Fact Sheet

Willamette River Basin Mercury TMDL

What is a TMDL?

A Total Maximum Daily Load, commonly called a TMDL, is required when a river, lake or stream does not meet state water quality standards and is listed on the Clean Water Act 303(d) list. A TMDL identifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards.

The Willamette River Basin is currently impaired for mercury and is listed on the 303(d) list. The TMDL and accompanying Water Quality Management Plan are plans on how to meet the fish tissue methylmercury standard for the Willamette River Basin. The Oregon Department of Environmental Quality and U.S. Environmental Protection Agency will identify and estimate the sources and loading of mercury in the basin by using Willamette Basin and regional monitoring data and modeling to determine the reduction needed to meet water quality standards over time.

Willamette Basin Mercury TMDL background

In September 2006, EPA approved DEQ's Mercury TMDL for the Willamette Basin. DEQ developed the TMDL to meet the mercury criterion, in place at the time, of 0.3 mg/kg (milligram of methylmercury per kilogram of fish tissue). In October 2011, EPA approved DEQ's methylmercury fish tissue criterion of 0.040 mg/kg, which was based on a more protective fish consumption rate of 175 g/day. Subsequently, Northwest Environmental Advocates filed a lawsuit in 2012, which argued the validity of the 2006 mercury TMDL and EPA's approval of the TMDL. In April 2017, the U.S. District Court issued a ruling requiring EPA to revise the TMDL by April 2019, while allowing the 2006 TMDL to remain in effect until EPA issues or approves the revised TMDL. In 2019, the court approved an extension until November 2019. EPA, with input from DEQ, is leading the technical work associated with modeling the amount of mercury gained and lost by stream systems, as well as modeling the concentration of mercury in the aquatic food web, which will help to identify links between fish exposure to mercury in the environment and mercury concentrations in fish. DEQ is leading the development of the TMDL implementation planning process, which includes convening an advisory committee to help identify ways to reduce mercury pollution and address load (unpermitted sources) and waste load (permitted sources) allocations.

Mercury in the environment

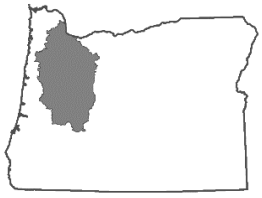
Mercury is a naturally occurring element that persists in the environment through many forms and is found most commonly as elemental mercury or in inorganic mercury compounds. It becomes highly toxic to humans when converted to organic forms or methylmercury through microbial processes in the water column, or in waterbody sediments. The Western United States has a legacy of mercury mining, and using mercury to amalgamate gold and silver. Global coal burning is a source of atmospheric mercury that deposits to land surfaces and washes off to waterbodies. Improperly handling mercury waste exacerbates the natural transport and

State of Oregon Department of Environmental Quality

Water Quality Program
700 NE Multnomah St.,
Suite 600
Portland, OR 97232
Phone: 503-229-5101
800-452-4011
Fax: 503-229-6762
Contact: Paula Calvert

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

U.S. EPA Region 10
1200 6th Ave.
Seattle, WA 98101
Contact: Alan Henning
Phone: 541-687-7360



transformation of mercury, and contributes to the buildup of methylmercury in the environment. Methylmercury becomes more concentrated up the ecological food chain where it can be found in high concentrations in fish tissues. Methylmercury is a neuro-toxin and can cause severe damage to the brain and other organs in adults and children. It is particularly harmful to children and developing fetuses. Human exposure to methylmercury occurs primarily through the consumption of fish and shellfish.

TMDL scope

The TMDL and Water Quality Management Plan will cover the 11,478-square-mile area of the Willamette River Basin. Ultimately, the goal of the revised TMDL is to reduce mercury in the Willamette Basin to levels allowing safe consumption of fish and shellfish and meet water quality standards for the protection of aquatic life.

Technical approach

DEQ and EPA are using a technical approach similar to what was used in the 2006 TMDL. The pathways that mercury moves through in the environment are complex, and it is difficult to fully represent all its transformations in models. However, the revised TMDL will benefit from the inclusion of data collected since development of the 2006 TMDL. The technical approach is divided into three components as described below:

1. Watershed/Mass Balance Model

Connects mercury sources to mercury levels in the river network. A watershed model, which uses the Hydrological Simulation Program - FORTRAN, will simulate movement of mercury via flow and sediment routing.

2. Food Web Model

Identifies links between fish exposure to mercury in the environment and mercury contamination in fish. Environmental mercury experts reviewed the food web model used in the 2006 TMDL for application in the revised TMDL. They found it remains representative of current science.

3. Mercury Translator

Converts measurements of total mercury to dissolved methylmercury. Total mercury is one of the most commonly sampled forms of mercury and this translation allows greater use of total mercury data by providing reasonable estimates of dissolved methylmercury, which is the primary mercury form for fish uptake.

The Willamette River near Keizer, Oregon.

Advisory committee meetings and tribal coordination

The committee was established to provide feedback on the implementation of the Willamette River Mercury TMDL. Committee members are representatives of a range of stakeholders affected by implementation of the TMDL. Although only committee members can provide formal feedback at this time, the meetings are open to the public. Upcoming meeting dates and past meeting minutes can be found online. EPA and DEQ are also coordinating with tribal staffs to share the TMDL development process and receive their input.

TMDL development timeline

December 2017-June 2018:
Advisory committee meetings
June 2018:
Draft TMDL, Water Quality Management Plan
July-August 2019:
Public comment period
September-October 2019:
DEQ response to public comments
November 2019:
DEQ submits revised TMDL to EPA
November 2019:
Submission of EPA-approved TMDL to court

Alternative formats

Documents can be provided upon request in an alternate format for individuals with disabilities or in a language other than English for people with limited English skills. To request a document in another format or language, call DEQ in Portland at 503-229-5696, or toll-free in Oregon at 1-800-452-4011, ext. 5696; or email deqinfo@deq.state.or.us.