TMDL FACT SHEET

UNNAMED TRIBUTARY (UT) TO SOUTH FORK RUSSELL CREEK AT RIVER MILE (RM) 4.85

Project Name:	UT to South Fork Russell Creek at RM 4.85: Chlorides/TDS/Salinity
Location:	Green County, Kentucky
Scope/Size:	UT at RM 4.85: RM 0.0 to 0.6
TMDL Issues:	Point and Nonpoint Sources
Data Sources:	Kentucky Dept. for Environmental Protection Division of Water (KDEP-DOW), SMC Martin Inc.
Control Measures:	KPDES Regulations, Kentucky Nonpoint Source TMDL Implementation Plan, Kentucky Watershed Framework
Summary:	In 1993, the UT at RM 4.85, a tributary to South Fork Russell Creek, was determined not to be supporting the designated use of aquatic life. Therefore, the stream was listed on the 303(d) list for Total Maximum Daily Load (TMDL) development. The stream segment was impacted by chlorides (in conjunction with total dissolved solids [TDS], and salinity), the result of brine

discharges to surface streams from oil production activities (stripper wells). The period of greatest impact was during low base-flow conditions. Currently, no oil production activity is occurring; however, the potential exists for this to reoccur, thus the need for this TMDL.

TMDL Development: Total maximum daily loads in pounds per day (lbs/day) were computed based on the allowable maximum concentration for chloride (the standard for chronic exposure is 600 milligrams per liter [mg/l] for warm water aquatic habitat) and the estimated 7-day, 10-year low-flow value (0.00 ft^3/sec). The TMDL was done for chloride because numerical criteria are available for chloride but not for TDS or salinity. Because these parameters are so closely related to chloride, the TMDL for chloride will also account for impairments resulting from TDS and salinity.

The total allowable chloride load is 0.00 lbs/day for the UT at RM 4.85 of South Fork Russell Creek. There are currently no permitted dischargers of chloride (WLAs) and the 7-day 10-year low-flow value is 0.00 ft^3/sec (which is the critical flow condition). Therefore, the current load from WLAs is 0.00 lbs/day. The allowable

load for contributions from nonpoint sources and from natural background (LAs) is also 0.00 lbs/day because the 7-day 10-year low-flow value is 0.00 ft^3/sec (which is the critical flow condition). Chloride concentrations at the control site (indicative of background conditions) were about 4 mg/l during the December 1993 synoptic survey, when the stream was flowing. However, because the 7-day 10-year low-flow value is 0.00 ft^3/sec, the background load is therefore 0.00 lbs/day. Also, allowable nonpoint source contributions (which would most likely come from failing separator tanks or holding ponds, or seepage from holding ponds) is 0.00 lbs/day.

However, for permit requests that may be received in the future by the KDEP-DOW, the allowable loads provided in this TMDL will be modified to account for the permitted flow. The permittee will be allowed 50 percent of the requested load (in effect, meeting a chloride concentration of 300 mg/l). The remaining 50 percent of the load will be allocated to nonpoint sources of chloride as a margin of safety (implicit) to account for uncontrollable or unknown nonpoint sources (failing separator tanks or holding ponds, abandoned wells, seepage from holding ponds, or other sources).

Permit applications requesting to exceed the 50 percent allowable load allocation would be approved by the KDEP-DOW, provided that the applicant remove an equivalent amount from nonpoint sources in the watershed (referred to as an offset), such as separator tanks or abandoned holding ponds. At no time would permits be approved beyond 80 percent of the requested load (in effect, meeting a chloride concentration of 480 mg/l). This would provide at least a 20 percent margin of safety (explicit) to account for uncontrollable or unidentified nonpoint sources. The allocations were made in this manner because of the uncertainty of the impact of abandoned ponds and failing separator tanks.

Implementation Controls: Discharge permits were required from oil producers starting in 1987. Throughout the state, many of these permits were not renewed by the producers because production has ceased or has significantly decreased. Production in Kentucky dropped from 17,700 barrels in 1986 to 9,400 barrels in 1996. Correspondingly, production has decreased in the South Fork Russell Creek basin. The drop in production was likely the result of a drop in crude oil prices worldwide in the 1990's, making production less economical,

particularly for smaller producers. Chloride levels from nonpoint sources should decrease over time as dilution lowers concentration levels in existing ponds. In this respect, this TMDL is a Phased TMDL. Follow-up monitoring will need to be conducted to assess the water quality of the stream. The chloride level for the UT at RM 4.85 on December 21, 1993 was 201 mg/l, which is lower than Kentucky's water quality standard for chloride. However, the biological assessment showed that the UT at RM 4.85 was not meeting the designated use of aquatic life, indicating that the stream had not yet recovered (in 1993) from past practices related to the disposal of brine.

Kentucky is currently conducting stream monitoring on a watershed basis. Sampling to determine levels of chloride, TDS, and salinity will be conducted during the period April 2001 to March 2002 in this watershed. If chloride concentrations are determined to be below 600 mg/l and the biological community is no longer impaired, then a request will be made to remove the stream from the list of impaired waters.

If oil production in the basin appreciably increases (which would most likely result from increasing oil prices or an oil supply shortage), permit compliance will be

pursued, and periodic monitoring of stream water quality (including chloride, TDS, and salinity levels) will be conducted as deemed appropriate.