KANSAS-LOWER REPUBLICAN BASIN TOTAL MAXIMUM DAILY LOAD

Waterbody: **Mill Creek Watershed**
Water Quality Impairment: Chloride

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasin: Lower Kansas **County:** Johnson

HUC 8: 10270104 **HUC 11:** 170 (entire watershed)

Drainage Area: Approximately 71 square miles.

Main Stem Segments: 39, starting at confluence of Kansas River, headwaters near Olathe

Tributary Segments: Little Mill Creek (78)

Designated Uses: Expected Aquatic Life; Primary Contact Recreation; and all other designated uses on Main Stem; Secondary Contact Recreation; and all other designated uses on Little Mill Creek

1998 303d Listing: Table 1–Predominant Point and Non-point Source Impacts

Impaired Use: Domestic Water Supply

Water Quality Standard: 250 mg/l for Domestic Water Supply (KAR 28-16-28e(c)(3)(A)

2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Level of Support for Designated Use under 1998 303d: Partially Supporting Domestic Water Supply

Monitoring Sites: Station 251 near Shawnee

Period of Record Used: 1986 to 1998

Flow Record: Calculated from Blue River near Stanley (USGS Station 06893080); recorded daily data from 1974 - 1997 by proportional drainage correction.

Current Condition: Since loading capacity varies as a function of the flow present in the stream, this TMDL represents a continuum of desired loads over all flow conditions, rather than fixed at a single value. Flow duration data were examined from the Stanley Gaging Station for each of the three defined seasons: Spring (Apr-Jun), Summer-Fall (Jul-Oct) and Winter (Nov-

Mar). High flows and runoff equate to lower flow durations, baseflow and point source influences generally occur in the 85-99% range. Load curves were established for Drinking Water criterion by multiplying the flow values along the curve by the applicable water quality criterion and converting the units to derive a load duration curve of pounds of chloride per day. These load curves represent the TMDL since any point along the curve represents water quality at the standard at that flow. Historic excursions from WQS are seen as plotted points above the load curves. Water quality standards are met for those points plotting below the applicable load duration curves.

The only excursions from WQS were noted during Winter under low flows. Four percent of all samples exceeded the chloride criterion, indicating a baseline condition of full support of the domestic water supply use.

PERCENT OF SAMPLES OVER WATER QUALITY STANDARDS BY FLOW AND SEASON

				DURATION						
STREAM NAME	IMPAIRMENT	SEASON	MAGNITUDE	0 TO 10 %	10 TO 30 %	30 TO 60 %	60 TO 90 %	90 TO 100 %	FREQUENCY	Current Condition of Water Quality at Site 251 Over 1986-1998
MILL CREEK	CL	S		0	0	0	0	0	0/25 = 0%	4/105 = 4% Exceedence
		SF		0	0	0	0	0	0/36 = 0%	
		W		0	0	0	7	2	4/44 = 9%	

Desired Endpoints of Water Quality at Site 251 over 2004 - 2008:

Overall, the endpoint of this TMDL will be to maintain the percent of samples over the applicable criteria to less than 10% for samples taken over the monitoring period of 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 endpoints is accounted for by TMDL curves established for each season and will be evaluated based on monitoring data from 2004-2008. Monitoring data plotting below the applicable seasonal TMDL curves will indicate attainment of the water quality standards. As with the overall endpoint, the manner of evaluation of the seasonal endpoints is consistent with the assessment protocols used to establish the case for impairment in these streams. Seasonal endpoints will be developed in 2004 to reflect additional sampling and confirmation of impaired status. Tentatively, less than 10% of the samples taken in Winter will exceed the chloride criterion at flows under 30 cfs.

3. SOURCE INVENTORY AND ASSESSMENT

Groundwater contributing geologic formations are predominately absent from the watershed. Much of the chloride in the surface water must be attributed to anthropogenic sources. Load duration curves indicate runoff from salt treatments on icy roads during winter months are the most likely source of chloride loadings.

4. ALLOCATION OF POLLUTION REDUCTION RESPONSIBILITY

Point Sources: The Waste Load Allocation represents the allowable impact of the discharge from the Olathe Main treatment plant. Therefore the Wasteload Allocation will be 6700 pounds per day at design flows of 3.2 MGD (5 cfs).

Non-Point Sources: Load allocation will be the difference in the seasonally flow derived TMDL and the constant Wasteload Allocation, allowing for the Margin of Safety. Since the excursions were seen at flows below 30 cfs in the winter, this will cap the permissible load of chloride at 40,500 pounds per day, providing a Load Allocation of up to 27,950 pounds per day. The allocation will diminish as flows decline, down to zero at 5 cfs. Additional assessment will be necessary to ascertain the significance of loading due to winter road treatments.

Defined Margin of Safety: Ten percent of the applicable chloride load shall be the defined margin of safety. This is equivalent to 4050 pounds per day of chloride at 30 cfs, which appears to be the normal low flows on the creek.

State Water Plan Implementation Priority: Because it appears this watershed's chloride load frequency of excursion from WQS is less than 10%, there are no domestic water supply points of diversion along Mill Creek and incidental loads from icy road treatment runoff cause the impairment, 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 and Stream Segments: Pending additional monitoring and assessment, no priority subwatersheds or stream segments should be identified.

5. IMPLEMENTATION

Desired Implementation Activities

1. Minimize road salt contributions of chloride loading to creek.

Implementation Programs Guidance

Until the 2004 assessment of impairment based on monitoring is made, no direction can be made to those implementation programs.

Timeframe for Implementation: Continued monitoring over the years 2000-2004.

Targeted Participants: County highway department and road crews.

Milestone for 2004: The year 2004 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, additional monitoring data from Station 251 will be reexamined to confirm the impaired status of the streams within this watershed. Should the case of impairment remain, source assessment, allocation and implementation activities will ensue

Delivery Agents: Depending upon confirmation of impairment and assessment of probable sources, the primary delivery agents for program participation will be the county public works department.

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.

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: Improvements in reducing chloride loading to streams can be accomplished through appropriate management of winter road treatments such as substitution of sand for salt.

6. MONITORING

KDHE will continue to collect bimonthly samples at Station 251, including chloride samples over each of the three defined seasons. Sampling emphasis should be placed on lower flows (under 30 cfs) in the Winter season. Based on that sampling, the status of 303d listing will be evaluated in 2004. Should impaired status remain, the desired endpoints under this TMDL will be refined and direct more intensive sampling will need to be conducted under specified seasonal flow conditions over the period 2004-2008.

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 current condition and the degree of impairment which has occurred within the watershed of Mill Creek. Subsequent decisions will be made regarding implementation approach and follow up of additional implementation.

Consideration for 303d Delisting: Mill Creek 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 streams 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 water quality criteria 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 Years 2004.

Approved January 26, 2000.