

Missouri Department of Natural Resources
Total Maximum Daily Load Information Sheet

Spring Fork Lake

Waterbody Segment at a Glance:

County: Pettis
Nearby Cities: Cole Camp
Area of impairment: 178 acres
Pollutant: Nutrients
Source: Agricultural Nonpoint Source Pollution



State map showing location of watershed

TMDL Priority Ranking: TMDL Approved 2006

Description of the Problem

Beneficial uses of Spring Fork Lake

- Livestock and Wildlife Watering
- Protection of Warm Water Aquatic Life
- Protection of Human Health associated with Fish Consumption
- Boating and Canoeing
- Drinking Water Supply

Use that is impaired

- Drinking Water Supply

Standards that apply

- The impairment of Spring Fork Lake is based on exceedence of the general criteria contained in Missouri's Water Quality Standards, 10 CSR 20-7.031 (3)(A) and (C). These criteria state:
 - Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses.
 - Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses.

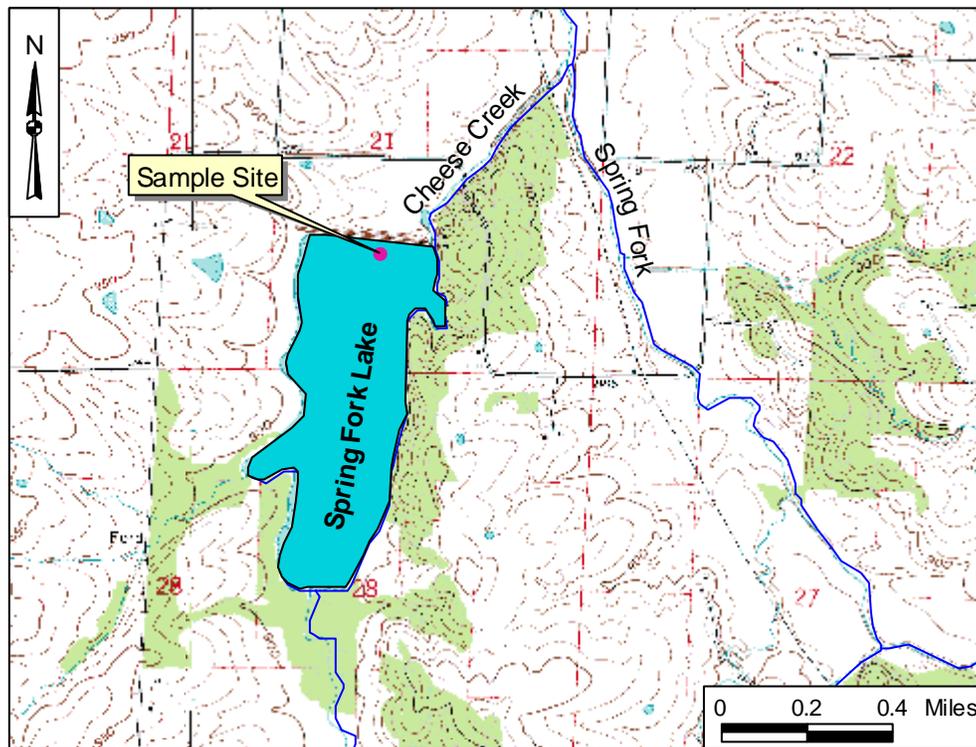
Background information and Water Quality Data

Spring Fork Lake serves as a drinking water source for the City of Sedalia. There have been occasional complaints about taste and odor problems in the city's drinking water supply. Taste and odor problems are usually related to the presence of large amounts of algae (especially when there is a sudden die-off) in a drinking water supply source. Large algal populations are stimulated by excess amounts of nitrogen and phosphorus (nutrients). The watershed of Spring Fork Lake is agricultural in nature, with commercial fertilizer use and animal manure being significant sources of nitrogen and phosphorus.

In 2003, the department started working with Sedalia Public Works on creating a Source Water Protection Plan for Spring Fork Lake. The Sedalia Source Water Protection Committee was formed January 2004 with seven members and support from both the department and U.S. Environmental Protection Agency. This volunteer group looks at what can be done to protect the reservoir. For example, implementation of nutrient management plans on farms in this watershed may be effective in reducing the present problem. Also, since there was only one sampling site and very little data, members of the watershed group requested training to do stream and lake monitoring. The Volunteer Water Quality Monitoring activity under the Missouri Stream Team program and the Missouri Lakes Volunteer Program provided this training to the watershed group.

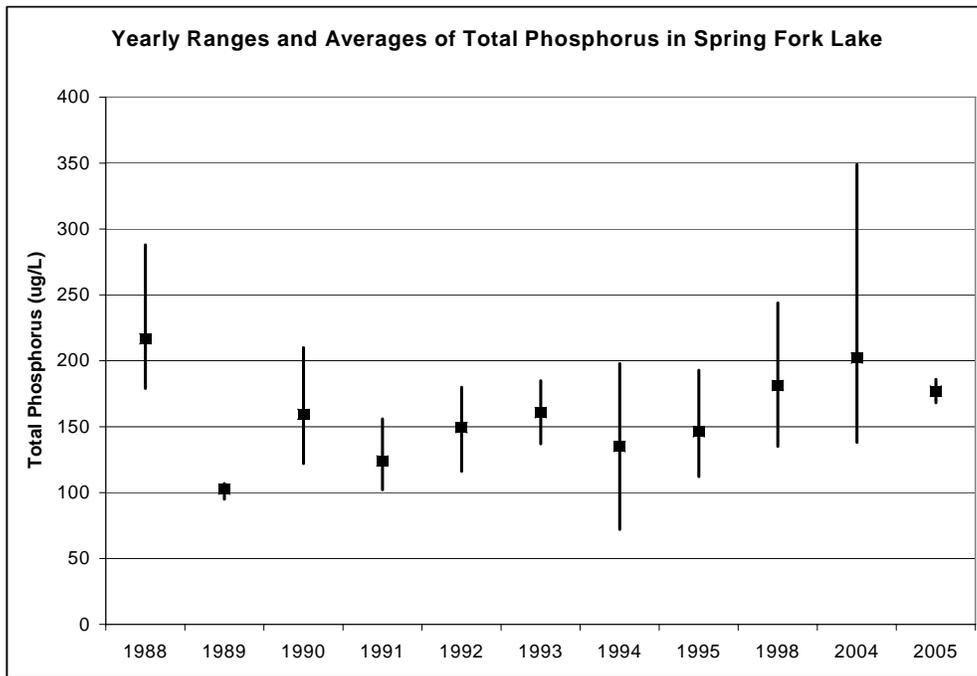
Presently, the average total phosphorus (TP) concentration for Spring Fork Lake during summer months (July – September) is 163 µg/L. The TMDL has determined a numeric endpoint for total phosphorus (TP) of 36 µg/L (micrograms per liter or parts per billion) using the reference lake approach. This requires an 80 percent reduction in TP. The goals of the watershed management plan that the group develops and the best management practices that are being instituted are to help the lake to meet that target. The U.S. Environmental Protection Agency approved this TMDL July 20, 2006. A map of the area and graphs summarizing the data are below.

Spring Fork Lake in Pettis County, Missouri

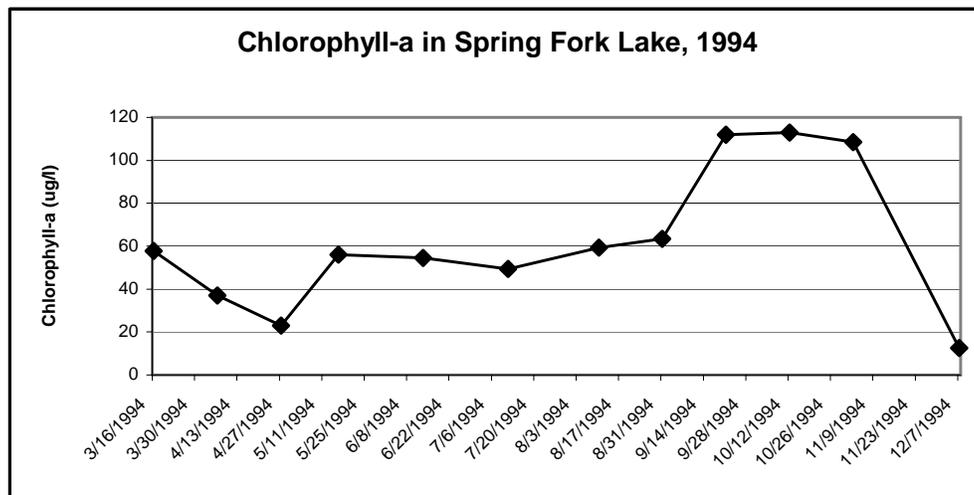


The first graph below shows the phosphorus levels in Spring Fork Lake from 1988 – 2005. While Missouri does not have specific standards for nutrients, 25 µg/L has been suggested for the nutrient phosphorus standard for lakes. Furthermore, 27 µg/L was calculated for the McDaniel Lake TMDL as the concentration of phosphorus that would limit chlorophyll-a (found in the second graph) to 10 µg/L. Chlorophyll-a occurs in all green plants and is used as a measure of the amount of algae. When a certain type of algae, blue-green algae, die, they release the particular compounds that

cause unpleasant taste and odor. Suspended chlorophyll-a has been found to predict the risk of dominance of blue-green algae. This risk increases exponentially in lakes when chlorophyll-a exceeds 10 µg/L.



Source: Dr. Jack Jones, Professor of Limnology, University of Missouri, Columbia



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