

# THE TOTAL MAXIMUM DAILY LOADS PROCESS IN KANSAS

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## Abstract

The Clean Water Act of 1972 required states to establish Total Maximum Daily Loads (TMDLs) for surface water bodies that contain one or more pollutants that exceed water quality standards. A TMDL is a written, measurable assessment of a specific stream segment and its water quality problems and contributing pollutants. This assessment outlines the amount of a pollutant that needs to be reduced to meet water quality standards, allocates control responsibilities among pollution sources in a watershed, and provides a basis for taking actions to restore water quality. A TMDL also includes monitoring programs and plans for public input and response. Kansas will be establishing about 900 TMDLs between 1999 and 2006. For streams, the major issue will be reduction of bacteria levels. For lakes, the major issue will be reduction of pesticide and phosphorus levels. TMDL implementation will be done on a watershed basis. In Kansas, a combination of regulatory and voluntary actions will be used to reach the goals of the TMDL process.

## Introduction

The Clean Water Act of 1972 requires states to set water quality standards. The standards for any given body of water depend on the designated uses (public drinking water, fish and wildlife, recreation, agricultural, industrial, etc.) that apply to that water.

The Act also requires states to identify and set priorities on waters not meeting those standards. These waters include streams, rivers, reservoirs, lakes, ponds (except for private ponds in Kansas), and wetlands. If one or more pollutants are found to exceed the water quality standards for a given body of water, the Clean Water Act requires a state to establish a Total Maximum Daily Load (TMDL) for that body of water. If the state does not set and submit TMDLs to the Environmental Protection Agency (EPA), EPA is directed in the law to set TMDLs for the state. However, until the 1990s, few if any states voluntarily established TMDLs for their impaired waters and EPA did not intervene and set TMDLs. In 1995, the Kansas Natural Resource Council and the Sierra Club sued the Environmental Protection Agency (EPA) for the agency's failure to require Kansas to develop and submit TMDLs. Similar cases have been filed in at least 24 other states. Previous experience in these cases resulted in the federal courts placing the TMDL establishment in the federal court or EPA. Concerned with losing control of water quality standards and TMDL establishment, the state of Kansas intervened and joined the case, agreeing to settle the lawsuit in 1998. The state agreed to establish TMDLs for impaired stream segments. All TMDLs will be set in Kansas by June 2006.

The Kansas Department of Health and Environment (KDHE) has responsibility in Kansas for setting TMDLs and will be establishing about 900 TMDLs between 1999 and 2006. Many of the TMDLs will be in rural settings and will rely on participation of agricultural producers to be successfully implemented. For streams in Kansas, the major issue will be reduction of bacteria levels. For lakes, the major issue will be reduction of pesticide and phosphorus levels. TMDL implementation will be done on a watershed basis.

In simple terms, TMDL is the maximum amount of pollution a water body can receive without violating water quality standards. But in practice, a TMDL is more than that. It is a multi-faceted analysis of the water quality standard (WQS) for a given pollutant in a given body of water and watershed. It establishes desired endpoints for pollution levels.

A TMDL establishes a range of acceptable limits that vary with flow conditions. For example, a TMDL for atrazine may state that the WQS of 3 parts per billion (ppb) can be exceeded in the period of April through September one day every three years at seasonal flood pool levels, and in less than 10 percent of samples during spring flood conditions. A TMDL plan is a written document that takes into account:

1. Recent water quality monitoring data over a period of 2 or more years,
2. Which pollutants are occurring at levels above the Water Quality Standard (WQS) levels in the stream segment or lake,
3. The frequency of WQS violations,
4. The flow conditions existing when the high levels of pollutants were recorded, and
5. The sources of the pollutant within the watershed and how much each source may be contributing to the problem.

### **Implementing a TMDL**

Once the desired endpoints of pollution levels are established, the TMDL document sets into motion several important processes. First, KDHE quantifies how much reduction in the pollutant load is needed in the watershed area to meet the desired water quality endpoints. Second, KDHE divides responsibility for reducing pollution among all possible point and nonpoint sources of the pollutant within the watershed during a specified number of years.

For nonpoint pollution sources, voluntary actions will be set in place to achieve compliance. This will consist of efforts to demonstrate, promote, design, and implement Best Management Practices (BMPs) for water quality improvement. These voluntary efforts will be a partnership between the private sector; Kansas State University Research and Extension; and various state, local, and federal agencies and organizations.

If future water quality monitoring shows that the body of water is no longer impaired, no

additional action is needed to reduce pollution. But if pollution levels are still too high at the end of the time period for voluntary action, KDHE will determine what measures must be taken and by whom to reduce the pollution to acceptable levels. These measures may be mandatory at that time.

### **The Goal of TMDLs**

Monitoring data indicate the historic number of violations of WQS levels. The goal of TMDLs in Kansas will be to reduce the number of those violations. It is the hope of the state that violations will occur in less than 10 percent of the samples, and when violations occur, they are associated with high-flow events. Violations during high flow are indicative of nonpoint source pollution. The key to successful implementation of TMDLs will be setting reasonable goals for pollution reduction, focusing on specific watersheds with highest priority, concentrating on activities that occur near streams, getting voluntary participation among those who contribute to nonpoint source pollution, providing those sources with enough time and money to implement BMPs, and making state programs available for assistance.

### **Water Quality Monitoring in Kansas**

The Kansas Department of Health and Environment monitors the quality of surface waters of Kansas. KDHE prepared lists of impaired surface waters in 1994, 1996, and 1998. The 1998 list includes more than 770 impaired stream segments and 130 impaired lakes within the 12 major river basins, requiring the establishment of TMDLs.

The 1998 list of impaired waters was based on monitoring data from 1996 and 1997. This data is taken from 291 monitoring sites throughout Kansas. Sites are monitored on a bimonthly basis.

### **The TMDL Process**

TMDLs will be established for bodies of water not meeting their designated uses due to violations in water quality standards. If a body of water is impaired by more than one pollutant, a separate TMDL will be established for each pollutant. The TMDL assessment outlines the amount of a pollutant that needs to be reduced to meet WQS levels, allocates control responsibilities among pollution sources in a watershed, and provides a basis for taking actions to restore water quality. The process of developing and implementing TMDLs involves:

1. Identifying the impaired water body, the pollutant(s) causing the impairment, and defining the goal for improved water quality.
2. Determining to what extent the impaired water body can assimilate the pollutants.
3. Estimating the type, location, and magnitude of the sources contributing pollutants to the water body.

4. Estimating the relationship between each source and the pollutant load in the impaired water body.
5. Allocating permissible loads of each pollutant among point, nonpoint, and background sources.
6. Assigning responsibility for reducing pollutants among the various sources.
7. Establishing a margin of safety for each pollutant.
8. Follow-up monitoring of water quality.
9. Establishing a mechanism to ensure that the TMDL process is working effectively so that the water body will meet established water quality standards for all designated uses.

#### **The TMDL Schedule for Kansas**

Kansas was required to submit TMDLs to the EPA for impaired stream segments and lakes in each of the 12 major river basins in Kansas over an eight-year period, ending June 30, 1996. Kansas plans to accelerate this schedule. The first TMDLs were submitted on June 30, 1999 for the Kansas-Lower Republican Basin. The accelerated schedule for TMDLs in Kansas is:

- 1999: Kansas-Lower Republican River Basin (completed June 30, 1999)
- 2000: Lower Arkansas, Upper Arkansas, and Cimarron River Basins
- 2001: Marais des Cygnes and Missouri River Basins
- 2002: Neosho, Verdigris, and Walnut River Basins
- 2003: Smoky Hill-Saline, Solomon, and Upper Republican River Basins

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