenon was most evident during the fall of 2008, when actual water quality issues related to these parameters emerged in the Monongahela River basin. While river flows reached seasonal lows, the concentrations of TDS and sulfates in the river increased to historic highs, exceeding the water quality standards at all of the 17 Potable Water Supply (PWS) intakes from the border with West Virginia to Pittsburgh. Violations of water quality standards for TDS and sulfate persisted in the river through November and December of 2008.

A study conducted by the Environmental Protection Agency (EPA), the Pennsylvania Department of Environmental Protection (DEP) and the Allegheny County Health Department (ACHD) also identified bromides as a key parameter of concern in these waters. The study concluded that a high percentage of the Disinfection By-Products (DBPs) being formed in the drinking water systems were brominated DBPs, which pose a greater health risk than chlorinated DBPs. As a result, the 17 potable water supply intakes on the Monongahela River are subject to higher levels of the more toxic brominated DBPs, which result in increased risks of bladder cancer to their consumers.

Several studies on the potential impacts to aquatic life from these large TDS discharges were also conducted on major tributaries flowing into the Monongahela River in Greene County, Pennsylvania. It is evident from the results of these studies that increases in salinity have caused a shift in biotic communities.

The Monongahela River watershed is being adversely impacted, with TDS, sulfates and chlorides as the cause. However, the Monongahela is not an anomalous situation. Recent reports on the water quality of the Beaver and Conemaugh Rivers in southwestern Pennsylvania and the West Branch of the Susquehanna River watershed have documented that these rivers are also severely limited in the capacity to assimilate new loads of TDS and sulfates.

DEP is constrained from approving any significant portion of the pending proposals and applications for new sources of discharge high-TDS wastewater that include sulfates and chlorides, and still protect the quality of Pennsylvania's streams.

The existing practice for high TDS wastewaters is the removal of heavy metals, but currently no treatment for TDS, sulfates and chlorides exists, other than dilution. As documented by the rising levels of TDS, dilution can no longer be considered adequate treatment for high TDS wastewaters.

The Department's "Permitting Strategy for High Total Dissolved Solids (TDS) Wastewater Discharges" (April 11, 2009) outlines the foundation and scientific rationale for promulgation of such rules and regulations necessary to address the existing and potential pollution of Pennsylvania's waters from large sources of TDS, sulfates and chlorides. The goal of this permitting strategy is that by January 1, 2011, new sources of High-TDS wastewaters will be prohibited from Pennsylvania's waters. To achieve this goal, the Department proposes to amend Chapter 95 – relating to wastewater treatment requirements – to establish new effluent standards.

The department proposes to add a new subsection to § 95.5, which addresses waters for which water quality criteria are not being achieved, and for which a TMDL has been prepared. The TMDL should be the basis for effluent limits, in lieu of any less stringent technology-based limitations established in this Chapter.

The department is also proposing a new section §95.10 relating to effluent standards for new sources of wastewaters containing high Total Dissolved Solids (TDS) concentrations. Subsection (a) provides a definition of high TDS wastewater. Subsection (b) establishes effluent standards for Total Dissolved Solids (500 mg/L), Total Chlorides (250 mg/L), and Total Sulfates (250 mg/L), and provides for exceptions to these criteria for industries that have established federal criteria for TDS, sulfates and chlorides. Subsection (c) establishes criteria for new sources of wastewaters resulting from fracturing, production, field exploration, drilling or completion of oil and gas wells, and establishes effluent limits for two additional parameters of concern – barium (10 mg/L) and strontium (10 mg/L). Subsection (d) establishes that the effluent limitations in section 95.10 will not apply if an NPDES permit has established more stringent limitations than the limits specified in this section.

These regulatory changes were first prompted by escalating TDS levels in Pennsylvania's rivers. These regulations will apply to industries that generate high TDS wastewater, including, but not necessarily limited to the following: oil and gas drilling, metal mining, meat packing plants, vegetable processing plants, grain milling plants, bakeries, beverage processing facilities, agricultural chemical manufacturing, petroleum refining, leather processing, primary metal industries, fabricated metal products, electric services, refuse systems, scrap and waste material industries.