SMOKY HILL/SALINE RIVER BASIN TOTAL MAXIMUM DAILY LOAD

Water Body/Assessment Unit: Cedar Bluff Lake Watershed including the Smoky Hill River (Elkader, Gove, and Trego)
Water Quality Impairment: Selenium

1. INTRODUCTION AND PROBLEM IDENTIFICATION

Subbasin: Smoky Hill Headwaters, North Fork Smoky Hill, Upper Smoky Hill**,** Ladder, and Hackberry

Counties: Gove, Greeley, Lane, Logan, Ness, Scott, Sherman, Thomas, Trego, Wallace, and Wichita

HUC 8:	10260001	**HUC 11** (14)**:**	**010** (090, 100, 110) (Figure 1) **020** (010, 020, 030) **030** (010, 020, 030, 040) **040** (010, 020, 030, 040, 050, 060)
	10260002		**010** (060, 070, 080, 090, 100, 110, 120) **030** (010, 020, 030, 040, 050, 060)
	10260003		**010** (010, 020, 030, 040, 050, 060) **020** (010, 020, 030, 040, 050, 060, 070, 080, 090) **030** (010, 020, 030) **040** (010, 020, 030, 040, 050, 060, 070, 080) **050** (010, 020, 030, 040, 050, 060, 070, 080)
	10260004		**010** (040, 050, 060, 070, 080) **020** (030, 040, 050, 060, 070, 080, 090) **030** (010, 020, 030, 040) **040** (010, 020, 030, 040) **050** (010, 020, 030, 040, 050, 060, 070, 080, 090)
	10260005		**010** (010, 020, 030, 040, 050, 060) **020** (010, 020, 030, 040, 050, 060, 070)

Ecoregion: Western High Plains, Moderate Relief Rangeland (25c)
Western High Plains, Flat to Rolling Cropland (25d)
Central Great Plains, Rolling Plains and Breaks (27b)

Drainage Area: Approximately 4,305 square miles.

Cedar Bluff Lake (Unimpaired)

Conservation Pool: Area = 6,618 acres
Watershed Area: Lake Surface Area = 416:1
Maximum Depth = 19.0 meters (62.3 feet)
Mean Depth = 7.8 meters (25.6 feet)
Retention Time = 1.36 years (16.3 months)

Designated Uses: Primary and Secondary Contact Recreation; Expected Aquatic Life Support; Food Procurement; Irrigation

Authority: Federal (U.S. Bureau of Reclamation) and State (Kansas Dept. of Wildlife and Parks)

Smoky Hill River

Main Stem Segment: WQLS: 1, 3, 4, 6, 8, 10, 21-part, 22, 24 (Smoky Hill River (Elkader)), 9, 10, 12, 13, 14, 16, 17-part (Smoky Hill River (Trego)), and 17-part, 19, 20, 21-part (Smoky Hill River (Gove)) starting at Cedar Bluff Lake and traveling upstream to the Colorado border.

Main Stem Segments with Tributaries by HUC 8 and Watershed/Station Number:

HUC 10260003

Smoky Hill R (Trego) Station 550

Smoky Hill R (9)	Sand Cr (29)	E. Branch Sand Cr (40)	
Smoky Hill R (10)	Downer Cr (11)	E. Br. Downer Cr (39)	
Smoky Hill R (12)	**10260005** Hackberry Cr (1)	Spring Cr (2)	
	Hackberry Cr (3)	W. Spring Cr (8)	
		S. Branch Hackberry Cr (7)	
		M. Branch Hackberry Cr (4)	N. Br. Hackberry Cr (5)
		M. Branch Hackberry Cr (5)	
Smoky Hill R (13)	Gibson Cr (34)		
	Wild Horse Cr (28)		
Smoky Hill R (14)	Big Windy Cr (38)		
	Sand Cr (37)		
	Indian Cr (15)		
Smoky Hill R (16)	Unnamed Stream (27)		
Smoky Hill R (17-part)			

HUC 10260003

Smoky Hill R (Gove) Station 739

Smoky Hill R (17-part)	Plum Cr (18)	
Smoky Hill R (19)	Cheyenne Cr (36)	
	Salt Cr (26)	E. Salt Cr (35)

Smoky Hill R (20)	Hell Cr (25)		
Smoky Hill R (21 - part)			
HUC 10260003			
Smoky Hill (Elkader) Station 224			
Smoky Hill R (21 - part)	**10260004** Ladder Cr (1)	Twin Butte (2)	
	Ladder Cr (3)	Chalk Cr (4)	
	Ladder Cr (5)	Unnamed Stream (6)	
	Ladder Cr (7)	Middle S.F. Ladder Cr (15)	
	Ladder Cr (8)	S. Ladder Cr (12)	Middle Ladder Cr (13) Middle N. Fk. Ladder Cr (17) Middle Ladder Cr (14)
	Ladder Cr (9)	Unnamed Stream (10)	
	Ladder Cr (11)		
Smoky Hill R (22)	Sixmile Cr (23)		
Smoky Hill R (24)	West Spring Cr (33)		
	10260002 N. Fk. Smoky Hill R (1)	Sand Cr (2)	
	N. Fk. Smoky Hill R. (3)	Sandy Cr (4)	
	N. Fk. Smoky Hill R. (5)	Turtle Cr (15)	
	N. Fk. Smoky Hill R. (6)		
10260001 Smoky Hill R (1)	Lake Cr (2)	S. Fk. Lake Cr (18)	
Smoky Hill R (3)	Depperschmidt Draw (309)		
	Capper Draw (311)		
	Coon Cr (20)		
	Pond Cr (21)		
	Rose Cr (19)		
	Eagletail Cr (17)		
Smoky Hill R (4)	Goose Cr (5)		
Smoky Hill R (6)			
Smoky Hill R (8)	Unnamed Stream (9)		
Smoky Hill R (10)			

Designated Uses: Primary and Secondary Contact Recreation; Drinking Water; Food Procurement; Groundwater Recharge, Industrial Water Supply, Irrigation; Livestock Watering on Main Stem Segments

Special Aquatic Life Support on segments 1, 3 Smoky Hill River (Elkader)
Expected Aquatic Life Support on remaining Main Stem Segments

2002 303(d) Listing: Cedar Bluff Lake Basin Streams

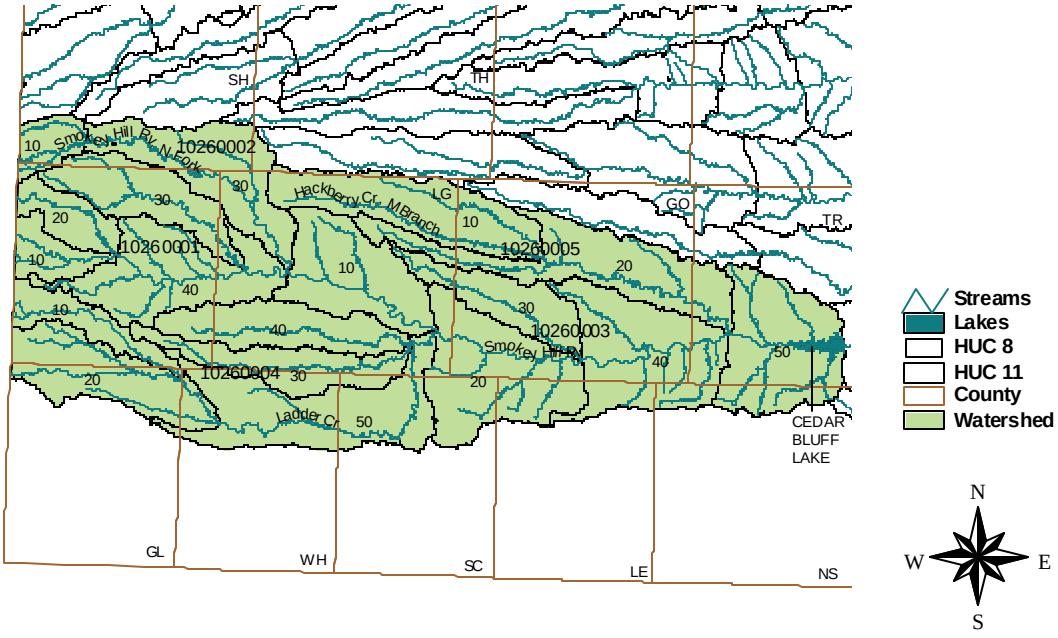
Impaired Use: Chronic Aquatic Life Support

Water Quality Standard: 5 Fg/liter for Chronic Aquatic Life; 20 Fg/liter for Acute Aquatic Life (KAR 28-16-28e(c)(2)(F)(ii)

In stream segments where background concentrations of naturally occurring substances, including chlorides and sulfates, exceed the domestic water supply criteria listed in table 1a in subsection (d), at ambient flow, due to intrusion of mineralized groundwater, the existing water quality shall be maintained, and the newly established numeric criteria for domestic water supply shall be the background concentration, as defined in K.A.R. 28-16-28b(e). Background concentrations shall be established using the methods outlined in the ‘‘Kansas implementation procedures: surface water quality standards,’’ as defined in K.A.R. 28-16-28b(ee), available upon request from the department. (K.A.R. 28-16-28e(c) (3)(B))

Figure 1

Cedar Bluff Lake HUC 8 and HUC 11



2. CURRENT WATER QUALITY CONDITION AND DESIRED ENDPOINT

Lake Monitoring Site: Station 013001 in Cedar Bluff Lake (Figure 2).

Period of Record Used: Six surveys during 1988 - 2003

Elevation Record: Cedar Bluff Reservoir near Ellis, KS (USGS Gage 06861500)

Stream Chemistry Monitoring Sites:

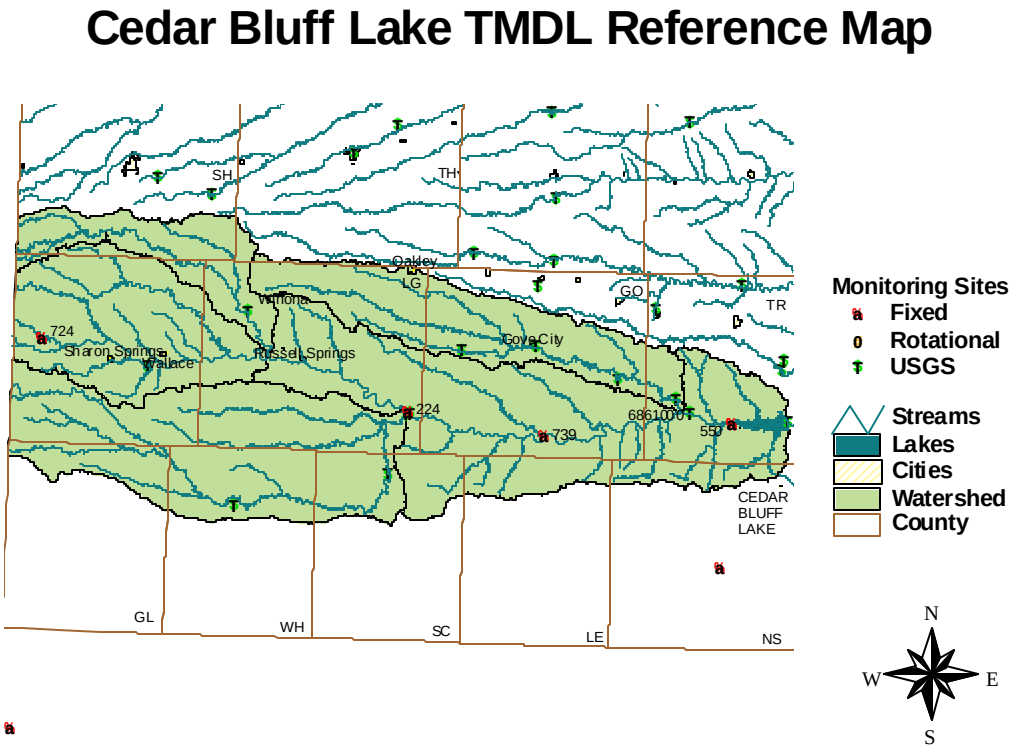
Station 224 near Elkader (Smoky Hill River); **Period of Record Used:** 1987 - 2003
Flow Record: Smoky Hill River at Elkader, KS (USGS Gage 06860000)
Long Term Flow Conditions: Median Flow = 0.5 cfs

Station 550 near Trego (Smoky Hill River); **Period of Record Used:** 1990 - 2003
Flow Record: Smoky Hill River near Arnold, KS (USGS Gage 06861000)
Long Term Flow Conditions: Median Flow = 1.1 cfs

Station 739 near Gove (Smoky Hill River); **Period of Record Used:** 2002 - 2003
Flow Record: Smoky Hill River near Arnold, KS (USGS Gage 06861000)
Long Term Flow Conditions: Median Flow = 1.1 cfs

Note: Station 724 is apart of the Willow Creek assessment unit, not impaired, and not included in this TMDL.

Figure 2



Current Condition: In 1991, the water level in Cedar Bluff Lake was down 49 feet, and selenium could not be detected. The flood of 1993 replenished the lake (Appendix B). The rain infiltrated the high selenium soils, and the runoff carried increased levels of selenium into the lake. In 1994, the selenium concentration rose to 0.0058 mg/L which is the only time on record that the concentration was above the water quality standard (Appendix A).

Average Selenium Concentration in Cedar Bluff Lake

Date	Selenium (mg/L)	Reservoir Forebay Elevation (ft)*
6/28/88	< 0.0010	2,104.3
7/31/91	< 0.0010	2,095.0
6/6/94	0.0058	2,122.2
6/24/97	0.0022	2,140.6
7/18/00	< 0.0020	2,144.5
8/4/03	0.0023	2138.97

*Normal Pool Elevation = 2,144.0 ft

Under normal flow conditions, the concentrations of selenium in Cedar Bluff Lake are usually below the concentrations in the Smoky Hill River at Elkader, Gove, and Trego during the six months prior to the lake sampling date (Figures 3). The stream chemistry frequently exceeds the chronic water quality standard (Figures 4, 5, & 6). Over the period of record, stations 550 and 739 had two excursions over the acute water quality standard. Based on the sample size, there are too few excursions to list the watershed for an acute aquatic life impairment.

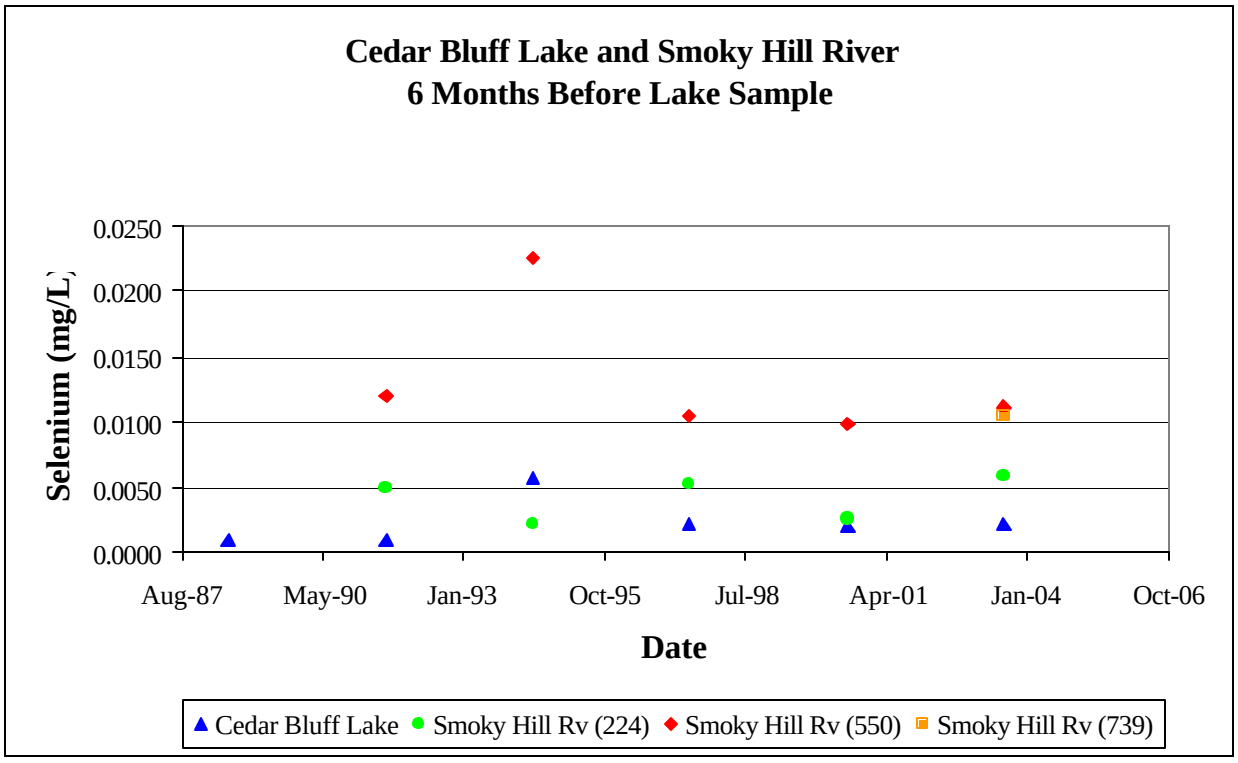


Figure 3

Figure 4

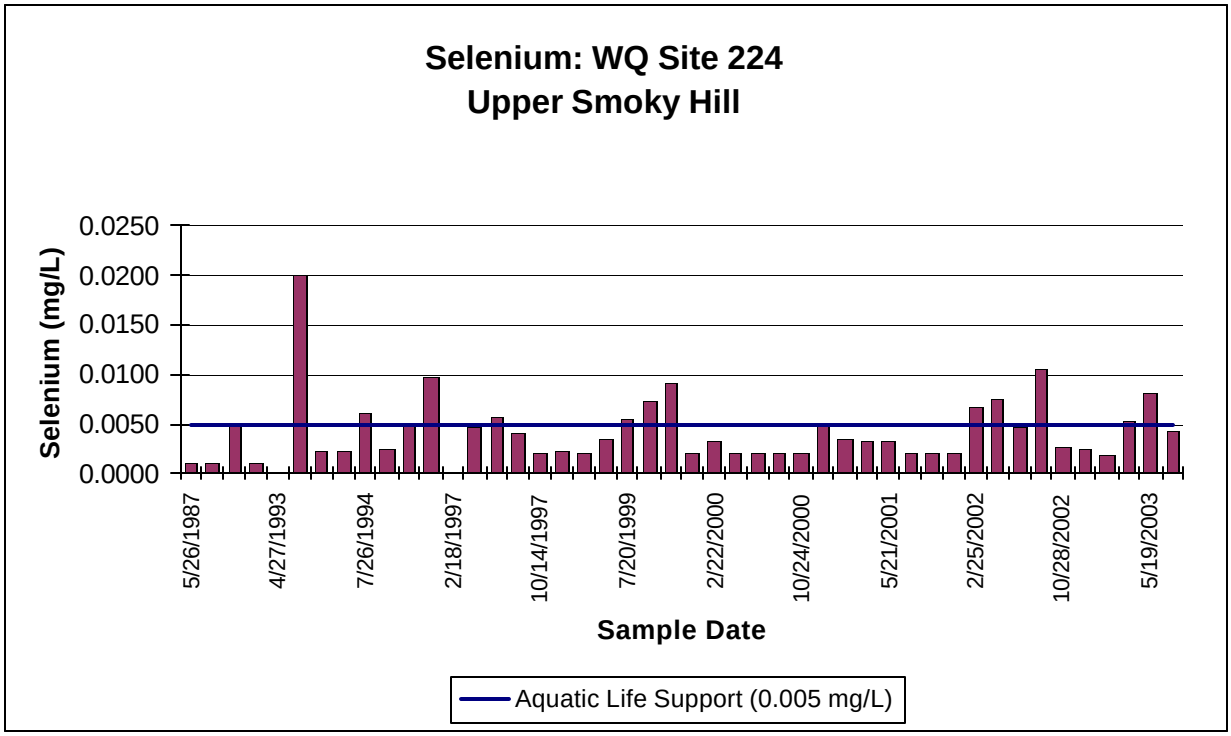
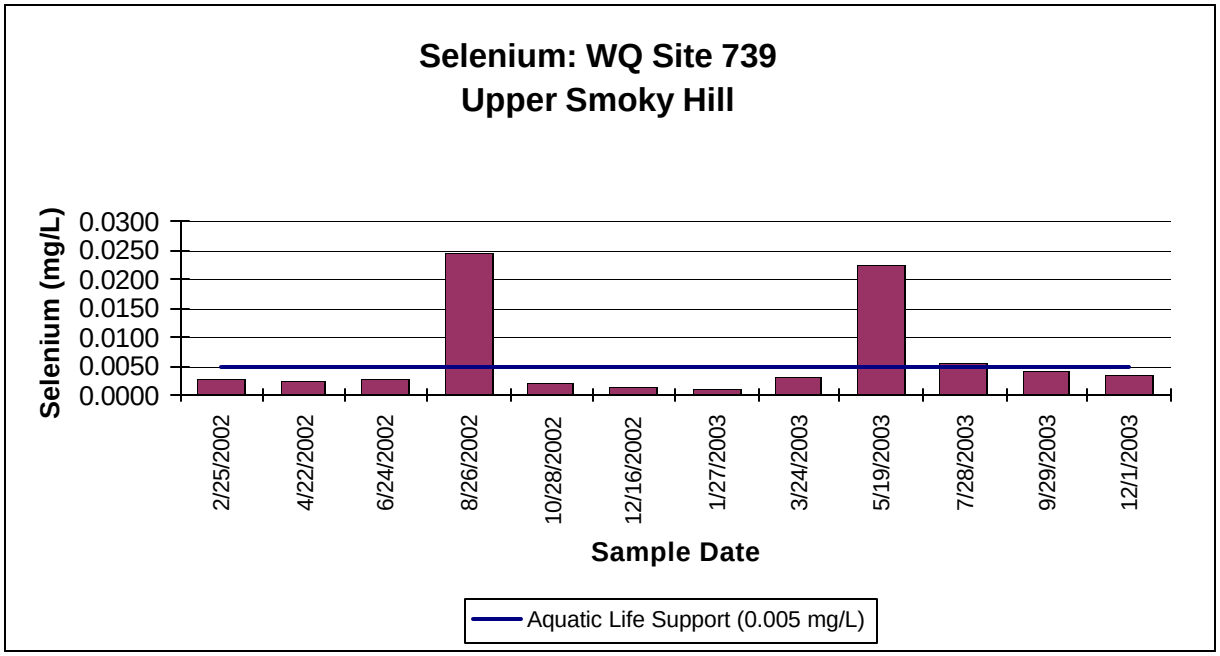


Figure 5



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. Sample data for the sampling sites were categorized for each of the three defined seasons: Spring (Apr-Jul), Summer-Fall (Aug-Oct) and Winter (Nov-Mar). High flows and runoff equate to lower flow durations; baseflow and point source influences generally occur in the 75-99% range. Load curves were established for the chronic Aquatic Life Support 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 tons of selenium per day. These load curves represent the TMDL since any point along the curve represents water quality for the standard at that flow. Historic excursions from the water quality standard are seen as plotted points above the load curves. Water quality standards are met for those points plotting below the load duration curves (Figures 7, 8, & 9).

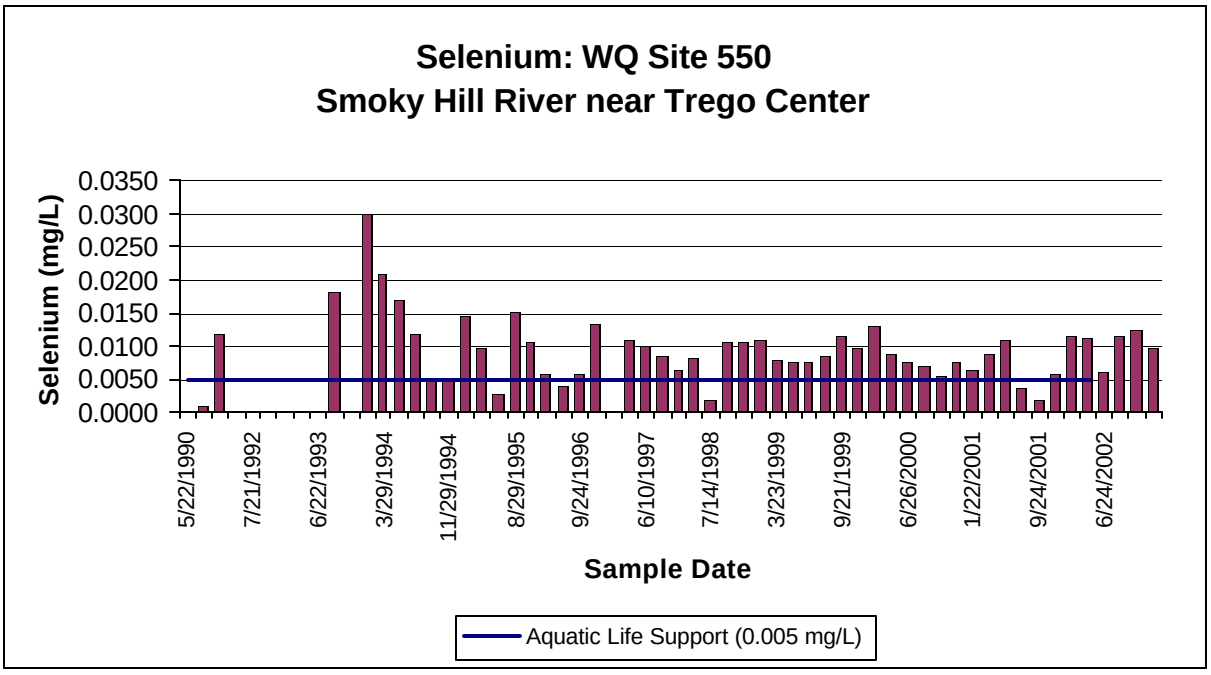
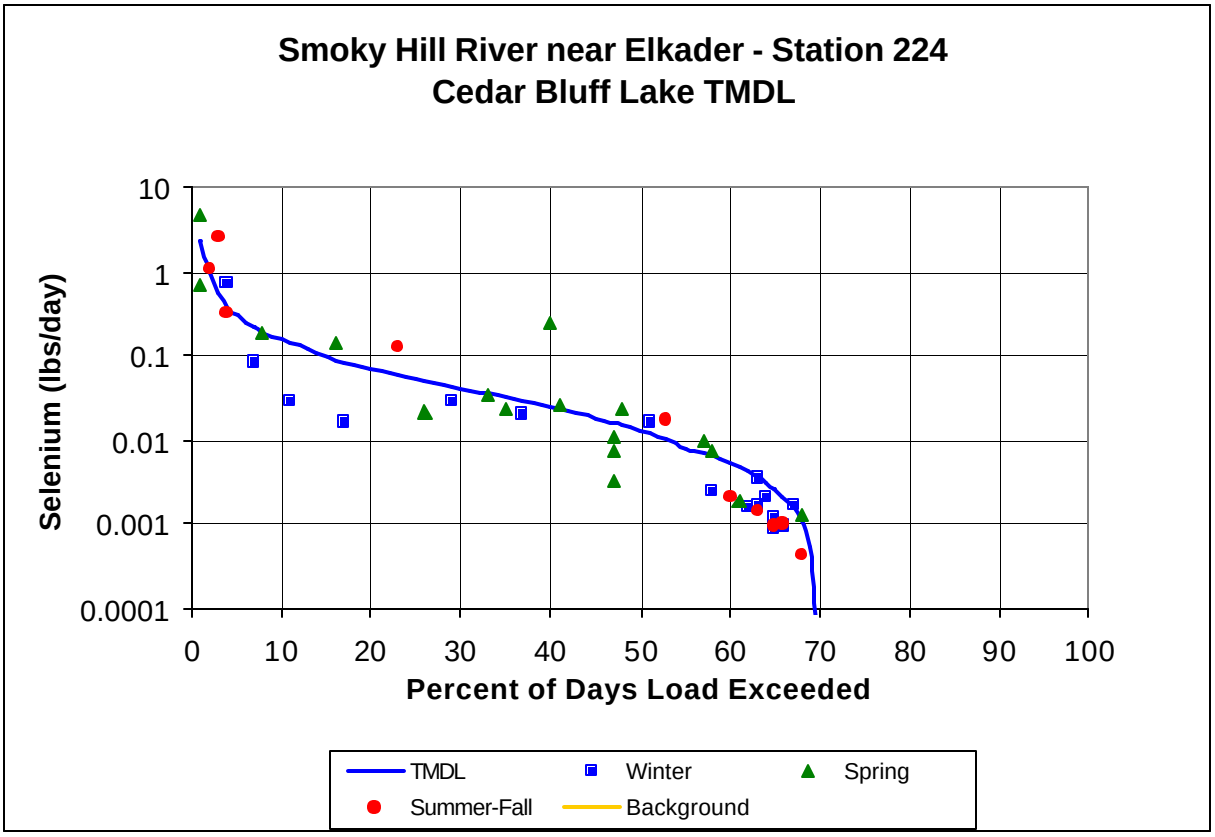


Figure 6

Figure 7

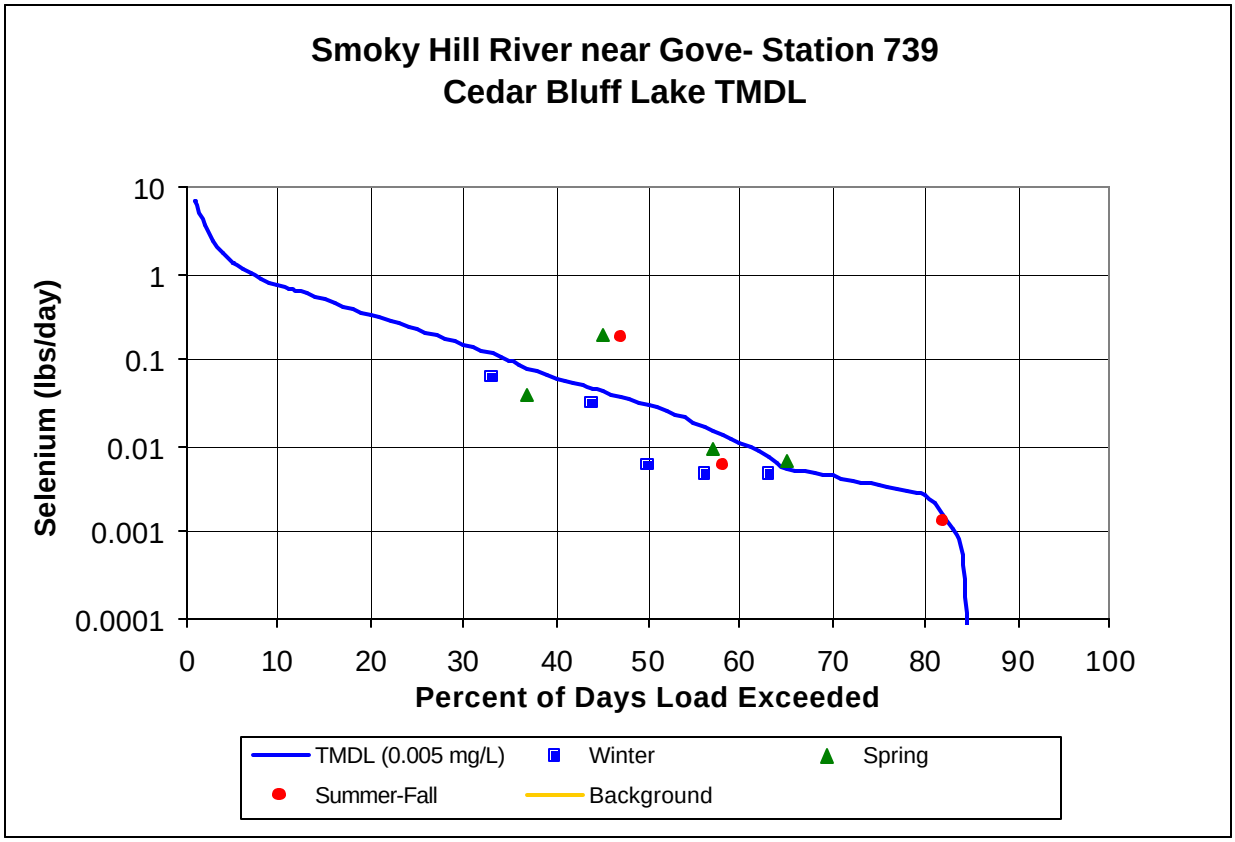


Station 224: Excursions were seen in each of the three defined seasons and are outlined below. Forty-seven percent of Spring samples and 30% of Summer-Fall samples were over the domestic supply criterion. Thirteen percent of Winter samples were over the criterion. Overall, 30% of the samples were over the criteria.

NUMBER OF SAMPLES OVER SELENIUM STANDARD OF 0.005 mg/L BY FLOW AND SEASON

Station	Season	0 to 10%	10 to 25%	25 to 50%	50 to 75%	75 to 90%	90 to 100%	Cum Freq.
Station 224 near Elkader (Smoky Hill River)	Spring	1	1	3	3	0	0	8/17 = 47%
	Summer	1	1	0	1	0	0	3/10 = 30%
	Winter	1	0	0	1	0	0	2/16 = 13%

Figure 8

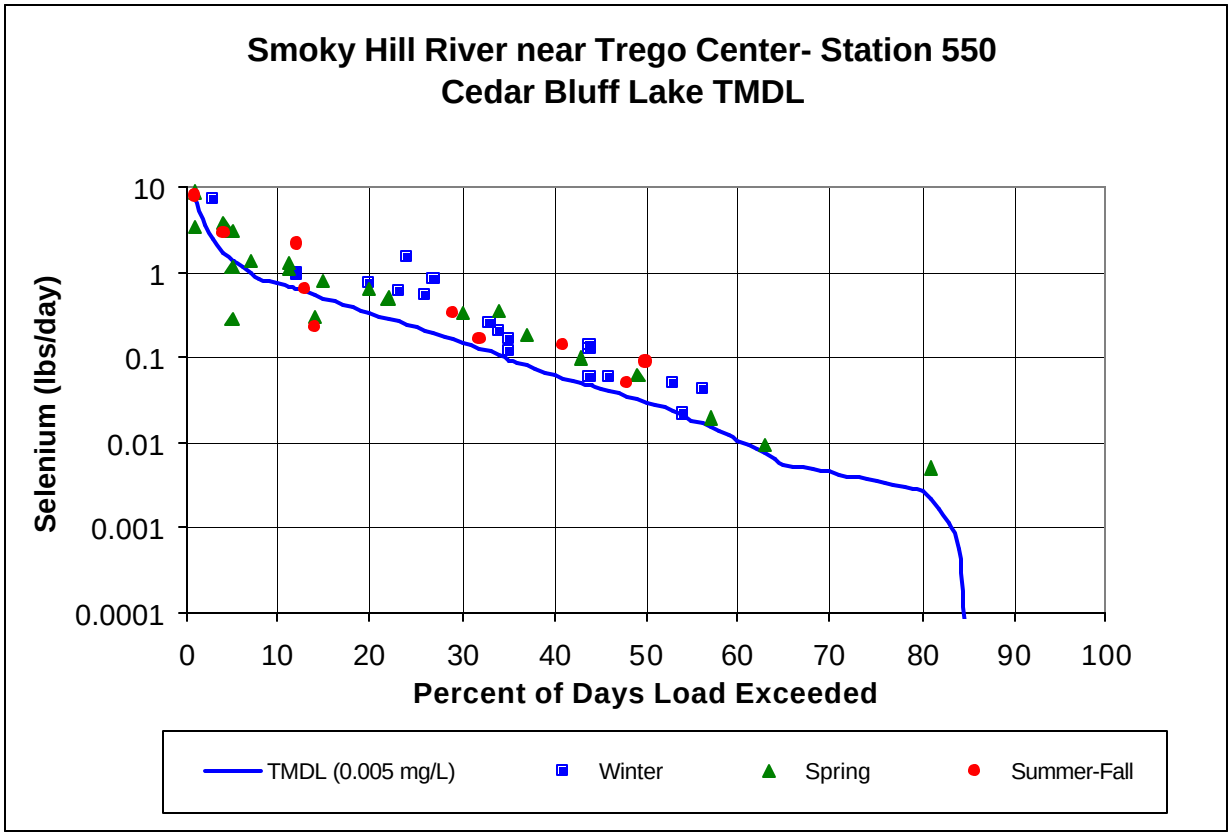


Station 739: Excursions were seen in each of the three defined seasons and are outlined below. Fifty percent of Spring samples and 33% of Summer-Fall samples were over the domestic supply criterion. Zero percent of Winter samples were over the criterion. Overall, 25% of the samples were over the criteria.

NUMBER OF SAMPLES OVER SELENIUM STANDARD OF 0.005 mg/L BY FLOW AND SEASON

Station	Season	0 to 10%	10 to 25%	25 to 50%	50 to 75%	75 to 90%	90 to 100%	Cum Freq.
Station 739 near Gove (Smoky Hill River)	Spring	0	0	1	1	0	0	2/4 = 50%
	Summer	0	0	1	0	0	0	1/3 = 33%
	Winter	0	0	0	0	0	0	0/5 = 0%

Figure 9



Station 550: Excursions were seen in each of the three defined seasons and are outlined below. Eighty-eight percent of Spring samples and 100% of Summer-Fall samples were over the domestic supply criterion. Ninety-four percent of Winter samples were over the criterion. Overall, 90% of the samples were over the criteria.

NUMBER OF SAMPLES OVER SELENIUM STANDARD OF 0.005 mg/L BY FLOW AND SEASON

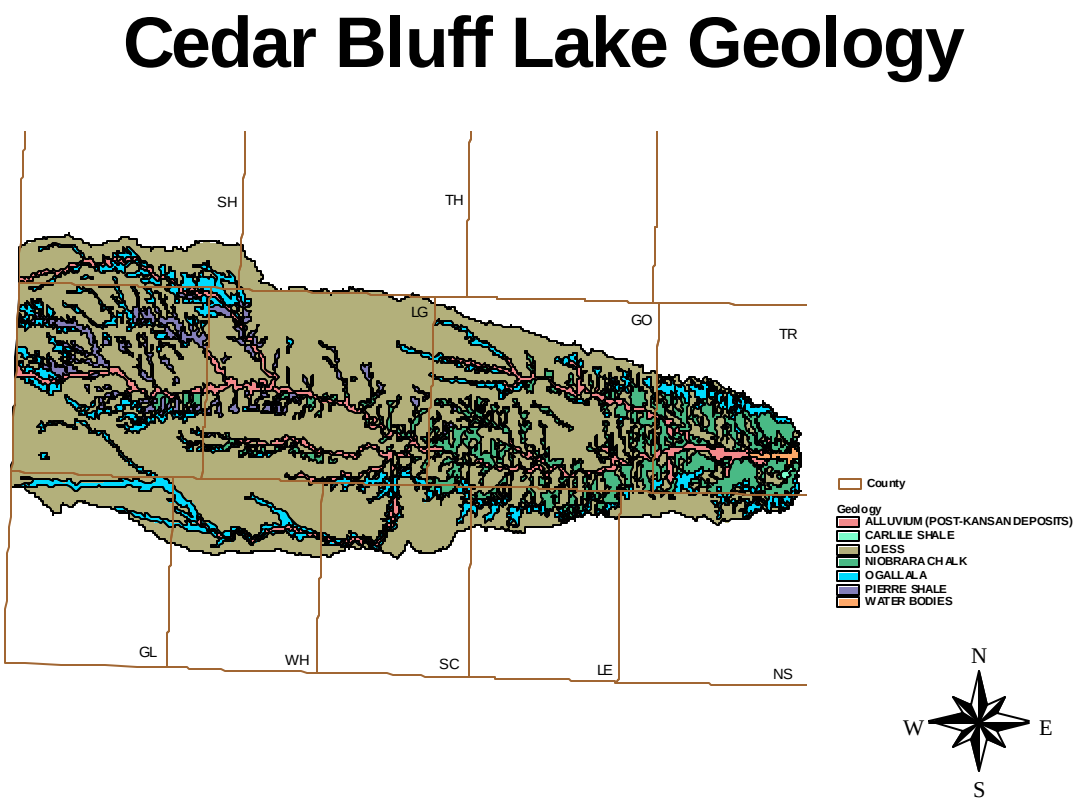
Station	Season	0 to 10%	10 to 25%	25 to 50%	50 to 75%	75 to 90%	90 to 100%	Cum Freq.
Station 550 near Trego (Smoky Hill River)	Spring	3	5	5	2	1	0	17/21 = 81%
	Summer	1	2	4	1	0	0	8/10 = 80%
	Winter	1	5	10	3	0	0	19/19 = 100%

Interim Endpoints of Water Quality (Implied Load Capacity) at Cedar Bluff Lake and Stations 224, 550, and 739 over 2008 - 2012:

The ultimate endpoint for this TMDL will be to achieve the Kansas Water Quality Standards fully supporting chronic aquatic life support. The current standard of 0.005 mg/L of selenium was used to establish the TMDL. The Cedar Bluff Lake Watershed is subject to loading of selenium from the underlying upper Cretaceous bedrock and its high selenium content. As such, the watershed's main stem often has elevated selenium levels from this natural source. Because some of this elevated selenium is tied to historic water consumption via surface water irrigation, the 0.005 mg/l endpoint will apply to all flows at Stations 224, 550, and 739.

Seasonal variation has been incorporated in this TMDL through the documentation of the seasonal consistency of elevated selenium levels. Achievement of the endpoints indicates 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.

3. SOURCE INVENTORY AND ASSESSMENT
Figure 10



The main natural source of selenium in the Smoky River basin upstream of Cedar Bluff Lake is from the weathering of upper Cretaceous bedrock that underlies the drainage basin. The upper Cretaceous bedrock, primarily the Niobrara Chalk and lower Pierre Shale, contains relatively high concentrations of selenium in comparison with other bedrock in Kansas. The bentonite beds, which are presumed to be of volcanic origin, in the Chalk and lower Pierre can be especially high in selenium. Soils weathered from the bedrock can have relatively high selenium content. Some plants growing in grasslands on soils containing high selenium concentration can accumulate enough selenium that they are toxic to livestock. Rainfall infiltrating through the high selenium soils and weathered bedrock leaches selenium. Water discharging from the soil and weathered bedrock transports dissolved selenium into streams. Evapotranspiration consumption of surface water and groundwater in the drainage basin then further increases the selenium concentration of the stream water.

No significant correlation exists between flow and selenium concentration over the period of record (Figure 11). Similar to the situation seen in the lake, the selenium concentration rose sharply after the 1993 flood (Figure 12). The levels at station 550 are significantly higher that the levels seen at stations 739 and 224. The concentration increases as the water flows downstream with a mean concentration of 0.0043 mg/L at station 224 to 0.0064 mg/L at station 739 and to 0.0095 mg/L at station 550.

The mean data suggest that the selenium concentration of the stations on the Smoky Hill River depends on the distribution of the flow derived from groundwater discharge and runoff from different parts of the watershed. Larger proportions of drainage derived from areas of Niobrara Chalk and Pierre Shale with greater leachable concentrations of selenium will be expected to produce stream flow with higher selenium values than for drainage mainly derived from the Tertiary sediments and thick loess cover. The increase in the average selenium concentration downstream in the Smoky Hill River is probably both to an increase in the percentage of the land surface with outcropping Niobrara Chalk and the impact of evapotranspiration to concentrate dissolved selenium along with other residual dissolved solids.

Figure 11

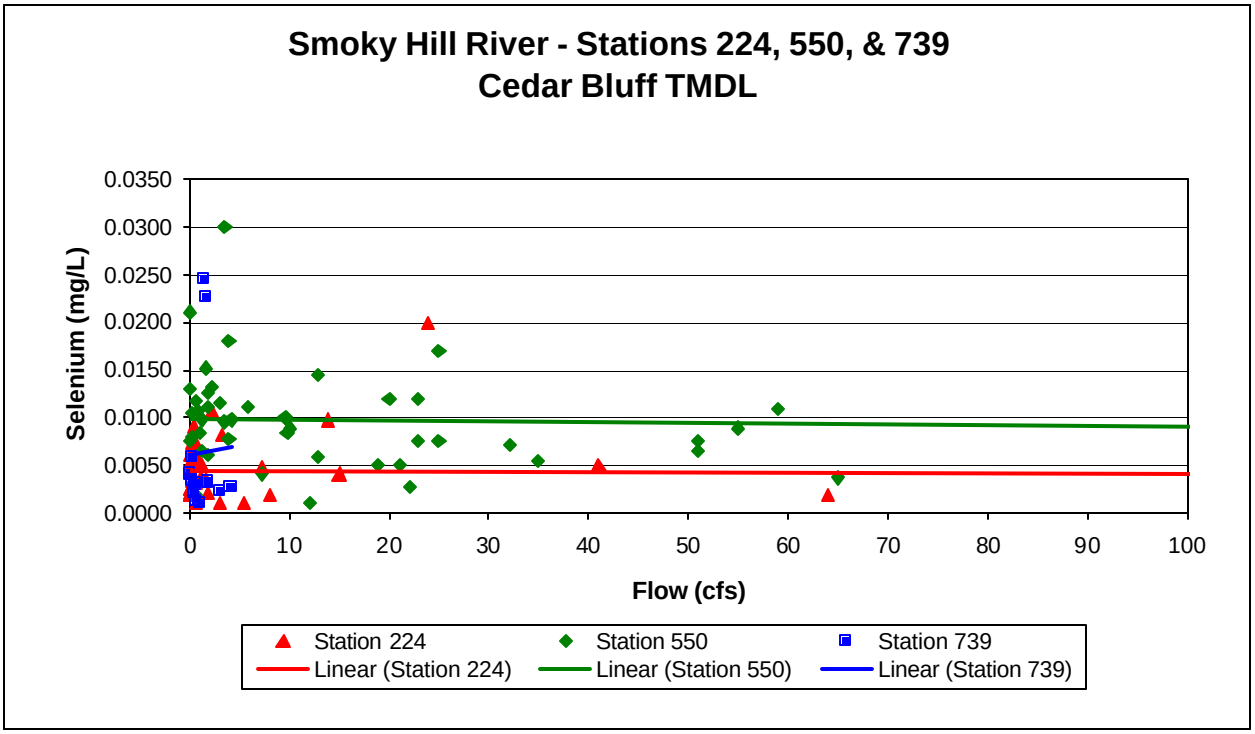
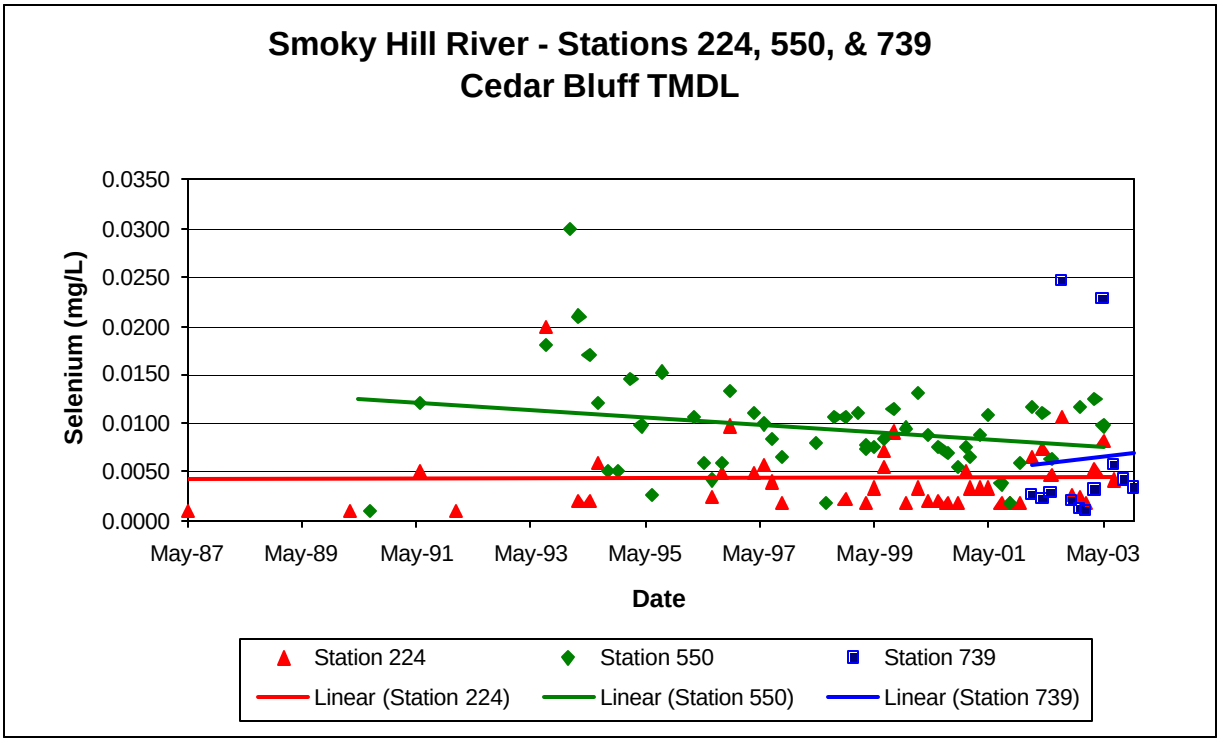


Figure 12

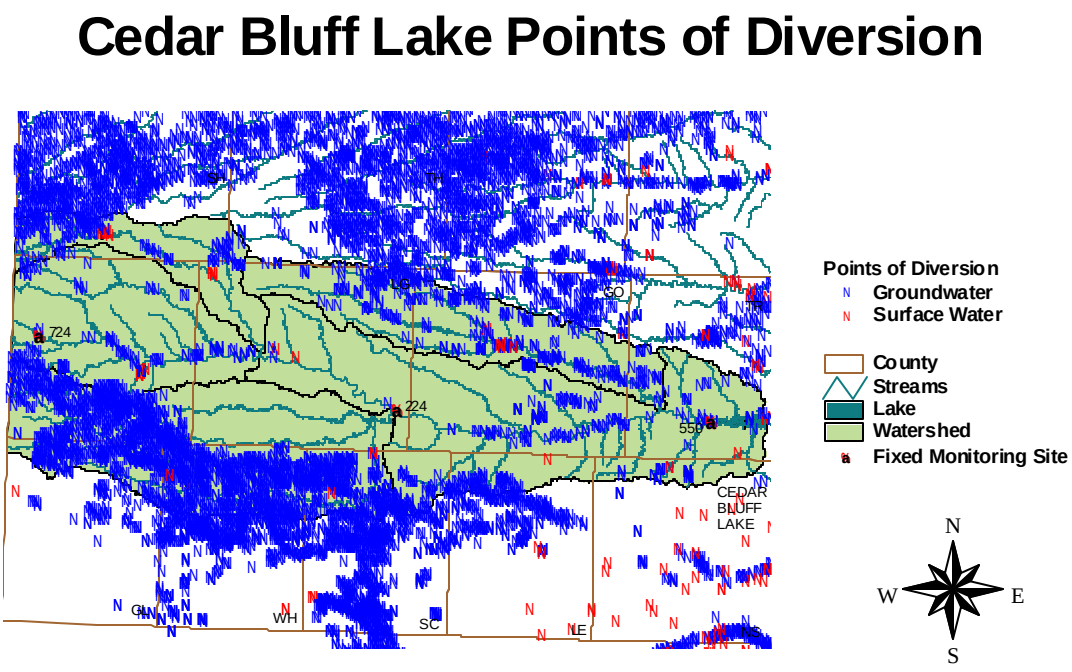


Irrigation Return Flows: Although there are surface water rights in the Smoky Hill River upstream of Cedar Bluff Reservoir (Figure 13), there is usually not enough water in the river to be used under these rights for irrigation. There is no known irrigation return flow that enters via canals or other constructed surface drainage into the Smoky Hill River upstream of Cedar Bluff Lake. Irrigation reports from 2003 show the following:

Water Use Statistics for Each Monitoring Site

Monitoring Sites	Surface Water		Groundwater	
	Area (acres)	Volume (acre-feet)	Area (acres)	Volume (acre-feet)
Station 224 near Elkader (Smoky Hill River)	0	0	145,124	147,706
Station 739 near Gove (Smoky Hill River)	0	0	7,968	10,023
Station 550 near Trego (Smoky Hill River)	105	60	47,234	47,158

Figure 13



Phreatophytes: Changes in phreatophyte species and density could have caused a long-term increase in the selenium concentration by increasing evapotranspiration consumption of water, leaving the residual dissolved solids, including selenium, in a smaller water volume. However, variations in climate and the

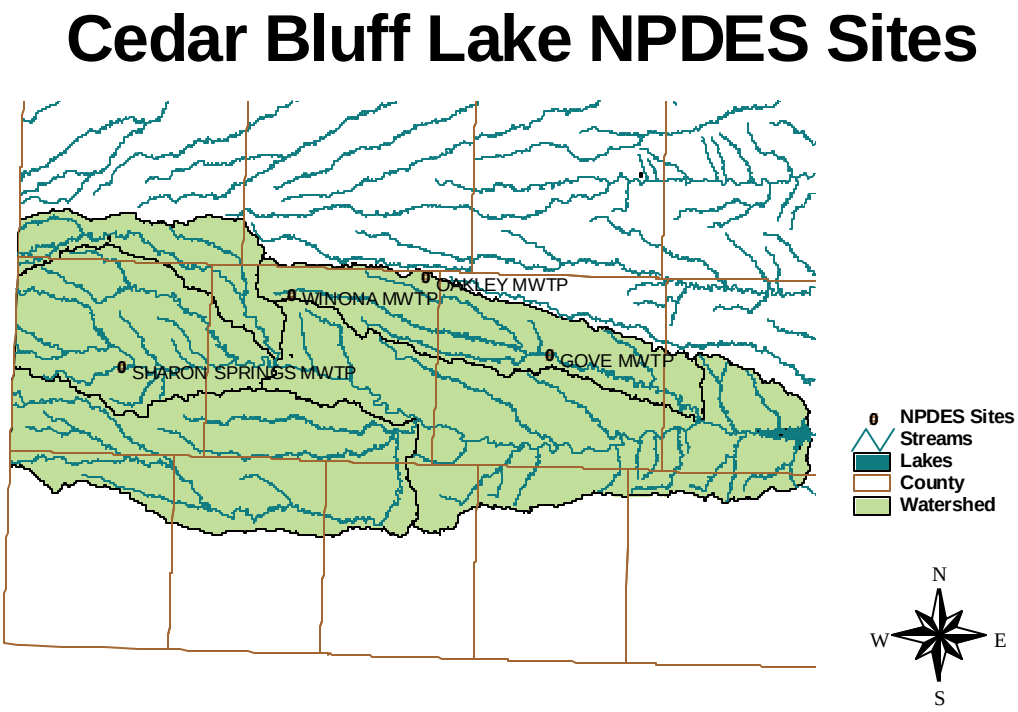
proportions of surface runoff, deeper soil moisture, and groundwater components of stream flow probably have a greater effect on the short-term variations in selenium concentration of the river than irrigation and phreatophyte distributions changes in the basin.

NPDES: Four permitted waste treatment facilities are located within the watershed (Figure 14). Three are non-overflowing lagoons that are prohibited from discharging. The Oakley MWTP discharges approximately 0.2 MGD based on monitoring data from last year. Any anthropogenic selenium sources or hydrologic modifications increasing the selenium concentration would be minor in comparison with the natural selenium source in the watershed.

Waste Treatment Plants in the Cedar Bluff Lake Watershed

Kansas Permit Number	Name	Type	Design Capacity (MGD)	S_e Wasteload Allocation
M-SH11-NO01	Gove MWTP	Two-cell Lagoon	Non-overflowing	0 lbs/day
M-SH29-OO01	Oakley MWTP	Trickling Filter	0.4	0.0175 lbs/day*
M-SH35-NO01	Sharon Springs MWTP	Two-cell Lagoon	Non-overflowing	0 lbs/day
M-SH41-NO01	Winona MWTP	Three-cell Lagoon	Non-overflowing	0 lbs/day

Figure 14



Since Oakley MWTP is not currently required to monitor for selenium in its effluent, the average selenium concentration for this municipal source was estimated based on the selenium in its influent, 0.0052 mg/L. For this mechanical plant, a one to one ratio was used to estimate the selenium in effluent from the city in the watershed's finished water.

Contributing Runoff: The watershed's average soil permeability is 1.7 inches/hour according to NRCS STATSGO database. About 77.9% of the watershed produces runoff even under relatively low (1.5''/hr) potential runoff conditions. Runoff is chiefly generated as infiltration excess with rainfall intensities greater than soil permeabilities. As the watersheds' soil profiles become saturated, excess overland flow is produced. Generally, storms producing less than 0.5"/hr of rain will generate runoff from 5.3% of this watershed, chiefly along the stream channels.

4. ALLOCATION OF POLLUTANT REDUCTION RESPONSIBILITY

The source assessment has ascertained that natural selenium loading within the watershed is overwhelmingly responsible for the excursions seen at the monitoring stations located within the Cedar Bluff Lake basin.

Point and Non-Point Sources: In the below table, the Wasteload and Load Allocations are given for all the stations included in this TMDL. The total Wasteload Allocation entering Cedar Bluff Lake is 0.0175 pounds per day.

Allocations for Cedar Bluff Lake Watershed

TMDL (0.005 mg/L)			
	SC224	SC550	SC739
Load Capacity	0.0135	0.0297	0.0297
Wasteload Allocation	0.0000*	0.0175	0.0000*
Load Allocation	0.0135	0.0122	0.0297

* Should future point sources be proposed in the subwatershed and discharge into the impaired segments, the current wasteload allocation will be revised by adjusting current load allocations to account for the presence and impact of these new point source dischargers.

DefinedMargin of Safety: There are varying degrees of impact on selenium levels from historic irrigation within the drainage of Cedar Bluff Lake. In the long term, the Load Allocations established by this TMDL reflect either the existing water quality standard or the background concentrations. The Margin of Safety implicitly assures these Load Allocations will achieve the endpoints of the TMDL through policies and objectives established under the Kansas Water Plan. Two objectives under the State Water Plan call for, by 2010; 1) reduction of water level decline rates within the Ogallala aquifer and implementation of enhanced water management in targeted areas; and, 2) reduction in the number of irrigation points of diversion for which the amount of water applied in acre-feet per acre exceeds an amount considered reasonable for the area and those [irrigation points of diversion] that overpump the amount authorized by their water rights. Pursuit of these two water conservation objectives will have water quality benefits, including assuring excessive irrigation will not directly or indirectly load surface waters with residual salts, thereby causing endpoints to be non-attained.

State Water Plan Implementation Priority: Because the selenium impairment is primarily from natural geologic sources, this TMDL will be a Low Priority for implementation.

Unified Watershed Assessment Priority Ranking: Cedar Bluff Lake lies within the Smoky Hill Headwaters (HUC 8: 10260001) with a priority ranking of 70 (Low Priority for restoration), North Fork Smoky Hill (HUC 8: 10260002) within Category IV, Upper Smoky Hill (HUC 8: 10260003) with a priority ranking of 66 (Low Priority for restoration), Ladder (HUC 8: 10260004) with a priority ranking of 65 (Low Priority for restoration), and Hackberry (HUC 8: 10260005) with a priority ranking of 68 (Low Priority for restoration).

Priority HUC 11s: The majority of the bedrock outcropping is in HUC 11 (10260005020, 10260003020, 10260003030, 10260003040, and 10260003050), and thus the Upper Smoky Hill and Hackberry subwatersheds should take priority.

5. IMPLEMENTATION

Desired Implementation Activities

1. Monitor any anthropogenic contributions of selenium loading to the lake and rivers.
2. Establish an alternative background criterion.
3. Evaluate irrigation management practices for reducing salt leaching.

Implementation Programs Guidance

NPDES and State Permits - KDHE

a. Municipal permits for facilities in the watershed will be renewed after 2004 with annual selenium monitoring and any excessive selenium discharge will have appropriate permit limits which does not increase the ambient background levels of selenium.

Non-Point Source Pollution Technical Assistance - KDHE

a. Evaluate any potential anthropogenic activities which might contribute selenium to the lake as part of an overall Watershed Restoration and Protection Strategy.

b. Evaluate impact of irrigation return flows on selenium loading to streams.

Water Quality Standards and Assessment - KDHE

a. Establish background levels of selenium for the rivers, tributaries, and lake.

Subbasin Management - DWR

a. Evaluate Best Management Practices for irrigation which decrease salt loading to streams.

Time Frame for Implementation: Development of a background level-based water quality standard should be accomplished with the 2006 water quality standards revision.

Targeted Participants: Primary participants for implementation will be KDHE and DWR.

Milestone for 2008: The year 2008 marks the midpoint of the ten-year implementation window for the watershed. At that point in time, additional monitoring data from Cedar Bluff Lake will be reexamined to confirm the impaired status of the lake and the suggested background concentration. Should the case of impairment remain, source assessment, allocation and implementation activities will ensue.

Delivery Agents: The primary delivery agents for program participation will be the Kansas Department of Health and Environment and the Division of Water Resources.

Reasonable Assurances:

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

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 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.

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 nonpoint 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.*

6. The *Kansas Water Plan* and the Smoky Hill/Saline 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 pollutant 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 are a Low Priority consideration and should not receive funding.

Effectiveness: Minimal control can be exerted on the amount of natural background.

6. MONITORING

KDHE will continue to collect samples from Cedar Bluff Lake and at Stations 224, 550, and 739. Based on that sampling, the priority status will be evaluated in 2007 including application of a numeric criterion based on background concentrations. 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 2008-2012.

Monitoring of selenium levels in effluent will be a condition of NPDES and state permits for facilities. This monitoring will continually assess the functionality of the systems in reducing selenium levels in the effluent released to the streams upstream of Cedar Bluff Lake.

7. FEEDBACK

Public Meetings: Public meetings to discuss TMDLs in the Smoky Hill/Saline Basin were held January 7 and March 5, 2003 in Hays. 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 Smoky Hill/Saline Basin.

Public Hearing: A Public Hearing on the TMDLs of the Smoky Hill/Saline Basin was held in Hays on June 2, 2003.

Basin Advisory Committee: The Smoky Hill/Saline Basin Advisory Committee met to discuss the TMDLs in the basin on October 3, 2002, January 7, March 5, and June 2, 2003.

Milestone Evaluation: In 2008, evaluation will be made as to the degree of implementation which has occurred within the watershed and current condition of Cedar Bluff Lake. Subsequent decisions will be made regarding the implementation approach and follow up of additional implementation in the watershed.

Consideration for 303(d) Delisting: The lake will be evaluated for delisting under Section 303(d), based on the monitoring data over the period 2008-2012. Therefore, the decision for delisting will come about in the preparation of the 2012 303(d) 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 2004 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 2004-2008.

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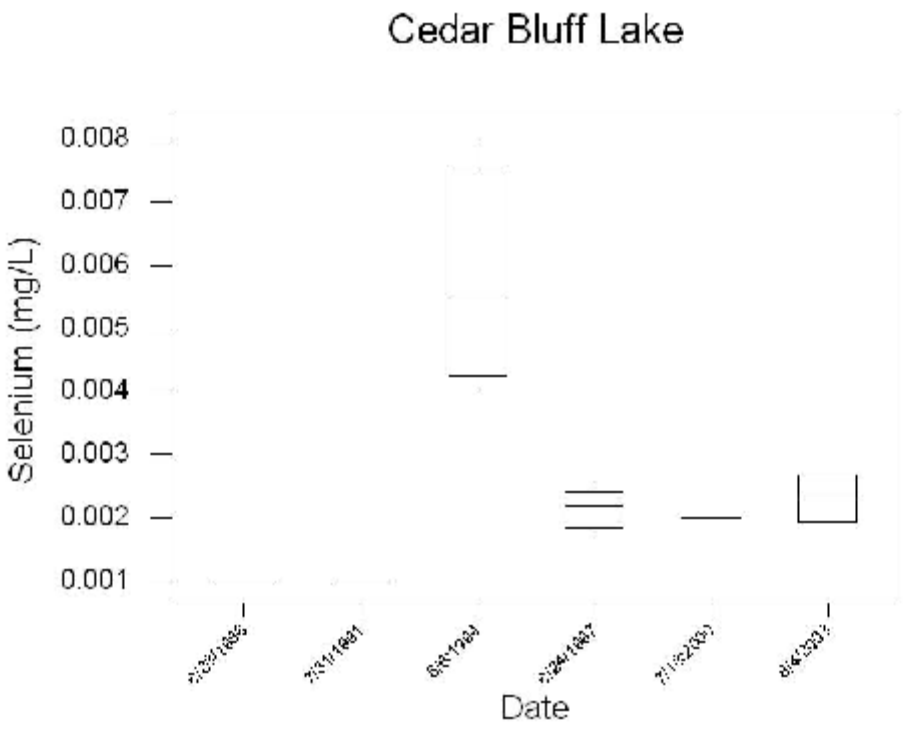
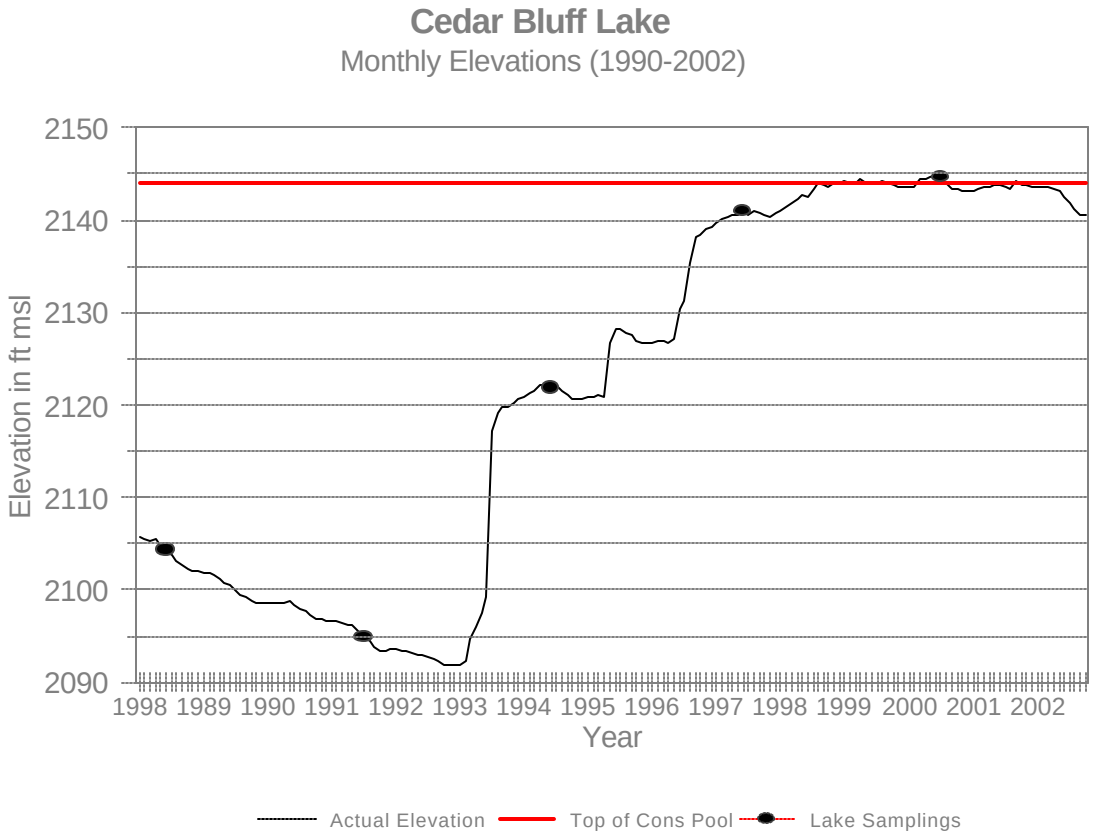
Appendix A - Boxplot



Appendix B - Monthly Elevations



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