

MISSOURI RIVER BASIN TOTAL MAXIMUM DAILY LOAD

Water Body: Antioch Park Lake South
Water Quality Impairment: Chlordane

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasin: *Lower Missouri-Crooked* (where the lake appears on 1998 303(d) Listing)

Basin: Kansas Lower-Republican (actual location of Antioch Park Lake South)

Subbasin: Lower Kansas

County: Johnson

HUC 8: 10270104

HUC 11 (HUC 14): 060 (070)

Drainage Area: 0.27 square miles

Conservation Pool: Area = 2.2 acres

Designated Uses: Expected Aquatic Life Support; Primary Contact Recreation; Secondary Contact Recreation; Food Procurement
Designated uses are for Antioch Park Lake (LM067701)

1998 303(d) Listing: Table 4 - Water Quality Limited Lakes

Impaired Use: Food Procurement on Main Stem Segments

Water Quality Standard: 0.00048 ug/l (KAR 28-16-28e(c)(4)(A))

Surrogate used for Food Procurement WQS of 0.02 mg/kg (Fish Consumption Advisory Level) - Substances that can bioaccumulate in the tissues of edible aquatic or semiaquatic life or wildlife through bioconcentration or biomagnification shall be limited in surface waters to concentrations that result in no harm to human consumers of these tissues. (KAR 28-16-28e(c)(4)(B))

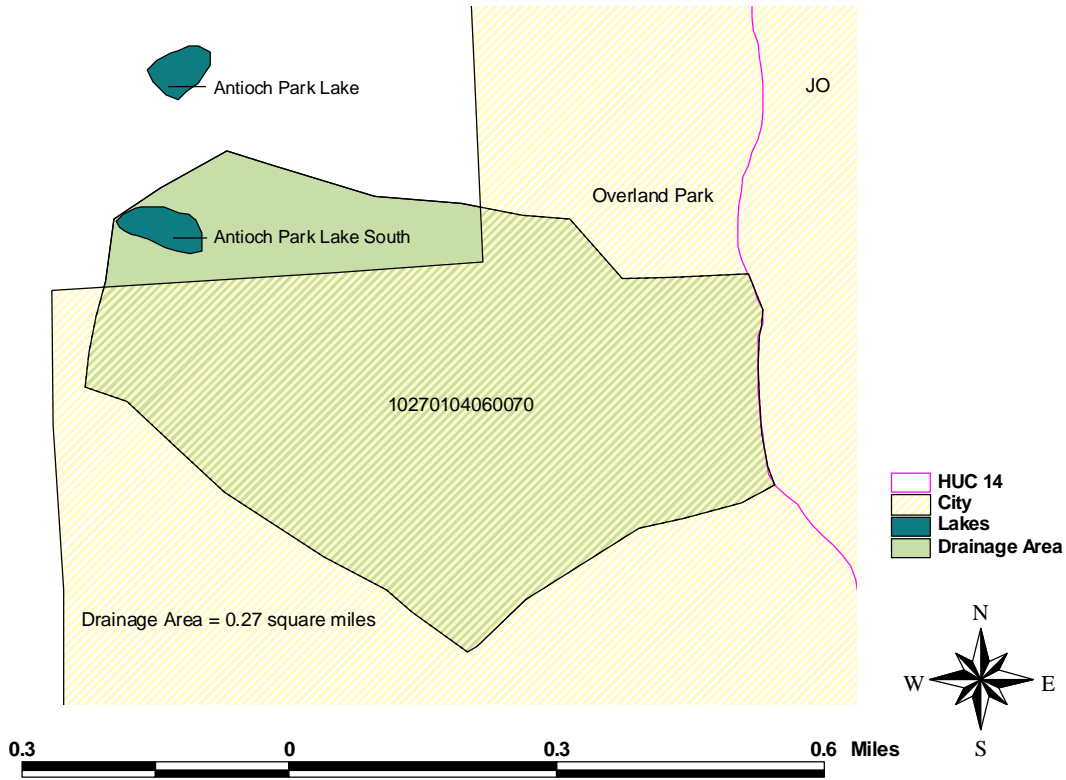
2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Level of Support for Designated Use under 1998 303(d): Not Supporting Food Procurement

Monitoring Sites: Antioch Park Lake South in Antioch Park, Overland Park/Merriam (Figure 1)

Figure 1

Antioch Park Lake TMDL Reference Map

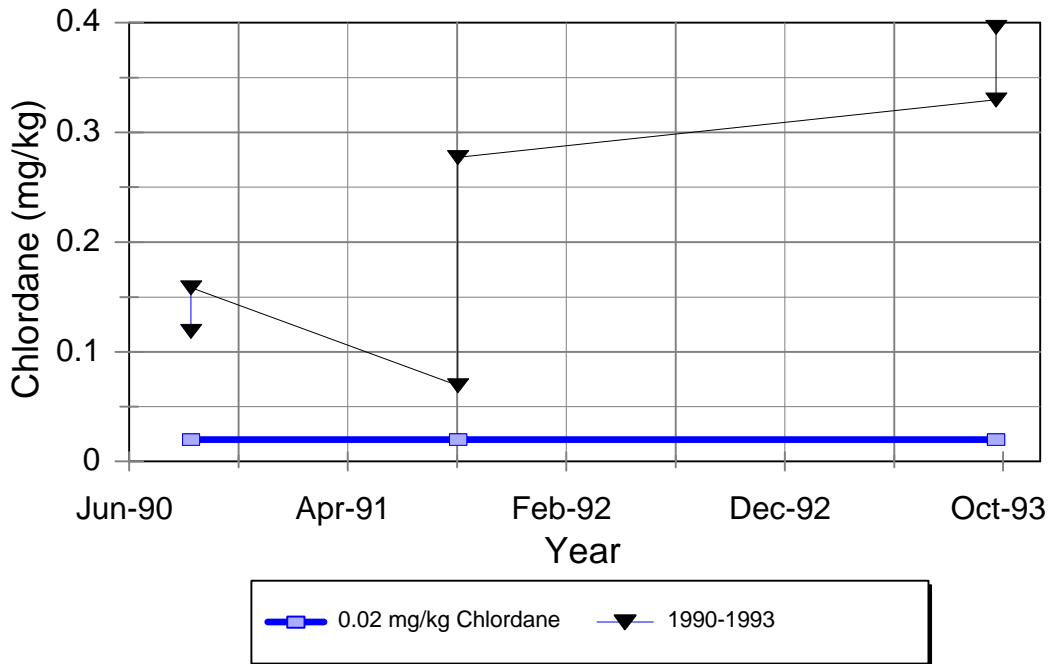


Period of Record Used: 1990, 1991, and 1993

Current Condition: The fish tissue monitoring and survey program was implemented to analyze fish tissue samples for chlordane in order to define water body segments impacted by contamination and provide long term monitoring on segments with past or present fish consumption advisories. Bottom feeding fishes such as carp are sampled because of their feeding or dwelling preferences near the lake bed sediments where chlordane remains in the sediments. Fish tissue samples were collected in 1990-1993.

The plot of samples from Antioch Park Lake South indicates increase concentrations over time. The average concentration of chlordane in fish tissue was 0.225 mg/kg in Antioch Park Lake South.

Antioch Park Lake Chlordane TMDL



Desired Endpoints of Water Quality on Antioch Park Lake South over 2005 - 2009:

Fish tissue concentrations will gradually decline as chlordane is purged or degraded in the lake sediments during high flows. Given the suspended status of chlordane use nationwide, the endpoint delineating sufficient water quality to fully support the designated use will be average fish tissue concentrations below 0.02 mg/kg, leading to removal of fish consumption advisories. There is no seasonal variation associated with this TMDL.

3. SOURCE INVENTORY AND ASSESSMENT

The original source of chlordane has been runoff, particularly from urban areas where widespread termite eradication occurred around homes in the 1970's- 1980's. Chlordane is very persistent in the environment, yet very insoluble in water. Samples taken from water rarely contain chlordane. The chlordane is attached to sediments which allow for transportation into lakes and accumulation in the bed sediments. Chlordane was banned (all uses) in 1988. No additional loading should occur.

4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY

Point Sources: As the product is banned, there will be no discharge of chlordane into the lake via wastewater treatment plants. The Wasteload Allocation, established under this TMDL, is zero.

Non-Point Sources: With the banning of the product, there will be no application of chlordane anywhere it might be discharged under runoff conditions and enter the lake. Therefore, under this TMDL, the Load Allocation is zero.

Margin of Safety: In order to ensure there is no threat of chlordane levels impairing the food procurement use of the lake, fish advisories will remain in place until all samples taken from fish tissue have concentrations below 0.02 mg/kg for three consecutive years.

State Water Plan Implementation Priority: Because no additional loading is expected this TMDL will be a Low Priority for implementation.

Unified Watershed Assessment Priority Ranking: This watershed lies within the Lower Kansas Subbasin (HUC 8: 10270104) with a priority ranking of 1 (Highest Priority for restoration work).

Priority HUC 11s: Pending additional monitoring and assessment, no priority subwatersheds.

5. IMPLEMENTATION

Desired Implementation Activities

1. Maintain fish consumption advisories.

Implementation Programs Guidance

KDHE will continue to assess trends of fish tissue samples through 2006.

Time Frame for Implementation: Continued monitoring over the years from 2001 to 2006.

Targeted Participants: None.

Milestone for 2006: The year 2006 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, additional monitoring data from fish tissue samples will be reexamined to confirm the impaired status of the lake.

Delivery Agents: None.

Reasonable Assurances

Authorities: The following authorities may be used to direct activities in the watershed to reduce pollution.

1. K.S.A. 65-164 and 165 empowers the Secretary of KDHE to regulate the discharge of sewage into the waters of the state.
2. K.S.A. 65-171d empowers the Secretary of KDHE to prevent water pollution and to protect the beneficial uses of the waters of the state through required treatment of sewage and established water quality standards and to require permits by persons having a potential to discharge pollutants into the waters of the state.
3. K.S.A. 2-2439 empowers the Secretary of Agriculture to oversee pesticide management, registration and use in the state.

Funding: The State Water Plan Fund annually generates \$16-18 million and is the primary funding mechanism for implementing water quality protection and pollution reduction activities in the state through the Kansas Water Plan. The state water planning process, overseen by the Kansas Water Office, coordinates and directs programs and funding toward watersheds and water resources of highest priority. Typically, the state allocates at least 50% of the fund to programs supporting water quality protection. This TMDL is a Low Priority consideration and should not receive funding.

Effectiveness: The substance banned from use; continued flushing out of the lake will purge chlordane from bed sediments.

6. MONITORING

KDHE will continue to collect fish tissue samples in Antioch Park Lake South. Three consecutive years of sampling should occur between 2001-2006. Based on that sampling, the status of 303(d) listing will be evaluated in 2006.

7. FEEDBACK

Public Meeting: A public meeting to discuss TMDLs in the Missouri Basin was held February 28, 2001 in Atchison. An active Internet Web site was established at <http://www.kdhe.state.ks.us/tmdl/> to convey information to the public on the general establishment of TMDLs and specific TMDLs for the Missouri Basin.

Public Hearing: A Public Hearing on the TMDLs of the Missouri Basin was held in Hiawatha on May 29, 2001.

Basin Advisory Committee: The Missouri Basin Advisory Committee met to discuss the TMDLs in the basin on October 3, 2000, February 28 and May 29, 2001.

Milestone Evaluation: In 2006, evaluation will be made as to the degree of impairment which has occurred within the drainage and current condition of Antioch Park Lake South. Subsequent decisions will be made regarding implementation approach, follow up of additional implementation and implementation in the nonpriority subwatersheds.

Consideration for 303(d) Delisting: Antioch Park Lake South will be evaluated for delisting under Section 303(d), based on the monitoring data over the period 2005-2009. Therefore, the decision for delisting will come about in the preparation of the 2010 303(d) list. Should modifications be made to the applicable nutrient criterion during the ten-year implementation period, consideration for delisting, desired endpoints of this TMDL and implementation activities may be adjusted accordingly.

Incorporation into Continuing Planning Process, Water Quality Management Plan and the Kansas Water Planning Process: Under the current version of the Continuing Planning Process, the next anticipated revision will come in 2002 which will emphasize revision of the Water Quality Management Plan. At that time, incorporation of this TMDL will be made into both documents. Recommendations of this TMDL will be considered in *Kansas Water Plan* implementation decisions under the State Water Planning Process during Fiscal Years 2002-2006.