

TMDL FACT SHEET

FLEMING CREEK WATERSHED

Project Name: Fleming Creek Watershed: Pathogens
Includes Allison Creek, Craintown Branch, Doty Creek, Fleming Creek, Sleepy Run, Town Branch, Wilson Run, Cassidy Creek, Logan Run, Poplar Creek, and the Unnamed Tributary (UT) at River Mile (RM) 4.28.

Location: Fleming County, Kentucky

Scope/Size:

Allison Creek	River Mile 0.0 to 4.7
Craintown Branch	River Mile 0.0 to 3.5
Doty Creek	River Mile 0.0 to 4.0
Fleming Creek	River Mile 0.0 to 39.2
Sleepy Run	River Mile 0.0 to 2.8
Town Branch	River Mile 0.0 to 4.0
Wilson Run	River Mile 0.0 to 5.1
Cassidy Creek	River Mile 0.0 to 3.9
Logan Run	River Mile 0.0 to 2.3
Poplar Creek	River Mile 0.0 to 3.1
UT at RM 4.28	River Mile 0.0 to 2.2

TMDL Issues: Point and Nonpoint Sources

Data Sources: KY Dept for Environmental Protection - Division of Water (DOW)

Control Measures: KY Pollutant Discharge Elimination System (KPDES) Regulations
KY No Discharge Operational Permit (KNDOP)
KY Non-point Source TMDL Implementation Plan
KY Watershed Management Framework
KY Agriculture Water Quality Act

Summary: The first 7 streams listed above were determined as not supporting the designated use of swimming and were therefore included on the 1994 and subsequent 303(d) lists for Total Maximum Daily Load (TMDL) development. A subsequent review of the data when this TMDL was developed indicated that 4 additional stream segments were also not supporting of the designated use of swimming because of pathogens contamination. The 11 stream segments are impacted by both point and nonpoint sources, but

mostly by nonpoint sources (polluted runoff from beef cattle and dairy operations). The greatest impact occurs during runoff events, but fecal coliform levels (which are used as an indicator of pathogens contamination) are high during base-flow conditions at several stream locations.

TMDL Development: Total maximum daily loads of fecal coliform (FC) in colonies per day were computed based on the allowable maximum FC value, of 400 colonies per 100 milliliters of sample in no more than 20 percent of samples during routine (monthly) sampling). For point source dischargers, the FC count shall not exceed 200 colonies/100 ml of sample (based on a geometric mean of 5 samples taken during a 30-day period) and shall not exceed 400 colonies per 100 milliliters of sample in 20 percent or more of all samples taken during the month. Although this level of data collection is generally not available, the dischargers are required to submit Discharge Monitoring Reports (DMRs) to the KDOW which includes a reporting of the monthly mean and the maximum FC determination of the effluent. The base-flow and runoff streamflow values correspond to a 90 percent and 10 percent daily streamflow exceedance value, respectively. This value is appropriate for this watershed, where 7Q10 streamflow for the main stem and tributaries is zero and where a 10 percent exceedance of the daily flow represents a normal runoff condition. The Waste Load Allocation (WLA) value is based on an FC count of 200 and the design flow of 1.0 cfs (0.66 mgd). Background loads for the base-flow and runoff conditions were based on a FC count of 10 and 50 colonies, respectively. Load Allocations (LAs) were determined by subtracting the WLA from the total load. The WLA incorporates background load, which can be delineated. The

Margin of Safety is based on a FC count of 25 colonies. The allowable FC loads are given in Tables 1 and 2.

Table 1. The Allowable Fecal Coliform Loads for the Base-flow Condition (xE8 colonies/day)

<u>Stream</u>	<u>WLA</u>	<u>LA</u>	<u>Background</u>	<u>Margin of Safety</u>
UT at RM 4.28	0	3.6	0.1	0.2
Poplar Creek	0	6.2	0.2	0.4
Doty Creek	0	22.3	0.6	1.5
Craintown Branch	0	5.3	0.2	0.4
Cassidy Creek	0	6.2	0.2	0.4
Allison Run	0	62.4	1.7	4.3
Wilson Run	0	11.0	1.0	1.0
Sleepy Run	0	5.3	0.2	0.4
Logan Run	0	5.3	0.2	0.4
Town Branch	48.8	8.6	0.6	0.6
Fleming Creek	0	124.9	3.4	8.5

Table 2. The Allowable Fecal Coliform Loads for the Runoff Condition (xE8 colonies/day)

<u>Stream</u>	<u>WLA</u>	<u>LA</u>	<u>Background</u>	<u>Margin of Safety</u>
UT at RM 4.28	0	468	72	36
Poplar Creek	0	953	146	73
Doty Creek	0	199	30	15
Craintown Branch	0	9,590	120	60
Cassidy Creek	0	951	146	73
Allison Run	0	2,145	330	165
Wilson Run	0	1,660	260	130
Sleepy Run	0	800	120	60
Logan Run	0	800	120	60
Town Branch	49	1,508	232	116
Fleming Creek	0	26,900	4,200	2,100

Implementation

Controls:

This will be a phased TMDL because of the presence of nonpoint sources of pollution on all of the stream reaches listed. A phased TMDL is necessary when the efficiency of remedial activities is unknown. Remedial activities will need to be implemented, and follow-up monitoring will need to be conducted. If water quality standards are still not being met upon review of the data from the

follow-up monitoring, the remedial activities will need to be modified. To assist in developing a remediation strategy, the Kentucky Watershed Management Framework (KWMF) will be utilized in conjunction with the Kentucky Agriculture Water Quality Plan (KAWQP) of 1996, which was developed by the Kentucky Agriculture Water Quality Authority (KAWQA, 1996). The KWMF is based on 5 watershed units, each on a 5-year cycle. Selected activities are planned during each year of the 5-year cycle. As part of the KWMF, a Licking River Basin Unit Team, with a Basin Coordinator, has been formed to carry out certain recommended activities. One of these activities is to develop a Local Watershed Task Force, which will then be asked to develop a Local Action Plan. The Local Action Plan will be the document that describes the remediation activities that are needed and how implementation will be achieved. The KAWQPs will be an integral part of the Action Plan. The Action Plan will be developed in the fourth year of the five-year cycle, and Implementation will occur in the fifth year of the cycle. This information is described in a document developed by the KDOW for addressing nonpoint TMDLs; Implementation Plan for Achieving Load Allocations for Nonpoint Source TMDLs. The Licking River Basin Unit is currently in the second year of the Watershed cycle. Stakeholder groups currently exist within the watershed and will be asked to participate in this process of developing an Action Plan.

Remedial actions to nonpoint sources of pollution will be taken based on the establishment of BMPs as described in the KAWQP of 1996 (KAWQA, 1996). Agricultural operations (including silviculture) of 10 acres or more must develop and implement a water quality plan (based on guidance from the KAWQP) for their agricultural operation by October 23, 2001. To assist landowners in developing their plan, the KAWQA developed

The Producer Workbook (KAWQA, 1997) is available along with many other planning tools through conservation districts and county extension offices. The tools were designed to provide a process for developing an individual water quality plan and also gives a list of contacts at various State and Federal agencies that can provide technical and financial assistance to develop and implement the plan.

The Fleming Creek Demonstration Project was initiated in 1992 by a group of local landowners concerned about the water quality of Fleming Creek and its tributaries. They formed the Fleming Creek Water Quality Committee, which was dedicated to assessing the needs and interests of all local citizens. Initially, this committee coordinated with local farmers and government agencies and represented the farmers. As the project evolved, the Community Farm Alliance (CFA) became the principal grassroots coordinating organization for those groups.

Tables 3 and 4 provide information on BMPs that have been installed in the watershed. The tables use data provided by the Division of Conservation (DOC, written commun., 1999). Also, an application was submitted by KDOW to the National Forum on Nonpoint Source Pollution (a private organization dedicated to finding solutions for nonpoint source pollution control) soliciting additional funds for animal waste management systems. Farm field days have been held at selected operations to encourage the use of and to demonstrate the benefit of BMPs to vicinity farmers. It is anticipated that the number of farmers that incorporate BMPs into their operations will increase.

Table 3. Applied Best Management Practices (BMPs) in the Fleming Creek Watershed, May 1, 1990 to May 31, 1994 (Peake, KDOW, written commun., 2000).

<u>Type of BMP</u>	<u>Funding Source</u>	<u>Unit</u>
Trough or Tank	FSA	124
Waste Management System	LTA, WSP	12
Diversion	LTA	800 feet
Fencing	LTA	1,200 feet
Waste Storage Pond	LTA	1
Heavy Use Area Protection	LTA	1 acre
Waste Utilization	LTA, WSP	107 acres
Filter Strip	WSP	2 acres

FSA = Food Security Act

LTA = Long Term Agreement

WSP = Water Quality Special Project

Table 4. Applied Best Management Practices (BMPs) in the Fleming Creek Watershed, June 1, 1994 to June 1, 1999 (Peake, KDOW, written commun., 2000).

<u>Type of BMP</u>	<u>Funding Source</u>	<u>Unit</u>
Waste Management System	CTA, FSA, LTA, WSP	16
Waste Storage Facility	CTA, FSA, LTA, WSP	13
Cover & Green Manure Crop	CTA	70 acres
Pond	CTA, FSA	8
Fencing	CTA, FSA	900 feet
Trough or Tank	CTA, FSA, WQP	190
Waste Utilization	CTA, FSA, WSP	239 acres
Filter Strip	FSA	4 acres
Use Exclusion	FSA	100 acres
Prescribed Grazing	FSA	30 acres
Heavy Use Area Protection	FSA, WSP	5 acres
Nutrient Management	FSA	40 acres
Sediment Basin	LTA	2
Waste Storage Pond	WSP	3

CTA = Conservation Technical Assistance

FSA = Food Security Act

LTA = Long Term Agreement

WSP = Water Quality Special Project

WQP = Water Quality Demonstration Project

More recently (1999), a work plan for the Fleming Creek CWAP has been submitted by the DOC to continue the work of identifying, evaluating, and implementing agricultural BMPs in the watershed (KDOW, 1999). The BMPs will permit sustained use of natural resources by meeting specific quality criteria. Follow-up monitoring will also be conducted as part of the project. Also, a proposal has been developed for an Agricultural Watershed Awareness Program (AWAP) by the DOC (Giesecke, written commun., 1999) to develop and foster educational programs to enhance the awareness of people living in the watershed to activities that promote the protection of water quality. Monitoring is proposed as part of the educational activities.

Animal feeding operations (AFOs) are permitted under 401 KAR 5:005 using a Kentucky No Discharge Operational Permit (KNDOP) for Agricultural Wastes Handling System. The Natural Resources Conservation Service (NRCS) works with the permittee to develop a Nutrient Management Plan for the handling of the wastes that are produced. KDOW Field Offices are currently involved in extensive surveillance activities to inventory both permitted and unpermitted AFOs. Regulations are currently being developed to define siting criteria for Concentrated Animal Feeding Operations (CAFOs) for beef and dairy operations and for the permittee to perform certain monitoring tasks. CAFOs would need a KPDES permit. A CAFO is generally defined as an animal feeding operation with more than 1000 animal units, with a beef cow being designated as 1.0 animal unit. The KPDES permit for beef and dairy operations would also require that a (more detailed) Comprehensive Nutrient Management Plan be developed which uses the most recent NRCS guidelines as a basis for waste management. The regulatory authority for remediating nonpoint sources of pollution from agricultural and silviculture operations in Kentucky is derived from:

(1) Kentucky Revised Statutes (KRS) 224; more specifically Title 401 of the Kentucky Administrative Regulations (KRA), Chapter 5, Section 31 (401 KAR 5:031); and (2) the Kentucky Agriculture Water Quality Act (The Act), which is KRS 224.71-100 to 224.71-140, and was the name given to Senate Bill 241 (passed by the Kentucky General Assembly in 1994). Remedial actions for nonpoint sources of pollution will be taken based on the establishment of BMPs as described in The Kentucky Agriculture Water Quality Plan (KAWQP) of 1996 (KAWQA, 1996). Governmental agricultural agencies have provided regular workshops and individual assistance to landowners required to develop plans. The Producer Workbook and KAWQP document provide information on potential sources of financial assistance to implement the BMPs described in the KAWQP. The Act provides procedures or protocols for corrective measures to resolve situations where it is documented that water pollution is occurring due to agricultural practices. The Act defines a 'bad actor' and provides actions that can be taken in this regard.