

KANSAS-LOWER REPUBLICAN BASIN TOTAL MAXIMUM DAILY LOAD

Waterbody: Jamestown Wildlife Management Area
Water Quality Impairment: Siltation

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasin: Lower Republican **County:** Cloud

HUC 8: 10250017 **HUC 11:** 030

Drainage Area: Approximately 137.5 square miles.

Conservation Pool: Area 1265 acres, Maximum Depth 1.0 meter

Designated Uses: Secondary Contact Recreation; Aquatic Life Support

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

Impaired Use: Aquatic Life Support

Water Quality Standard: Suspended solids - Narrative: Suspended solids added to surface waters by artificial sources shall not interfere with the behavior, reproduction, physical habitat or other factor related to the survival and propagation of aquatic or semi-aquatic or terrestrial wildlife. (KAR 28-16-28e(c)(2)(D)).

2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Monitoring Sites: Station 052801 in Jamestown WMA.

Period of Record Used: Five complete surveys—1989, 1992, 1995, 1997, & 1998

Current Condition: Over the five years that surveys were taken, the total suspended solid concentration was high seventy percent of the time. The average concentration of TSS was 133.7 mg/L, ranging from 48 to 240 mg/L. The average amount of total suspended solids within the conservation pool was 674 tons. It is generally desired to maintain total suspended solid concentrations below 100 mg/l. There is high inorganic turbidity, but no deficiency of light within water column due to shallow conditions.

Interim Endpoints of Water Quality (Implied Load Capacity) at Jamestown WMA over 2004 - 2008:

Ten percent or less of the samples taken from the wetland exceed 100 mg/l over 2004-2008.

This TMDL endpoint meets water quality standards as measured and determined by Kansas Water Quality Assessment protocols. 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 the endpoint is not established by this TMDL. This endpoint can 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 stream, water quality standards are attained and full support of the designated uses of the stream has been restored, therefore the narrative water quality standard pertaining to suspended solids would be attained.

3. SOURCE INVENTORY AND ASSESSMENT

Land Use: The cause of high concentrations of total suspended solids is most likely due to cropland. Soil from exposed land runs-off into the wildlife management area, increasing the concentration of total suspended solids. Within the watershed, the land is predominantly used for cropland (64%) and grassland (29%). More woodland and grassland is needed around the stream to prevent erosion.

Sediment from urban land may get transported into the watershed. However, this source is probably not a major contributor because there is minimal urban land around the lake and population projections for the county to the year 2020 indicate decline in population.

Contributing Runoff: The watershed has an average soil permeability of 1.4 inches/hour according to NRCS STATSGO data base. Runoff would be produced from storms one hour in duration, having a recurrence interval of five, ten or twenty five years and from storm 2 hours in duration having a recurrence interval of ten and twenty five years. Runoff is chiefly generated as infiltration excess with rainfall intensities greater than soil permeabilities. Generally, 9 percent of the watershed would generate runoff under dryer conditions or smaller storms. Moderate or wet conditions or larger storms would see runoff contributed from 46 or 79 percent of the watershed respectively.

Background Levels: Background levels of total suspended solids come from geological sources. Sediment becomes suspended during high flow events as soil along the banks is eroded.

4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY

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

Non-Point Sources: Elevated suspended solids are primarily due to non-point source pollution. The assessment suggests that cropland throughout the watershed contribute to the high total suspended solid concentrations in the lake. Given the runoff characteristics of the watershed, overland runoff can carry sediment into the lake. Approximately 754 tons of sediment are suspended in the lake/wetland complex on average. The Load Allocation would be a reduction of sediment loads by 25% such that less than 560 tons were suspended, lowering average total suspended solids below 100 mg/l.

Defined Margin of Safety: The margin of safety will be taken as 10 tons of total suspended solids, allowing greater certainty that the desired endpoint of the lake will be achieved.

State Water Plan Implementation Priority: This TMDL will be a Low Priority for implementation because of the wetland nature of this waterbody.

Unified Watershed Assessment Priority Ranking: This watershed lies within the Lower Republican Subbasin (HUC 8: 10250017) with a priority ranking of 22 (Medium Priority for restoration work).

Priority HUC 11s: The entire watershed is within HUC 11 (030).

5. IMPLEMENTATION

Desired Implementation Activities

BMPs may be able to curtail excessive siltation. The following are examples of some of the activities that could be implemented:

1. Implement and maintain conservation farming, including conservation tillage, contour strips and no till farming.
2. Reduce activities within riparian areas

Implementation Programs Guidance

Until additional assessment of probable non-point sources is made, no direction can be made to those implementation programs.

Timeframe for Implementation: Pollution reduction practices should be installed within the lake drainage during the years 2008-2012.

Targeted Participants: Primary participants for implementation will be agricultural producers within the drainages of the lake. Implemented activities should be targeted at those areas with greatest potential to impact the stream. Nominally, this would be activities located within one mile of the streams including:

1. Total rowcrop acreage
2. Cultivation alongside stream

Some inventory of local needs should be conducted in 2000-2004 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 mid-point of the ten year implementation window for the watershed. At that point in time, adequate source assessment should be complete which allows an allocation of resources to responsible activities contributing to the sediment impairment. Additionally, sampled data from Jamestown WMA should indicate evidence of reduced TSS levels in the pool relative to the conditions seen over 1988-1998.

Delivery Agents: The primary delivery agents for program participation will be Kansas Department of Wildlife and Parks, 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.

Reasonable Assurances:

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

1. 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 established water quality standards
2. 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.
3. 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.
4. 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.

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

7. 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.

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 Low Priority consideration and should not receive funding until after 2004.

Effectiveness: Sediment control has been proven effective through conservation tillage, contour farming and use of grass waterways and buffer strips. The key to success will be widespread utilization of conservation farming within the watersheds cited in this TMDL.

6. MONITORING

KDHE will continue to collect seasonal open water samples from Jamestown WMA over 4 times during 1999-2008

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

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

Consideration for 303d Delisting: Jamestown WMA will be evaluated for delisting under Section 303d, based on the monitoring data over the period 1999-2003. Therefore, the decision for delisting will come about in the preparation of the 2004 303d list. Should the lake continue to be listed as impaired in 2004, the next evaluation for delisting will occur with the preparation of the 2008 Section 303d list. Should modifications be made to the applicable nutrient criterion during the ten year implementation period, consideration for delisting, development of desired endpoints of this TMDL and implementation activities will 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 after Fiscal Year 2004.

Approved January 26, 2000.