Background

Mercury is a naturally-occurring metal which is used in many items and processes. Atmospheric mercury deposition in Michigan comes from local, regional, national and global sources that are both anthropogenic and natural in origin. The well-known neurotoxic properties of mercury make it dangerous to both humans and wildlife, especially the young. Mercury has a strong tendency to bioaccumulate, and its accumulation in fish tissue and human exposure through the consumption of fish is the principal public health concern with mercury in the environment.

What is a TMDL?

When a lake or stream does not meet Water Quality Standards (WQS), a study must be completed to determine the amount of a pollutant that can be put in a water body from point sources and nonpoint sources and still meet WQS. Section 303(d) of the Federal Clean Water Act requires states to list the waters that are not attaining WQS and define the amount of pollutant that a water body can receive and still meet WQS. This amount is defined as a total maximum daily load (TMDL). In other words, a TMDL is used as a short hand acronym to describe the process used to determine how much pollutant load a lake or stream can assimilate. This TMDL (otherwise referred to as maximum allowable load or loading capacity) is allocated to point sources that receive a wasteload allocation (WLA), and nonpoint sources that receive a load allocation (LA). A TMDL accounts for seasonal variations in water quality, and includes a margin of safety (MOS) to account for technical uncertainties such as model predictions, and analysis of technical data.

What are Water Quality Standards?

Water Quality Standards are state rules established to protect the surface waters of the state. These rules define the water quality goals for a lake or stream.

What waters are addressed under the TMDL?

This TMDL is unique because it focuses solely on inland waters primarily impaired by *atmospheric deposition* of mercury. It does not address the Great Lakes, connecting waters to the Great Lakes or mercury legacy sites. The Great Lakes and connecting channels will be covered under a separate TMDL. Sediment remediation activities will continue to address mercury legacy site contamination.

What is the numeric TMDL target?

TMDL submittals must include a description of any applicable WQS (in the form of numeric or narrative criteria), and must also identify numeric water quality targets, which are quantitative values used to measure whether or not WQS are being attained. Depending on the designated use being addressed by the TMDL, the criteria used for setting a TMDL target may be based on human health, aquatic life, or wildlife criteria. Designated uses are those water uses that must be achieved and protected using WQS. Where possible, the water quality criterion for the pollutant causing impairment is used as the numeric water quality target for TMDL development. Water quality standards can be in a form that is not directly amenable for use in

TMDL development and may need to be translated into a numeric target value for TMDLs. A fish tissue concentration was chosen as the target for this TMDL, since the consumption of fish by humans and wildlife is the most significant route of exposure. Northern pike were used to determine mercury load reductions, and resulting compliance with the TMDL. The target is a fish tissue mercury concentration of 0.35 mg/kg.

What reductions in mercury are necessary?

An 82% reduction of anthropogenic atmospheric mercury sources is needed from 2001 levels (7.6 kg/day) to meet the allowable mercury load of 2.61 kg/day.

How are the allowable loads allocated?

TMDL Components	Units	Statewide
Target Level and Reduction Factor		
Target Fish Mercury Concentration (Fish Tissue Residue Value)	mg/kg	0.35
Mercury Concentration for Standard Length Northern Pike	mg/kg	1.01
Reduction Factor		65%
Mercury Load for Baseline Year 2001		
Point Source Load (PSL)	kg/day	0.11
Nonpoint Source Load (NPSL) (REMSAD Model)	kg/day	7.49
Total Source Load (TSL)	kg/day	7.6
Final TMDL		
Margin of Safety		Implicit
Wasteload Allocation (WLA)	kg/day	0.016
Load Allocation (LA)	kg/day	2.61
Mercury Load Allocation for In-State and Out-of-State Deposition Sources		
In-State Contribution to LA	kg/day	0.11
Out-of-State Contribution to LA	kg/day	2.5
Necessary Reduction from Anthropogenic Emission Sources		82%

What are the next steps?

Once approved, states are required to implement the TMDL so that water bodies covered by the TMDL will meet water quality standards. The TMDL is implemented through existing programs, such as NPDES permits for point source discharges and nonpoint source control programs, to achieve the necessary pollutant reductions.

Written comments on this TMDL are being accepted until May 8, 2013. Written comments on the draft TMDL may be submitted to Ms. Sylvia Heaton, Department of Environmental Quality, Water Resources Division, P.O. Box 30458, Lansing, Michigan 48909 7958, or via e-mail at heatons@michigan.gov.