KANSAS-LOWER REPUBLICAN BASIN TOTAL MAXIMUM DAILY LOAD

Waterbody: **Tuttle Creek Lake**
Water Quality Impairment: Atrazine

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasins: Lower Big Blue & Lower Little Blue

Counties: Marshall, Nemaha, Washington, and Republic

HUC 8s: 10270205 & 10270207

HUC 11s: 10270205: 035, 044, 050, 060, 070, 080, 090, 100, 110, 120, 130, 140, 150, 160, 169
10270207: 031, 074, 083, 090, 100

Drainage Area: Approximately 9,628 square miles.

Conservation Pool: Elevation 1075'; Volume 335,000 acre-feet

Tributary Arms: Big Blue River
Little Blue River
Black Vermillion River
Fancy Creek

Designated Uses: Primary Contact Recreation; Food Procurement; Domestic Water Supply; Expected Aquatic Life Support

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

Impaired Use: Expected Aquatic Life Support and Domestic Water Supply are impaired from Atrazine

Water Quality Standard: Atrazine: 3 μg/l (ppb) (KAR 28-16-28e(c)(2)(F)(ii) and (3)(A))

2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Level of Support for Designated Use under 1998 303d:Not Supporting Aquatic Life Support and Partial Supporting Domestic Water Supply

Monitoring Sites: Station 61201 in Tuttle Creek Lake.

Period of Record Used: 1988, 1991, 1994, 1996, 1997, 1998

Lake Record: 1968-1997 elevations from U.S. Army Corps of Engineers for Tuttle Creek Lake.

Current Condition: Lake consistently has elevated pesticides, notably atrazine during spring time conditions. Atrazine levels drop below the 3 ppb criterion in summer and winter. Most excursions have been associated with water in flood pool above 1078'. Sixty-seven percent of samples taken in 1993 or before were over 3 ppb. The percentage of excursions dropped to 27% from 1994-1998. The percentages demonstrated non-support of the designated uses. Sampling also occurred in the watershed at the lake headwaters (240); major intra-Kansas tributaries (502, 505, 507); and the stateline (232 ,233). Additionally, biweekly samples for atrazine were taken over 1996-1998 in the Black Vermillion watershed (stations 128-134, 141).

The historic frequency of the pool level at Tuttle Creek Lake was analyzed for the period of 1968-1997. The conservation pool at 1075' msl was reached or exceeded 65% of the time over those 30 years. The lake rarely had drawdowns of three or more feet. The pool at the lake was has been managed for fishery spawn support and waterfowl migration by holding water in the lower three feet of the flood pool in spring and fall. Pool levels exceeded 1078' msl 30% of the time. Seasonal runoff was usually controlled by detention in the lower seven feet of the flood control pool (1082' msl), a level which was exceeded only ten percent of the time.

The lake can be divided into three zones: a managed pool at or below 1078' msl where a majority of the designated uses would occur; a seasonal flood pool between 1078' and 1082' msl which reflected upstream watershed conditions and a critical flood pool over 1082' msl which detains extreme high flow events.

Examination of lake data indicated that most excursions from the 3 ppb standard occurred in the flood pool at durations of 35% of the time or less. Changes in the atrazine label dictating application rates were made in 1992-93. Application rates began to decline in the mid 1990's as more information became available on proper pesticide management and usage.

Since loading capacity varies as a function of the volume present in the lake, this TMDL represents a continuum of desired loads over all flow conditions, rather than fixed at a single value. The curve drawn on the lake atrazine graph represents the TMDL for the 3 ppb atrazine criterion across the spectrum of lake elevations seen at Tuttle Creek over the last 30 years. The curve was derived by converting the lake elevation into its associated volume and multiplying by that volume by 3 μg/l and applying the appropriate conversions. Lake samples were similarly plotted by multiplying the lake volume associated with the pool elevation at the time of sampling. Plots above the curve indicate excursions from the water quality standards, while those below the curve are in compliance with the standards.

Overall, the endpoint of this TMDL will be to minimize the percent of samples over the atrazine criteria within the managed pool of Tuttle Creek such that only one excursion from criterion is seen within a three-year period over 2004-2008. This TMDL endpoint meets water quality standards as measured and determined by Kansas Water Quality Assessment protocols and EPA

guidance relative to toxicants. These assessment protocols are similar to those used to cite the stream segments in this watershed as impaired on the Kansas 1998 Section 303d list.

Seasonal variation in endpoints is accounted for by this TMDL since the reservoir integrates the spring runoff season with the high use summer season by its flow detention characteristics. The desired endpoint will apply to samples taken between April and September over 2004-2008. Monitoring data plotting below the applicable TMDL curves will indicate attainment of the water quality standards.

Desired Endpoints of Water Quality at Tuttle Creek Lake over 2004 - 2008:

1. Atrazine levels in the managed pool below 1078' will remain below 3 ppb at all times.

2. Atrazine levels in the seasonal flood pool between 1078' and 1082' will be above 3 ppb once in three years.

3. The atrazine levels in the critical flood pool over 1082' will be over 3 ppb in less than 10% of the samples taken during spring flood conditions.

These endpoints will be reached as a result of expected reductions in loading from the various sources in the watershed resulting from implementation of corrective actions and Best Management Practices, as directed by this TMDL. Achievement of the endpoints indicate loads are within the loading capacity of the lake, water quality standards are attained with minimal excursions and full support of the designated uses of the lake has been restored. Conditions in the critical flood pool are sufficiently infrequent (less than 10% of the time) and are hydrologically limiting relative to the designated uses thus the use of an endpoint indicative of partial support of those uses is justified. Relative to domestic water supply, full support will be realized when samples do not exceed an annual average of 3 ppb nor is any drinking water use restriction in effect at Tuttle Creek.

3. SOURCE INVENTORY AND ASSESSMENT

The primary source of atrazine entering Tuttle Creek Lake is springtime runoff off of croplands in the Big and Little Blue River Basins. Atrazine has been widely used since the 1960's for selective control of broadleaf and grass weeds in corn and grain sorghum. Because of its high solubility in water, atrazine is susceptible to removal from cropland during overland runoff events. Within Marshall and Nemaha counties, a majority of the cropland is planted with grain sorghum with substantially smaller acreage in corn.

Selection of primary sources of atrazine is a function of a given watershed's proportion of cropland, its proximity to the lake and its propensity to generate runoff. Land use coverage analysis indicates large percentages of cropland in subwatersheds of the Big Blue River Subbasin

(HUC8=10270205), particularly along the Big Blue River itself and the Black Vermillion River. Sixty five to seventy percent of the subwatersheds is cropland. Subwatersheds of the Little Blue River Subbasin (HUC8=10270207) are about half cropland, with a greater proportion of grassland than the watersheds to the east. The subwatersheds of the Little Blue which are closer to the headwater of Tuttle Creek Lake have a higher proportion of cropland.

Soils in the eastern subwatersheds appear less permeable (average permeability of 0.4"/hr to 0.6"/hr) while those of the Little Blue Subbasin are more permeable (0.7"/hr to 0.9"/hr). Consequently, runoff contributions tend to be generated from the Big Blue River or Black Vermilllion drainages rather than from the western side of the drainage area. Under wet conditions or intense storms, the whole basin contributes runoff. Under moderate or lower conditions, a higher proportion of the eastern watersheds generate runoff than the western watersheds.

The following table summarizes these three characteristics for the subwatersheds above Tuttle Creek which are most likely to have contributions of atrazine loading into the lake. The recommended subwatershed targets are indicated by bold type.

CHARACTERISTICS OF TARGETED SUBWATERSHEDS FOR ATRAZINE TMDL						
				% of Watershed w/Runoff		
HUC 11	**Description**	**%Cropland**	**Avg. Perm**	**High**	**Mod**	**Low**
10270205035	**Mission-Murdock**	**65%**	**0.6"**	**97**	**93**	**51**
10270205044	**Hrshoe Crk-Big Blue**	**65%**	**0.6"**	**97**	**93**	**51**
10270205050	**Spring Creek**	**66%**	**0.6"**	**97**	**93**	**51**
10270205090	**N.Fork Black Vermillion**	**70%**	**0.4"**	**99**	**99**	**92**
10270205100	**Black Vermillion**	**65%**	**0.4"**	**99**	**99**	**92**
10270205070	**Robidoux Creek**	**54%**	**0.4"**	**99**	**99**	**92**
10270205080	**Marshall Co-Minor Strms**	**62%**	**0.4"**	**99**	**99**	**92**
10270207090	**Lower Little Blue**	**52%**	**0.8"**	**91**	**83**	**12**
10270207100	**Coon-Camp Crks**	**56%**	**0.8"**	**91**	**83**	**12**
10270207083	**Mill Creek**	**54%**	**0.9"**	**89**	**54**	**13**
10270205140	**Fancy Creek**	**44%**	**0.7"**	**91**	**83**	**12**

The suspected geographic areas contributing runoff and atrazine tend to be confirmed by conducting a load duration analysis for each of the water quality monitoring sites in the Tuttle Creek Drainage. Seasonal load duration graphs confirm the spring time nature of the atrazine issue as seen at the Tuttle Creek headwaters at Blue Rapids. Analysis of the sample data against the TMDL curves indicate that most of the loads correspond to significant runoff events. The largest loadings are seen on the Big Blue River at the stateline. Smaller loadings emanate from Nebraska on the Little Blue River and much smaller loadings from the Kansas watersheds. Data collected by Kansas State University indicate that 70% of the atrazine load entering Tuttle Creek in 1997 came from the Big Blue River; 25% from the Little Blue River and 5% from the Black Vermillion.

The following table indicates the relative contributions from the drainage since 1993 have the same general proportions of loading coming from the three major areas of the drainage. On average, flow conditions which were exceeded about 40% of the time (range: 34%-51%) generated excessive atrazine loads to the lake. Water quality standard excursion frequency is mostly noted within the Big Blue and Black Vermillion rivers. In order to reach the desired loading goal during flow conditions of 40% exceedance, a 75% reduction in atrazine loads has to occur on the Big Blue River, 67% reduction on the Black Vermillion River and 58% reduction on the Little Blue River.

RELATIVE CONTRIBUTIONS FROM UPSTREAM TRIBUTARY WATERSHEDS

River, Location and Loadings					Characteristics of 3 ppb WQS Excursion		
Location	**Flow Data**	**WQ Data**	**Current Avg. Load**	**40% TMDL**	**Frequency**	**Magnitude**	**Duration**
Tuttle Creek Headwaters	Barnes & Marysville	Blue Rapids	**100#/d**	25#/d	67%	75#/d	39%
Big Blue @ Stateline	Barneston	Oketo	**43#/d**	12#/d	67%	31#/d	36%
Little Blue @ Stateline	Hollenberg	Hollenberg	**19#/d**	8#/d	50%	11#/d	51%
Black Vermillion	Frankfort	Frankfort	**6#/d**	2#/d	57%	4#/d	38%
Washington Crk	Washington	Hanover	**3#/d**	1#/d	50%	2#/d	39%
Fancy Creek	Winkler	Winkler	**2#/d**	1#/d	33%	1#/d	34%

Analysis of tributary data in the Black Vermillion watershed indicates the seasonal pattern of water quality standard violations relative to atrazine. Average concentrations during runoff events are over 10 ppb, particularly in the tributaries feeding into the North Fork of the Black Vermillion River. Those tributaries tend to drain extensive cropland areas.

Governor's Water Quality Initiative Data		
Site	**Number of Samples Over 3 ppb**	**Average of those Samples**
128	10	12.6 ppb
129	4	7.3 ppb
130	10	9.8 ppb
131	9	11.4 ppb
132	9	13.5 ppb
133	10	11.4 ppb
134	12	14.0 ppb
141	12	7.1 ppb

4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY

Point Sources: Since this pollutant is associated with agricultural non-point source pollution, there will be no Wasteload Allocation assigned to point sources for atrazine under this TMDL.

Non-Point Sources: As described in the Source Assessment, the subwatersheds with high proportion of cropland, strong propensity for runoff and in proximity to the Tuttle Creek headwaters are targeted for implementing this TMDL. The Load Allocation will involve reducing the atrazine loads by 75% along the Big Blue River, on both sides of the stateline, a 58% reduction along the Little Blue River, on both sides of the stateline and a 67% reduction within the Black Vermillion River watershed. Managed reductions of this scale in the three major drainages entering Tuttle Creek should allow the endpoints to be met within the lake, accounting for some margin of safety.

Defined Margin of Safety: A margin of safety curve is drawn as a straight line interpolation between the data points at 50% duration and 99% duration. This margin of safety curve provides a safeguard against water quality standard violations within the managed conservation pool at Tuttle Creek Lake. The straight line interpolation of the atrazine mass curve for Tuttle Creek Lake between the 50% and 99% duration points will demarcate an implicit margin of safety. This curve falls below the historic load curve generated by the lake conditions. Evaluation of future lake sampling data will be judged based on those data positions which lie below the margin of safety line between the 50% and 99% duration points.

State Water Plan Implementation Priority: Because this lake has tremendous importance in influencing the water supply and water quality of the Kansas River, the investment made by the state in the conservation storage of the lake and the need to comprehensively package implementation measures to handle multiple impairments in the lake and watershed, this TMDL will be a High Priority for implementation.

Unified Watershed Assessment Priority Ranking: This lake's watersheds encompass both the Lower Big Blue Subbasin (HUC8: 10270205) and the Lower Little Blue Subbasin (HUC8: 10270207). The Unified Watershed Assessment assigned a priority ranking of 2 to the Lower Big Blue and 10 to the Lower Little Blue subbasins (Both Highest Priority for restoration work).

Priority HUC 11s and Stream Segments: Because of their high proportion of cropland, proximity to the lake and ability to generate runoff, the following subwatersheds are highest priority:

Big Blue River	**Subbasin**	**Priority Stream Segments**
10270205044	Horseshoe Crk-Big Blue	17, 18, 20, 21, 26
10270205050	Spring Creek	19
10270205090	N.Fork Black Vermillion	15
10270205100	Black Vermillion	13, 14
10270205070	Robidoux Creek	16
Little Blue River	**Subbasin**	**Priority Stream Segments**
10270207090	Lower Little Blue	1, 2
10270207100	Coon and Camp Creeks	23, 44

Focus should be made on the smaller tributaries feeding into the main stream segments listed for each of those subwatersheds as well as cropland adjacent to the main stream. Additionally, high priority is placed on reducing loads coming from Nebraska and crossing the stateline in the Big and Little Blue Rivers. The level of reduction is the same as that cited for the Kansas watersheds.

5. IMPLEMENTATION

Desired Implementation Activities

1. Implement proper mix of pesticide use best management practices, including incorporation, application timing, banding, alternative weed control and buffer zones
2. Implement necessary storage and handling site best management practices
3. Install necessary grass buffer strips along streams.
4. Increase label compliance by applicators
5. Harmonize water quality protection measures and use directions on labels of products containing atrazine

Implementation Programs Guidance

Non-Point Source Pollution Technical Assistance - KDHE

a. Support Section 319 demonstration projects for reduction of atrazine runoff from grain sorghum cropland.

b. Provide technical assistance on practices geared to establishment of vegetative buffer strips.

c. Guide federal programs such as the Environmental Quality Improvement Program, which are dedicated to priority subbasins through the Unified Watershed Assessment, to priority subwatersheds and stream segments within those subbasins identified by this TMDL.

Water Resource Cost Share & Non-Point Source Pollution Control Programs - SCC

a. Provide pesticide management areas for storage, mixing and handling.

b. Provide pesticide management practices to minimize pesticide spillage

Riparian Protection Program - SCC

a. Establish or reestablish natural riparian systems, including vegetative filter strips and streambank vegetation.

b. Develop riparian restoration projects in cropland areas

Buffer Initiative Program - SCC

a. Install grass buffer strips near streams.

b. Leverage Conservation Reserve Enhancement Program to hold riparian land out of production.

Extension Outreach and Technical Assistance - Kansas State University

a. Educate grain sorghum producers on pesticide management

b. Provide technical assistance on buffer strip design and minimizing cropland runoff and construction of pesticide handling pads

Pesticide Management Program - KDA

a. Implement pesticide bulk containment regulations
b. Increase label compliance by pesticide applicators
c. Harmonize product labels regarding use and protection measures
d. Continue basin pesticide education efforts through Kansas State and commodity associations

Big Blue River Compact - KDA

a. Continue to support bistate efforts to reduce atrazine runoff

Timeframe for Implementation: Pollution reduction practices should be installed within the priority subwatersheds and along the priority stream segments during the years 2000-2004, with minor follow up implementation, including other subwatersheds over 2004-2008.

Targeted Participants: Primary participants for implementation will be grain sorghum and corn producers operating within the drainages of the Big Blue River and the Black Vermillion River and the Little Blue River drainage between Barnes and Blue Rapids. Implemented activities should be targeted at those areas with greatest potential to impact the lake. Nominally, this would be activities located within one mile of the streams including:

1. Total corn and sorghum acreage
2. Location of tile drain outlets draining into streams.
3. Location of pesticide storage, mixing and handling sites
4. Cultivated riparian areas
5. Number of pesticide applicators
6. Use of pesticide products containing atrazine

Some inventory of local needs should be conducted in 2000 to identify such activities. Such an inventory would be done by local program managers with appropriate assistance by commodity representatives and state program staff in order to direct state assistance programs to the principal activities influencing the quality of the streams in the watershed during the implementation period of this TMDL.

Milestone for 2004: The year 2004 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, milestones should be reached which will have at least eighty percent of the producers responsible for the land use activities cited in the local assessment participating in the implementation programs provided by the state. Additionally, sampled data from Tuttle Creek should indicate evidence of reduced atrazine levels at non-critical pool elevations relative to the conditions seen over 1994-1998. Furthermore, atrazine loads coming across the stateline should be reduced by over half the recommended levels.

Delivery Agents: The primary delivery agents for program participation will be the conservation districts for programs of the State Conservation Commission and the Natural Resources

Conservation Service. Producer outreach and awareness will be delivered by Kansas State Extension and agricultural interest groups such as Kansas Corn Growers Association and Kansas Grain Sorghum Producers Association.

Reasonable Assurances:

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

1. K.S.A. 2-2439 empowers the Secretary of Agriculture to oversee pesticide management, registration and use in the state.

2. K.S.A. 2-2472 empowers the Secretary of Agriculture to establish Pesticide Management Areas to protect public health, safety and welfare and the natural resources of the state from pesticide pollution.

3. K.S.A. 82a-529 is the Big Blue River Compact which supports bistate pollution abatement in the Big Blue River Basin.

4. K.S.A. 2-1915 empowers the State Conservation Commission to develop programs to assist the protection, conservation and management of soil and water resources in the state, including riparian areas.

5. K.S.A. 75-5657 empowers the State Conservation Commission to provide financial assistance for local project work plans developed to control non-point source pollution.

6. K.S.A. 82a-901, et seq. empowers the Kansas Water Office to develop a state water plan directing the protection and maintenance of surface water quality for the waters of the state.

7. K.S.A. 82a-951 creates the State Water Plan Fund to finance the implementation of the *Kansas Water Plan*.

8. The *Kansas Water Plan* and the Kansas-Lower Republican Basin Plan provide the guidance to state agencies to coordinate programs intent on protecting water quality and to target those programs to geographic areas of the state for high priority in implementation.

9. The Federal Insecticide, Fungicide and Rodenticide Act authorizes the state to initiate the process of making label changes on the use, application and provision of environmental protection of pesticides.

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 watershed and its TMDL is a **High Priority** consideration. However, costs are likely to be associated with monitoring in the lake and watershed. Most pesticide application management practices can be made without cost-share considerations.

In State Fiscal Year 1999, the state provided to Washington, Marshall and Nemaha counties, $446,662 of State Water Plan Funds for non-point source pollution reduction, which included $5,600 for buffer strip installation. The Commission will decide State Fiscal Year 2000 allocations in May 1999 and is expected to direct similar amounts of funding to the three counties for the next fiscal year

Effectiveness: Pesticide management has proven to be effective in reducing atrazine levels in Perry Lake. Many voluntary approaches were promoted through the Pesticide Management Area established on the Delaware River Subbasin. Most of those producers raised corn. The key to effectiveness will be equivalent participation by grain sorghum producers in the Tuttle Creek drainage area. Equally important is similar participation by agricultural producers in Nebraska. The milestones established under this TMDL are intended to gauge the level of participation in those programs implementing this TMDL.

Should participation significantly lag below expectations over the next five years or monitoring indicates lack of progress in improving water quality conditions from those seen over 1990-1998, the state may employ more stringent conditions on agricultural producers in the watershed through establishment of a Pesticide Management Area in order to meet the desired endpoints expressed in this TMDL. The state can also push improvement in pesticide loadings from Nebraska through the Big Blue River Compact.

6. MONITORING

KDHE and the Corps of Engineers will continue to collect seasonal samples from Tuttle Creek Lake twice in the five year period 2000-2004. Over the period 2004-2008, monthly samples will be collected over April to September from specified pool level conditions. Fifteen samples should be taken at elevations below 1078' and another fifteen samples should be taken at elevations between 1078' and 1082'. A minimal number of samples should be taken at elevations greater than 1082'. Elevations should be fairly stable for a week prior to sampling.

Routine bimonthly sampling from the watershed stations should be maintained throughout the period 2000-2008. Kansas State University should continue to collect grab and runoff samples within the drainage area, particularly at Barnes and Marysville. Additionally, two to three years

of biweekly sampling for atrazine need to be taken over Spring and Summer-Fall at Stations 128-134 and 141 on the two main forks of the river above Frankfort. These samples will be compared to the sampling data of 1996-1998 collected as part of Governor's Water Quality Initiative. The intensive sampling should occur over 2006-2007 and as resources allow, 2008.

7. FEEDBACK

Public Meetings: Public meetings to discuss TMDLs in the KLR Basin were held March 10, 1999 in Topeka, April 27 in Lawrence and April 29 in Manhattan. 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 Kansas-Lower Republican Basin.

Public Hearing: A Public Hearing on the TMDLs of the Kansas-Lower Republican Basin was held in Topeka on June 3, 1999.

Basin Advisory Committee: The Kansas-Lower Republican Basin Advisory Committee met to discuss the TMDLs in the basin on December 3, 1998; January 14, 1999; February 18, 1999; March 10, 1999; May 20, 1999 and June 3, 1999.

Discussion with Interest Groups: Meetings to discuss TMDLs with interest groups include:

Agriculture: November 10, 1998; December 18, 1998; February 10, 1999; April 10, 1999, May 4, 1999, June 8, 1999 and June 18, 1999.

Municipal: November 12, 1998, January 25, 1999; March 1, 1999; May 10, 1999 and June 16, 1999.

Environmental: November 3, 1998; December 16, 1998; February 13, 1999; March 15, 1999, April 7, 1999 and May 3, 1999.

Conservation Districts: March 16-18, 24-25, 1999

Task Force: A special task force to examine the issues of establishing a TMDL on Tuttle Creek met on November 9, 1998; January 5, 1999 and February 15, 1999. Additionally, subcommittees met to discuss implementation, biological impacts, municipal impacts and data analysis.

Blue River Compact: The water quality committee of the Compact and the Compact Administration met on May 7 and May 23, 1999 to discuss this TMDL.

Milestone Evaluation: In 2004, evaluation will be made as to the degree of implementation which has occurred within the drainage and current condition of the Tuttle Creek Lake. Subsequent decisions will be made regarding implementation approach, follow up of additional implementation and implementation in the non-priority subwatersheds.

Consideration for 303d Delisting: Tuttle Creek Lake will be evaluated for delisting under Section 303d, based on the monitoring data over the period 2004-2008. Therefore, the decision for delisting will come about in the preparation of the 2008 303d list. Should modifications be

made to the applicable water quality criteria 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 for Fiscal Years 2000-2004.

Approved January 26, 2000.