Total Maximum Daily Load for *E. coli* and Fecal Coliform
18 Stream Segments within the Floyds Fork Watershed
Bullitt, Henry, Jefferson, Oldham, Shelby and Spencer Counties, Kentucky

Floyds Fork, Jefferson County

Final
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Kentucky UNBRIDLED SPIRIT

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Energy and Environment Cabinet
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This report is approved for release

Peter Goodmann, Director
Division of Water

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Glossary of Acronyms

ADD	Area Development District
AFO	Animal Feeding Operation
AWQA	Agriculture Water Quality Act
BMP	Best Management Practices
CAFO	Confined Animal Feeding Operation
CFR	Code of Federal Regulations
CPP	Continuing Planning Process
CSO	Combined Sewer Overflow
DMR	Discharge Monitoring Report
ft^3	Cubic feet
GIS	Geographic Information System
HUC	Hydrologic Unit Code
KAR	Kentucky Administrative Regulations
KDOW	Kentucky Division of Water
KGS	Kentucky Geological Survey
KRS	Kentucky Revised Statutes
KIA	Kentucky Infrastructure Authority
KNDOP	Kentucky No Discharge Operating Permit
KPDES	Kentucky Pollution Discharge Elimination System
L	Liter
LA	Load Allocations
MGD	Million Gallons per Day
ml	milliliter
MOS	Margin of Safety
MS4	Municipal Separate Storm Sewer Systems
NASS	National Agricultural Statistics Service
NLCD	National Land Cover Database
NRCS	Natural Resources Conservation Service
NPDES	National Pollution Discharge Elimination System
OSTDS	On Site Sewage Treatment and Disposal System
PCR	Primary Contact Recreation
QAPP	Quality Assurance Project Plan
RM	River Mile
SCR	Secondary Contact Recreation
SOP	Standard Operating Procedures
SSO	Sanitary Sewer Overflow
STP	Sewage Treatment Plant
SWS	Sanitary Wastewater System
TMDL	Total Maximum Daily Load
USDA	United States Department of Agriculture
USEPA	United States Environmental Protection Agency

USGS	United States Geological Survey
WBID	Waterbody Identification Number
WBP	Watershed Based Plan
WLA	Waste Load Allocation
WQC	Water Quality Criteria
WWTP	Wastewater Treatment Plant

Total Maximum Daily Load Summary

The goal of the Clean Water Act is to have the country's water safe for swimming, fishing and drinking. The Clean Water Act mandates that states identify waters such as streams and lakes that are polluted to the point that they are not safe for swimming, fishing, or drinking. For these polluted waters, the states must also write a report that indicates what the pollutant is and the maximum amount of the pollutant the water can safely handle. This is called a Total Maximum Daily Load, or TMDL, for short. For this report, "water" means a stream or river, not drinking water from a faucet or a well. This summary provides basic information from this report about why a TMDL was calculated and lists the allowable levels for bacteria-polluted streams in the Floyds Fork watershed.

Bacteria are a pollutant because the chance of an illness after swimming, wading, boating or fishing in the water is increased if bacteria numbers are too high. The bacteria themselves may not cause an illness, but when they are high in number other things that can cause an illness, like a virus, may be in the water. Bacteria cells are very small and they tend to grow in groups called "colonies." Because bacteria colonies can be seen by the human eye, they are grown and counted to determine how many bacteria are present.

Kentucky uses two different types of bacteria to tell whether the water is polluted. These are fecal coliform and *E. coli*. Kentucky regulations have numbers for the safe amounts of these bacteria in the water. The numbers are lower in the summer because people swim and wade in the water during the summer and a lower number during the summer is safer. The summer limits are called primary contact recreation (PCR) season criteria while the year round limits are called secondary contact recreation (SCR) season criteria. Kentucky also has two types of numbers for the bacteria: one is a geometric mean and the other is a maximum number. Geometric means are a type of average. Kentucky regulations state that at least five bacteria samples must be taken from the water in thirty days to calculate the geometric mean. Also, the bacteria colonies can not be above the maximum number more than 20% of the time. If the bacteria colonies are above the maximum number more than 20% of the time or if the calculated geometric mean from the water samples is above the legal geometric mean, the water is polluted. Information from Kentucky's regulations on allowable numbers of bacteria colonies in streams is summarized in Table S.1 below.

Table S.1 Kentucky's Bacteria Limits

	Summer PCR Limit (May 1 - Oct. 31)		SCR Limit (year round)	
Bacteria	Geometric Mean (colonies/100 ml)	Maximum (colonies/100 ml)	Geometric Mean (colonies/100 ml)	Maximum (colonies/100 ml)
Fecal coliform	**200** (from 5 samples collected within 30 days)	**400** (number not to be exceeded in more than 20% of the samples)	**1,000** (from 5 samples collected within 30 days)	**2,000** (number not to be exceeded in more than 20% of the samples)
E. coli	**130** (from 5 samples collected within 30 days)	**240** (number not to be exceeded in more than 20% of the samples)	No criterion (this does not mean that any number is safe; rather that Kentucky regulations do not tell the safe limit)	No criterion (this does not mean that any number is safe; rather that Kentucky regulations do not tell the safe limit)

Floyds Fork begins in Henry County, Kentucky, and flows southwest for 62 miles to join the Salt River in Bullitt County (Figure S.1). Floyds Fork also has 105 miles of tributaries. Parts of Henry, Oldham, Shelby, Spencer, Jefferson, and Bullitt Counties provide flow or drain to Floyds Fork and its tributaries. Land areas that drain to Floyds Fork or its tributaries are all in the Floyds Fork watershed. A watershed is an area of land where runoff flows to a point on a stream. A subwatershed is just a smaller area of a larger watershed.

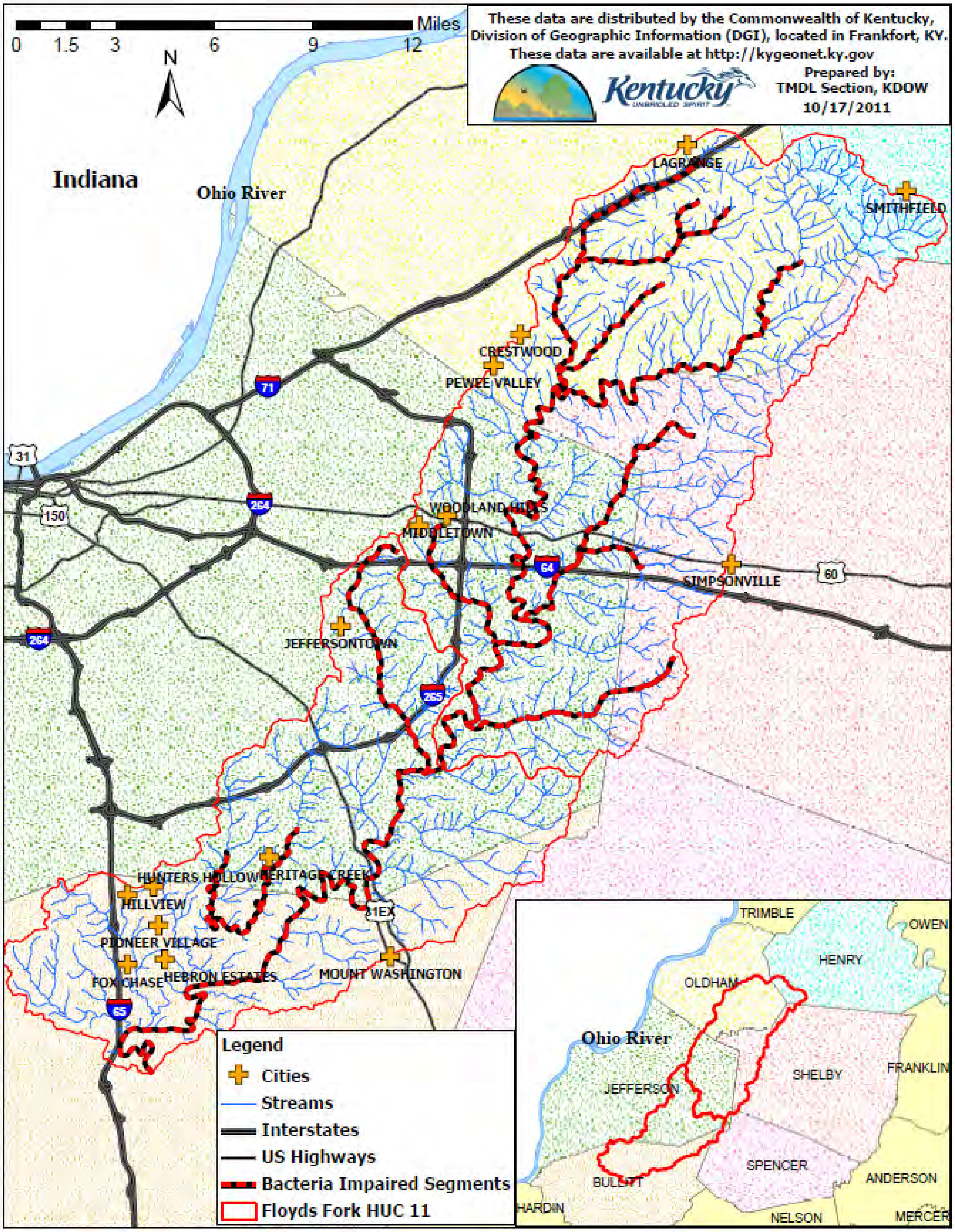

Figure S.1 Location of Floyds Fork Watershed

Some of the streams in the Floyds Fork watershed were identified as polluted because of bacteria during the early 1990s and more polluted streams have been identified since then. The bacteria polluted streams in the Floyds Fork watershed are listed in Table S.2 and shown in red on the map in Figure S.1. The list of streams includes river miles that tell where the bacteria are too high. The stream name and the polluted river miles are called a stream “segment.” A river mile of 0.0 is at the downstream mouth of the stream and river miles increase going upstream. As an example, South Fork Currys Fork 0.0 to 6.1 tells us that the bacteria pollution goes from the downstream end or “mouth” of South Fork Currys Fork and continues for 6.1 miles in the upstream direction on South Fork Currys Fork.

Table S.2 Streams Polluted by Bacteria in the Floyds Fork Watershed

Stream Segment	Bacteria	Season
Ashers Run 0.0 to 4.8	*E. coli*	Summer PCR
Ashers Run 0.0 to 4.8	Fecal coliform	Summer PCR
Cane Run 0.0 to 7.3	*E. coli*	Summer PCR
Cedar Creek 4.3 to 11.1	*E. coli*	Summer PCR
Cedar Creek 4.3 to 11.1	Fecal Coliform	Summer PCR
Chenoweth Run 0.0 to 5.25	*E. coli*	Summer PCR
Chenoweth Run 0.0 to 5.25	Fecal coliform	Summer PCR
Chenoweth Run 0.0 to 5.25	Fecal coliform	Year Round SCR
Chenoweth Run 5.25 to 9.2	*E. coli*	Summer PCR
Chenoweth Run 5.25 to 9.2	Fecal coliform	Summer PCR
Chenoweth Run 5.25 to 9.2	Fecal coliform	Year Round SCR
Currys Fork 0.0 to 4.8	*E. coli*	Summer PCR
Floyds Fork 0.0 to 11.7	*E. coli*	Summer PCR
Floyds Fork 11.7 to 24.2	Fecal coliform	Summer PCR
Floyds Fork 24.2 to 34.1	*E. coli*	Summer PCR
Floyds Fork 34.1 to 61.9	*E. coli*	Summer PCR
Floyds Fork 34.1 to 61.9	Fecal coliform	Year Round SCR
Long Run 0.0 to 9.9	*E. coli*	Summer PCR
North Fork Currys Fork 0.0 to 6.0	*E. coli*	Summer PCR
Pennsylvania Run 0.0 to 3.3	*E. coli*	Summer PCR
Pennsylvania Run 0.0 to 3.3	Fecal coliform	Year Round SCR
Pope Lick 0.0 to 2.1	*E. coli*	Summer PCR
Pope Lick Creek 2.1 to 5.5	*E. coli*	Summer PCR
South Fork Currys Fork 0.0 to 6.1	*E. coli*	Summer PCR
South Long Run 0.0 to 3.35	*E. coli*	Summer PCR
UT of South Fork Currys Fork 0.0 to 1.8	*E. coli*	Summer PCR

Some stream segments are listed as polluted by both fecal coliform and *E. coli* bacteria, while others are not. This may be because only one bacteria type was collected from the stream’s water or only one type of bacteria was too high. Also, while all the listed stream segments are polluted for the summer PCR number, only some are polluted for the year round SCR number. In order to be polluted for the year round SCR number, fecal coliform samples must have been collected from the stream during the winter (Nov 1 through Apr 30). Finally, for many streams in the Floyds Fork watershed, no bacteria have been collected to see if they are too high. These streams are considered as “unassessed,” which means it is not known if they are polluted by bacteria or not. These “unassessed” streams are not listed in this report.

The KDOW has calculated a TMDL for each of the steam segments listed in Table S.2. Because a TMDL is the amount of a pollutant allowed per day, KDOW had to determine the allowable daily load for the bacteria pollutant. To do this, KDOW had to change the legal limits in Table S.1 to a different form to calculate the bacteria TMDLs. The following pages tell how the TMDLs were calculated, how the allowable load was divided to different sources of bacteria in the watershed, and provide example calculations from one bacteria impaired stream segment.

Mathematical calculations were done to change the allowable amount of bacteria from a concentration (colonies of bacteria allowed per 100 ml of water) to a daily load (colonies of bacteria allowed per day). This is done by multiplying the allowable concentration of bacteria in Table S.1 by a stream flow (in cubic feet per second or cfs) and a conversion factor to change from colonies bacteria per 100 ml per cubic foot per second (cfs) to colonies bacteria per day. The conversion factor is figured as 1 cubic foot = 28,316.85 ml and 1 day = 86,400 seconds so the conversion factor is 24,465,758.4/day. The equation to calculate the TMDL is shown by Equation 1:

Equation 1:

TMDL (allowable colonies per day) = Allowable Concentration (colonies per 100 ml) x Flow (in cubic feet per second) x Conversion Factor (24,465,758.4/day)

The flow in this equation is called a “critical flow” and it is the flow of the stream when the water sample with the highest number of bacteria was collected. If flow was not measured in the stream, some way must be used to estimate what the flow was. In the Floyds Fork watershed, the United States Geological Survey (USGS) has several gages that measure flow in a stream. These gages may not be in the same place where the stream was sampled, but the flow measured by a gage can be used to estimate the flow at a nearby place. This is done by dividing the acres of land that drain to a sample site by the acres of land that drain to the gage site and multiplying by the flow at the gage. The equation for this is below:

Equation 2:

Flow at sample site (cfs) = Acres of land draining to sample site ÷ Acres of land draining to gage site x Flow at gage (cfs)

As an example, for South Fork Curry’s Fork the highest *E. coli* bacteria of 22,000 per 100 ml was collected on 7/31/2008 at a site called SFCF-2. Flow was not measured in the stream so it must be estimated. The nearby USGS gage had a flow of 233 cfs on 7/31/2008. The amount of land draining to sample site SFCF-2 is 4,672 acres and the amount of land draining to the gage is 51,136 acres.

Flow at sample site = 4,672 acres ÷ 51,136 acres x 233 cfs

Flow at sample site = 21.3 cfs

So the estimated flow for the sample site SFCF-2 is 21.3 cfs on 7/31/2008 when the highest bacteria number was collected.

This estimated flow can now be used in Equation 1 to calculate the TMDL. South Fork Curry's Fork is polluted for summer (PCR) *E. coli* and the legal maximum number from Table S.1 is 240 colonies per 100 ml.

TMDL = 240 *E. coli* colonies per 100 ml x 21.3 cfs x 24,465,758.4/day

TMDL = 125,068,956,900 *E. coli* colonies per day

Because this is a very large number, another way to show the number is used in science; this form is called "scientific notation." In this form, the TMDL number above is shown as 1.25E+11. This means that there are really 11 numbers (E+11), but only two of them are shown. To get close to the real number, the decimal point should be moved 11 places to the right. A negative scientific notation number like 1.25E-3 means that the decimal point should be moved to the left three places and the real number is .00125. Scientific notation just helps to not have to write a lot of large numbers.

If the site where bacteria were collected is not at the downstream end of a stream segment, one last step is done to determine the stream segment TMDL. The TMDL number must be adjusted for increased flow at the downstream end of the stream segment. This is done by multiplying the site TMDL by the number of acres draining to the end of the stream segment and then dividing by the number of acres draining to the site as shown in Equation 3.

Equation 3:

Stream Segment TMDL = Site TMDL x Acres at downstream end of stream segment
÷ Acres at site

As an example for South Fork Curry's Fork, the acres of land draining to the downstream end at river mile 0.0 are 5,949 acres. From above, the acres of land draining to the site SFCF-2 are 4,672 acres and the site TMDL is 1.25E+11 *E. coli* colonies/day.

Segment TMDL = 1.25E+11 *E. coli* colonies per day x (5,949 acres ÷ 4,672 acres)

Segment TMDL = 1.25E+11 *E. coli* colonies per day x (1.27)

Segment TMDL = 1.59E+11 *E. coli* colonies per day

This is the final *E. coli* TMDL for the stream segment South Fork Curry's Fork 0.0 to 6.1.

All the bacteria TMDLs in Floyds Fork watershed were calculated the same way as outlined above. For each stream segment, the site with the highest bacteria count is used, the flow from this site is either estimated or used directly if it was measured, the bacteria limit is read from the chart (Table S.1), and the numbers are adjusted for differences in acres of land draining to the gage, the site, and the end of the stream segment.

Once the total allowable load for a stream segment (the segment TMDL) is figured, the allowable amount is split to different sources of bacteria in the watershed (i.e., split to sources that contribute bacteria to the downstream impaired stream segment). Also, part of the allowable load has to be “saved” and not given to any source to be on the safe side. This saved part is called a “Margin of Safety.” One type of source of bacteria is those with a permit to release bacteria to water. The load that is split to this type of source is called a “Waste Load Allocation” or WLA for short. Permitted sources include things like facilities that treat human sewage and some city drainage systems that carry water and pollutants to the stream (called Municipal Separate Storm Sewer Systems, or MS4 for short). The second type of source includes those that discharge bacteria to a stream but are not required to have a permit to do so. The load that is split to these unpermitted sources is called a “Load Allocation” or LA for short. This type of source includes wildlife and other natural sources of bacteria, rural areas and most farms, among others. Although they do not have a permit, LA sources are still legal. Any source that is illegal is not given a split of the allowable load. Illegal sources include things like failing septic tanks, leaking sewer lines, and sanitary sewer overflows, among others. The equation used to explain the dividing of the load to sources is:

Equation 4:

TMDL = ∑WLA (sum of splits to permitted sources) + ∑LA (sum of splits to legal sources with no permit) + MOS (margin of safety)

The symbol “∑” means that things are added together or summed. This equation means that the TMDL is equal to the sum of all the Waste Load Allocations given to the permitted sources of bacteria plus the sum of all the Load Allocations given to the sources of bacteria that do not have a permit plus the Margin of Safety. This tells how the allowable load from the TMDL is split to the different sources of bacteria and to the Margin of Safety.

Because Equation 1 and Equation 4 both tell what a TMDL is, the equations can be used to learn something about TMDLs. From Equation 1: TMDL = Allowable Concentration x Flow x Conversion Factor and Equation 4: TMDL = ∑WLA + ∑LA + MOS, we can learn that:

Allowable Concentration x Flow x Conversion Factor = ∑WLA + ∑LA + MOS

Because the allowable concentration does not change (it is the legal number) and the conversion factor does not change (it is 24,465,758.4/day), we can learn that the flow changes what the allowable load is and that allocations are based upon the chosen flow. What this means is that there are many loads that will meet the allowable concentration of bacteria in the stream. As the flow increases the load also increases and the allowable allocations split to different sources also increase. However, it is required that one flow be chosen to determine one segment TMDL and this is called the "critical flow" as mentioned above.

We can see how the TMDL changes with flow by showing information on a graph. The graphs in this report are called "load duration curves." Load duration curves do not determine a TMDL (Equations 1 through 3 tell how TMDLs are calculated), they just show load and flow information at one site on a stream segment. An example load duration curve is shown for South Fork Curry's Fork at site SFCF-2 in Figure S.2, below.

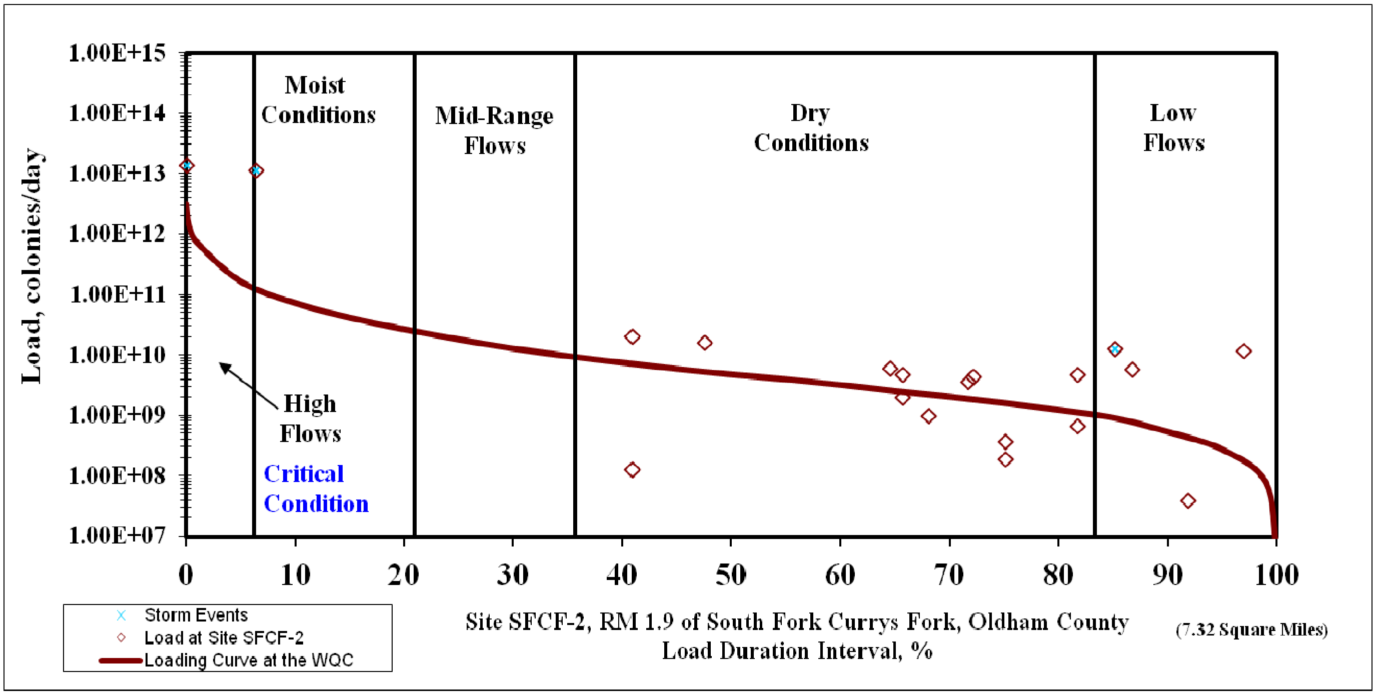

Figure S.2 Load Duration Curve for Site SFCF-2 on South Fork Curry's Fork

On this graph, loads are plotted on the y axis and flow intervals are on the x axis. A flow interval is the percentage of time any flow in a stream is equaled or exceeded. For example, very low flows or droughts plot on the right side of the graph and have flows that are often exceeded (more than about 83% of the time on this graph). Very high flows or floods plot on the left side of the graph and have flows that are not often exceeded (only about 6 or 7% of the time on this graph). This figure shows several things. First, the red line shows the site TMDL. As mentioned above, as the flow increases, the allowable TMDL also increases. The site TMDL (red line) was calculated as explained for Equation 1 (TMDL = Allowable Concentration x Flow x Conversion Factor) using many different flows in the equation. Second, the bacteria samples collected are shown as a load (plotted as a "◊") based upon the flow on the day a sample was collected. This is done using Equation 5.

Equation 5:

Sample Load = Sample Concentration x Flow (on sample day) x Conversion Factor

This is much the same as Equation 1 but, instead of using the legal limit, the actual sample concentration is used. This sample load is called the "existing load" for any given sample day. On the graph in Figure S.2, sample loads that are above the red TMDL line are loads that are above the legal limit. Sample loads below the red TMDL line are below the legal limit. Third, samples that were collected when much of the water in the stream was storm water are shown with a light blue x in the ◊ (after changing from concentration to load); there are three of these on this graph. Finally, the graph shows under what types of flows the loads tend to be greater than the TMDL line. The storm water samples all tend to be high on this graph, so we can guess that rain or storm water results in higher bacteria loads. If the sample load is above the TMDL line, the flow condition (high, moist, mid-range, dry, or low) can tell us something about what sources may be present. This is shown in Table S.3 (Table from EPA, 2007).

Table S.3 Sources Associated with Flow Zones

Contributing Source Area	Duration Curve Zone				
	High Flow	Moist	Mid-Range	Dry	Low Flow
Point Source				*M*	*H*
On-site wastewater systems			*H*	*M*	
Riparian Areas		*H*	*H*	*H*	
Storm water: Impervious Areas		*H*	*H*	*H*	
Combined sewer overflows	*H*	*H*	*H*		
Storm water: Upland	*H*	*H*	*M*		
Bank erosion	*H*	*M*			
Note: Potential relative importance of source area to contribute loads under given hydrologic condition *(H: High; M: Medium)*					

As mentioned above, once a TMDL is calculated, the allowable load must be split to different sources and to the Margin of Safety. The Margin of Safety (MOS) for the TMDLs in this report was set at 10% of the allowable load. This is shown in Equation 6.

Equation 6:

Margin of Safety = TMDL x 10%

As an example for South Fork Currys Fork 0.0 to 6.1, the Margin of Safety is:

MOS = (1.59E+11 *E. coli* colonies per day) x 10% = 1.59E+10 *E. coli* colonies per day

The TMDL Equation can now be written as:

TMDL –MOS (margin of safety) = ∑WLA (sum of splits to permitted sources) + ∑LA (sum of splits to sources with no permit)

Next, the split that goes to the facilities that have a permit (those that treat sewage) can be calculated. The word "facilities" includes an individual home, apartment units, schools, and others that treat their own sewage as well as treatment plants that collect and treat sewage from many different places. Because there are many types of WLAs, the KDOW calls the WLAs that go to a facility a “SWS-WLA”, where SWS stands for “Sanitary Wastewater System.” The individual SWS-WLA split given to each facility is calculated by Equation 7:

Equation 7:

SWS-WLA (sanitary wastewater facility split) = Allowable Concentration of Bacteria (colonies per 100 ml) x Facility Design Capacity (Design Flow in cfs) x Conversion Factor (24,465,758.4/day)

For these types of facilities, the allowable concentration of bacteria is determined by the summer limits in Table S.1. The facilities have to meet these summer limits throughout the year, including during the winter.

There may be no facilities or many in any given subwatershed of Floyd Fork. For South Fork Currys Fork, there are four permitted facilities. The maximum *E. coli* SWS-WLAs for the facilities in South Fork Currys Fork subwatershed are shown in Table S.4. The numbers in the rows were multiplied to figure the SWS-WLA. These were then added together to get the total SWS-WLA for the South Fork Currys Fork subwatershed.

Table S.4 *E. coli* SWS-WLAs for South Fork Currys Fork

Permit #	Facility Name	Maximum Allowable Limit for *E. coli* (colonies/100 ml)	Facility Design Capacity (cfs)	Conversion Factor (1/day)	SWS-WLA (*E. coli* colonies/day
KY0039870	Lakewood Valley	240	0.1547229	24,465,758.40	9.08E+08
KY0054674	Lockwood Estates Subdivision	240	0.069625305	24,465,758.40	4.09E+08
KY0076732	Centerfield Elementary	240	0.01547229	24,465,758.40	9.08E+07
KYG400289	Gibson Residence	240	0.000618892	24,465,758.40	3.63E+06
Total subwatershed SWS-WLA					1.41E+09

Because some of the allowable load has already been split to different sources and to the margin of safety, only some of the allowable load is left. The part that is left is called the “remainder” by the KDOW. This remainder is calculated as shown in Equation 8 where ∑SWS-WLA is the total of all the individual SWS-WLAs in the subwatershed.

Equation 8:

Remainder = TMDL – MOS (margin of safety) – ∑SWS-WLA (total of splits for sanitary wastewater sources)

For South Fork Currys Fork 0.0 to 6.1, the Remainder is calculated as:

Remainder = 1.59E+11 - 1.59E+10 – 1.41E+09

Remainder = 1.42E+11 *E. coli* (colonies/day)

Another split of the allowable load goes to the permitted MS4s in the subwatershed. These are also a split of the WLA and are called a "MS4-WLA" by the KDOW. The MS4-WLA is calculated based upon the remainder, the acres of land in the subwatershed and the acres of land that are within the MS4; excluding agricultural land or open water. The equation for this is shown in Equation 9.

Equation 9:

MS4-WLA = # Acres of MS4 area within Urbanized Boundary of MS4 ÷ # Acres in Subwatershed x Remainder

For South Fork Currys Fork 0.0 to 6.1, there are 1,980.63 acres of MS4 land in the MS4 boundary, 5,948.52 acres in the subwatershed, and the remainder is 1.42E+11 *E. coli* (colonies/day). The MS4-WLA for South Fork Currys Fork 0.0 to 6.1 is figured as:

MS4-WLA = 1,980.63 acres ÷ 5,948.52 acres x 1.42E+11 *E. coli* (colonies/day)

MS4-WLA = 4.72E+10 *E. coli* (colonies/day)

A third split of the WLA goes to "future growth" in the watershed. The KDOW calls this the "Future Growth-WLA" and it is a split that is saved for future permitted sources, including new facilities, increasing design capacity at current facilities, new storm water sources, and growth of existing storm water sources (such as MS4s).

The Future Growth-WLA is calculated based on a percentage of the remainder and is calculated as shown in Equation 10.

Equation 10:

Future Growth-WLA = Future Growth WLA Percentage x Remainder

The Future Growth WLA Percentage is based on the acres of developed land in the subwatershed divided by the acres of land in the subwatershed. Table S.5 shows what percentage of the remainder is used for the Future Growth-WLA.

Table S.5 Future Growth

Percent Developed Area in the Subwatershed	Future Growth WLA Percentage
≥25%	5%
≥20% – <25%	4%
≥15% – <20%	3%
≥10% – <15%	2%
≥5% – <10%	1%
<5%	0.5%

For the South Fork Currys Fork 0.0 to 6.1 subwatershed, there are 754 acres of developed land and 5,948.52 acres of land in the subwatershed. Dividing these gives a percent developed area of 12.68 (754 ÷ 5,948.52 = 12.68%). Because 12.68% is between 10 % and 15%, Table S.5 tells us to use 2% for the Future Growth WLA Percentage. The Future Growth-WLA for the South Fork Currys Fork subwatershed can now be calculated as:

Future Growth-WLA = 2% x 1.42E+11 *E. coli* (colonies/day)

Future Growth-WLA = 2.84E+09 *E. coli* (colonies/day)

These are all the steps to determine the split of the allowable load that goes to WLA sources. Next, the split that goes to the sources with no permit (the LA sources) is determined. This is calculated by rearranging the TMDL allocation equation (Equation 4) to that shown in Equation 11:

Equation 11:

∑LA (total of splits to sources with no permit) = TMDL – MOS (margin of safety) - ∑WLA (total of splits to permitted sources)

As an example for the South Fork Currys Fork subwatershed, the TMDL is 1.59E+11, the MOS is 1.59E+10, the SWS-WLA is 1.41E+09, the MS4-WLA is 4.72E+10, and the Future Growth-WLA is 2.84E+09. Adding all the different types of WLAs together to get ∑WLA gives us a ∑WLA of 5.15E+10 (1.41E+09 + 4.72E+10 + 2.84E+09 = 5.15E+10). Putting this into Equation 11 gives:

∑LA= 1.59E+11 – 1.59E+10 – 5.15E+10

∑LA= 9.81E+10

This is the final step to determine the allowable spilt to different sources in the watershed.

In this report, Sections 1 through 3 tell some general information about the Floyds Fork watershed. Section 4 tells about the bacteria sampling that has happened in the watershed with more information in Appendix B. Section 5 tells about the different sources that are or may be in the watershed. Section 6 tells the bacteria-limits and Section 7 tells how the TMDLs were calculated. Section 8 tells the information for each bacteria-polluted stream segment, gives the TMDL and allocations for it, and shows a load duration curve for each bacteria-impairment. Section 9 tells what some of the implementation options are in the Floyds Fork watershed, but does not give specific implementation details. Section 10 tells about public participation and Section 11 gives the references. The eleven equations above are all of the equations that go into determining the TMDLs and allocations in Section 8 of this report. Summary tables for each of the segment TMDLs calculated for the Floyds Fork watershed are shown in tables S.6 through S.8.

Table S.6 TMDLs for *E. coli* Summer PCR Impaired Segments

Waterbody Name	TMDL (colonies/ day)	MOS (colonies/ day)	SWS-WLA (colonies/ day)	Future Growth-WLA (colonies/ day)	MS4-WLA (colonies/ day)	LA (colonies/ day)
Asher Run 0.0 to 4.8	5.71E+10	5.71E+09	0	5.14E+08	2.30E+10	2.79E+10
Cane Run 0.0 to 7.3	4.67E+10	4.67E+09	4.54E+06	2.10E+08	2.20E+10	1.98E+10
Cedar Creek 4.3 to 11.1	1.44E+12	1.44E+11	6.83E+10	6.16E+10	8.64E+11	3.06E+11
Chenoweth Run 0.0 to 5.25	2.43E+12	2.43E+11	3.86E+10	1.07E+11	1.75E+12	2.92E+11
Chenoweth Run 5.25 to 9.2	4.09E+11	4.09E+10	3.63E+10	1.66E+10	3.04E+11	1.09E+10
Currys Fork 0.0 to 4.8	4.91E+11	4.91E+10	2.05E+10	1.27E+10	1.96E+11	2.13E+11
Floyds Fork 0.0 to 11.7	4.33E+13	4.33E+12	2.21E+11	1.16E+12	1.85E+13	1.92E+13
Floyds Fork 24.2 to 34.1	2.00E+13	2.00E+12	8.82E+10	3.59E+11	7.00E+12	1.06E+13
Floyds Fork 34.1 to 61.9	1.74E+13	1.74E+12	8.81E+10	3.12E+11	5.22E+12	1.01E+13
Long Run 0.0 to 10.0	5.52E+10	5.52E+09	8.18E+06	2.48E+08	1.28E+10	3.66E+10
North Fork Currys Fork 0.0 to 6.0	1.78E+11	1.78E+10	1.85E+10	5.67E+09	7.58E+10	6.02E+10
Pennsylvania Run 0.0 to 3.3	8.20E+09	8.20E+08	1.87E+09	2.76E+08	4.30E+09	9.42E+08
Pope Lick Creek 0.0 to 2.1	3.18E+11	3.18E+10	3.63E+07	1.43E+10	2.24E+11	4.77E+10
Pope Lick Creek 2.1 to 5.5	5.36E+11	5.36E+10	1.82E+07	2.41E+10	3.66E+11	9.30E+10
South Fork Currys Fork 0.0 to 6.1	1.59E+11	1.59E+10	1.41E+09	2.84E+09	4.72E+10	9.18E+10
South Long Run 0.0 to 3.35	2.63E+09	2.63E+08	0	2.37E+07	4.78E+08	1.87E+09
UT to South Fork Currys Fork 0.0 to 1.8	1.18E+11	1.18E+10	9.08E+08	1.05E+09	5.38E+09	9.89E+10

Table S.7 TMDLs for Fecal Coliform Summer PCR Impaired Segments

Waterbody Name	TMDL (colonies/day)	MOS (colonies/day)	SWS-WLA (colonies/day)	Future Growth-WLA (colonies/day)	MS4-WLA (colonies/day)	LA (colonies/day)
Asher Run 0.0 to 4.8	2.41E+09	2.41E+08	0	2.17E+07	9.69E+08	1.18E+09
Cedar Creek 4.3 to 11.1	2.23E+11	2.23E+10	1.14E+11	4.35E+09	6.10E+10	2.17E+10
Chenoweth Run 0.0 to 5.25	6.34E+11	6.34E+10	6.43E+10	2.53E+10	4.12E+11	6.89E+10
Chenoweth Run 5.25 to 9.2	1.41E+12	1.41E+11	6.06E+10	6.06E+10	1.11E+12	3.96E+10
Floyds Fork 11.7 to 24.2[(1)]	1.16E+13	1.16E+12	2.13E+11	2.05E+11	4.57E+12	5.49E+12

Note: [(1)]Due to an administrative error, the pollutant was listed as E. coli on the 2012 Integrated Report. This will be corrected to fecal coliform on the 2014 Integrated Report. A TMDL was calculated for the correct pollutant, fecal coliform.

Table S.8 TMDLs for Fecal Coliform Year Round SCR Impaired Segments

Waterbody Name	TMDL (colonies/day)	MOS (colonies/day)	SWS-WLA (colonies/day)	Future Growth-WLA (colonies/day)	MS4-WLA (colonies/day)	LA (colonies/day)
Chenoweth Run 0.0 to 5.25	3.17E+12	3.17E+11	6.43E+10	1.39E+11	2.27E+12	3.79E+11
Chenoweth Run 5.25 to 9.2	7.07E+12	7.07E+11	6.06E+10	3.15E+11	5.78E+12	2.06E+11
Floyds Fork 34.1 to 61.9	1.46E+12	1.46E+11	1.47E+11	2.34E+10	3.91E+11	7.55E+11
Pennsylvania Run 0.0 to 3.3	9.20E+12	9.20E+11	3.12E+09	4.14E+11	6.45E+12	1.41E+12

1.0 Introduction

Section 303(d) of the Clean Water Act (1972) requires states to identify waterbodies within their boundaries that have been assessed and are not currently meeting their designated uses (401 KAR 10:026 and 10:031) and that require the development of a Total Maximum Daily Load (TMDL). States must establish a priority ranking for such waters, taking into account their intended uses and the severity of the pollutant. Section 303(d) also requires that states provide a list of this information called the 303(d) list. This list is submitted to the Environmental Protection Agency (EPA) during even-numbered years and each submittal replaces the previous list. The 2012-303(d) information for Kentucky can be found in the *Final 2012 Integrated Report to Congress on the Condition of Water Resources in Kentucky Volume II. 303(d) List of Surface Waters* (Kentucky Division of Water [KDOW], 2013) and can be obtained at: http://water.ky.gov.

States are also required to develop TMDLs for the pollutants that cause each waterbody to fail to meet its designated uses. The TMDL process establishes the allowable amount (i.e. "load") of pollutant a waterbody can naturally assimilate while continuing to meet the water quality criteria (WQC) for each designated use. The pollutant load must be established at a level necessary to implement the applicable WQC with seasonal variations and a Margin of Safety (MOS) that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. This load is then divided among different sources of the pollutant in a watershed. Information from EPA on TMDLs can be found at: http://www.epa.gov/owow/tmdl.

This document contains the monitoring results and describes TMDL development for bacteria indicators in the Floyds Fork watershed as required under Section 303(d) of the Clean Water Act. By providing bacteria allocations, this TMDL can provide an analytical foundation for identifying, planning, and implementing water quality-based controls to reduce bacteria pollution from identified sources. The ultimate goal is the restoration and maintenance of water quality in the waterbody so that designated uses are met.

2.0 Problem Definition

The Clean Water Act requires states to designate uses for surface waters within their jurisdiction. The designated uses assigned to waterbodies in Kentucky can be found in 401 KAR 10:026 and includes primary contact recreation (PCR) and secondary contact recreation (SCR). 401 KAR 10:001 defines PCR or SCR waters as "waters suitable for full body contact recreation during the recreation season of May 1 through October 31" or "waters suitable for partial body recreation, with minimal threat to public health due to water quality," respectively. 401 KAR 10:031 establishes standards that are "minimum requirements that apply to all surface waters in the Commonwealth of Kentucky in order to maintain and protect them for designated uses." The pathogen-related WQC in 401 KAR 10:031 are based upon those proposed by EPA (EPA, 1986).

The term pathogen refers to bacteria, viruses, or other biological agents (such as parasites) that can cause disease. Because it is currently resource intensive, difficult, and a potential health hazard to detect most pathogens in water, other organisms are used to indicate whether the presence of pathogens is likely in waters. Like EPA's proposed criteria, Kentucky uses *Escherichia coli* (*E. coli*) and fecal coliform bacteria as indicator organisms of pathogens. *E. coli* and fecal coliform are found in the fecal waste of humans and warm-blooded animals (birds and mammals). The presence of these bacteria in a waterbody indicates that contamination from human or animal wastes has likely occurred and that pathogens may be present.

2.1 Watershed Description

The Floyds Fork watershed is located in the Salt River Basin in north central Kentucky (Figure 2.1). The Floyds Fork watershed drains portions of Henry, Oldham, Shelby, Spencer, Jefferson, and Bullitt Counties. The watershed contains all or part of the following municipalities: Peewee Valley, LaGrange, Mount Washington, Simpsonville, Smithfield, Crestwood, Forest Hills, Hillview, Hunter's Hollow, Pioneer Village, Fox Chase, Shepherdsville, and Louisville, Kentucky.

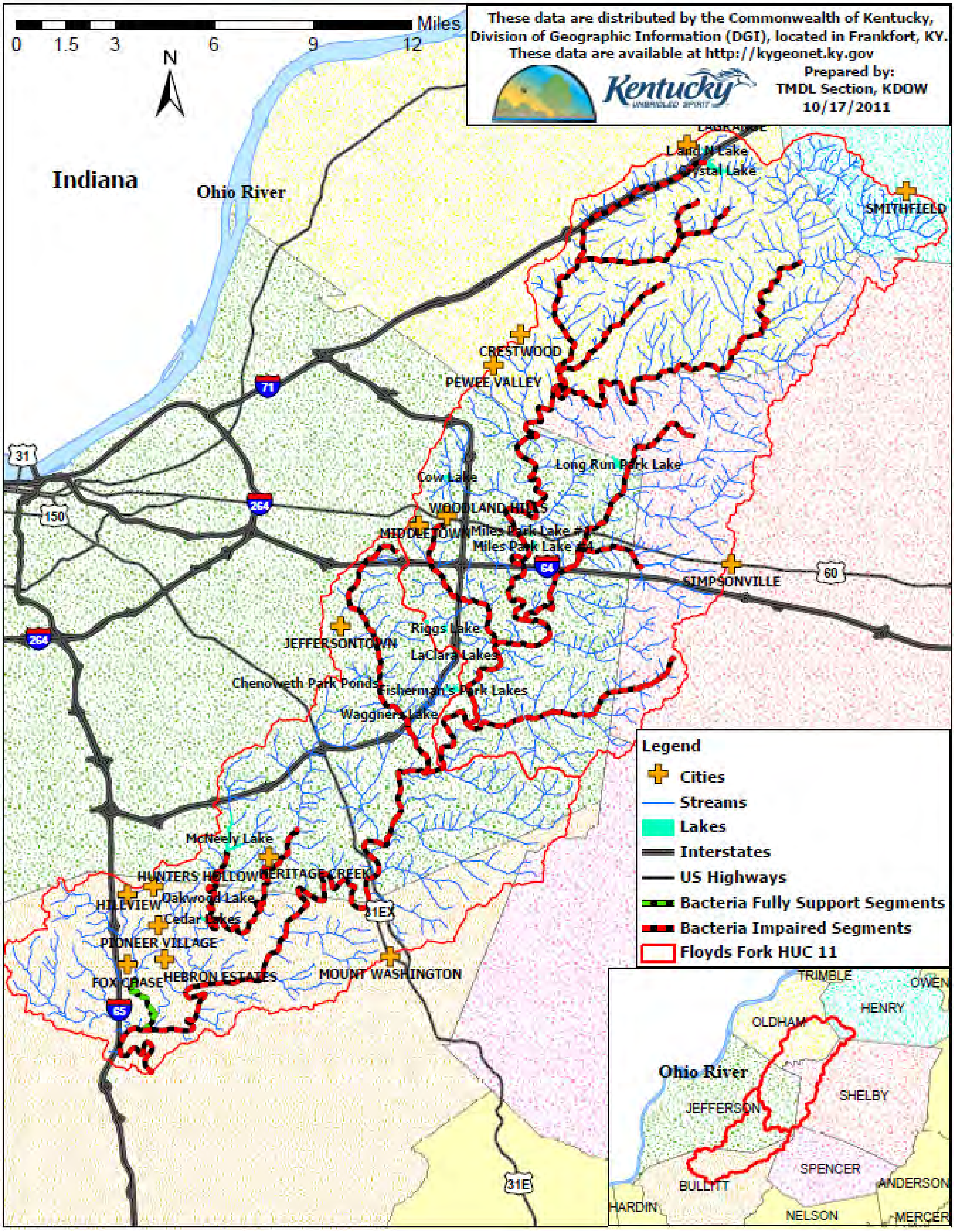

Figure 2.1 Location of Floyds Fork Watershed

Note: Individual impaired segments are identified in Figures 2.2 and 2.3.

2.2 303(d) Listing History

Floyds Fork and many of its tributaries are on Kentucky's final 2012-303(d) List of Impaired Waters for the contact recreation uses to bacteria indicators (Table 2.1). The information presented below relays the history of 303(d) listings for bacteria impaired segments in the Floyds Fork watershed.

Ashers Run 0.0 to 4.8
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli* and fecal coliform.

Brooks Run 2.7 to 4.4
6.0 miles of Brooks Run were first listed on the 1990-303(d) report as impaired for pathogens. The 1994-303(d) report indicated that this listing was based upon evaluated data, not in-stream monitoring data. This listing was updated on the 1998-303(d) Report to RM 0.0 to 6.1. On the 2006-303(d) Report, this segment was split into two and identified as RM 2.5 to 4.1. The 2006-303(d) Report included a delisting for RM 0.0 to 2.5 for pathogens. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012 303(d) List of Impaired Waters, the RMs of this segment were updated to 2.7 to 4.4 and the segment was delisted due to lack of appropriate number of samples to determine whether this segment is impaired. *This segment is not included in the bacteria TMDL work in this document.*

Brooks Run 4.4 to 6.4
6.0 miles of Brooks Run were first listed on the 1990-303(d) report as impaired for pathogens. The 1994-303(d) report indicated that this listing was based upon evaluated data, not in-stream monitoring data. This listing was updated on the 1998-303(d) Report to RM 0.0 to 6.1. On the 2006-303(d) Report, this segment was split into two and identified as RM 4.1 to 6.1. The 2006-303(d) Report included a delisting for RM 0.0 to 2.5 for pathogens. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs of this segment were updated to 4.4 to 6.4 and the segment was delisted due to lack of appropriate number of samples to determine whether this segment is impaired. *This segment is not included in the bacteria TMDL work in this document.*

Cane Run 0.0 to 7.3
This segment first appears in 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

Cedar Creek 4.3 to 11.1
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli* and fecal coliform.

Chenoweth Run 0.0 to 5.25
9.1 miles of Chenoweth Run were first listed on the 1990-303(d) report as impaired for pathogens. This listing was updated on the 2002-303(d) Report to RM 0.0 to 5.2. The 2008-

303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs of this segment were updated to 0.0 to 5.25 and the impairments updated to include the PCR use due to *E. coli* and fecal coliform and the SCR use due to fecal coliform.

Chenoweth Run 5.25 to 9.2

9.1 miles of Chenoweth Run were first listed on the 1990-303(d) report as impaired for pathogens. This listing was updated on the 2002-303(d) Report to RM 5.3-9.1. The RMs for this listing were changed to 5.2 to 9.2 on the 2006-303(d) Report. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs of this segment were updated to 5.25 to 9.2 and the impairments updated to include the PCR use due to *E. coli* and fecal coliform and the SCR use due to fecal coliform.

Currys Fork 0.0 to 4.8

This segment was first listed for pathogens on the 2002-303(d) Report. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the impairment was updated to *E. coli* as opposed to fecal coliform.

Floyds Fork 0.0 to 11.7

61.6 miles of Floyds Fork were first listed on the 1992-303(d) report as impaired for pathogens. This listing was changed on the 1994-303(d) Report to 23.8 miles of impaired stream based upon monitored data and 13.8 miles of impaired stream based upon evaluated data. This listing was updated on the 2006-303(d) Report to RM 0.0 to 11.6. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs were updated to 0.0 to 11.7 and the impairment was updated to *E. coli* as opposed to fecal coliform.

Floyds Fork 11.7 to 24.2

61.6 miles of Floyds Fork were first listed on the 1992-303(d) report as impaired for pathogens. This listing was changed on the 1994-303(d) Report to 23.8 miles of impaired stream based upon monitored data and 13.8 miles of impaired stream based upon evaluated data. This listing was updated on the 2002-303(d) Report to RM 11.6 to 21.6. An additional segment from RM 21.6 to 24.2 was listed on the 2004-303(d) Report. During the 2006-303(d) listing cycle, these two segments were combined to form one segment from 11.6 to 24.2. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs were updated to 11.7 to 24.2. Due to an administrative error, the 2012 Integrated Report indicates *E. coli* as the bacteria indicator.; this will be corrected to fecal coliform on the 2014 Integrated Report.

Floyds Fork 24.2 to 34.1

61.6 miles of Floyds Fork were first listed on the 1992-303(d) report as impaired for pathogens. This listing was changed on the 1994-303(d) Report to 23.8 miles of impaired stream based upon monitored data and 13.8 miles of impaired stream based upon evaluated data. This listing was updated on the 2002-303(d) Report to RM 31.3 to 34.1. During the 2006-303(d) listing cycle, this segment was expanded to include RMs 24.2 to 34.1. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the impairment was updated to *E. coli* as opposed to fecal coliform.

Floyds Fork 34.1 to 61.9
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli* and SCR nonsupport due to fecal coliform.

Long Run 0.0 to 9.9
9.5 miles of Long Run were first listed on the 1992-303(d) report as impaired for pathogens. This listing was updated on the 1998-303(d) Report to RM 0.0 to 9.5. During the 2006-303(d) listing cycle, this segment was expanded to include RMs 0.0 to 10.0. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs were updated to 0.0 to 9.9 and the impairment was updated to *E. coli* as opposed to fecal coliform.

North Fork Currys Fork 0.0 to 6.0
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

Pennsylvania Run 0.0 to 3.3
3.0 miles of Pennsylvania Run were first listed on the 1990-303(d) report as impaired for pathogens. The river miles for this listing were increased to 5.5 miles on the 1992-303(d) report. This listing was updated on the 1998-303(d) Report to RM 0.0 to 3.1. During the 2006-303(d) listing cycle, this segment was expanded to include RMs 0.0 to 3.3. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the impairment was updated to PCR nonsupport due to *E. coli* and SCR nonsupport due to fecal coliform.

Pope Lick 0.0 to 2.1
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

Pope Lick Creek 2.1 to 5.5
5.0 miles of Pope Lick Creek were first listed on the 1992-303(d) report as impaired for pathogens. This listing was updated on the 2002-303(d) Report to RM 2.0 to 5.2. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012-303(d) List of Impaired Waters, the RMs were updated to 2.1 to 5.5 and the impairment was updated to *E. coli* as opposed to fecal coliform.

South Fork Currys Fork 0.0 to 6.1
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

South Long Run 0.0 to 3.35
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

UT to Brooks Run 0.0 to 2.0
This segment was first listed for pathogens on the 2002-303(d) Report. The 2008-303(d) Report more correctly indentified the cause of impairment as fecal coliform as opposed to pathogens. For the 2012 303(d) List of Impaired Waters, the segment was delisted due to lack of appropriate number of samples to determine whether this segment is impaired. *This segment is not included in the bacteria TMDL work in this document.*

UT of South Fork Currys Fork 0.0 to 1.8
This segment first appears in the 2012-303(d) List of Impaired Waters for PCR nonsupport of *E. coli*.

During the compilation of bacteria data in the watershed, it was found that the Brooks Run 2.7 to 4.4, Brooks Run 4.4 to 6.4 and UT to Brooks Run 0.0 to 2.0 Category 5 listings (impaired and TMDL required) were based upon KDOW TMDL monitoring; however, there were insufficient samples collected to assess these streams as impaired (see Section 4 and Appendix B for data). For this reason, a request was made to delist these segments from Category 5 and place them in Category 5B (suspected impaired based upon evaluated data, no TMDL required until in-stream confirmation occurs). These segments are not included in the bacteria TMDL development effort and are not shown as impaired on maps contained in this document.

To facilitate bacteria TMDL development, the U.S. Geological Survey (USGS) was contracted by the USEPA to collect *E. coli* samples at stations located throughout the Floyds Fork watershed. These data resulted in the listing of Ashers Run RM 0.0 to 4.8, Cane Run RM 0.0 to 7.3, Cedar Creek RM 4.3 to 11.1, Floyds Fork RM 34.1-61.9, North Fork Currys Fork RM 0.0 to 6.0, Pope Lick Creek RM 0.0 to 2.1, South Fork Currys Fork RM 0.0 to 6.1, South Long Run RM 0.0 to 3.35, and UT of South Fork Currys Fork RM 00 to 1.8 as impaired for the PCR use due to *E. coli*. Additionally, these data resulted in the listing of *E. coli* bacteria as a cause of impairment on segments previously 303(d)-listed for fecal coliform.

In addition to the TMDL monitoring effort, the Louisville Metropolitan Sewer District (MSD) monitors fecal coliform within the Floyds Fork watershed. Data from this monitoring resulted in the 303(d) listing of Chenoweth Run RM 0.0 to 5.25, Chenoweth Run RM 5.25 to 9.2, Floyds Fork RM 34.1 to 61.9, and Pennsylvania Run 0.0 to 3.3 as impaired for the SCR use due to fecal coliform bacteria.

Table 2.1 indicates the 2012-303(d) listings for bacteria-impaired segments that are addressed in this document. To display greater detail within Floyds Fork, the watershed was divided into two Hydrologic Unit Code (HUC) 11 subwatersheds. The northern-most HUC 11 is called Floyds Fork, LaGrange while the southern-most is Floyds Fork, Fern Creek-Jeffersontown. The system of HUCs was developed by the USGS to identify specific watersheds and includes all the land area that drains to a particular stream (USGS, 2004). The larger the HUC number, the smaller the watershed and the more specific the identification of a watershed to one particular stream. Figures 2.2 and 2.3 show the bacteria-impaired segments within these HUC 11 subwatersheds.

Table 2.1 Bacteria Impaired Segments on the Final 2012-303(d) List

Waterbody Name	Pollutant	County	WBID	Suspected Sources	Impaired Use (Support Status)
Ashers Run 0.0 to 4.8	*E. coli*, Fecal coliform	Oldham	KY486083_01	On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
Cane Run 0.0 to 7.3	*E. coli*	Jefferson	KY488794_01	Source Unknown	PCR (nonsupport)
Cedar Creek 4.3 to 11.1	*E. coli*, Fecal coliform	Jefferson	KY489183_01	Source Unknown	PCR (nonsupport)
Chenoweth Run 0.0 to 5.25	*E. coli*, Fecal coliform	Jefferson	KY489391_01	Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Unspecified Urban Stormwater, Landfills	PCR (nonsupport), SCR (partial support)
Chenoweth Run 5.25 to 9.2	*E. coli*, Fecal coliform	Jefferson	KY489391_02	Grazing in Riparian or Shoreline Zones, Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Unspecified Urban Stormwater	PCR (nonsupport), SCR (nonsupport)
Currys Fork 0.0 to 4.8	*E. coli*	Oldham	KY490506_01	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)
Floyds Fork 0.0 to 11.7	*E. coli*	Bullitt	KY492778_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)

Waterbody Name	Pollutant	County	WBID	Suspected Sources	Impaired Use (Support Status)
Floyds Fork 11.7 to 24.2	Fecal coliform(1)	Jefferson	KY492278_02	Municipal Point Source Discharges, Package Plant or Other Permitted Small Flow Discharges, Agriculture, Urban Runoff/Storm Sewers	PCR (nonsupport)
Floyds Fork 24.2 to 34.1	*E. coli*	Jefferson	KY492278_03	Highway/Road/Bridge Runoff (Non-construction Related), Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)
Floyds Fork 34.1 to 61.9	*E. coli*, Fecal coliform	Oldham, Shelby	KY492278_04	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport), SCR (nonsupport)
Long Run 0.0 to 9.9	*E. coli*	Jefferson	KY497142_01	Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Urban Runoff/Storm Sewers	PCR (nonsupport)
North Fork Currys Fork 0.0 to 6.0	*E. coli*	Oldham	KY499547_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
Pennsylvania Run 0.0 to 3.3	*E. coli*, Fecal coliform	Jefferson	KY500387_01	Illegal Dumps or other Inappropriate Waste Disposal, Municipal Point Source Discharges, Urban Runoff/Storm Sewers	PCR (nonsupport), SCR (nonsupport)
Pope Lick 0.0 to 2.1	*E. coli*	Jefferson	KY501089_01	Municipal Point Source Discharges, Unspecified Urban Stormwater	PCR (nonsupport)

Waterbody Name	Pollutant	County	WBID	Suspected Sources	Impaired Use (Support Status)
Pope Lick Creek 2.1 to 5.5	*E. coli*	Jefferson	KY501089_02	Municipal Point Source Discharges, Unspecified Urban Stormwater	PCR (nonsupport)
South Fork Currys Fork 0.0 to 6.1	*E. coli*	Oldham	KY503919_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
South Long Run 0.0 to 3.35	*E. coli*	Jefferson	KY503961_01	Source Unknown	PCR (nonsupport)
UT of South Fork Currys Fork 0.0 to 1.8	*E. coli*	Oldham	KY503919-3.9_01	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)

Note: (1)Due to an administrative error, the pollutant was listed as E. coli on the 2012 Integrated Report. This will be corrected to fecal coliform on the 2014 Integrated Report. A TMDL was calculated for the correct pollutant, fecal coliform.

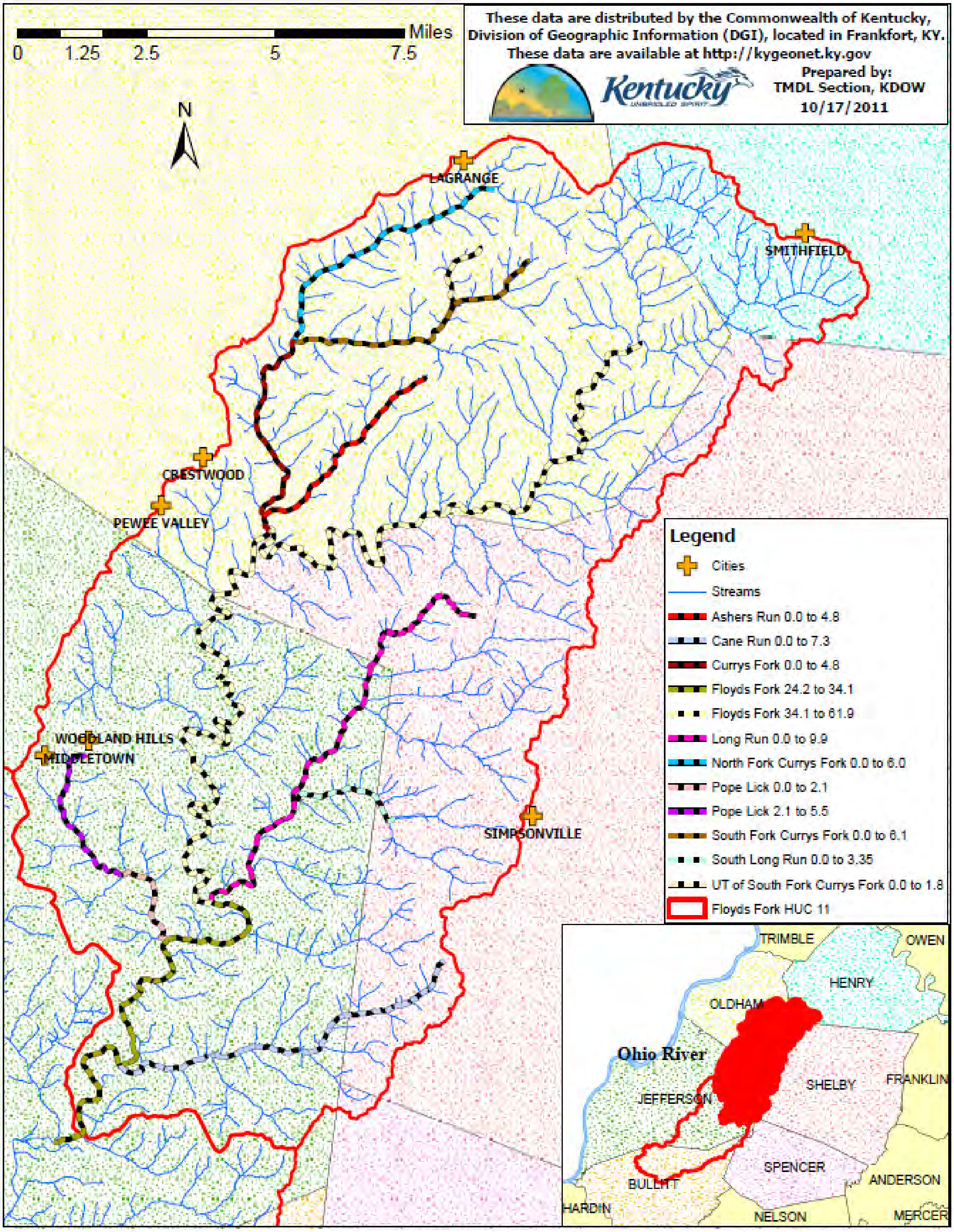

Figure 2.2 Bacteria Impaired Segments in Floyds Fork, LaGrange HUC11

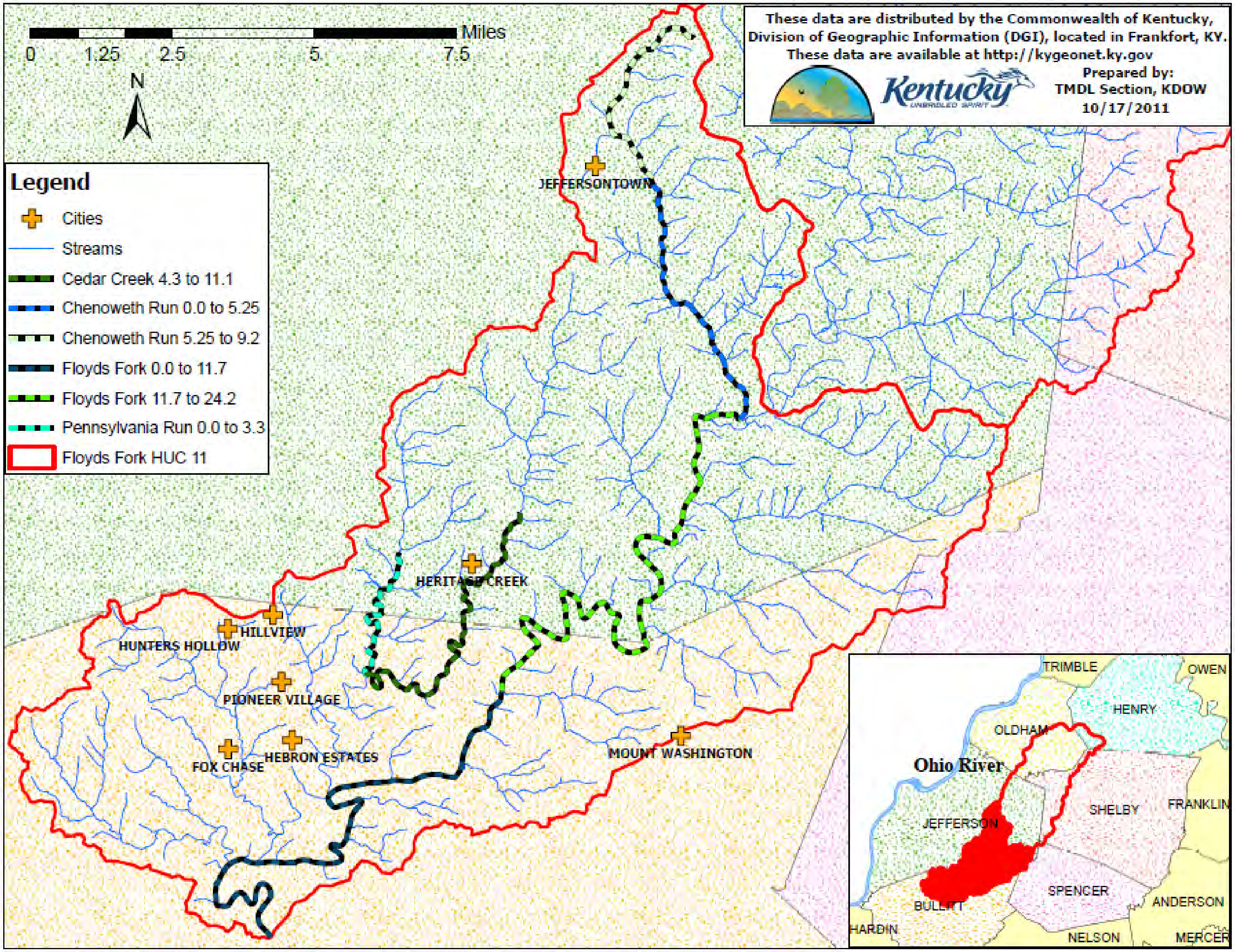

Figure 2.3 Bacteria Impaired Segments in Floyds Fork, Fern Creek-Jeffersontown HUC 11

3.0 Physical Setting

The Floyds Fork watershed is located in the United States Geological Survey (USGS) 8-digit HUC 05140102, in the Salt River Basin. The HUC 14s that are in the Floyds Fork watershed are identified in Tables 3.1 and 3.2 and are shown in Figures 3.1 and 3.2.

Floyds Fork originates in Henry County, Kentucky, and flows southwest for 62 miles before joining the Salt River in Bullitt County. An additional 105 miles in stream length are contributed by the tributaries of Floyds Fork. The Floyds Fork watershed is 284 square miles and drains portions of Henry, Oldham, Shelby, Spencer, Jefferson, and Bullitt Counties. The watershed contains all or part of the following municipalities: Peewee Valley, LaGrange, Mount Washington, Simpsonville, Smithfield, Crestwood, Forest Hills, Hillview, Hunter's Hollow, Pioneer Village, Fox Chase, Shepherdsville, and Louisville, Kentucky. The TMDL area includes the entire Floyds Fork Watershed.

Table 3.1 HUC 14s in the Floyds Fork LaGrange HUC11

HUC 14	HUC 14 NAME	ACRES
05140102-180-010	East Fork of Floyds Fork	5713
05140102-180-020	North Fork of Floyds Fork	4777
05140102-180-030	Floyds Fork	2188
05140102-180-040	Gathright Branch	1016
05140102-180-050	Floyds Fork	2480
05140102-180-060	Lick Fork	2531
05140102-180-070	Floyds Fork	4509
05140102-180-080	Junkins Run	2274
05140102-180-090	Floyds Fork	5568
05140102-180-100	North Fork of Currys Fork	6432
05140102-180-110	South Fork of Currys Fork	5930
05140102-180-120	Currys Fork	3622
05140102-180-130	Ashers Run	2168
05140102-180-140	Currys Fork	98
05140102-180-150	Floyds Fork	12512
05140102-180-160	Brush Run	2248
05140102-180-170	Floyds Fork	2647
05140102-180-180	Long Run	1708
05140102-180-190	Lang Run	1673
05140102-180-200	Long Run	163
05140102-180-210	Tater Run	855
05140102-180-220	Long Run	5565
05140102-180-230	South Long Run	4858
05140102-180-240	Long Run	1288
05140102-180-250	Shakers Run	1811
05140102-180-260	Long Run	528
05140102-180-270	Floyds Fork	256
05140102-180-280	Brush Run	2981
05140102-180-290	Floyds Fork	685
05140102-180-300	Pope Lick	6187
05140102-180-310	Floyds Fork	2424
05140102-180-320	Cane Run	6282
05140102-180-330	Sheckels Run	1708
05140102-180-340	Cane Run	1144
05140102-180-350	Floyds Fork	1528

Figure 3.1 Location of HUC 14s in the Floyds Fork LaGrange HUC11
Note: Only the last 3 digits of the HUC 14 are labeled on the map

Table 3.2 HUC 14s in the Floyds Fork Fern Creek-Jeffersontown HUC 11

HUC 14	HUC 14 NAME	ACRES
05140102-190-010	Brush Run	1494
05140102-190-020	Floyds Fork	371
05140102-190-030	Chenoweth Run	7428
05140102-190-040	Razor Branch	758
05140102-190-050	Chenoweth Run	255
05140102-190-060	Shinks Branch	1408
05140102-190-070	Chenoweth Run	928
05140102-190-080	Floyds Fork	654
05140102-190-090	Turkey Run	733
05140102-190-100	Floyds Fork	55
05140102-190-110	Broad Run	2764
05140102-190-120	Back Run	2949
05140102-190-130	Wheelers Run	885
05140102-190-140	Back Run	831
05140102-190-150	Broad Run	313
05140102-190-160	Floyds Fork	476
05140102-190-170	Big Run	3144
05140102-190-180	Floyds Fork	515
05140102-190-190	Old Mans Run	2141
05140102-190-200	Floyds Fork	5766
05140102-190-210	Wells Run	2440
05140102-190-220	Floyds Fork	1142
05140102-190-230	Bethel Branch	1497
05140102-190-240	Floyds Fork	1199
05140102-190-250	Cedar Creek	2819
05140102-190-260	Little Cedar Creek	1310
05140102-190-270	Cedar Creek	4569
05140102-190-280	Pennsylvania Run	5384
05140102-190-290	Cedar Creek	582
05140102-190-300	Tanyard Branch	1832
05140102-190-310	Cedar Creek	989
05140102-190-320	Floyds Fork	2800
05140102-190-330	Brooks Run	6262
05140102-190-340	Floyds Fork	131
05140102-190-350	Bluelick Creek	3615
05140102-190-360	Clear Run	1503
05140102-190-370	Bluelick Creek	277
05140102-190-380	Floyds Fork	1313

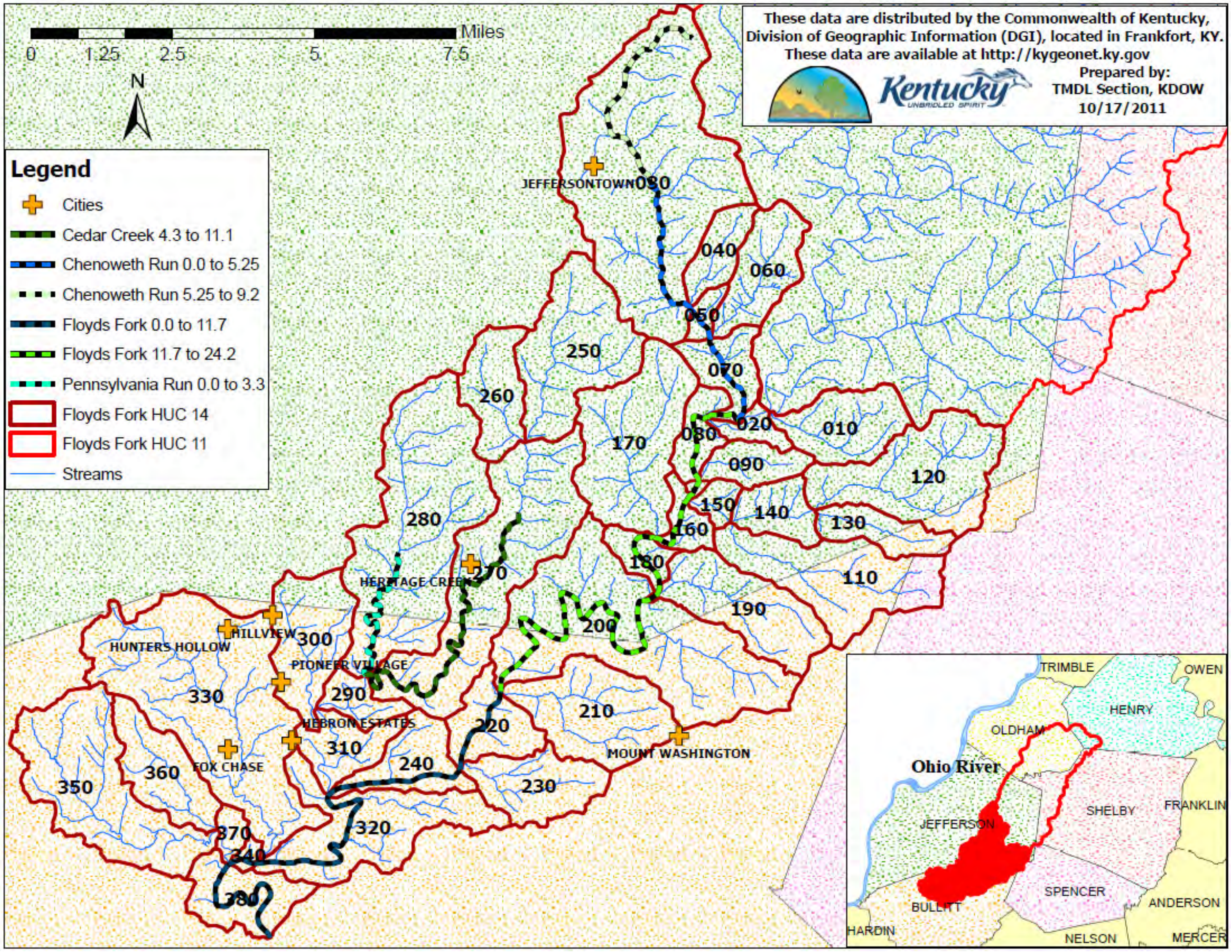

Figure 3.2 Location of HUC 14s in the Floyds Fork Fern Creek-Jeffersontown HUC 11
Note: Only the last 3 digits of the HUC 14 are labeled on the map

3.1 Geology

The Floyds Fork watershed is in the Outer Bluegrass and Knobs physiographic regions. The majority of the watershed is in the Level IV Ecoregion of the Outer Bluegrass with a small area of the downstream watershed in the Knobs-Norman Upland (Figure 3.3). Information from Woods, et al. (2002) indicates that the Outer Bluegrass is dominated by rolling to hilly terrain with springs, sinkholes and entrenched rivers. Woods, et. al. (2002) further indicates that the Knobs-Norman Upland is dominated by forested, rounded hills and ridges with narrow, high gradient valleys.

The majority of the Floyds Fork watershed is composed of limestones and shales from the Ordovician and Silurian Periods. The Ordovician rocks, formed 510 to 440 million years ago, are the oldest outcrop in the State. Some of the limestones also produce natural spring water that is bottled and sold for drinking water (http://www.uky.edu/KGS/geoky/ordovician.htm, accessed 7/27/2011). Ordovician rocks are surrounded by a ring of Silurian strata (440 to 410 million years ago). Silurian strata consist mostly of limestones and dolostones. Silurian rocks found in Kentucky are marine and the fossils are marine (sea-dwelling) invertebrates (http://www.uky.edu/KGS/geoky/silurian.htm, accessed 7/27/2011). Floyds Fork watershed also contains a strip of Devonian strata (410 to 360 million years ago). Devonian strata consist of limestones and dolostones and a thick deposit of dark gray to black shale. The color of the shales comes from organic material trapped in the rock. During the Late Devonian, muds were deposited beneath a sea that covered most of the eastern United States (http://www.uky.edu/KGS/geoky/devonian.htm, accessed 7/27/2011). Mississippian-age strata (360 to 325 million years ago) occur in the western tip of the Floyds Fork watershed. The strata are dominated by limestones, shales, and sandstones. A thick sequence of Mississippian limestone contains numerous oil reservoirs where it occurs beneath the surface; the same limestone is quarried where it occurs at the surface. Caves are also known to occur in these strata (http://www.uky.edu/KGS/geoky/mississippian.htm, accessed 7/27/2011). The major members of the deposits in the Floyds Fork watershed are the Drakes Formation, Louisville Limestone and Waldron Shale, and Laurel Dolomite, Osgood Formation and Brassfield Dolomite (Figure 3.4).

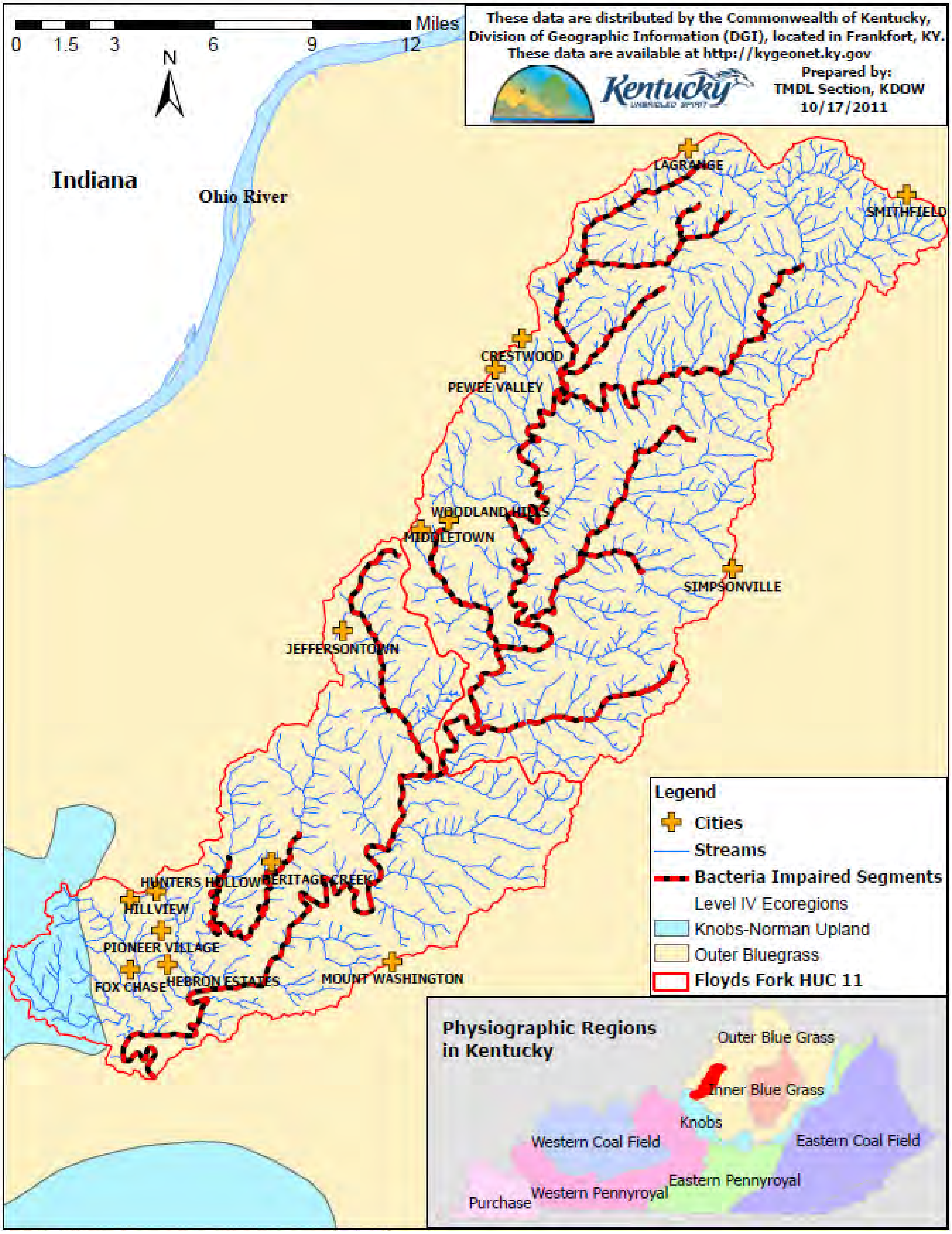

Figure 3.3 Level IV Ecoregions of Floyds Fork Watershed

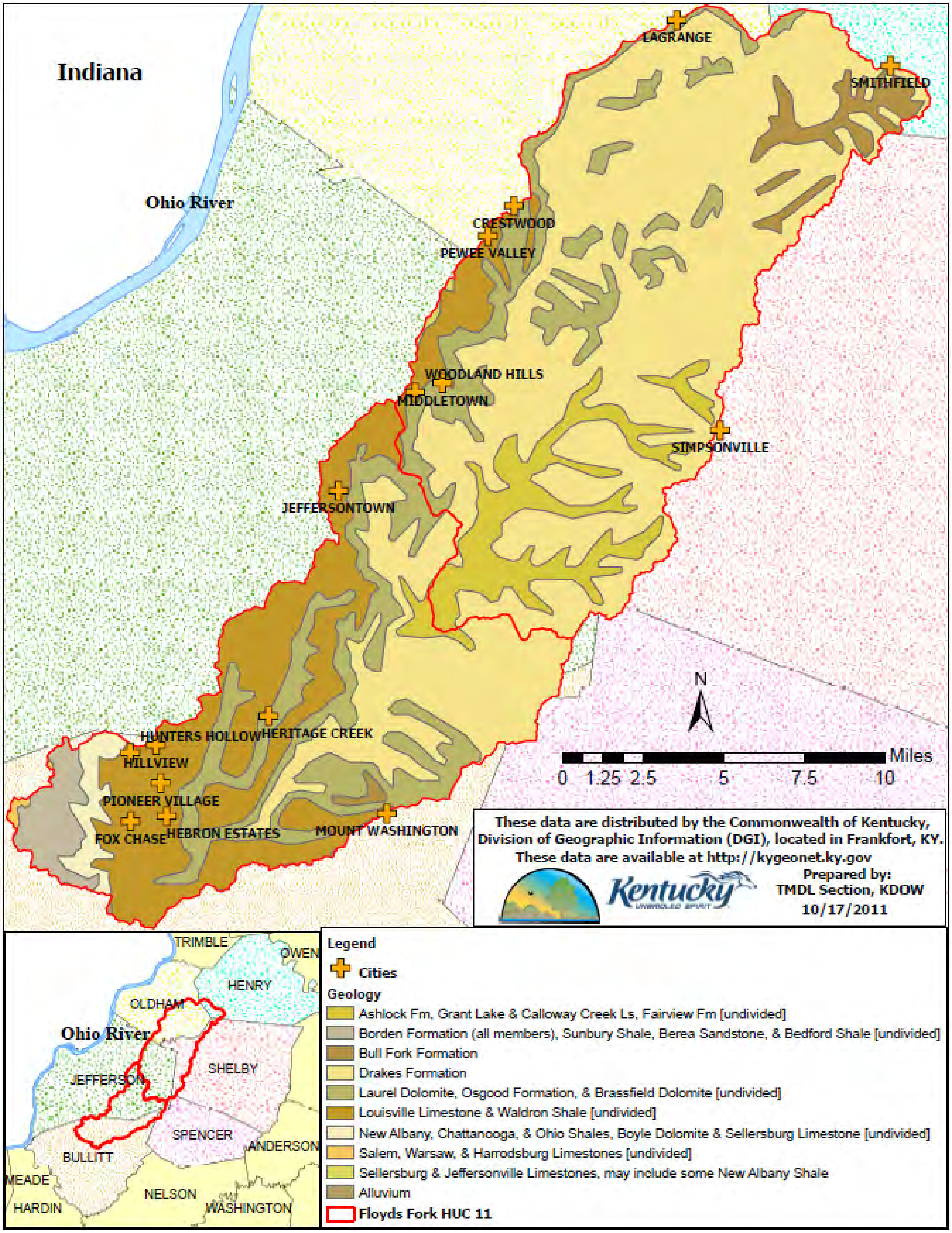

Figure 3.4 Geology in Floyds Fork Watershed

There are no faults present in the Floyds Fork watershed; however, as noted above, karst features are present. Karst features such as caves, sinkholes, and springs are formed over centuries as rainwater dissolves limestone beneath the surface (Figure 3.5).

Official watershed boundaries may not be accurate in well-developed karst regions. Although groundwater drainage generally follows topographic basin boundaries, this is not always true. Subsurface drainage transfer between surface watersheds in a karst region does occur, which increases or decreases the actual boundaries of an affected stream basin. The KDOW and the KGS maintain a Karst Atlas of groundwater tracing data and delineated basins (both as static PDF maps and ArcView shape files) that can be downloaded at http://kygeonet.ky.gov.

Karst pathways can serve as underground tributaries to surface water, and thus can serve as a transport pathway for pollutants to streams. Improper waste management activities (e.g., dumping into sinkholes, poorly installed or failing OSTDs) or improper best management practices (e.g., lack of buffer strips around sinkholes in agricultural fields) can lead to direct contamination of water supplies. Karst also provides a challenge for nonpoint source pollution management as its pathways have long been regarded as “nature’s sewer system” – sinkhole plains, sinking streams, and springs provide a direct connection between surface water and groundwater systems.

Karst topography is highly correlated with geology in the Floyds Fork watershed. In this watershed, Silurian limestone is highly prone to karst and Ordovician limestone is characterized as medium intensity karst. Numerous springs and sinkholes exist in the Floyds Fork watershed and much of the watershed is rated as 3-5 for groundwater sensitivity (Figure 3.6). A detailed field inventory has not been conducted, so additional karst features may occur in this watershed. Dye traces have not been conducted to date in the Floyds Fork watershed. This information would provide data to understand the connections between karst features and underground flow routes.

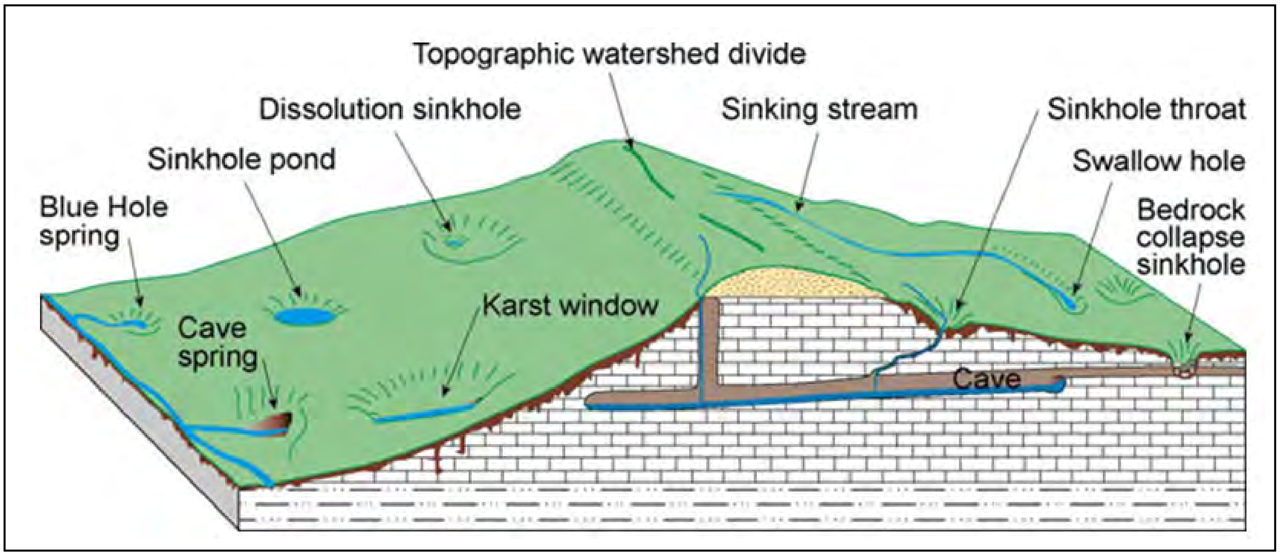

Figure 3.5 Conceptual Model of Typical Karst Terrain Encountered in the Floyds Fork Watershed
Accessed at: http://www.uky.edu/KGS/water/general/karst/karst_landscape.htm

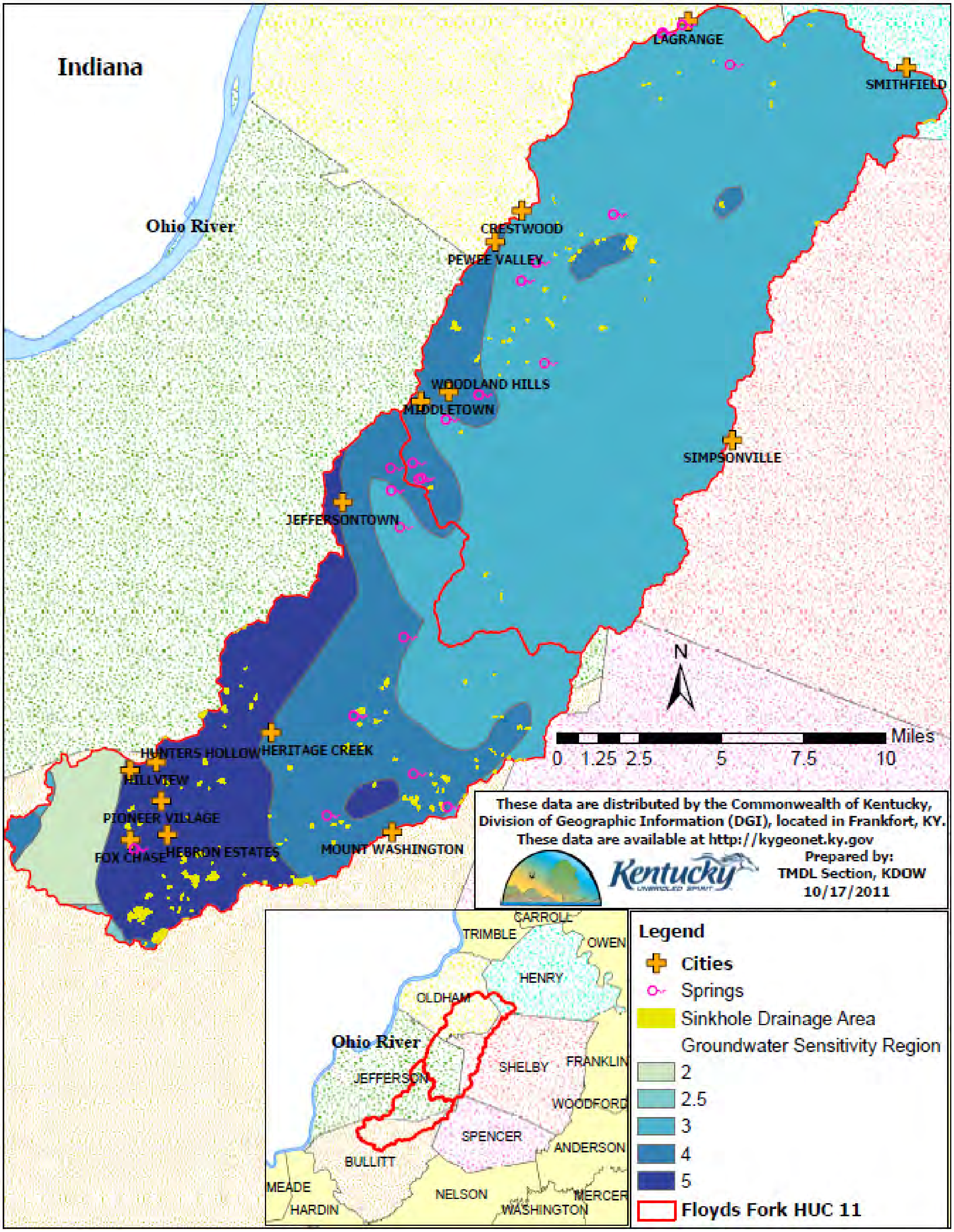

Figure 3.6 Location of Springs and Sinkhole Areas and Groundwater Sensitivity Regions in Floyds Fork Watershed

Silty loams are the predominant soil type in the Floyds Fork watershed (Figure 3.7). Once deposited on or in soils, fecal bacteria can die-off or re-grow. A review of factors important in the survival of fecal bacteria in soils showed, in general, longer bacteria survival time with 1.) greater soil moisture content - survival of days in dry soils versus longer than 1.5 months in wet soils, 2.) lower temperatures - with a doubling of the die-off rate for each 10° Celsius increase in temperature, 3.) alkaline soils - survival of days in acidic soils versus weeks in alkaline soils, with neutral soils optimal, 4.) decreased sunlight - ultraviolet light is bactericidal, and 5.) increased organic material - a nutrient source for the bacteria (reviewed in Gerba et. al., 1975). In soils, bacteria can adhere to soil particles, particularly clay particles, and either be retained in the soil or move with water flow via erosion processes (reviewed in Reddy, et. al., 1981). Bacteria that do not adsorb to a soil particle can remain bound to fecal waste particles and move with those particles in runoff or, rarely, be unbound in the soil pore water and move in an unbound state (reviewed in Reddy, et. al., 1981). Determining the fate and transport of bacteria in the soils of Floyds Fork watershed was beyond the scope of this document; however information on soils can obtained from the U.S. Department of Agriculture (USDA) Web Soil Survey at URL http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

Soil erosion and water runoff can both move bacteria to a stream or to groundwater. The hydrologic soil groups (HSG) in Floyds Fork are shown in Figure 3.8. The HSG is used to relay information about the runoff potential of a soil when thoroughly wet. For runoff potential, ratings are low, moderately low, moderately high, and high for HSGs A, B, C, and D, respectively (USDA-NRCS, 2009). For dual HSG assignment (i.e. A/D, B/D, or C/D) soils can be adequately drained, but a water table exists within 24 inches of the soil surface (USDA-NRCS, 2009). In these cases, the first letter denotes the drained condition while the second denotes the undrained condition (USDA-NRCS, 2009).

The USDA Natural Resources Conservation Service (NRCS) rates the performance of septic tank absorption fields, defined as the area in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Soil ratings are based on soil properties, site features, and the observed performance of the soils - permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of septic tank effluents. Soils in the study area include the Ashton, Beasely, Captina, Corydon, Crider, Dickson, Elk, Fairmount, Huntington, Lowell, Lawrence, Lindside, Newark, Otway, Robertson, Russellville, Shelbyville, Taft, and Woolper. These soil types are classified primarily as silt loam. USDA Natural Resource Conservation Service (NRCS) rates these soil series as somewhat to very limited for installation of septic tank absorption fields due to slope and severely eroded soils (Table 3.3 and Figure 3.9). As mentioned above, this watershed is located in a karst region. The Kentucky Geological Survey has developed Generalized Geologic Maps for Land-Use Planning (http://www.uky.edu/KGS/) for every county of the State to inform individuals of the general geologic bedrock condition that can affect a site and its intended uses. For example, a vast extent of the watershed area is underlain with limestone and shale bedrock – according to the planning guidance, this type of rock carries slight to severe limitations for septic tank disposal systems depending on the amount of soil cover and depth to impermeable bedrock. A severe limitation is one that is "difficult to overcome and commonly is not feasible because of the expense involved." A depiction of the correlations between surface and ground water, land use and karst terrains is shown in Figure 3.5.

Based on the soil ratings and prevailing karst formations it is likely many of the septic systems in the watershed are not functioning properly. Failing OSTDSs are probable sources of bacteria due to the porous nature of the karst formations underlying some parts of the watershed.

Table 3.3 Septic Suitability in Floyds Fork Watershed

Category	**Area (square miles)**	**Percent**
Not limited	0	0
Somewhat limited	32	11
Very limited	211	74

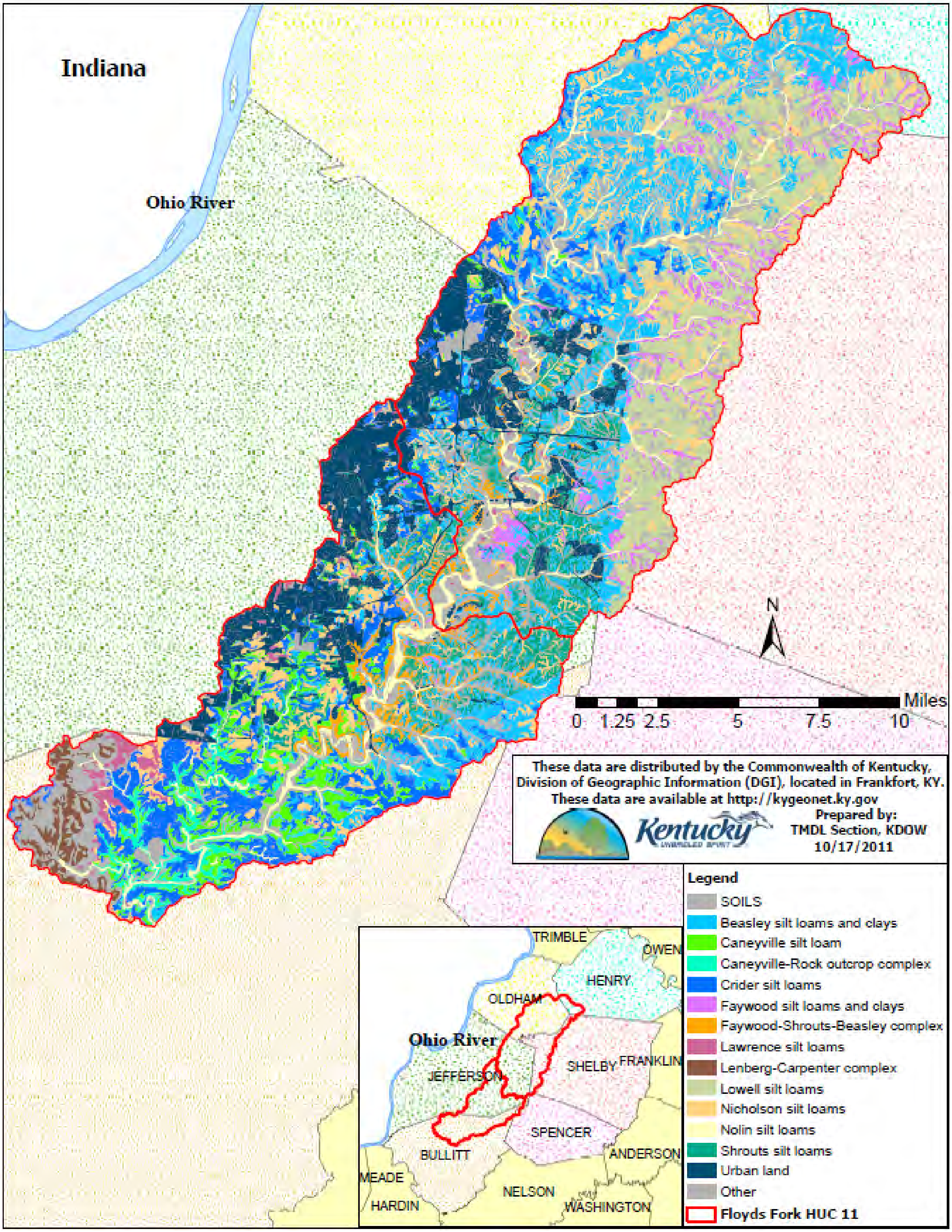

Figure 3.7 Soil Types in the Floyds Fork Watershed

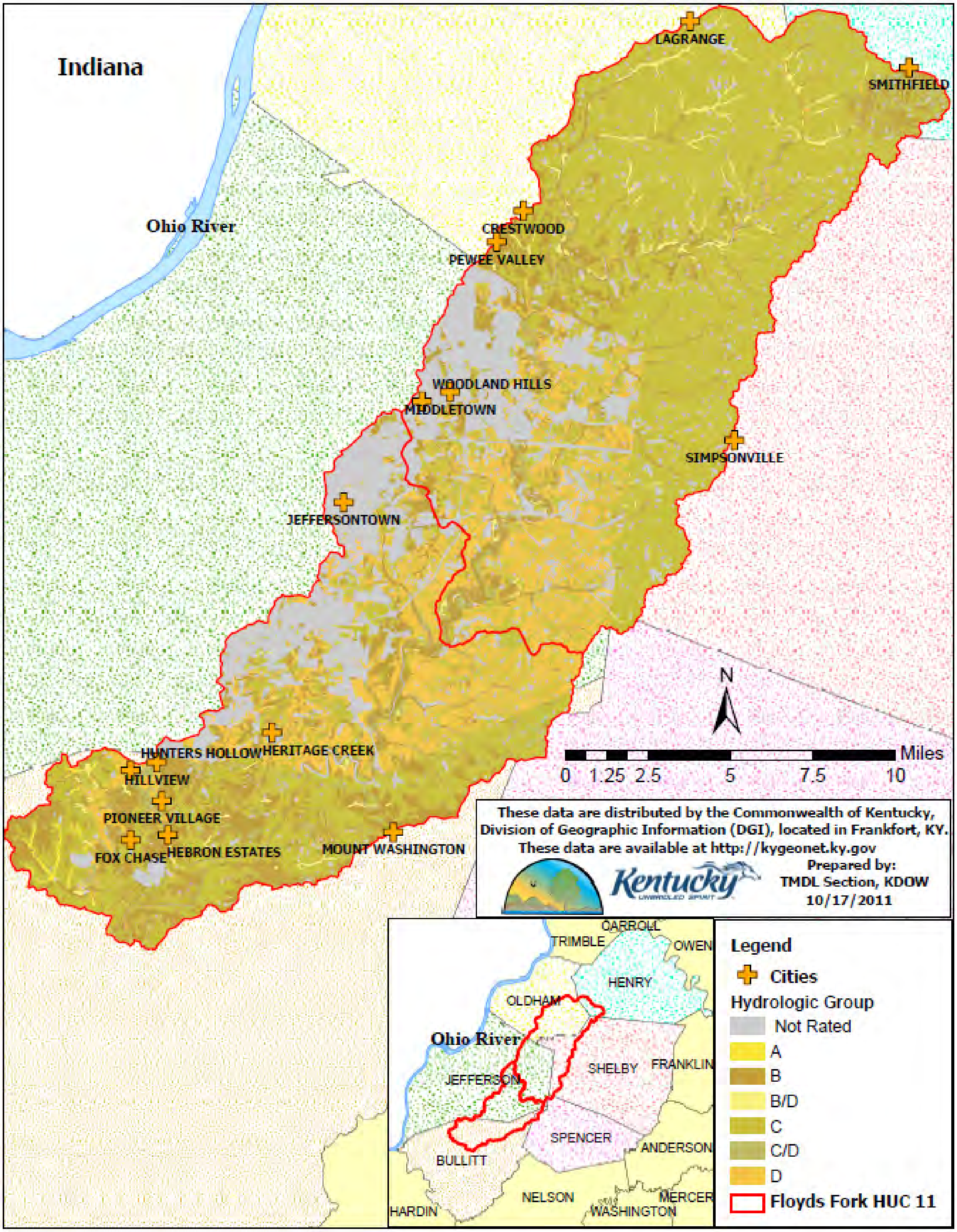

Figure 3.8 Soil Hydrologic Groups in Floyds Fork Watershed

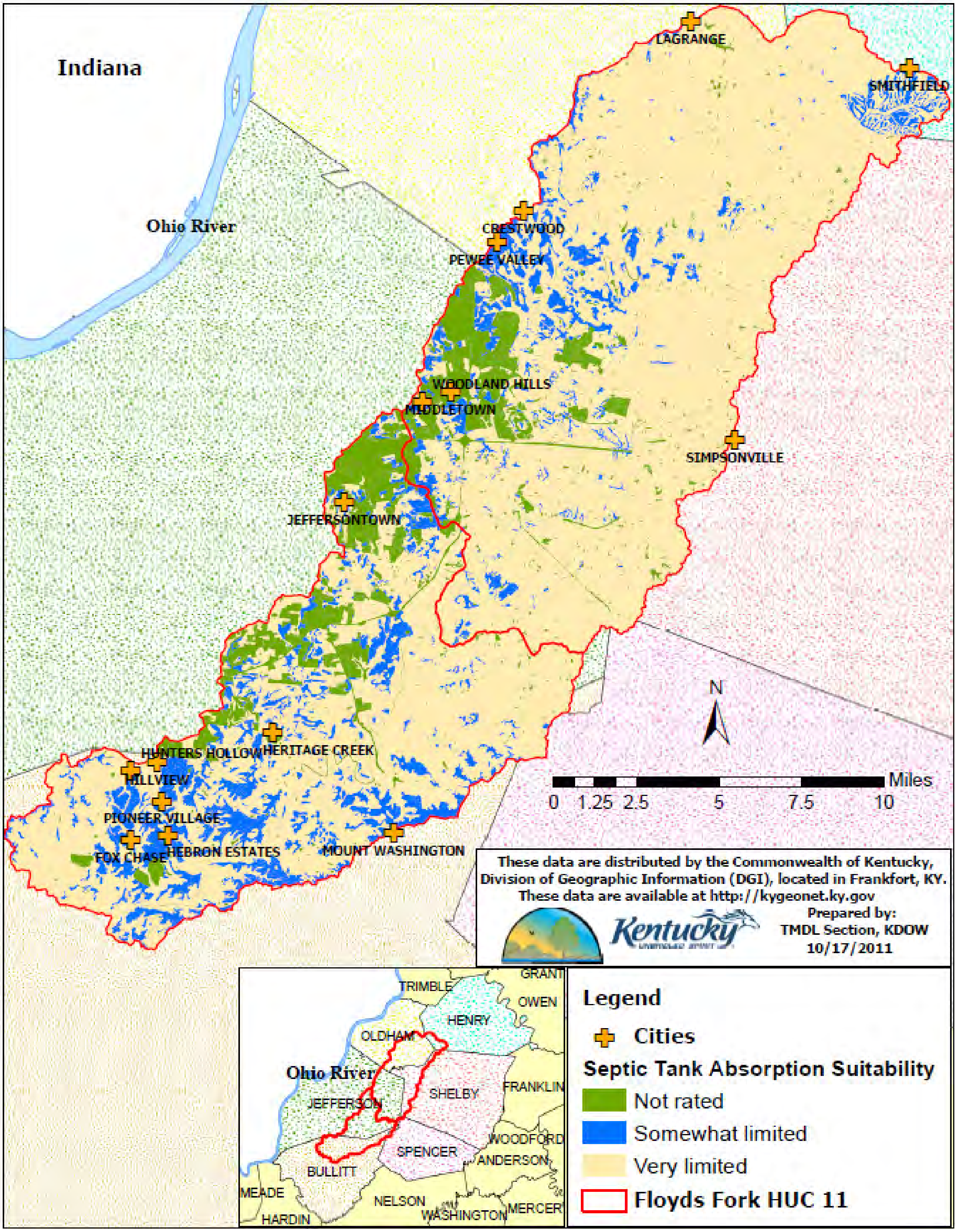

Figure 3.9 Soil Suitability for Septic Tanks

3.2 Hydrology

KDOW follows the Strahler (1952) method for stream order determination where small upstream segments with no tributaries are first order. When two first order streams merge, they form a second order stream segment; two second order segments merge to form a third order segment; and so on. In this method, a first order segment merging with a second order segment results in a continuation of the second order segment; order only increases when segments with the same order merge or if a tributary to a main segment has a larger order. First order streams tend to be small and carry little flow except during wet weather events while larger stream orders indicate larger systems with greater flow. At a 1:100 scale, the main stem of Floyds Fork below Long Run is 4th order (Figure 3.10).

There are ten permitted water withdrawals in the Floyds Fork watershed. All of them are surface water withdrawals. Table 3.4 displays KDOW water withdrawal permit information while Figure 3.10 shows the location of the withdrawals.

Table 3.4 Water Withdrawal Permit Information

AI #	Name	Latitude	Longitude	Permitted Withdrawal (MGD)	Withdrawal Location
454	KENTUCKY SOLITE CORP	38.0355	-85.7177	≤0.5 Year Round	A LARGE RESERVOIR, LOCATED APPROXIMATELY 1.08 MILES SOUTH OF BROOKS, KY; ABOUT 0.2 MILES WEST OF HWY 1020; BETWEEN CLEAR CREEK AND BLUELICK CREEK
473	ROGERS GROUP INC BULLITT CO STONE	38.0364	-85.6781	≤1.1 Year Round	SURFACE WATER INTAKE LOCATED IN THE BULLITT COUNTY STONE QUARRY PIT
71257	GOLF DEVELOPMT CO QUAIL CHASE	38.1036	-85.6347	≤1 Apr. & Nov.; ≤1.25 May-Oct.	SURFACE INTAKE LOCATED IN MCNEELY LAKE, AN IMPOUNDMENT AT MILE 3.14 OF PENNSYLVANIA RUN
1935	ACTION LANDSCAPE INC	38.1979	-85.5586	≤0.01 Mar.-May & Sep.; ≤.018 Jun.; ≤0.0235 Jul. & Aug.	SURFACE WATER INTAKE LOCATED AT MILE 4.3 OF CHENOWETH RUN

AI #	Name	Latitude	Longitude	Permitted Withdrawal (MGD)	Withdrawal Location
3934	CARDINAL CLUB LLC THE	38.2131	-85.3747	≤0.4 Year Round	A SURFACE WATER INTAKE LOCATED NEAR MILE 5.2 OF SOUTH LONG RUN, A TRIBUTARY OF LONG RUN
63657	MIDLAND TRAIL GOLF CLUB	38.2261	-85.4747	≤0.25 Mar. and Nov.; ≤0.5 Apr. , May, & Oct.; ≤0.8 Jun.- Sep.	A SURFACE WATER INTAKE LOCATED AT MILE 37.55 OF FLOYDS FORK
2185	POLO FIELDS GOLF COURSE/GC DEVELP	38.2583	-85.4425	≤0.25 Apr. & Oct.; ≤0.5 May-Sep.	SURFACE WATER INTAKE LOCATED IN THE POLO FIELDS LAKE, AN IMPOUNDMENT OF BRUSH RUN
2088	ROGERS GROUP INC JEFFERSON CO STONE	38.2691	-85.4978	≤0.35 Year Round	A SURFACE WATER INTAKE LOCATED IN THE JEFFERSON COUNTY STONE QUARRY
3955	PERSIMMON RIDGE GOLF CLUB	38.2981	-85.4381	≤0.3 Jul.-Sep.	SURFACE INTAKE AT RMI 49.45 OF FLOYDS FORK.
3955	PERSIMMON RIDGE GOLF CLUB	38.2981	-85.4386	≤0.3 Mar.-Oct.	SURFACE INTAKE LOCATED IN IRRIGATION LAKE #1 ON THE PERSIMMON RIDGE PROPERTY

There are thirty-five KDOW regulated dams in the watershed. Many of them are on smaller order tributaries (first or second order) and form ponds or small lakes. Table 3.5 shows the information for these dams while Figure 3.10 shows their location.

Table 3.5 Dams in the Floyds Fork Watershed

Dam ID #	Name	Latitude	Longitude	County
254	MT WASHINGTON DAM	38.073931	-85.546062	Bullitt
591	WHITMAN DAM	38.080555	-85.518333	Bullitt
1052	GILBERT DAM	38.085167	-85.706041	Bullitt
117	LAKE MCNEELY DAM	38.097222	-85.636666	Jefferson
1084	GLENMARY DAM	38.120005	-85.561575	Jefferson
594	FERN CREEK SPORTSMAN CLUB DAM	38.123035	-85.475892	Jefferson
603	SAMPSON DAM	38.131948	-85.488909	Jefferson

Dam ID #	Name	Latitude	Longitude	County
909	BILL MCMAHAN LAKE DAM	38.158333	-85.531111	Jefferson
600	MIRROR LAKE (LOWER) DAM	38.16837	-85.5161	Jefferson
601	LOWRY DAM	38.175569	-85.498177	Jefferson
872	LOGAN LAKE DAM	38.178145	-85.460906	Jefferson
1131	AS PROPERTIES DAM NO 2	38.18075	-85.51185	Jefferson
94	RIGGS LAKE DAM	38.19609	-85.51435	Jefferson
1100	NTS DETENTION DAM SECTION 6B	38.21591	-85.53214	Jefferson
867	JOE GUY HAGAN DAM	38.2279	-85.5154	Jefferson
1195	WATERSTONE PARK DAM	38.23359	-85.46172	Jefferson
940	TWIN LAKES LOWER DAM	38.247777	-85.483333	Jefferson
1105	POLO FIELDS	38.258849	-85.443614	Jefferson
1102	LAKE FOREST GOLF COURSE NO 1	38.262526	-85.486944	Jefferson
1101	LAKE FOREST GOLF COURSE NO 2	38.262659	-85.484881	Jefferson
301	LONG RUN PARK LAKE DAM	38.265	-85.415833	Jefferson
1160	GAULT EASTPOINT LLC DAM	38.272777	-85.504166	Jefferson
25	REYNOLDS MEADOWS DAM	38.314444	-85.4175	Oldham
24	LAKEWOOD SHORES DAM	38.377777	-85.363055	Oldham
1004	LOWER EAGLE CREEK GOLF COURSE DAM	38.380555	-85.366666	Oldham
866	EAGLE CREEK DAM (LOWER DAM)	38.3825	-85.3625	Oldham
718	LAKEWOOD GARDENS LAKE DAM	38.391944	-85.396944	Oldham
300	CRYSTAL LAKE DAM	38.398888	-85.3675	Oldham
95	LAGRANGE L&N RAILROAD LAKE DAM	38.404444	-85.37	Oldham
1038	NORRENBROCK FARM LAKE	38.165	-85.401944	Shelby
899	GK EISONBACK LAKE DAM	38.170277	-85.404166	Shelby
1092	MAJESTIC OAKS DAM	38.2042	-85.3806	Shelby
1104	BENNINGFIELD FARM	38.272222	-85.351111	Shelby
893	CONDON LAKE DAM	38.289475	-85.421008	Shelby
903	HAYDEN LAKE DAM	38.292777	-85.423333	Shelby

Eight USGS gauging stations are located in the Floyd Fork watershed (Figure 3.11). Information on the gages can be found at the hyperlinks in Table 3.6.

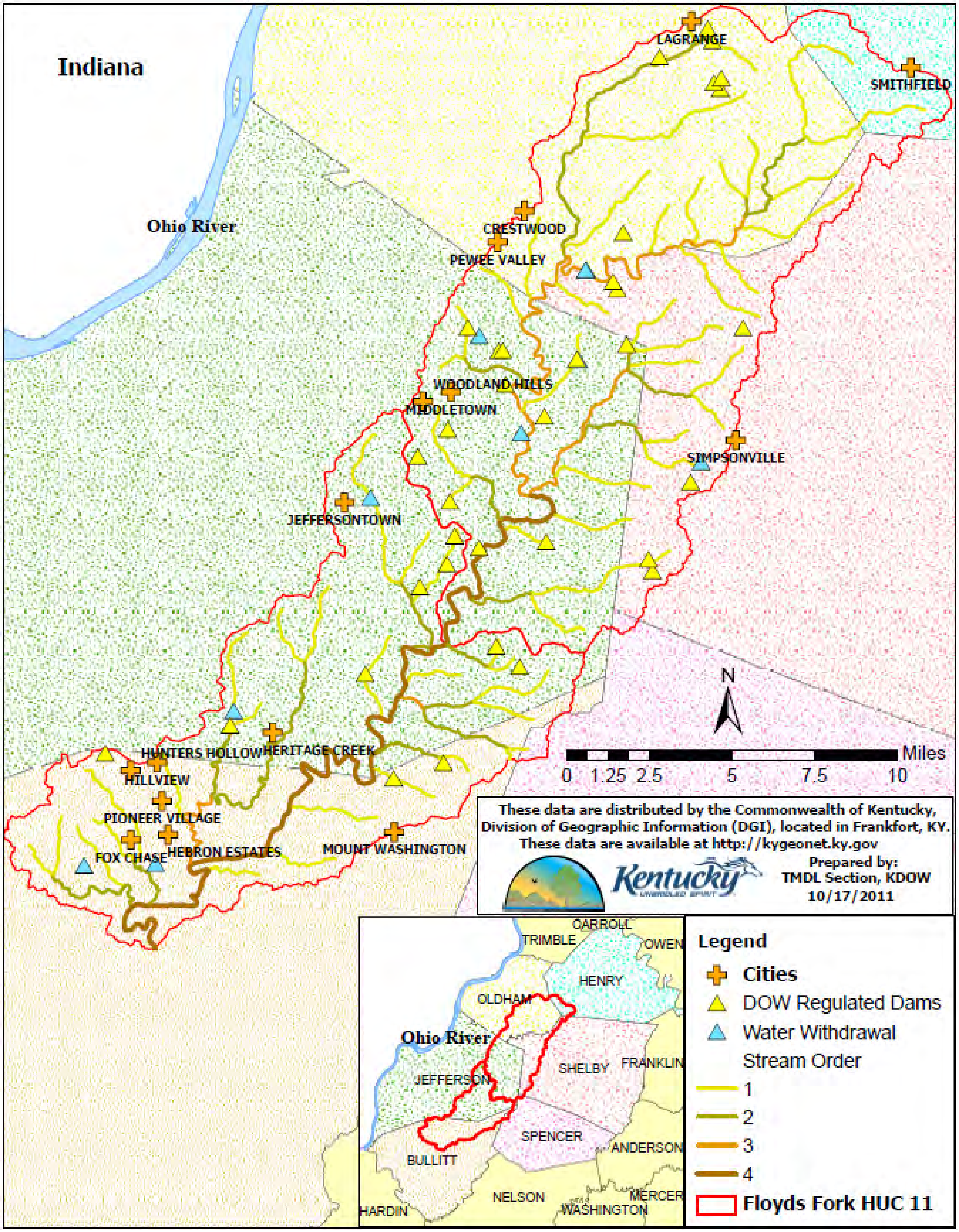

Figure 3.10 Stream Order and Dam and Water Withdrawal Locations

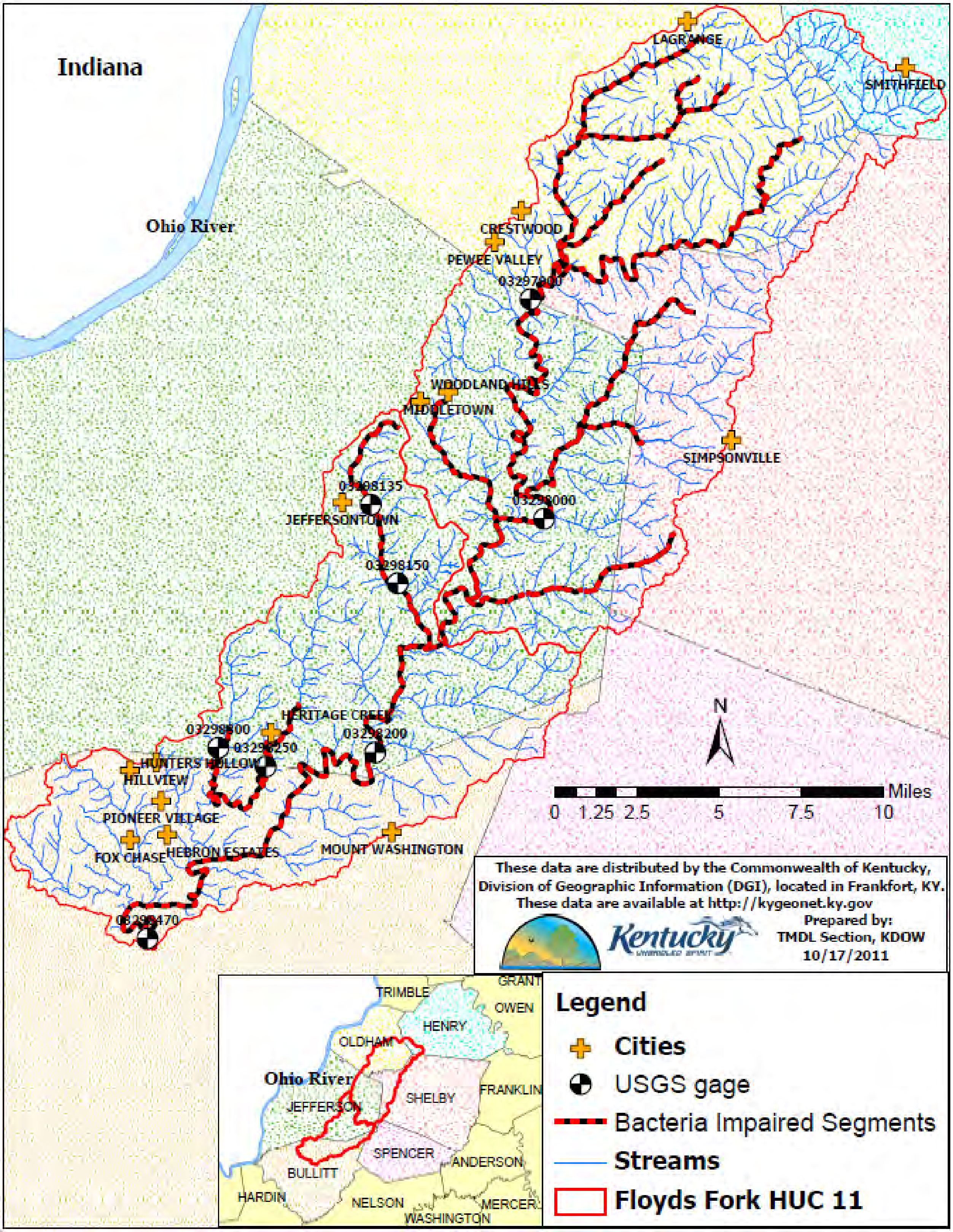

Figure 3.11 Location of USGS Gages in Floyds Fork Watershed

Table 3.6 USGS Gages in the Floyds Fork Watershed

Site ID	Name	Latitude	Longitude	Link
03298470	Floyds Fork near Shephersdsville	38.00333	-85.68222	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298470
03298250	Cedar Creek at Thixton Road near Louisville	38.07917	-85.61611	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298250
03298200	Floyds Fork near Mt. Washington	38.08528	-85.555	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298200
03298300	Pennsylvania Run at Mt Washington	38.0875	-85.6425	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298300
03298150	Chenoweth Run at Gelhaus Lane	38.16	-85.54222	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298150
03298000	Floyds Fork at Fisherville	38.18833	-85.46028	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298000
03298135	Chenoweth Run at Ruckriegal Pkwy	38.19472	-85.55722	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298135
03297900	Floyds Fork near Pewee Valley	38.28528	-85.4675	http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03297900

3.3 Land Cover Distribution

The 2001 National Land Cover Dataset (USGS, 2003) was used to determine the land cover within the Floyds Fork watershed. The 2001 National Land Cover Database (NLCD) Land Cover Class Definitions are in Appendix A. Table 3.7 lists the percent land cover by class within the watershed. For the land cover tables, all forms of developed area (i.e., high-, medium- and low-intensity developed area, as well as developed open space), were aggregated, as were all forms of forest and shrub land. This was done to simplify the source analysis. Land cover is shown graphically in Figure 3.12. The land cover indicates that approximately 43.7 percent of the watershed is forest/shrub land, 32.9 percent is devoted to agriculture, and 17.6 percent is developed.

Table 3.7 Amount of Land Cover Class in Floyds Fork Watershed

Land Cover	% of Total Area	Acres	Square Miles
Developed	17.6	32,059	50.1
Agriculture (total)	32.9	59,900	93.6
Pasture	28.0	50,927	79.6
Row Crop	4.9	8,973	14.0
Forest/Shrub land	43.7	79,475	123.7
Natural Grassland	3.7	6,662	10.4
Open Water	0.7	1,332	2.1
Wetland	1.0	1,801	2.8
Barren	0.4	699	1.1
Total	100.0	181,927	283.8

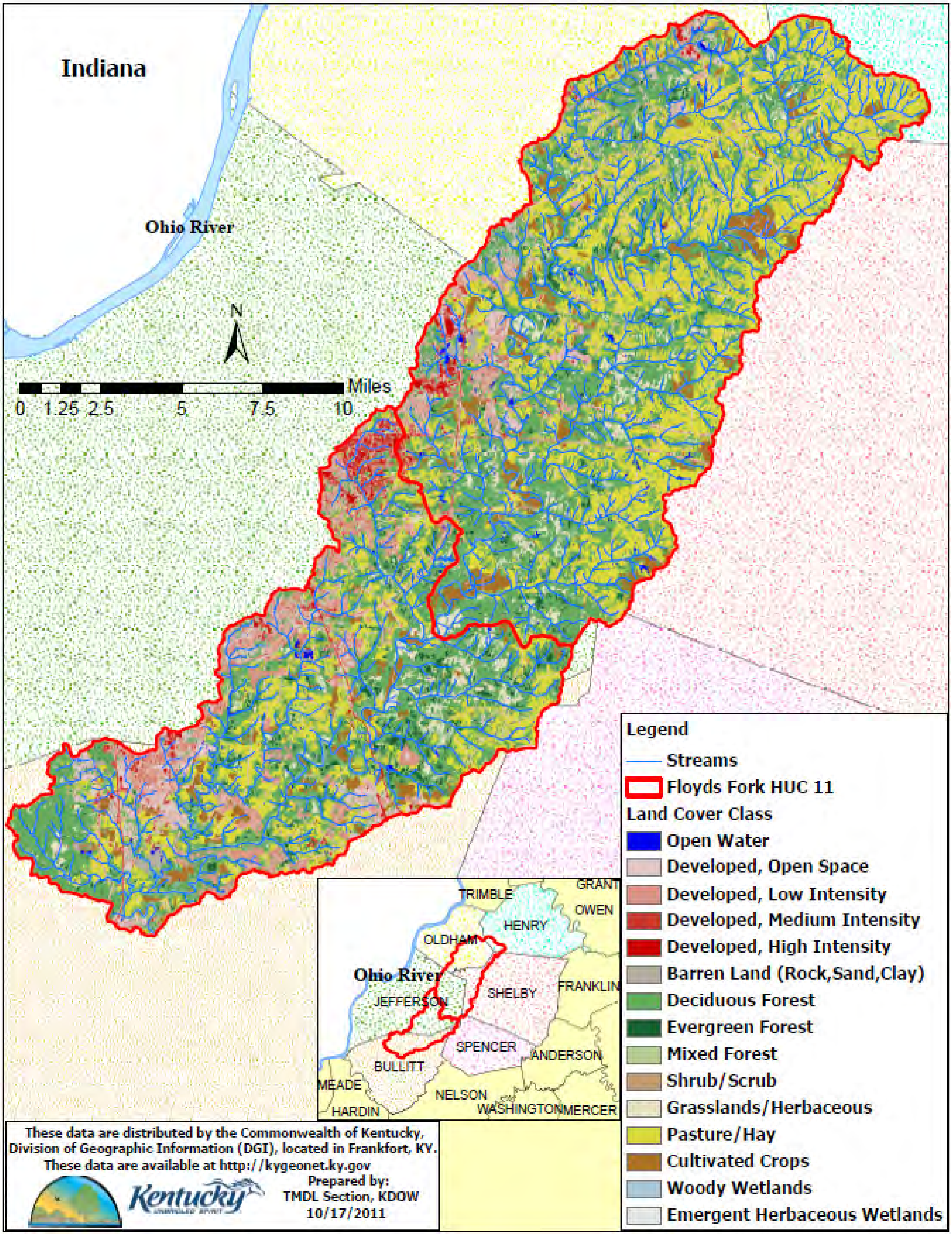

Figure 3.12 Land Cover in the Floyds Fork Watershed

4.0 Monitoring

This section summarizes historical and recent monitoring in the Floyds Fork watershed. Only bacteria sites in the Floyds Fork watershed with data that passed KDOW quality assurance procedures and validation tests are shown in the figures below. Additional data that failed KDOW quality assurance procedures or the sample validation process are available for some sites but are not presented in this Section. The full data sets are presented in Appendix B.

4.1 Historical Monitoring

Oldham County Fiscal Court was awarded Clean Water Act Section 319(h) Nonpoint Source Funding (grant # 06-06) to address the pollutants that cause designated use impairments and develop a watershed plan (WBP) for Currys Fork. Oldham County Fiscal Court contracted Strand Associates, Inc.® to collect fecal coliform samples at eleven sites within the Currys Fork watershed during the PCR season of 2007 and 2009. Sampling station locations are summarized in Table 4.1, while sample site locations are shown in Figure 4.1. Data are summarized in Table 4.2. Data from site TB1 were used to establish the PCR fecal coliform TMDL for Ashers Run RM 0.0 to 4.8.

Table 4.1 Currys Fork WBP Sample Site Locations

Station Name	Latitude	Longitude	Stream Segment	RM
CF1	38.305884	-85.450435	Currys Fork 0.0 to 4.8	0.2
CF2	38.309383	-85.451593	Currys Fork 0.0 to 4.8	0.45
CF3	38.355536	-85.440502	Currys Fork 0.0 to 4.8	4.65
NC1	38.359264	-85.439417	North Fork Currys Fork 0.0 to 6.0	0.2
NC1a	38.377220	-85.427500	North Fork Currys Fork 0.0 to 6.0	2
NC1b	38.388720	-85.397030	North Fork Currys Fork 0.0 to 6.0	4.05
NC2	38.400327	-85.367154	North Fork Currys Fork 0.0 to 6.0	6
SC1	38.356789	-85.438633	South Fork Currys Fork 0.0 to 6.1	0.1
SC2	38.368120	-85.374600	South Fork Currys Fork 0.0 to 6.1	4.55
TB1	38.308944	-85.444289	Ashers Run 0.0 to 4.8	0.4
TB1a	38.331670	-85.412220	Ashers Run 0.0 to 4.8	3.25

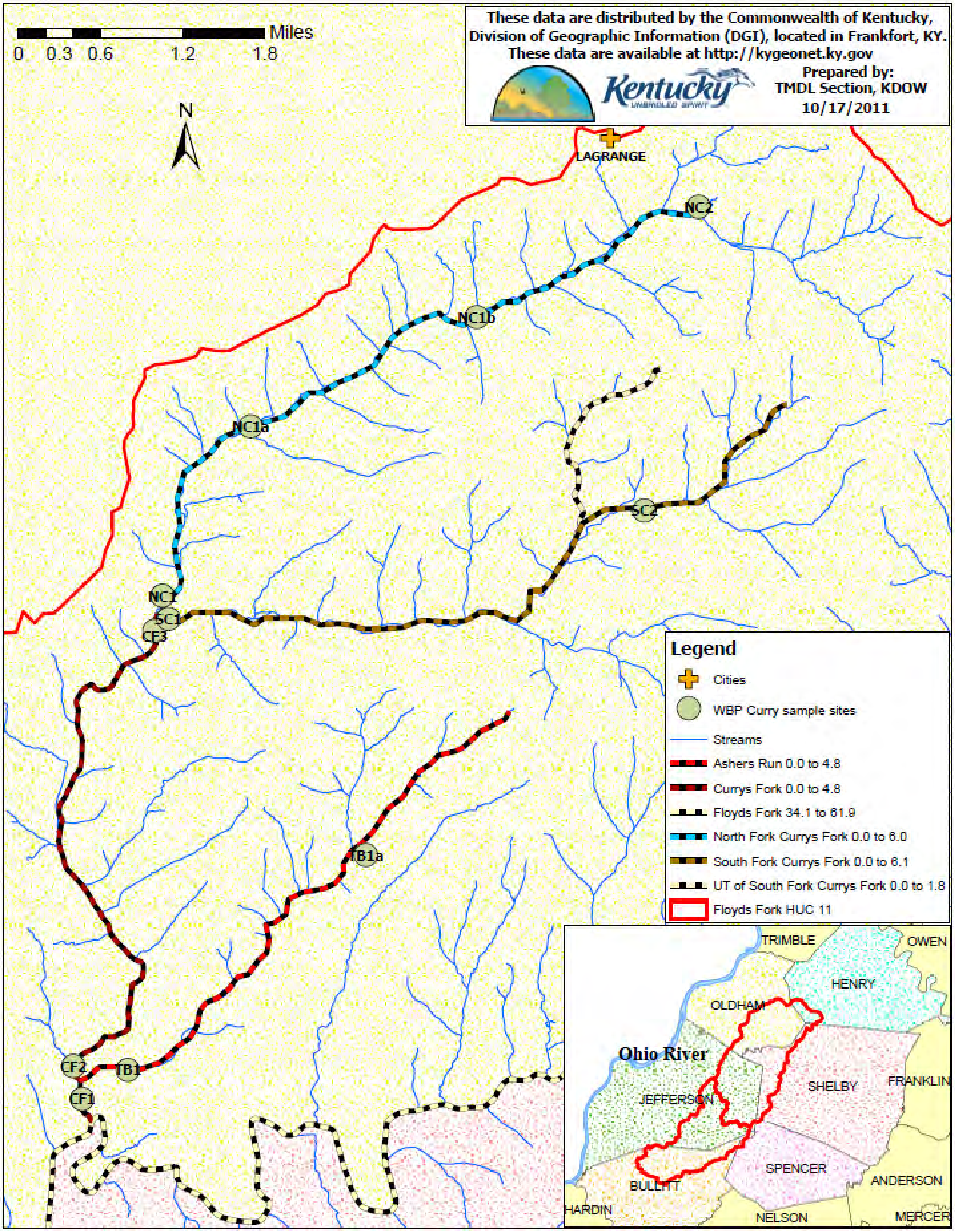

Figure 4.1 Currys Fork WBP Sites in Floyds Fork Watershed

Table 4.2 Currys Fork WBP Sample Data Summary

Station Name	Number of Observations	% Exceeding WQC (400 colonies/100 ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
CF1	24	54.2	50	9,900	1,478
CF2	24	70.8	60	25,000	3,314
CF3	24	66.7	200	88,000	4,987
NC1	30	76.7	100	22,000	3,567
NC1a	18	72.2	60	21,000	3,329
NC1b	10	60.0	50	6,800	1,828
NC2	17	47.1	18	5,000	890
SC1	27	85.2	110	87,000	6,381
SC2	28	57.1	50	6,300	2,049
TB1	20	65.0	30	13,000	1,788
TB1a	12	91.7	200	5,900	1,777

The Louisville Metropolitan Sewer District (MSD) monitors fecal coliform at seven sites within the Floyds Fork Watershed. Samples typically are collected weekly during the PCR season (May 1st through October 31st) with a few samples collected during November 1st through April 30th. Sampling station locations are summarized in Table 4.3, while sample site locations are shown in Figure 4.2. Data from 2000 through 2010 are summarized in Table 4.4. Data from this monitoring resulted in the 303(d) listing of Chenoweth Run RM 0.0 to 5.25, Chenoweth Run RM 5.25 to 9.2, Floyds Fork RM 34.1 to 61.9, and Pennsylvania Run 0.0 to 3.3 as impaired for the SCR use due to fecal coliform bacteria. Data from sites on these segments were used to develop fecal coliform SCR TMDLs.

Table 4.3 Louisville MSD Sample Site Locations

Station Name	Latitude	Longitude	Stream Segment	RM
ECCCC001	38.080000	-85.616111	Cedar Creek 4.3 to 11.1	8.3
EFFCR001	38.160000	-85.542222	Chenoweth Run 0.0 to 5.25	2.4
EFFCR002	38.194722	-85.557222	Chenoweth Run 5.25 to 9.2	5.35
EFFFF001	38.285278	-85.467500	Floyds Fork 34.1 to 61.9	45.7
EFFFF002	38.085278	-85.555000	Floyds Fork 11.7 to 24.2	18.85
EFFFF003	38.188333	-85.460278	Floyds Fork 24.2 to 34.1	32.8
EPRPR001	38.087500	-85.642500	Pennsylvania Run 0.0 to 3.3	2.4

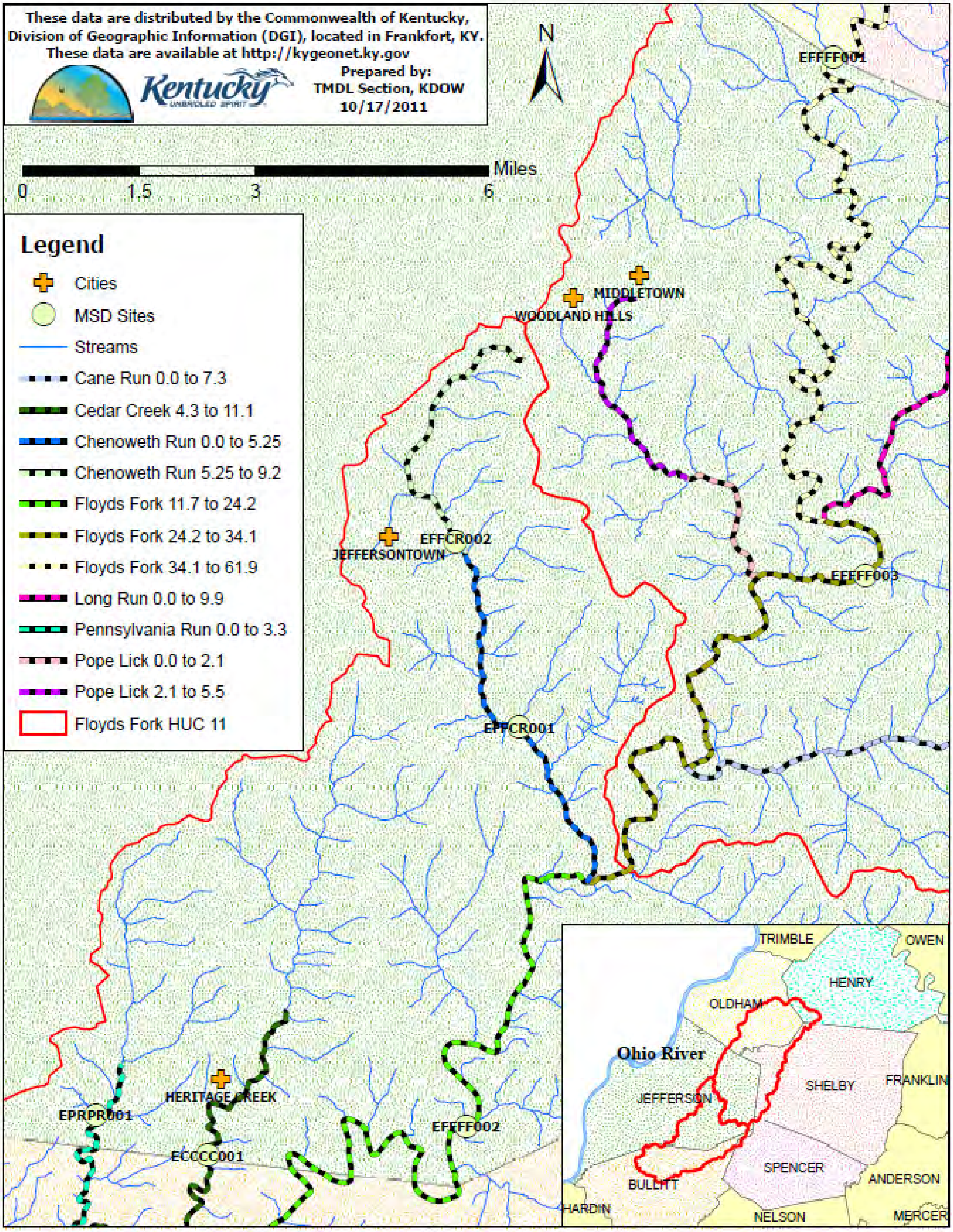

Figure 4.2 Louisville MSD Sites in Floyds Fork Watershed

Table 4.4 MSD Sample Data Summary

Station Name	Number of Observations	% Exceeding WQC (400 colonies/100 ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
ECCCC001	345	23.5	3	58,400	788
EFFCR001	346	28.6	3	15,000	769
EFFCR002	343	37.9	2	29,400	1,264
EFFFF002	319	30.7	3	31,350	1,041
EFFFF003	346	28.6	3	64,800	859
EFFFF001	343	30.6	3	33,429	2,859
EPRPR001	336	36.0	3	45,600	1,334

During 1999, the KDOW collected fecal coliform samples at nine sites in the Brooks Run subwatershed. Many of the samples were collected on un-assessed stream segments with insufficient data to assess these segments. In Table 4.5, these un-assessed streams are in parenthesis. KDOW also collected fecal coliform samples at the long-term (ambient) monitoring station, PRI100, on Floyds Fork near Shepherdsville from 1998 through 2004. *E. coli* samples were collected at this same site from 2006 through 2009. In addition, fecal coliform data was collected at site SRW012 during 2004. Sampling station locations are summarized in Table 4.5, while sample site locations are shown in Figure 4.3. Data are summarized in Table 4.6. These data were not used to establish TMDLs.

Table 4.5 KDOW Sample Site Locations

Station Name	Latitude	Longitude	Stream Segment[1]	RM
1	38.078021	-85.714616	(Brooks Run)	6.3
2	38.069263	-85.704538	(Brooks Run)	5.3
3	38.059655	-85.696223	(Brooks Run)	4.4
4	38.074898	-85.692529	(UT at RM 4.35 of Brooks Run)	1.3
5	38.077920	-85.694896	(UT at RM 1.15 of UT at RM 4.35 of Brooks Run)	0.35
6	38.073470	-85.694100	(UT at RM 1.15 of UT at RM 4.35 of Brooks Run)	0.01
7	38.061434	-85.694346	(UT at RM 4.35 of Brooks Run)	0.15
8	38.051183	-85.688222	(Brooks Run)	3.5
9	38.034645	-85.689068	Brooks Run 0.0 to 2.7	2.1
PRI100	38.035	-85.659444	Floyds Fork 0.0 to 11.7	7.55
SRW012	38.1899	-85.4581	Floyds Fork 24.2 to 34.1	33

Note: [1]Parenthesis indicate that the sample site was not on an assessed segment; only the stream name is noted.

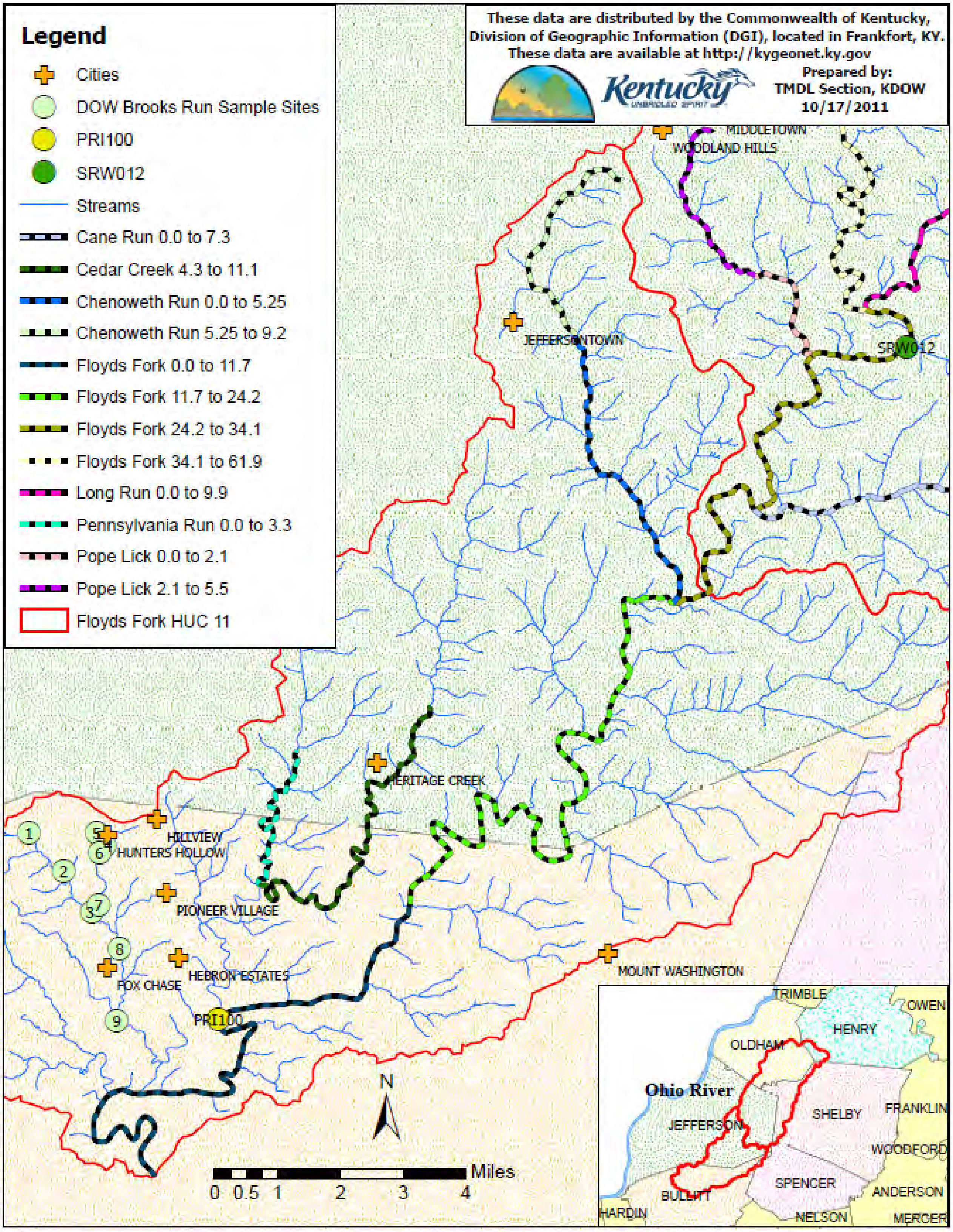

Figure 4.3 KDOW Sites in Floyds Fork Watershed

Note: Site 4 is located to the right of sites 5 and 6.

Table 4.6 KDOW Sample Data Summary

Station Name	Number of Fecal Coliform Observations	% Exceeding WQC (400 colonies/100 ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
1	1	0	10	10	N/A[1]
2	1	100	1,500	1,500	N/A[1]
3	1	100	500	500	N/A[1]
4	1	100	520	520	N/A[1]
5	1	100	3,000	3,000	N/A[1]
6	1	100	3,000	3,000	N/A[1]
7	1	0	200	200	N/A[1]
8	1	0	300	300	N/A[1]
9	7	0	40	310	176
PRI100	33	30.3	10	12,000	806
SRW012	6	33.3	120	3,400	987
Station Name	Number of *E. coli* Observations	% Exceeding WQC (240 colonies/100 ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
PRI100	18	38.9	39.9	3100	830

Note: [1]N/A indicates insufficient samples to calculate an average

As part of a 2003-319(h) Nonpoint Source Funding grant awarded to Bullitt County Fiscal Court (grant # 03-14), a limited number of fecal coliform samples were collected from 15 sites in 2005 and 2006. Sampling station locations are summarized in Table 4.7, while sample site locations are shown in Figure 4.4. Many of the samples were collected on un-assessed stream segments with insufficient data to assess these segments. In Table 4.7, these un-assessed streams are in parenthesis. Data from all sites are summarized in Table 4.8. Sites FF-1 and FF-2 include one round of stormwater sampling with four samples collected over 24-hrs on October 17, 2006. These data were not used for TMDL development.

Table 4.7 Bullitt County Sample Site Locations

Station Name	Latitude	Longitude	Stream Segment[1]	RM
BB-1	38.037998	-85.576797	(Bethal Branch)	2.8
BB-2	38.036399	-85.604499	(Bethal Branch)	1.05
BL-1	38.031101	-85.735496	(Bluelick Creek)	4.55
BL-2	38.025798	-85.691902	(Bluelick Creek)	0.85
BR-1	38.060199	-85.696998	(Brooks Run)	4.45
BR-2	38.034698	-85.687896	Brooks Run 0.0 to 2.7	2.05
CC-1	38.060798	-85.6287	Cedar Creek 4.3 to 11.1	6.2
CC-2	38.036598	-85.658996	(Cedar Creek)	0.15

Station Name	Latitude	Longitude	Stream Segment[1]	RM
CR-1	38.040298	-85.708702	(Clear Run)	1.5
FF-1	38.034599	-85.658996	Floyds Fork 0.0 to 11.7	7.5
FF-2	38.003799	-85.6819	Floyds Fork 0.0 to 11.7	0.45
TB-1	38.0746	-85.668899	(Tanyard Branch)	1.55
TB-2	38.063999	-85.664497	(Tanyard Branch)	0.75
WR-1	38.055999	-85.560203	(Wells Run)	2.75
WR-2	38.057201	-85.569801	(Wells Run)	2.15

Note: [1]Parenthesis indicate that the sample site was not on an assessed segment; only the stream name is noted.

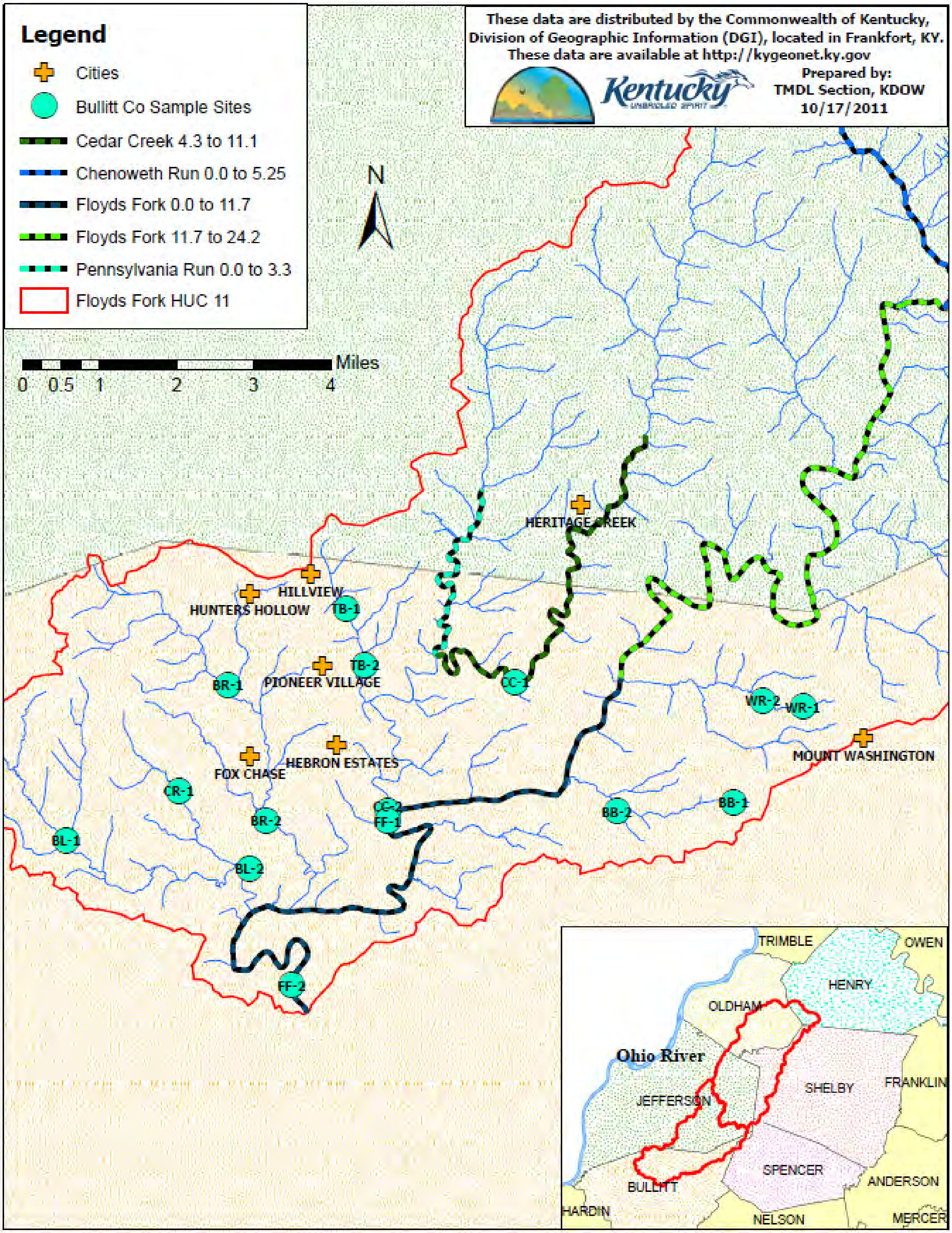

Figure 4.4 Bullitt County Sites in Floyds Fork Watershed

Table 4.8 Bullitt County Sample Data Summary

Station Name	Number of Observations	% Exceeding WQC (400 colonies/100ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
BB-1	3	66.7	320	60,000	20,267
BB-2	3	66.7	20	60,000	21,773
BL-1	3	100	600	3,000	1,500
BL-2	3	33.3	210	2100	900
BR-1	3	100	2,100	60,000	23,700
BR-2	3	100	600	1,700	1,233
CC-1	3	100	500	560	520
CC-2	3	66.7	230	500	410
CR-1	3	100	1,400	60,000	21,300
FF-1	7	71.4	130	7,900	2,700
FF-2	7	57.1	100	6,000	1,393
TB-1	3	100	23,000	60,000	43,000
TB-2	3	100	800	60,000	20,567
WR-1	3	100	600	23,000	9,200
WR-2	3	100	600	60,000	20,667

4.2 TMDL Monitoring

To facilitate bacteria TMDL development, the U.S. Geological Survey (USGS) was contracted by the USEPA to collect *E. coli* samples at 26 stations located throughout the Floyds Fork Watershed during 2007 and 2008. The USGS worked in cooperation with KDOW to select the sampling stations. Sampling station locations are summarized in Table 4.9, while sample site locations are shown in Figures 4.5 and 4.6. Data from all sites are summarized in Table 4.10. These data resulted in the listing of Ashers Run RM 0.0 to 4.8, Cane Run RM 0.0 to 7.3, Cedar Creek RM 4.3 to 11.1, Floyds Fork RM 34.1-61.9, North Fork Currys Fork RM 0.0 to 6.0, Pope Lick Creek RM 0.0 to 2.1, South Fork Currys Fork RM 0.0 to 6.1, South Long Run RM 0.0 to 3.35, and UT of South Fork Currys Fork RM 00 to 1.8 as impaired for the PCR use due to *E. coli*. Additionally, these data resulted in the listing of *E. coil* bacteria as a cause of impairment on segments previously 303(d)-listed for fecal coliform. Data from sites except CR-2, FF-1, FF-3, FF-4, FF-7, JTOWNSTP, LR-1, and PL-3, were used to develop *E. coli* PCR TMDLs for the impaired segments.

Table 4.9 USGS Sample Site Locations

Station Name	Latitude	Longitude	Stream Segment	RM
AR-1	38.315000	-85.434722	Ashers Run 0.0 to 4.8	1.2
CANE-1	38.152778	-85.491389	Cane Run 0.0 to 7.3	0.25
CC-2	38.080000	-85.616111	Cedar Creek 4.3 to 11.1	8.3
CF-1	38.307222	-85.450556	Currys Fork 0.0 to 4.8	0.3

Station Name	Latitude	Longitude	Stream Segment	RM
CR-1	38.194722	-85.557222	Chenoweth Run 5.25 to 9.2	5.35
CR-2	38.160000	-85.542222	Chenoweth Run 0.0 to 5.25	2.4
CR-3	38.132778	-85.525278	Chenoweth Run 0.0 to 5.25	0.15
FF-1	38.347500	-85.329167	Floyds Fork 34.1 to 61.9	60.8
FF-2	38.298611	-85.426667	Floyds Fork 34.1 to 61.9	50.85
FF-3	38.285278	-85.467500	Floyds Fork 34.1 to 61.9	45.7
FF-4	38.188333	-85.460278	Floyds Fork 24.2 to 34.1	32.8
FF-5	38.085278	-85.555000	Floyds Fork 11.7 to 24.2	18.85
FF-6	38.003333	-85.682222	Floyds Fork 0.0 to 11.7	0.4
FF-7	38.199444	-85.475833	Floyds Fork 34.1 to 61.9	34.5
FF-8	38.132390	-85.518610	Floyds Fork 24.2 to 34.1	24.65
JTOWNSTP	38.193056	-85.555000	Chenoweth Run 0.0 to 5.25	5.2
LR-1	38.255060	-85.415000	Long Run 0.0 to 9.9	5.9
LR-2	38.219444	-85.448889	Long Run 0.0 to 9.9	2.4
NFCF-1	38.359440	-85.438786	North Fork Currys Fork 0.0 to 6.0	0.2
PL-1	38.219160	-85.518611	Pope Lick Creek 2.1 to 5.5	3.6
PL-2	38.188889	-85.488056	Pope Lick 0.0 to 2.1	0.15
PL-3	38.206389	-85.502222	Pope Lick 0.0 to 2.1	2.1
PR-1	38.087500	-85.642500	Pennsylvania Run 0.0 to 3.3	2.4
SFCF-1	38.366642	-85.383451	UT to South Fork Currys Fork (at RM 3.85) 0.0 to 1.8	0.2
SFCF-2	38.356111	-85.408889	South Fork Currys Fork 0.0 to 6.1	1.9
SLR-1	38.229444	-85.424920	South Long Run 0.0 to 3.35	1.15

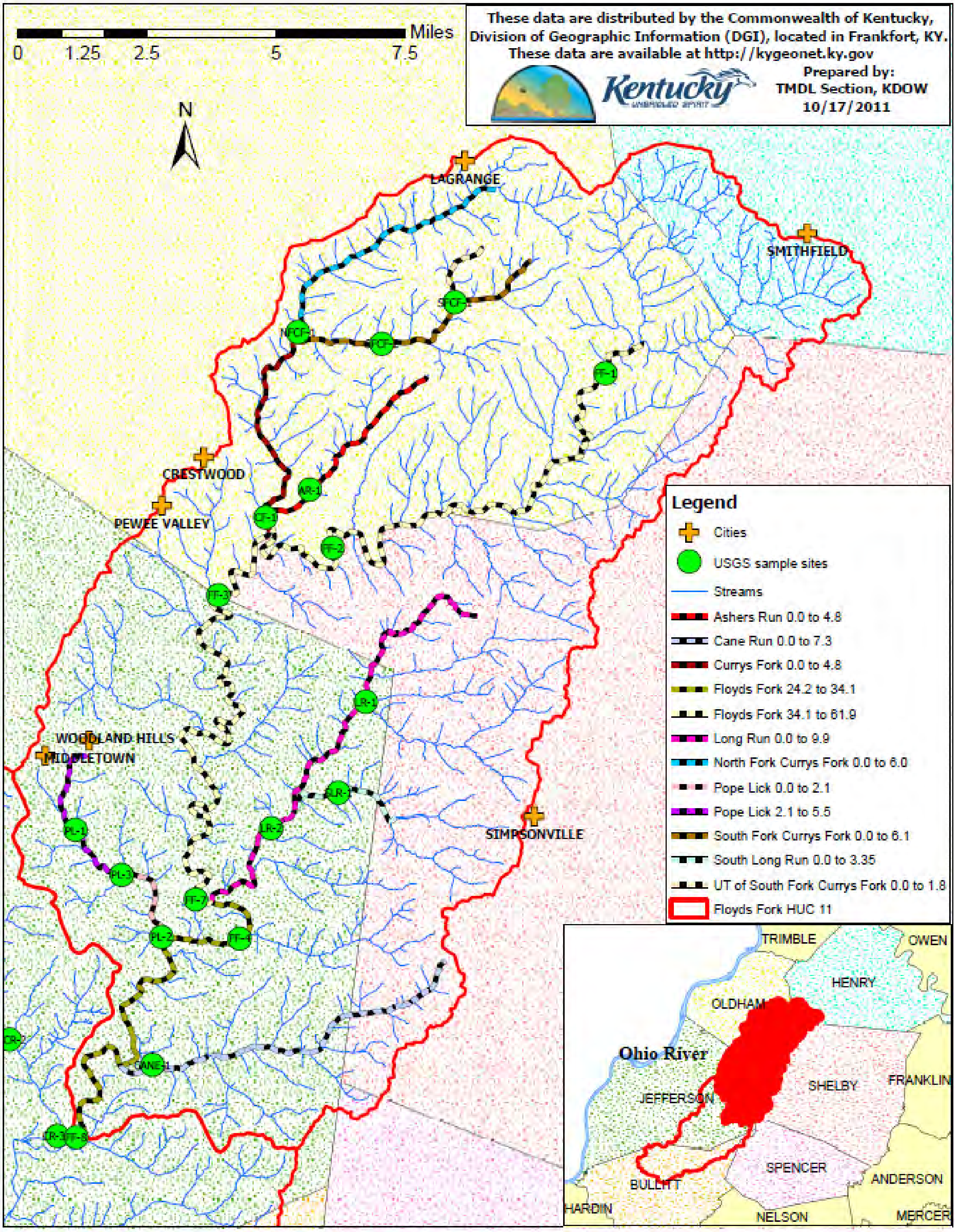

Figure 4.5 USGS Sites in Floyds Fork LaGrange HUC11

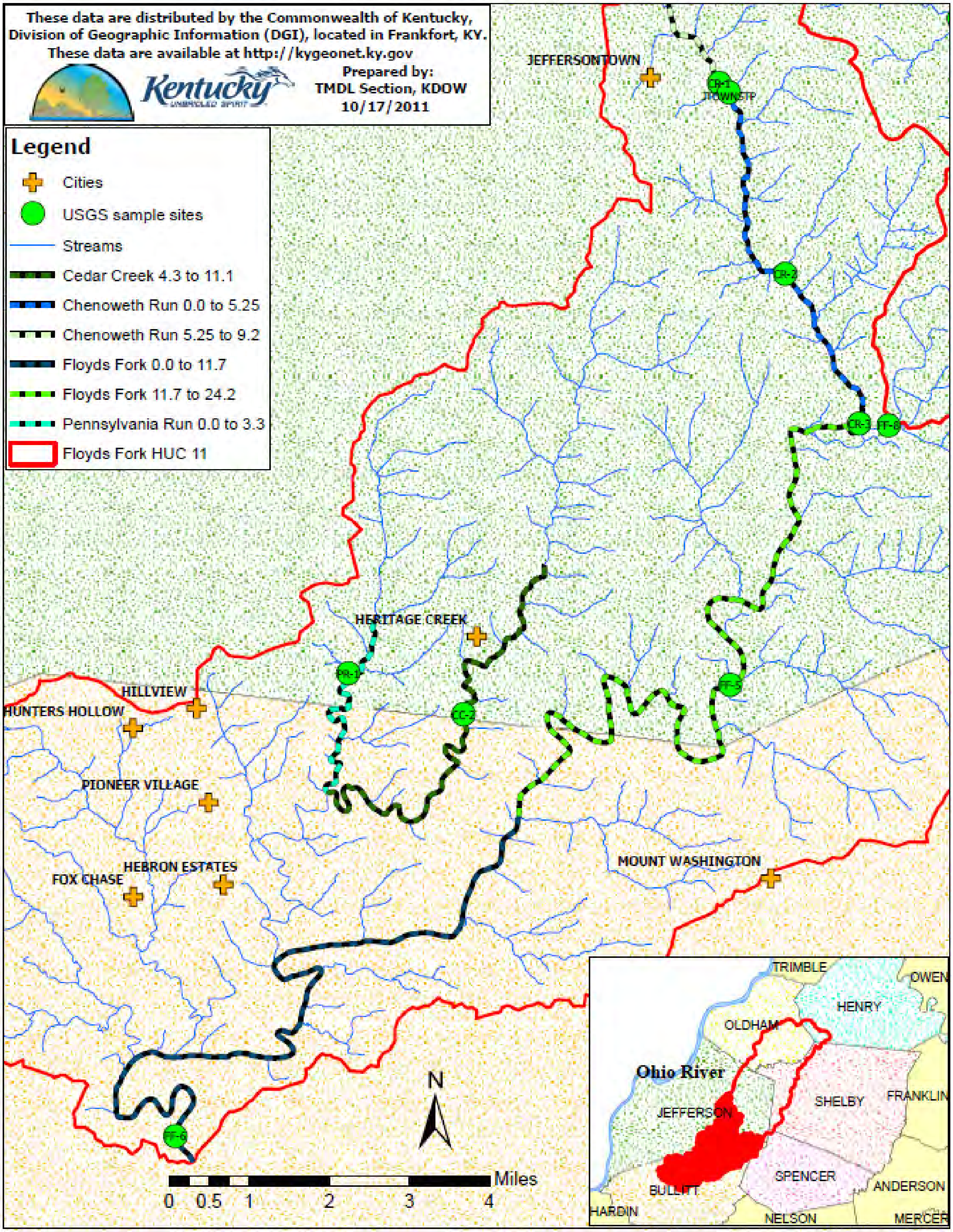

Figure 4.6 USGS Sites in Floyds Fork Fern Creek-Jeffersontown HUC 11

Table 4.10 USGS Sample Data Summary

Station Name	Number of *E. coli* Observations	% Exceeding WQC (240 colonies/100 ml)	Minimum (colonies/ 100 ml)	Maximum (colonies/ 100 ml)	Average (colonies/ 100 ml)
AR-1	6	100	390	21,000	7,022
CANE-1	12	50	20	36,000	4,187
CC-2	22	50	54	9,500	1,023
CF-1	20	70	92	20,000	2,295
CR-1	21	76.2	96	23,000	2,533
CR-2	20	45	40	12,000	1,084
CR-3	24	54.2	60	18,000	2,202
FF-1	17	41.2	16	8,300	925
FF-2	18	72.2	20	52,000	5,058
FF-3	19	52.6	4	48,000	3,178
FF-4	21	28.6	60	14,000	1,008
FF-5	21	19.0	4	19,000	1,149
FF-6	21	19.0	12	19,000	1,239
FF-7	22	31.8	10	31,000	1,816
FF-8	21	42.9	84	21,000	1,938
JTOWNSTP	18	22.2	8	13,000	978
LR-1	13	61.5	8	1,100	403
LR-2	16	62.5	60	8,900	1,650
NFCF-1	20	90	92	14,000	1,867
PL-1	17	70.6	24	17,000	1,997
PL-2	20	70	80	20,000	2,277
PL-3	17	47.1	36	9,000	854
PR-1	21	57.1	100	14,000	2,522
SFCF-1	15	33.3	4	3,300	449
SFCF-2	19	63.2	4	22,000	2,760
SLR-1	18	55.6	10	9,900	1,693

The recent monitoring efforts resulted in the identification of eighteen segments as impaired for the PCR use and four segments as impaired for the SCR use for pathogen indicators. Table 4.11 indicates the impaired segments for which TMDLs are developed in this document while Table 4.12 indicates the site(s) used for TMDL development.

Table 4.11 Pathogen Indicator Impaired Segments for TMDL Development

Waterbody Name	**Pollutant**	**County**	**WBID**	**Suspected Sources**	**Impaired Use (Support Status)**
Ashers Run 0.0 to 4.8	*E. coli*, Fecal coliform	Oldham	KY486083_01	On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
Cane Run 0.0 to 7.3	*E. coli*	Jefferson	KY488794_01	Source Unknown	PCR (nonsupport)
Cedar Creek 4.3 to 11.1	*E. coli*, Fecal coliform	Jefferson	KY489183_01	Source Unknown	PCR (nonsupport)
Chenoweth Run 0.0 to 5.25	*E. coli*, Fecal coliform	Jefferson	KY489391_01	Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Unspecified Urban Stormwater, Landfills	PCR (nonsupport), SCR (partial support)
Chenoweth Run 5.25 to 9.2	*E. coli*, Fecal coliform	Jefferson	KY489391_02	Grazing in Riparian or Shoreline Zones, Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Unspecified Urban Stormwater	PCR (nonsupport), SCR (nonsupport)
Currys Fork 0.0 to 4.8	*E. coli*	Oldham	KY490506_01	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)
Floyds Fork 0.0 to 11.7	*E. coli*	Bullitt	KY492778_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
Floyds Fork 11.7 to 24.2	Fecal coliform(1)	Jefferson	KY492278_02	Municipal Point Source Discharges, Package Plant or Other Permitted Small Flow Discharges, Agriculture, Urban Runoff/Storm Sewers	PCR (nonsupport)

Waterbody Name	**Pollutant**	**County**	**WBID**	**Suspected Sources**	**Impaired Use (Support Status)**
Floyds Fork 24.2 to 34.1	*E. coli*	Jefferson	KY492278_03	Highway/Road/Bridge Runoff (Non-construction Related), Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)
Floyds Fork 34.1 to 61.9	*E. coli*, Fecal coliform	Oldham, Shelby	KY492278_04	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport), SCR (nonsupport)
Long Run 0.0 to 9.9	*E. coli*	Jefferson	KY497142_01	Municipal Point Source Discharges, Livestock (Grazing or Feeding Operations), Urban Runoff/Storm Sewers	PCR (nonsupport)
North Fork Currys Fork 0.0 to 6.0	*E. coli*	Oldham	KY499547_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
Pennsylvania Run 0.0 to 3.3	*E. coli*, Fecal coliform	Jefferson	KY500387_01	Illegal Dumps or other Inappropriate Waste Disposal, Municipal Point Source Discharges, Urban Runoff/Storm Sewers	PCR (nonsupport), SCR (nonsupport)
Pope Lick 0.0 to 2.1	*E. coli*	Jefferson	KY501089_01	Municipal Point Source Discharges, Unspecified Urban Stormwater	PCR (nonsupport)
Pope Lick Creek 2.1 to 5.5	*E. coli*	Jefferson	KY501089_02	Municipal Point Source Discharges, Unspecified Urban Stormwater	PCR (nonsupport)

Waterbody Name	Pollutant	County	WBID	Suspected Sources	Impaired Use (Support Status)
South Fork Currys Fork 0.0 to 6.1	*E. coli*	Oldham	KY503919_01	Package Plant or Other Permitted Small Flow Discharges, On-site Treatment Systems (septic Systems and Similar Decentralized Systems)	PCR (nonsupport)
South Long Run 0.0 to 3.35	*E. coli*	Jefferson	KY503961_01	Source Unknown	PCR (nonsupport)
UT of South Fork Currys Fork 0.0 to 1.8	*E. coli*	Oldham	KY503919-3.9_01	Package Plant or Other Permitted Small Flow Discharges	PCR (nonsupport)

Note: [1]Due to an administrative error, the pollutant was listed as E. coli on the 2012 Integrated Report. This will be corrected to fecal coliform on the 2014 Integrated Report. A TMDL was calculated for the correct pollutant, fecal coliform.

Table 4.12 Sites Used for TMDL Development

Stream Segment	Station Number	Latitude	Longitude	Sample Site RM	Data Collector
Ashers Run 0.0 to 4.8	AR-1	38.315000	-85.434722	1.2	USGS
Ashers Run 0.0 to 4.8	TB1	38.308944	-85.444289	0.4	Currys Fork WBP
Cane Run 0.0 to 7.3	CANE-1	38.152778	-85.491389	0.25	USGS
Cedar Creek 4.3 to 11.1	CC-2	38.080000	-85.616111	8.3	USGS
Cedar Creek 4.3 to 11.1	ECCCC001	38.08	-85.616111	8.3	Louisville MSD
Chenoweth Run 0.0 to 5.25	CR-3	38.132778	-85.525278	0.15	USGS
Chenoweth Run 0.0 to 5.25	EFFCR001	38.160000	-85.542222	2.4	Louisville MSD
Chenoweth Run 5.25 to 9.2	CR-1	38.194722	-85.557222	5.35	USGS
Chenoweth Run 5.25 to 9.2	EFFCR002	38.194722	-85.557222	5.35	Louisville MSD
Currys Fork 0.0 to 4.8	CF-1	38.307222	-85.450556	0.3	USGS
Floyds Fork 0.0 to 11.7	FF-6	38.003333	-85.682222	0.4	USGS
Floyds Fork 11.7 to 24.2	EFFFF002	38.085278	-85.555000	18.85	Louisville MSD
Floyds Fork 24.2 to 34.1	FF-8	38.132390	-85.518610	24.65	USGS
Floyds Fork 34.1 to 61.9	EFFFF001	38.285278	-85.467500	45.75	Louisville MSD
Floyds Fork 34.1 to 61.9	FF-2	38.298611	-85.426667	50.85	USGS
Long Run 0.0 to 9.9	LR-2	38.219444	-85.448889	2.4	USGS
North Fork Currys Fork 0.0 to 6.0	NFCF-1	38.359440	-85.438786	0.2	USGS
Pennsylvania Run 0.0 to 3.3	EPRPR001	38.087500	-85.642500	2.4	Louisville MSD
Pennsylvania Run 0.0 to 3.3	PR-1	38.087500	-85.642500	2.4	USGS
Pope Lick 0.0 to 2.1	PL-2	38.188889	-85.488056	0.15	USGS
Pope Lick Creek 2.1 to 5.5	PL-1	38.219160	-85.518611	3.6	USGS
South Fork Currys Fork 0.0 to 6.1	SFCF-2	38.356111	-85.408889	1.9	USGS
South Long Run 0.0 to 3.35	SLR-1	38.229444	-85.424920	1.15	USGS
UT of South Fork Currys Fork 0.0 to 1.8	SFCF-1	38.367778	-85.382778	0.2	USGS

5.0 Source Identification

For regulatory purposes, the sources of fecal coliform and *E. coli* in a watershed can be placed into two categories: KPDES-permitted and non KPDES-permitted sources. A KPDES-permitted source requires a Kentucky Pollutant Discharge Elimination System (KPDES) discharge permit, a storm water permit, or a Municipal Separate Storm Sewer System (MS4) permit from KDOW. KPDES discharge permits include wastewater treatment facilities that discharge directly to a stream, facilities discharging storm water, and some agricultural operations (e.g., Concentrated Animal Feeding Operations (CAFOs) with a discharge permit). KPDES is not the only permitting program that may affect water quality or quantity within a watershed; other permitting examples include water withdrawal permits, permits to build structures within a floodplain, permits to construct an onsite sewage treatment disposal system (OSTDS), and permits to land apply waste from sewage treatment plants. However, within the framework of the TMDL process a KPDES-permitted source is defined as one regulated under the KPDES program. Non KPDES-permitted sources include nonpoint sources of pollution. Nonpoint sources of pollution are often caused by runoff from precipitation over and/or through the ground and are correlated to land use.

5.1 KPDES-Permitted Sources

KPDES-permitted sources include all sources regulated by the KPDES permitting program. KPDES permit and point source are defined in 401 KAR 10:001. A Wasteload Allocation (WLA) is assigned to KPDES-permitted sources.

5.1.1 Sanitary Wastewater Systems

Sanitary Wastewater Systems (SWSs) include all facilities with a design flow which are permitted to discharge fecal coliform or *E. coli*. This includes Wastewater Treatment Plants (WWTPs), Sewage Treatment Plants (STPs), package plants and home units.

There are sixty-nine facilities that discharge wastewater in the Floyds Fork watershed. Facilities that discharge more than 1 million gallons of effluent per day (mgd) are classified as “major” facilities. There are four major wastewater facilities in the Floyds Fork watershed: MSD Cedar Creek (7.5 mgd), MSD Jeffersontown (4 mgd), MSD Floyds Fork (6.5 mgd), and the City of LaGrange (1.9 mgd). Nineteen facilities discharge between 0.1 and 1 mgd, while forty-six (46) facilities discharge less than 0.1 mgd. Effluent from the Persimmon Ridge facility goes to a retention lake from which it is either spray irrigated or discharged. There are thirty wastewater facilities in the Floyds Fork watershed that have general KPDES permits. The general permit is used to cover a group of facilities, in this case home-based wastewater treatment systems. These home systems are smaller, ranging from 0.0004 to 0.0013 mgd. Under the KPDES permit, most of the larger facilities are required to submit discharge monitoring report (DMR) data each month, while the smaller facilities are required to submit DMRs each quarter. Table 5.1 identifies the SWSs in Floyds Fork, the facility design flow for each outfall, the permit limits for either *E. coli* (EC) or fecal coliform (FC), the location of the outfall, and the number of DMR exceedances for both the daily maximum and monthly average permit limit while Figures 5.1 and 5.2 show the location of the SWSs. DMR records for permitted entities are available upon request from the KDOW records custodian. Information on the Kentucky Open Records Act is available at http://water.ky.gov.

Table 5.1 Current Information for SWSs in Floyds Fork

KPDES Permit Number	Facility Name	SIC Description	Facility Design Flow (mgd)	*E. coli* (EC)/ Fecal Coliform (FC) Limits (colonies/100 mL)		Outfall Latitude	Outfall Longitude	DMR Exceedances [1]	
				Daily Maximum	Monthly Average			Daily Maximum	Monthly Average
KYG402142	CARPENTER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.19583	-85.49167	N/A[2]	N/A
KYG401962	YOUNG RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.3528	-85.44028	66.7%	73.3%
KYG401905	VORMBROCK RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.09389	-85.48944	50.0%	58.3%
KYG401875	WOOD RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.06278	-85.57833	N/A	N/A
KYG400958	PORTER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.2058	-85.5275	N/A	N/A
KYG400613	MURRELL RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.25167	-85.46917	N/A	N/A
KYG400420	SEALS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.02444	-85.73056	35.7%	35.7%
KYG400403	FREUDENBERGER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.14278	-85.46611	N/A	N/A
KYG400329	CARLISLE RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0013	240 (EC)	130 (EC)	38.07167	-85.71583	N/A	N/A
KYG400289	GIBSON RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.35806	-85.42917	33.3%	33.3%
KYG400259	BALLARD RESIDENCE	OPER OF DWELL OTHER THAN APART	0.00075	240 (EC)	130 (EC)	38.18972	-85.49611	N/A	N/A
KYG400251	WEBER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0007	240 (EC)	130 (EC)	38.17194	-85.55194	27.3%	36.4%
KYG400250	BROOKS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.24028	-85.43417	N/A	N/A
KYG400235	POWERS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.001	240 (EC)	130 (EC)	38.29750	-85.49278	50.0%	50.0%
KYG400194	SEBA RESIDENCE	OPER OF DWELL OTHER THAN APART	0.001	240 (EC)	130 (EC)	38.23139	-85.53083	N/A	N/A
KYG400189	WEIS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.00075	240 (EC)	130 (EC)	38.13056	-85.51361	N/A	N/A
KYG400177	BERRYMAN RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.14639	-85.57111	N/A	N/A

KPDES Permit Number	Facility Name	SIC Description	Facility Design Flow (mgd)	*E. coli* (EC)/ Fecal Coliform (FC) Limits (colonies/100 mL)		Outfall Latitude	Outfall Longitude	DMR Exceedances [1]	
				Daily Maximum	Monthly Average			Daily Maximum	Monthly Average
KYG400166	SHIPP RESIDENCE	OPER OF DWELL OTHER THAN APART	0.001	240 (EC)	130 (EC)	38.10167	-85.60278	N/A	N/A
KYG400161	MCKEE RESIDENCE	OPER OF DWELL OTHER THAN APART	0.00075	400 (FC)	200 (FC)	38.16111	-85.54083	N/A	N/A
KYG400153	DIORIO RESIDENCE	OPER OF DWELL OTHER THAN APART	0.00075	240 (EC)	130 (EC)	38.18861	-85.49278	N/A	N/A
KYG400150	MILLER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0007	240 (EC)	130 (EC)	38.16722	-85.55083	N/A	N/A
KYG400147	EBBS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.34194	-85.42861	100.0%	100.0%
KYG400139	ENTIN RESIDENCE	OPER OF DWELL OTHER THAN APART	0.001	240 (EC)	130 (EC)	38.09806	-85.59722	N/A	N/A
KYG400137	PETERS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0008	240 (EC)	130 (EC)	38.11389	-85.61639	0.0%	6.7%
KYG400128	FATHALIZADEH RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.24694	-85.42444	N/A	N/A
KYG400112	PARROTT RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0004	240 (EC)	130 (EC)	38.38056	-85.40611	N/A	N/A
KYG400105	MCCARSON RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.36889	-85.43556	45.5%	45.5%
KYG400032	WILLIAMS RESIDENCE	OPER OF DWELL OTHER THAN APART	0.00075	240 (EC)	130 (EC)	38.15694	-85.58806	N/A	N/A
KYG400028	AULBACH RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0005	240 (EC)	130 (EC)	38.22528	-85.51000	N/A	N/A
KYG400010	ZUERCHER RESIDENCE	OPER OF DWELL OTHER THAN APART	0.0008	240 (EC)	130 (EC)	38.16111	-85.54083	N/A	N/A
KY0103900	PROLOGIS-HILLVIEW WWTP	SEWERAGE SYSTEMS	0.15	240 (EC)	130 (EC)	38.06028	-85.70333	11.5%	3.8%
KY0103110	BUCKNER WWTP	SEWERAGE SYSTEMS	0.135	240 (EC)	130 (EC)	38.37639	-85.43417	13.3%	6.7%
KY0102873	COUNTRY LIVING MHP	OPER OF RES MOBILE HOME SITES	0.015	240 (EC)	130 (EC)	38.07778	-85.71333	8.3%	8.3%
KY0102784	MSD FLOYDS FORK WQTC	SEWERAGE SYSTEMS	6.5	400 (FC)	200 (FC)	38.22333	-85.47250	5.2%	0.0%
KY0101885	RIEDLING BUILDING	OPER OF NON-RESIDENTIAL BLDGS	0.0005	240 (EC)	130 (EC)	38.06250	-85.66889	0.0%	0.0%
KY0101419	KINGSWOOD SUBD	LAND SUBDIVIDERS & DEV, EX CEM	0.1	240 (EC)	130 (EC)	38.10861	-85.46028	8.7%	17.4%

KPDES Permit Number	Facility Name	SIC Description	Facility Design Flow (mgd)	*E. coli* (EC)/ Fecal Coliform (FC) Limits (colonies/100 mL)		Outfall Latitude	Outfall Longitude	DMR Exceedances (1)	
				Daily Maximum	Monthly Average			Daily Maximum	Monthly Average
KY0098540	MSD CEDAR CREEK WQTC	SEWERAGE SYSTEMS	7.5	400 (FC)	200 (FC)	38.11889	-85.59306	0.0%	0.0%
KY0094307	BCSD WILLABROOK SANITATION	LAND SUBDIVIDERS & DEV, EX CEM	0.525	400 (FC)	200 (FC)	38.06361	-85.70222	14.3%	7.1%
KY0090956	PERSIMMON RIDGE	LAND SUBDIVIDERS & DEV, EX CEM	0.142	240 (EC)	130 (EC)	38.29694	-85.43833	28.6%	9.5%
KY0086843	MIDDLETOWN INDUSTRIAL PARK	OPER OF NON-RESIDENTIAL BLDGS	0.16	400 (FC)	200 (FC)	38.25500	-85.50389	0.0%	0.0%
KY0077674	LAKE COLUMBIA SUBDIVISION	LAND SUBDIVIDERS & DEV, EX CEM	0.012	240 (EC)	130 (EC)	38.05750	-85.62778	16.7%	16.7%
KY0077666	CROSSINGS GOLF COURSE	PHYSICAL FITNESS FACILITIES	0.005	240 (EC)	130 (EC)	38.07750	-85.71778	0.0%	6.7%
KY0076741	CHERRYTREE APARTMENTS	OPERATORS OF APART BUILDINGS	0.0075	240 (EC)	130 (EC)	38.31417	-85.46694	14.3%	14.3%
KY0076732	CENTERFIELD ELEMENTARY	ELEMENTARY & SECONDARY SCHOOLS	0.01	240 (EC)	130 (EC)	38.35583	-85.41000	0.0%	0.0%
KY0073059	CAMP SHANTITUCK GIRL SCOUT (BULLITT)	SPORTING & RECREATIONAL CAMPS	0.01	240 (EC)	130 (EC)	38.04667	-85.65750	0.0%	0.0%
KY0072168	BIG VALLEY MHP	REC VEHICLE PARKS & CAMPSITES	0.07	240 (EC)	130 (EC)	38.02944	-85.73417	0.0%	0.0%
KY0069485	FRIENDSHIP MANOR	SKILLED NURSING CARE FACILITIES	0.017	240 (EC)	130 (EC)	38.29889	-85.49167	0.0%	10.0%
KY0060577	COUNTRY VILLAGE	LAND SUBDIVIDERS & DEV, EX CEM	0.06	240 (EC)	130 (EC)	38.32472	-85.43861	7.4%	3.6%
KY0054674	LOCKWOOD ESTATES SUBDIVISION	LAND SUBDIVIDERS & DEV, EX CEM	0.045	240 (EC)	130 (EC)	38.35778	-85.43361	17.9%	7.1%
KY0044342	LAKE OF THE WOODS MSD	LAND SUBDIVIDERS & DEV, EX CEM	0.044	400 (FC)	200 (FC)	38.16556	-85.55472	0.0%	0.0%
KY0042153	CEDAR RIDGE CAMP	SPORTING & RECREATIONAL CAMPS	0.005	240 (EC)	130 (EC)	38.17722	-85.48111	0.0%	0.0%
KY0040185	HEBRON MIDDLE SCHOOL	ELEMENTARY & SECONDARY SCHOOLS	0.031	240 (EC)	130 (EC)	38.0456	-85.67861	8.0%	8.0%
KY0039870	LAKEWOOD VALLEY	LAND SUBDIVIDERS & DEV, EX CEM	0.1	240 (EC)	130 (EC)	38.36556	-85.38306	7.1%	0.0%
KY0039004	KY DOJ WOMENS CORRECT	CORRECTIONAL INSTITUTIONS	0.125	240 (EC)	130 (EC)	38.28528	-85.46750	48.6%	11.4%
KY0038610	HUNTERS HOLLOW	LAND SUBDIVIDERS & DEV, EX CEM	0.24	240 (EC)	130 (EC)	38.07306	-85.69444	54.2%	33.3%

KPDES Permit Number	Facility Name	SIC Description	Facility Design Flow (mgd)	*E. coli* (EC)/ Fecal Coliform (FC) Limits (colonies/100 mL)		Outfall Latitude	Outfall Longitude	DMR Exceedances [1]	
				Daily Maximum	Monthly Average			Daily Maximum	Monthly Average
KY0036501	MSD BERRYTOWN SD	LAND SUBDIVIDERS & DEV, EX CEM	0.075	400 (FC)	200 (FC)	38.26556	-85.52028	0.0%	0.0%
KY0034801	BCSD BULLITT HILLS SUBDIVISION	LAND SUBDIVIDERS & DEV, EX CEM	0.35	400 (FC)	200 (FC)	38.07778	-85.66667	10.7%	1.8%
KY0034185	PIONEER VILLAGE (MARYVILLE #4)	LAND SUBDIVIDERS & DEV, EX CEM	0.31	400 (FC)	200 (FC)	38.05694	-85.68917	7.1%	1.8%
KY0034177	BCSD HILLVIEW #3 (MARYVILLE #3)	LAND SUBDIVIDERS & DEV, EX CEM	0.148	400 (FC)	200 (FC)	38.06667	-85.69194	1.8%	0.0%
KY0034169	BCSD HILLVIEW #2 (MARYVILLE #2)	LAND SUBDIVIDERS & DEV, EX CEM	0.317	240 (EC)	130 (EC)	38.07972	-85.68306	25.0%	0.0%
KY0034151	HILLVIEW #1 (MARYVILLE #1) (BULLITT)	LAND SUBDIVIDERS & DEV, EX CEM	0.231	240 (EC)	130 (EC)	38.06083	-85.67889	19.6%	7.1%
KY0031798	CEDAR LAKE LODGE	ELEMENTARY & SECONDARY SCHOOLS	0.02	240 (EC)	130 (EC)	38.39944	-85.32638	3.8%	3.8%
KY0031712	STARVIEW ESTATES MSD	LAND SUBDIVIDERS & DEV, EX CEM	0.1	400 (FC)	200 (FC)	38.25083	-85.52278	3.6%	0.0%
KY0029459	CHENOWETH HILLS WQTC MSD	LAND SUBDIVIDERS & DEV, EX CEM	0.2	400 (FC)	200 (FC)	38.17889	-85.55944	1.8%	0.0%
KY0029416	MCNEELY LAKE WQTC MSD	LAND SUBDIVIDERS & DEV, EX CEM	0.205	400 (FC)	200 (FC)	38.09778	-85.64306	0.0%	0.0%
KY0025194	JEFFERSONTOWN WQTC MSD	SEWERAGE SYSTEMS	4	400 (FC)	200 (FC)	38.19306	-85.55556	3.4%	0.0%
KY0024724	ASH AVENUE WWTP	LAND SUBDIVIDERS & DEV, EX CEM	0.3	400 (FC)	200 (FC)	38.29278	-85.47167	46.4%	19.6%
KY0023078	WHISPERING OAKS MHP	OPER OF RES MOBILE HOME SITES	0.125	240 (EC)	130 (EC)	38.08194	-85.70278	9.1%	0.0%
KY0020001	LAGRANGE, CITY OF	SEWERAGE SYSTEMS	1.9	400 (FC)	200 (FC)	38.39139	-85.38500	0.0%	0.0%

Note: [1]Percentage exceedance of DMRs was only calculated using numerical values; non-numerical values were excluded from analysis.
[2]N/A indicates that no numerical values were reported from which a comparison could be made between the bacteria effluent concentration and permit limit.

Wastewater treatment in the Floyds Fork watershed is rapidly changing, with many smaller facilities going off-line. Facilities that have gone off-line since the 2007-2008 USGS TMDL monitoring events are indicated in Table 5.2. These facilities are shown in the maps below and in Section 8 since they existed in the watershed at the time of TMDL sampling, but no allocation has been given to these facilities.

Table 5.2 Information for SWSs in Floyds Fork that Have Gone Off-line Since 2007 (List as of June, 2013)

KPDES Permit Number	Facility Name	SIC Description	Facility Design Flow (mgd)	*E. coli* (EC)/ Fecal Coliform (FC) Limits (colonies/100 mL)		Outfall Latitude	Outfall Longitude	DMR Exceedances [1]	
				Daily Maximum	Monthly Average			Daily Maximum	Monthly Average
KY0105384	ADVANCED CHILD CARE WEST	CHILD DAY CARE SERVICES	0.0006	240 (EC)	130 (EC)	38.31083	-85.46028	N/A	N/A
KY0026972	BATES ELEMENTARY	ELEMENTARY & SECONDARY SCHOOLS	0.013	240 (EC)	130 (EC)	38.13722	-85.57639	N/A	N/A
KY0042226	CHENOWETH RUN WQTC	LAND SUBDIVIDERS & DEV, EX CEM	0.47	400 (FC)	200 (FC)	38.24972	-85.4975	1.80%	0.00%
KY0029441	GREEN VALLEY APARTMENTS	OPERATORS OF APART BUILDINGS	0.03	400 (FC)	200 (FC)	38.3775	-85.36306	17.90%	3.60%

Note: [1]Percentage exceedance of DMRs was only calculated using numerical values; non-numerical values were excluded from analysis.
[2]N/A indicates that no numerical values were reported from which a comparison could be made between the bacteria effluent concentration and permit limit.

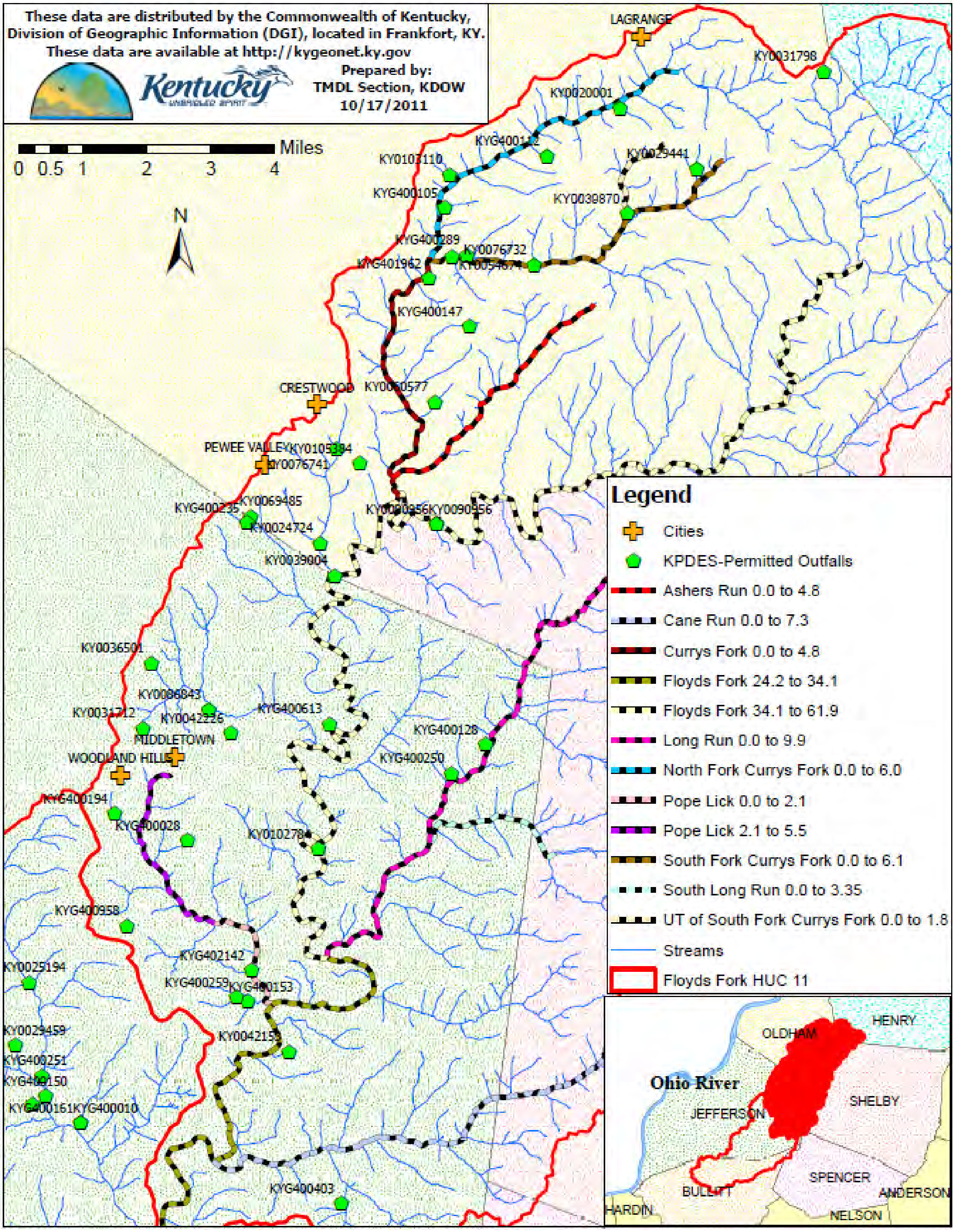

Figure 5.1 Location of SWSs in Floyds Fork LaGrange HUC11

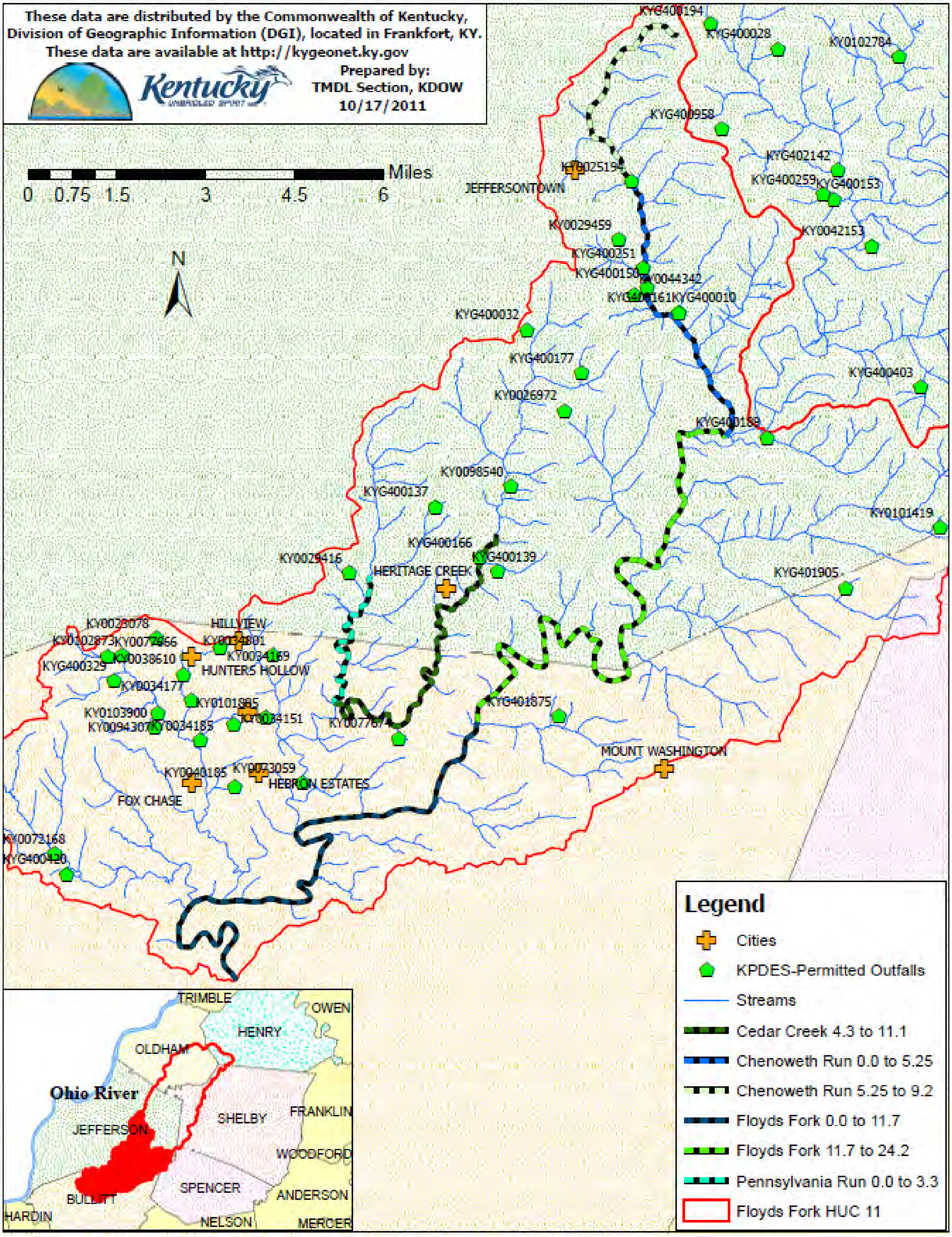

Figure 5.2 Location of SWSs in Floyds Fork Fern Creek-Jeffersontown HUC 11

5.1.2 Municipal Separate Storm Sewer Systems (MS4) Sources

MS4s are defined in 401 KAR 5:002. EPA has categorized MS4s into three categories: small, medium, and large. The medium and large categories are regulated under the Phase I Storm Water program. Large systems, such as the cities of Lexington and Louisville, have populations in excess of 250,000. Medium systems have populations in excess of 100,000 but less than 250,000; however, there are currently no medium-sized systems in Kentucky. Phase I systems have five-year permitting cycles and have annual reporting requirements. The small MS4 category includes all MS4s not covered under Phase I. Since this category covers a large number of systems, only a select group are regulated under the Phase II rule, either being automatically included based on population (i.e., having a total population over 10,000 or a population per square mile in excess of 1000) or on a case-by-case basis due to the potential to cause adverse impact on surface water. Water quality monitoring is not a requirement of Phase II MS4s, unless the waterbody has an approved TMDL and the MS4 causes or contributes to the impairment for which the TMDL was written. A WLA is assigned to all MS4 permit holders, including cities and counties, universities, military bases and the Kentucky Transportation Cabinet (KYTC).

There are fifteen MS4 communities in the Floyds Fork watershed (Table 5.3 and Figure 5.3). The Shelby County Fiscal Court does not yet have a MS4 permit but is in the process of obtaining a MS4 permit and is included as a MS4 in this document. Park Lake was annexed by Crestwood and is included under Crestwood. The communities of Louisville Metro, Anchorage, and Jeffersontown are all co-permitted under a Phase I Individual MS4 permit; Oldham County Fiscal Court, City of LaGrange, and Crestwood are co-permitted the General Phase II MS4 permit; while Bullitt County Fiscal Court, Hillview, Hunters Hollow, Pioneer Village, Hebron Estate, and Fox Chase are co-permittees under the General Phase II MS4 permit. All the other MS4 communities in the Floyds Fork watershed are under the General Phase II permit without co-permittees. The KYTC also has a MS4 permit and is responsible for stormwater from the pavement and right of way of interstates, parkways, U.S. highways, and state routes within the MS4 area. The Louisville Metro area is a Phase I MS4 while the others are Phase II. Figure 5.3 shows the MS4 communities in the Floyds Fork watershed, not the MS4 area. The 2010 census defined area meeting the population-based definition of a MS4 (the urbanized boundary of the MS4s) is shown in Figure 5.4 (census maps available at: http://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/, also see http://cfpub.epa.gov/npdes/stormwater/urbanmaps.cfm for information). The MS4 area for each permittee in the Floyds Fork watershed is shown in Figure 5.5.

Table 5.3 MS4 Permittees in Floyds Fork Watershed

PERMITTEE	KPDES NUMBER	MS4 PHASE
LOUISVILLE METRO	KYS000001	1
ANCHORAGE	KYS000001	1
JEFFERSONTOWN	KYS000001	1
OLDHAM COUNTY FISCAL COURT	KYG200005	2
CRESTWOOD (and PARK LAKE)	KYG200005	2
CITY OF LA GRANGE	KYG200005	2
BULLITT COUNTY FISCAL COURT	KYG200039	2
HILLVIEW	KYG200039	2
HUNTERS HOLLOW	KYG200039	2
PIONEER VILLAGE	KYG200039	2
HEBRON ESTATE	KYG200039	2
FOX CHASE	KYG200039	2
SHEPHERDSVILLE	KYG200036	2
MOUNT WASHINGTON	KYG200010	2
PEEWEE VALLEY	KYG200051	2
SHELBY COUNTY FISCAL COURT	Permit Pending	2
KYTC	KYS000003	N/A

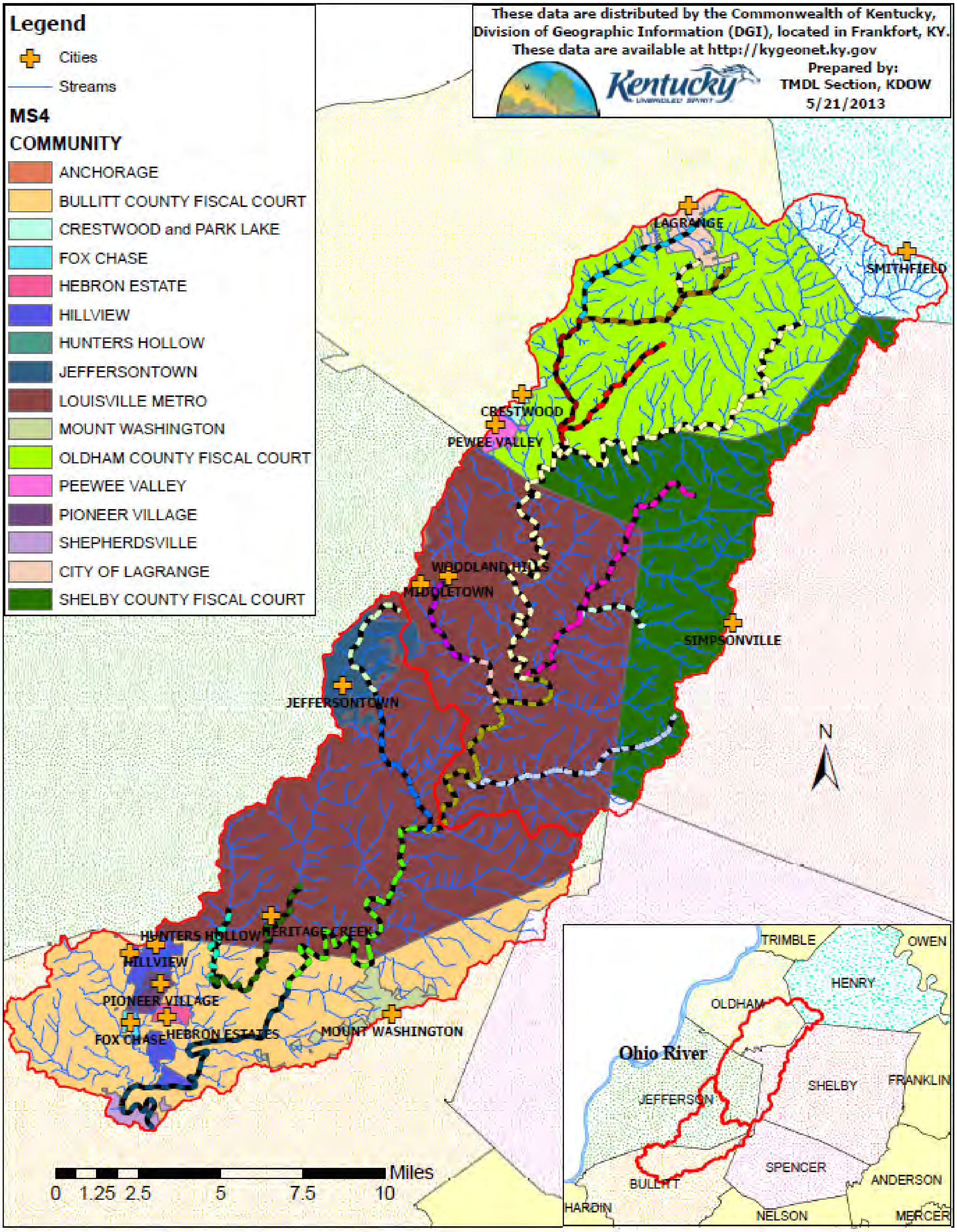

Figure 5.3 MS4 Communities in the Floyds Fork Watershed

Note: Identification of the stream segments can be made by using the legends in Figures 5.1 and 5.2. The Shelby County Fiscal Court MS4 permit is pending.

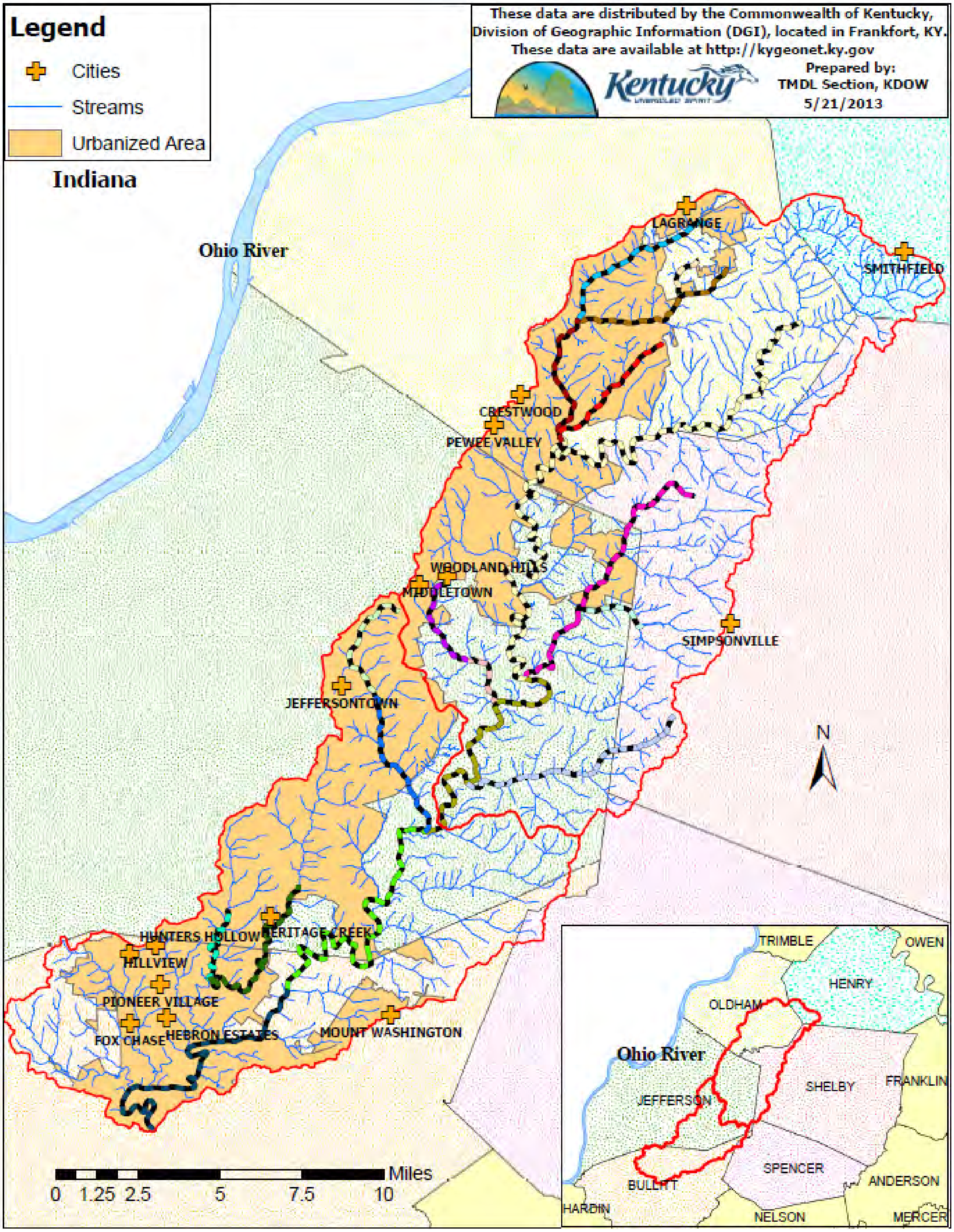

Figure 5.4 Census-defined Urban Area in the Floyds Fork Watershed

Note: Identification of the stream segments can be made by using the legends in Figures 5.1 and 5.2.

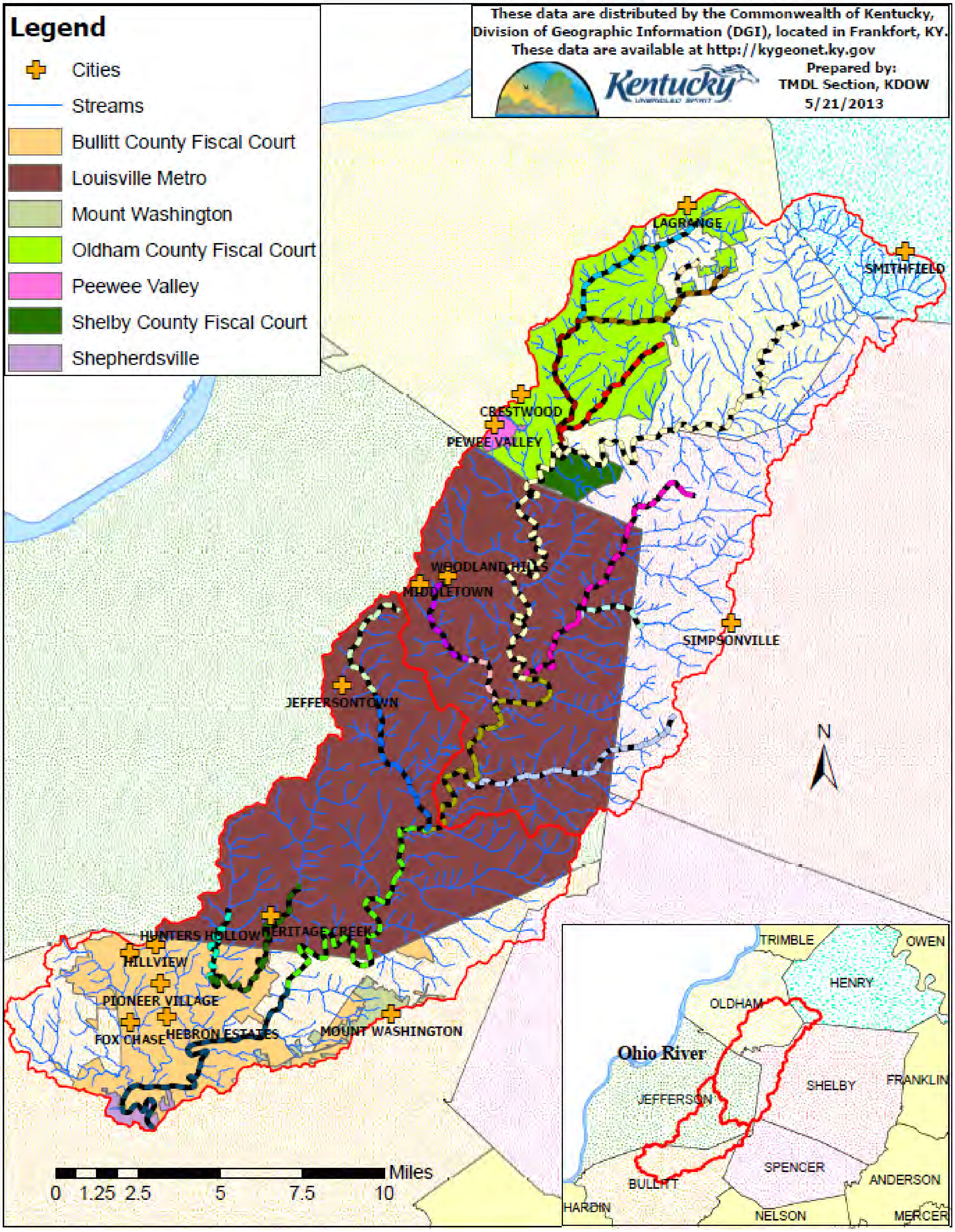

Figure 5.5 MS4 Boundaries in the Floyds Fork Watershed

Note: Identification of the stream segments can be made by using the legends in Figures 5.1 and 5.2. The Shelby County Fiscal Court MS4 permit is pending.

5.1.3 Concentrated Animal Feeding Operations (CAFO)

Operations that are defined as a CAFO pursuant to 401 KAR 5:002 are required to obtain a KPDES permit. Once defined as a CAFO, the operation can be permitted under a KPDES General Permit or a KPDES Individual Permit depending upon the nature of the operation. Conditions of both types of permits include no discharge to surface waters; however, holders of a KPDES Individual Permit may discharge to surface waters during a 25-year (24-hour) or greater storm event. There are no CAFOs located in the Floyds Fork Watershed.

5.2 Non-KPDES-Permitted Sources

Non KPDES-permitted sources include all sources not permitted by the KPDES permitting program and are often associated with land use. The loads to surface water from non-KPDES permitted sources are regulated by laws such as the Kentucky Agricultural Water Quality Act (AWQA, KRS 224.71-100 through 224.71-145, i.e., implementation of individual agriculture water quality plans and corrective measures), the federal Clean Water Act (i.e., the TMDL process) and 401 KAR 5:037 (Groundwater Protection Plans [GPPs]), among others. Unlike KPDES-permitted sources, non KPDES-permitted sources typically discharge pollutants to surface water in response to rain events. A Load Allocation (LA) is assigned to non KPDES-permitted sources.

5.2.1 Kentucky No Discharge Operating Permits

As stated in 401 KAR 5:005, facilities with agricultural waste handling systems or that dispose of their effluent by spray irrigation but do not discharge to surface waters are required to obtain a Kentucky No Discharge Operating Permit (KNDOP) from the KDOW prior to construction and operation. Animal Feeding Operations (AFOs) receive KNDOP permits. These operations handle liquid waste in a storage component of the operation (e.g., lagoon, pit, or tank) and may land apply the waste via spray irrigation or injection to cropped acreages. Land application of the waste that results in runoff to a stream is prohibited. Facilities that handle animal waste as a liquid are required to submit a Short Form B, construction plans, and a Comprehensive Nutrient Management Plan to the KDOW. Also included in KNDOP requirements are golf courses that land apply treated wastewater via spray irrigation, typically from a holding pond; some industrial operations also spray-irrigate. There are 140 KNDOPs in the Floyds Fork watershed; the vast majority of these (126) are individual residences (Table 5.4 and Figures 5.6 and 5.7).

Table 5.4 KNDOP Facilities in the Floyds Fork Watershed

KNDOP #	Facility Type	County	Latitude	Longitude
211098047	RESIDENCE- Individual Residence	Shelby	38.293889	-85.451667
12027043	UNLISTED-Unlisted Agency Interest Type	Jefferson	38.231351	-85.421309
12028070	RESIDENCE- Individual Residence	Oldham	38.341667	-85.376389
12027054	RESIDENCE- Individual Residence	Jefferson	38.215676	-85.462073
12028071	RESIDENCE- Individual Residence	Oldham	38.313056	-85.418333
12025046	RESIDENCE- Individual Residence	Jefferson	38.085278	-85.578333
12027098	RESIDENCE- Individual Residence	Jefferson	38.24786	-85.43598
12027145	RESIDENCE- Individual Residence	Jefferson	38.158333	-85.46
12025047	RESIDENCE- Individual Residence	Bullitt	38.096667	-85.485

KNDOP #	Facility Type	County	Latitude	Longitude
12027061	RESIDENCE- Individual Residence	Jefferson	38.165278	-85.472222
12028068	RESIDENCE- Individual Residence	Oldham	38.370834	-85.397781
12027079	RESIDENCE- Individual Residence	Jefferson	38.225	-85.426944
12025045	AGR- Hog & Pig Farming	Bullitt	38.054722	-85.616667
12028029	RESIDENCE- Individual Residence	Oldham	38.38221	-85.40129
12027123	RESIDENCE- Individual Residence	Jefferson	38.195833	-85.441111
12027074	RESIDENCE- Individual Residence	Jefferson	38.165556	-85.455278
12027065	RESIDENCE- Individual Residence	Jefferson	38.20389	-85.45076
12027115	RESIDENCE- Individual Residence	Jefferson	38.24	-85.410833
12027166	RESIDENCE- Individual Residence	Jefferson	38.192139	-85.442861
12027073	RESIDENCE- Individual Residence	Jefferson	38.160833	-85.454722
12027152	RESIDENCE- Individual Residence	Jefferson	38.261111	-85.407222
12027158	RESIDENCE- Individual Residence	Jefferson	38.16	-85.459722
12027062	RESIDENCE- Individual Residence	Jefferson	38.221005	-85.493262
12027136	MFG-Other Manufacturing	Jefferson	38.255278	-85.506111
12025036	RESIDENCE- Individual Residence	Bullitt	38.039444	-85.695
12027068	RESIDENCE- Individual Residence	Jefferson	38.19858	-85.44978
12025053	RESIDENCE- Individual Residence	Jefferson	38.11	-85.519722
12027106	RESIDENCE- Individual Residence	Jefferson	38.16706	-85.45674
12025057	RESIDENCE- Individual Residence	Bullitt	38.1025	-85.457222
12027089	RESIDENCE- Individual Residence	Jefferson	38.166389	-85.461389
12027072	RESIDENCE- Individual Residence	Jefferson	38.152778	-85.466389
12027139	RESIDENCE- Individual Residence	Jefferson	38.159444	-85.458333
12027058	RESIDENCE- Individual Residence	Jefferson	38.19771	-85.43988
12027151	RESIDENCE- Individual Residence	Jefferson	38.159722	-85.460278
12028056	RESIDENCE- Individual Residence	Oldham	38.371944	-85.345833
12027124	RESIDENCE- Individual Residence	Jefferson	38.165556	-85.460833
12027114	RESIDENCE- Individual Residence	Jefferson	38.144722	-85.48
12027087	RESIDENCE- Individual Residence	Jefferson	38.244611	-85.432294
1202129	RESIDENCE- Individual Residence	Jefferson	38.193889	-85.451667
12027117	RESIDENCE- Individual Residence	Jefferson	38.191944	-85.445278
12027140	RESIDENCE- Individual Residence	Jefferson	38.191944	-85.448056
12027148	RESIDENCE- Individual Residence	Jefferson	38.218889	-85.414444
12027157	RESIDENCE- Individual Residence	Jefferson	38.250556	-85.413889
12025044	GOVT- City Agency/Organization	Jefferson	38.105	-85.566944
0	AGR- Cattle Ranching & Farming	Henry	38.3654	-85.2755
12027164	RESIDENCE- Individual Residence	Jefferson	38.154722	-85.427306
12028046	RESIDENCE- Individual Residence	Oldham	38.38105	-85.40501
12028014	RESIDENCE- Individual Residence	Oldham	38.35494	-85.40759
12028060	RESIDENCE- Individual Residence	Oldham	38.345	-85.386667
12027059	RESIDENCE- Individual Residence	Shelby	38.22159	-85.39066
12027156	RESIDENCE- Individual Residence	Jefferson	38.26	-85.409444
12027082	RESIDENCE- Individual Residence	Jefferson	38.201667	-85.446111
12027070	RESIDENCE- Individual Residence	Jefferson	38.24176	-85.45786
12028025	RESIDENCE- Individual Residence	Oldham	38.32427	-85.42589
12027096	RESIDENCE- Individual Residence	Jefferson	38.11383	-85.51044
12028059	AGR- Dairy Farming	Oldham	38.321667	-85.344167

KNDOP #	Facility Type	County	Latitude	Longitude
12028059	AGR- Dairy Farming	Oldham	38.321667	-85.344167
12027108	RESIDENCE- Individual Residence	Jefferson	38.193611	-85.452222
12027084	RESIDENCE- Individual Residence	Jefferson	38.157778	-85.440556
12025058	RESIDENCE- Individual Residence	Jefferson	38.108889	-85.518889
12025033	RESIDENCE- Individual Residence	Bullitt	38.023889	-85.728889
12027137	RESIDENCE- Individual Residence	Jefferson	38.1675	-85.443611
12027107	RESIDENCE- Individual Residence	Jefferson	38.197778	-85.433611
12027167	RESIDENCE- Individual Residence	Jefferson	38.168556	-85.459722
12027170	RESIDENCE- Individual Residence	Jefferson	38.199028	-85.447306
12027075	RESIDENCE- Individual Residence	Jefferson	38.162028	-85.456809
12027165	RESIDENCE- Individual Residence	Jefferson	38.195861	-85.448875
12027110	RESIDENCE- Individual Residence	Jefferson	38.199444	-85.435556
0	AGR- Dairy Farming	Henry	38.404722	-85.291944
12028053	RESIDENCE- Individual Residence	Oldham	38.370833	-85.34
12027105	RESIDENCE- Individual Residence	Jefferson	38.168333	-85.456667
12027088	RESIDENCE- Individual Residence	Jefferson	38.250278	-85.416111
12027099	RESIDENCE- Individual Residence	Jefferson	38.16405	-85.45942
12027086	RESIDENCE- Individual Residence	Oldham	38.340833	-85.383333
12027048	RESIDENCE- Individual Residence	Jefferson	38.214796	-85.567063
12027149	RESIDENCE- Individual Residence	Shelby	38.189444	-85.406944
12027092	RESIDENCE- Individual Residence	Jefferson	38.259167	-85.475833
12027083	MFG-Other Manufacturing	Jefferson	38.194722	-85.474167
12028062	RESIDENCE- Individual Residence	Oldham	38.3275	-85.381111
12025060	RESIDENCE- Individual Residence	Bullitt	38.07241	-85.73339
12027103	RESIDENCE- Individual Residence	Jefferson	38.16812	-85.48649
12027102	RESIDENCE- Individual Residence	Jefferson	38.275204	-85.454469
12025055	SERV-Religious, Civic, Prof, & Similar Org	Bullitt	38.074444	-85.499722
12028038	RESIDENCE- Individual Residence	Fayette	38.35178	-85.42732
12027126	RESIDENCE- Individual Residence	Jefferson	38.189167	-85.443056
12027109	RESIDENCE- Individual Residence	Jefferson	38.165278	-85.458056
12028013	RESIDENCE- Individual Residence	Oldham	38.37986	-85.393313
12027097	RESIDENCE- Individual Residence	Jefferson	38.246667	-85.412222
12027111	RESIDENCE- Individual Residence	Jefferson	38.19291	-85.45041
12027071	RESIDENCE- Individual Residence	Jefferson	38.198611	-85.448056
12027142	RESIDENCE- Individual Residence	Shelby	38.199444	-85.383056
12027094	RESIDENCE- Individual Residence	Jefferson	38.161111	-85.455556
12027118	RESIDENCE- Individual Residence	Jefferson	38.205556	-85.449167
12027095	RESIDENCE- Individual Residence	Jefferson	38.170556	-85.458056
12027113	RESIDENCE- Individual Residence	Shelby	38.225	-85.399444
12027055	RESIDENCE- Individual Residence	Jefferson	38.16386	-85.47174
12028055	RESIDENCE- Individual Residence	Oldham	38.366111	-85.41
12028047	RESIDENCE- Individual Residence	Oldham	38.37149	-85.33928
12027128	RESIDENCE- Individual Residence	Jefferson	38.238333	-85.428889
12027100	RESIDENCE- Individual Residence	Jefferson	38.165833	-85.459722
12008005	RESIDENCE- Individual Residence	Shelby	38.179722	-85.395
12027067	RESIDENCE- Individual Residence	Jefferson	38.206534	-85.48293

KNDOP #	Facility Type	County	Latitude	Longitude
12027080	RESIDENCE- Individual Residence	Jefferson	38.166389	-85.453611
12027076	RESIDENCE- Individual Residence	Jefferson	38.165278	-85.456944
12025052	RESIDENCE- Individual Residence	Jefferson	38.1075	-85.528333
12028058	RESIDENCE- Individual Residence	Oldham	38.386389	-85.399722
12027163	REC-Arts, Entertainment, & Recreation	Jefferson	38.260556	-85.431944
12028052	AGR- Dairy Farming	Henry	38.40001	-85.30277
12027081	RESIDENCE- Individual Residence	Jefferson	38.198611	-85.438611
12027053	RESIDENCE- Individual Residence	Jefferson	38.216389	-85.465278
12027127	RESIDENCE- Individual Residence	Jefferson	38.147222	-85.491667
12027077	RESIDENCE- Individual Residence	Jefferson	38.192778	-85.454444
12027138	RESIDENCE- Individual Residence	Shelby	38.204444	-85.377778
12027064	RESIDENCE- Individual Residence	Jefferson	38.137778	-85.498889
12027168	CONST-Construction Industry	Jefferson	38.264167	-85.504667
12027066	RESIDENCE- Individual Residence	Jefferson	38.202778	-85.440833
12027162	RESIDENCE- Individual Residence	Jefferson	38.248	-85.415528
12027121	RESIDENCE- Individual Residence	Jefferson	38.1425	-85.501389
12027135	RESIDENCE- Individual Residence	Jefferson	38.160556	-85.473056
12027155	RESIDENCE- Individual Residence	Jefferson	38.191111	-85.443056
12027134	RESIDENCE- Individual Residence	Jefferson	38.161944	-85.460278
12027154	RESIDENCE- Individual Residence	Jefferson	38.193333	-85.434444
12028049	RESIDENCE- Individual Residence	Oldham	38.36908	-85.41121
12027147	RESIDENCE- Individual Residence	Jefferson	38.26066	-85.41144
12027125	RESIDENCE- Individual Residence	Shelby	38.284444	-85.464167
12027069	RESIDENCE- Individual Residence	Jefferson	38.265278	-85.456944
12025040	RESIDENCE- Individual Residence	Bullitt	38.050556	-85.619722
12027160	RESIDENCE- Individual Residence	Jefferson	38.195861	-85.448861
12028057	RESIDENCE- Individual Residence	Oldham	38.333889	-85.365556
12027171	RESIDENCE- Individual Residence	Jefferson	38.135167	-85.471111
12027038	REC-Arts, Entertainment, & Recreation	Jefferson	38.24268	-85.47198
12028066	RESIDENCE- Individual Residence	Oldham	38.334167	-85.462778
12027141	RESIDENCE- Individual Residence	Jefferson	38.213722	-85.485389
12027122	RESIDENCE- Individual Residence	Jefferson	38.166667	-85.504444
12027146	RESIDENCE- Individual Residence	Jefferson	38.24964	-85.41413
12027143	RESIDENCE- Individual Residence	Jefferson	38.198333	-85.455278
12027085	RESIDENCE- Individual Residence	Jefferson	38.18	-85.497222
12027150	RESIDENCE- Individual Residence	Jefferson	38.156111	-85.428889
12027051	RESIDENCE- Individual Residence	Jefferson	38.211111	-85.453611
12027159	RESIDENCE- Individual Residence	Jefferson	38.15932	-85.45824

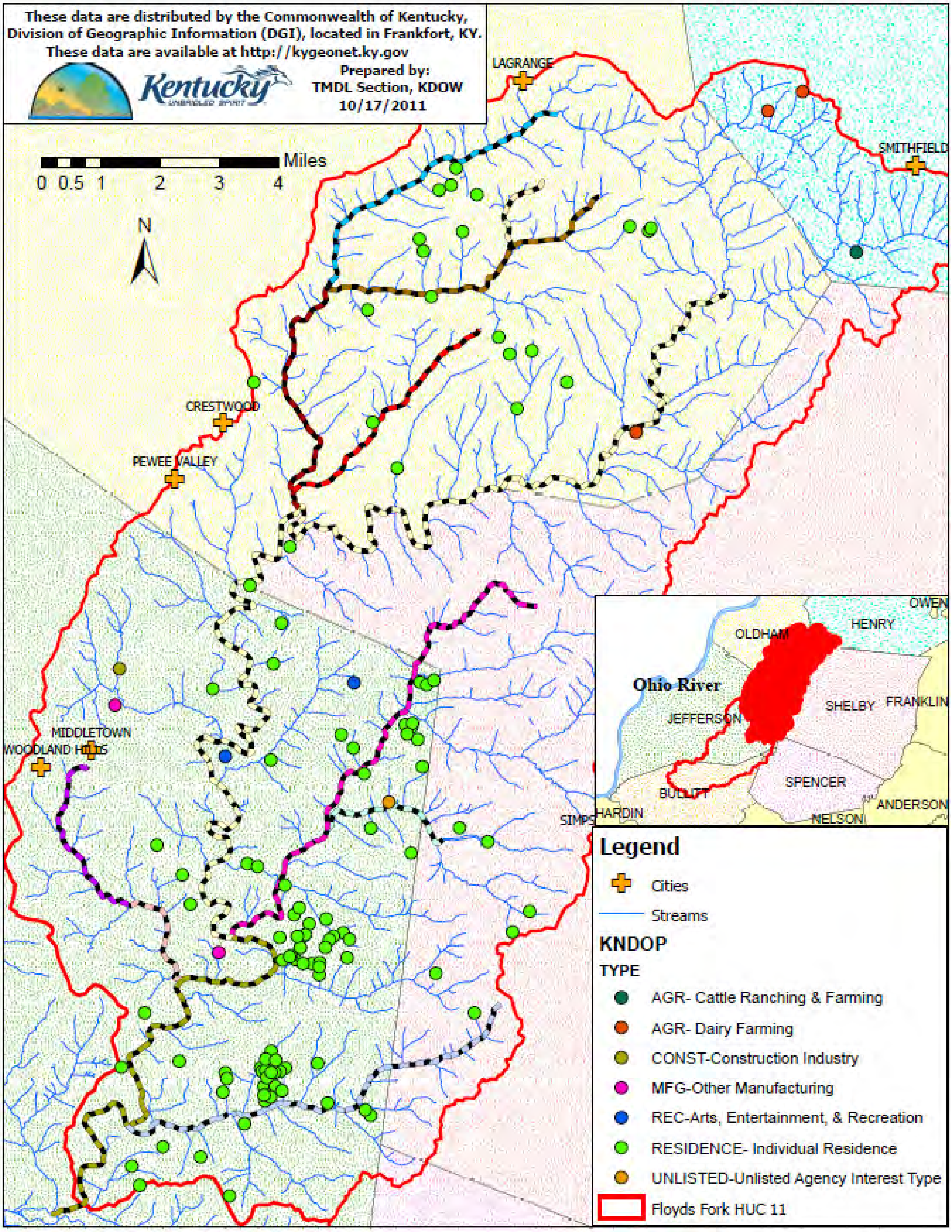

Figure 5.6 KNDOP Facilities in Floyds Fork LaGrange HUC11

Note: Identification of the stream segments can be made by using the legend in Figure 5.1.

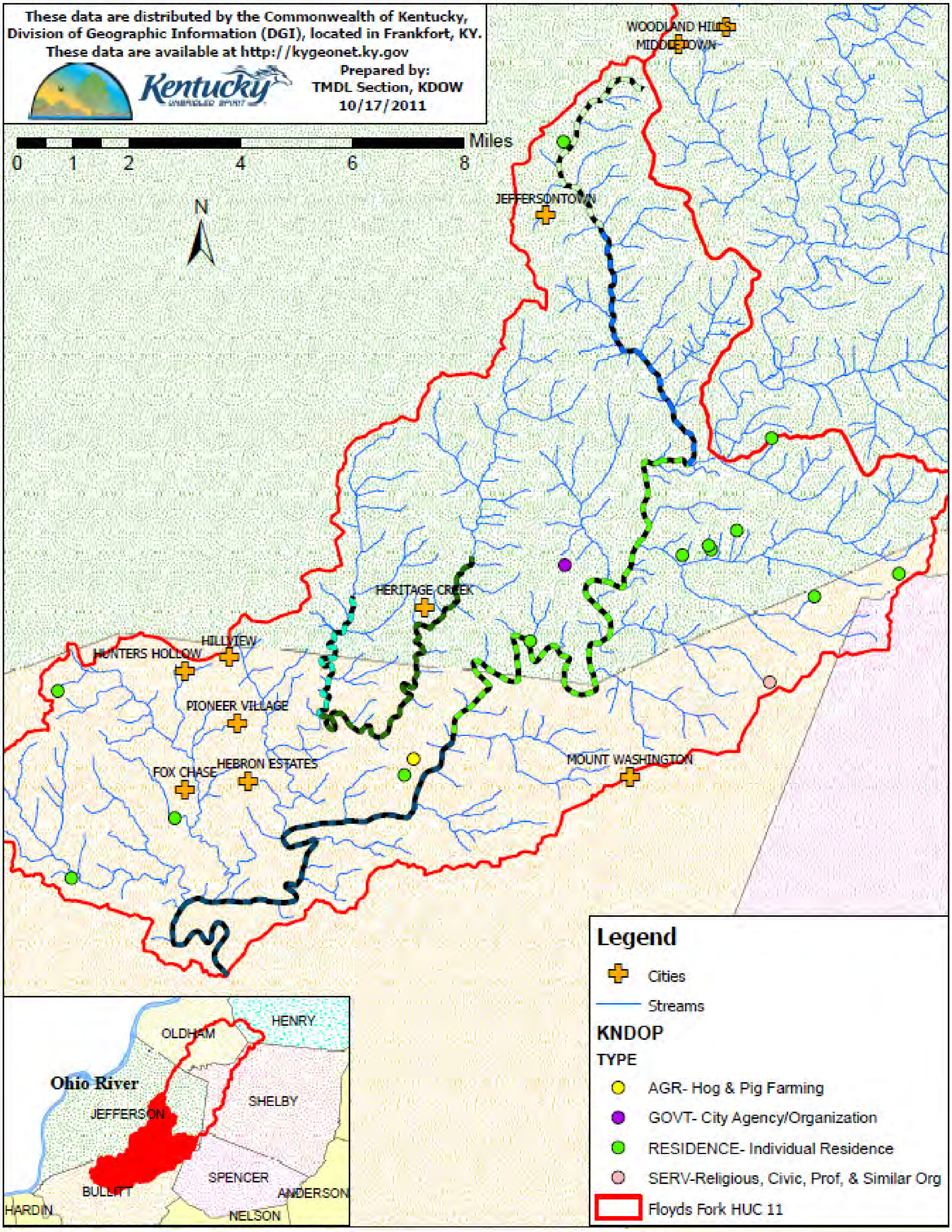

Figure 5.7 KNDOP Facilities in Floyds Fork Fern Creek-Jeffersontown HUC 11
Note: Identification of the stream segments can be made by using the legend in Figure 5.2.

5.2.2 Agriculture

The Kentucky Agriculture Water Quality Act (AWQA) was passed by the 1994 General Assembly. The law focuses on the protection of surface water and groundwater resources from agricultural and silvicultural activities. The Act created the Kentucky Agriculture Water Quality Authority (KAWQA), a 15-member peer group made up of farmers and representatives from various agencies and organizations. The Act requires all farms greater than 10 acres in size to adhere to the Best Management Practices (BMPs) specified in the Kentucky Agriculture Water Quality Plan. Specific BMPs have been designated for all operations.

The USDA National Agricultural Statistics Service (NASS) compiles Census of Agriculture data by County for virtually every facet of U.S. agriculture (USDA, 2007). Selected agricultural data from the latest Census of Agriculture reports for Counties within Floyds Fork are listed in Table 5.5. These data are based on County-wide data with no assumptions made on a watershed level. The percentage of agricultural types of land cover is calculated in Table 3.7 (Section 3.3).

Table 5.5 Agricultural Statistics from the 2007 USDA Agricultural Census

	Bullitt	Henry	Jefferson	Oldham	Shelby	Spencer
Farms (number/acres)	519/51,148	962/146,399	475/32,296	461/60,024	1,651/205,286	596/73,289
Total Cropland (acres)	24,764	72,729	15,430	29,014	124,208	36,145
Cattle and Calves Inventory (total number)	6,124	27,594	3,216	8,319	35,339	13,097
Beef Cows (total number)	3,693	14,638	1,768	4,244	16,191	6,985
Milk Cows (total number)	237	1,292	--	369	2,034	401
Hogs and Pigs (total number)	445	58	73	18	51	248
Sheep and Lamb (total number)	312	383	199	73	1,031	275
Poultry Layers (total number)	1,457	1,174	1,131	669	4,792	1,860
Poultry Broilers (total number)	-	-	(D)	(D)	6,018	(D)
Corn for grain (acres)	2,075	2,620	1,461	3,093	19,839	2,060
Wheat for grain (acres)	703	120	(D)	747	1,859	706
Corn for Silage (acres)	604	1,163	(D)	442	2,956	(D)
Soybeans (acres)	3,578	4,336	1,671	2,684	17,893	2,264
Tobacco (acres)	54	2,617	54	117	2,485	597
Forage (acres)	10,737	39,767	6,992	13,142	51,421	19,304

(D) = data withheld to avoid disclosing data for individual farms.

5.2.3 Wildlife

Wildlife undoubtedly contributes pathogens in the watershed. The Kentucky Department of Fish and Wildlife Resources estimate deer densities per square mile for all counties of Kentucky. (D. Yancy, Personal Communication, August 2, 2011). Table 5.6 shows the number of deer by county in the Floyds Fork watershed. Although wildlife contributes pathogens to surface water, such contributions represent natural background conditions and receive no reductions within a TMDL.

Table 5.6 Number of Deer by County in the Floyds Fork Watershed

County	(1)Deer, per square mile	County Size, in square miles	Total number of deer
Bullitt	21	299	6,279
Henry	44	289	12,716
Jefferson	15	385	5,775
Oldham	40	189	7,560
Shelby	38	384	14,592
Spencer	53	186	9,858

Note: (1)Information based on 2010-11 deer harvest season.

5.2.4 Human Waste

Human waste disposal is of particular concern in rural areas. Areas not served by sewers either employ an On Site Sewage Treatment and Disposal Systems (OSTDSs) or do not treat their sewage. OSTDS, including septic tank systems, are commonly used in areas where providing a centralized sewage collection and treatment system is not cost-effective or practical. When properly sited, designed, constructed, maintained, and operated, septic systems are an effective means of disposing and treating domestic waste. The effluent from a well-functioning OSTDS is comparable to secondarily treated wastewater from a sewage treatment plant. When not functioning properly, they can be a source of *E. coli* (or fecal coliform) to both groundwater and surface water, see Section 5.3, Illegal Sources, for further discussion of failing OSTDSs. Another type of non KPDES-permitted source that may exist in the watershed is straight-pipes, which are discrete conveyances that discharge sewage, gray water (i.e., water from household sinks, laundry, etc.), and stormwater to the surface waters of the Commonwealth without treatment.

Non-permitted OSTDS, including septic tanks, are commonly used in areas where providing a centralized sewage collection and treatment system is not cost-effective or practical. When properly sited, designed, constructed, maintained, and operated, septic systems are an effective means of disposing and treating domestic waste. The effluent from a well-functioning OSTDS is comparable to secondarily treated wastewater from a SWS. When not functioning properly, they can be a source of *E. coli* and fecal coliform to both groundwater and surface water. The soils information presented in Section 3.1 indicates that the soils in the Floyds Fork watershed are not ideal for installation of properly functioning septic systems.

The Kentucky Infrastructure Authority (KIA) compiled a report titled “Water Resource Development: A Strategic Plan for Wastewater Treatment” (KIA, 2000) with data from the Regional Area Development Districts (ADDs). Floyds Fork watershed is located in the KIPDA ADD. Table 5.7 shows 1999 and projected 2020 population and percentage of population serviced by public sewer systems (KIA, 2000) and the 2010 census population data (U.S. Census Bureau, 2010) for counties in the Floyds Fork watershed. This information indicates that Jefferson, Oldham, and Shelby Counties have surpassed 2020 population projections. Figures 5.8 and 5.9 show the existing and proposed sewer lines in Floyds Fork.

Table 5.7 Population Serviced by Public Sewer, On-Site Systems, and Package Treatment Plants (From KIA, 2000 and U.S. Census Bureau, 2010))

County	1999 Population	1999 Population Serviced by Public Sewer Systems	2010 Population	Estimated 2020 Population	Estimated 2020 Population Serviced by Public Sewer Systems
Bullitt	60,500	45%	74,319	78,100	50%
Henry	15,100	35%	15,416	18,300	55%
Jefferson	662,500	90%	741,096	652,000	99%
Oldham	41,100	45%	60,316	52,600	99%
Shelby	29,500	50%	42,074	37,400	50%
Spencer	10,000	17%	17,061	18,100	9%

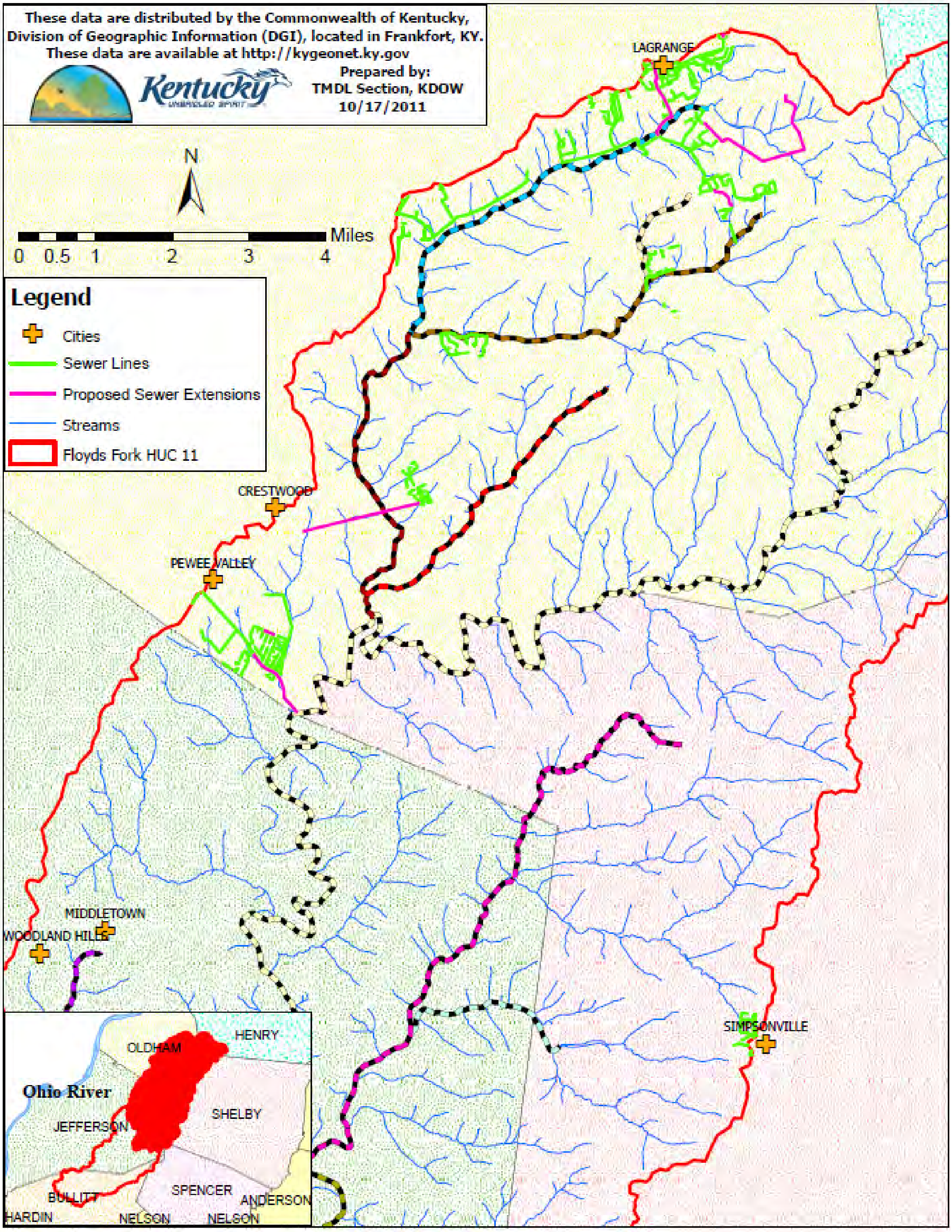

Figure 5.8 Existing and Proposed Sewer Lines in Floyds Fork LaGrange HUC11

Notes: Information is not available for Jefferson County

Identification of the stream segments can be made by using the legend in Figure 5.1.

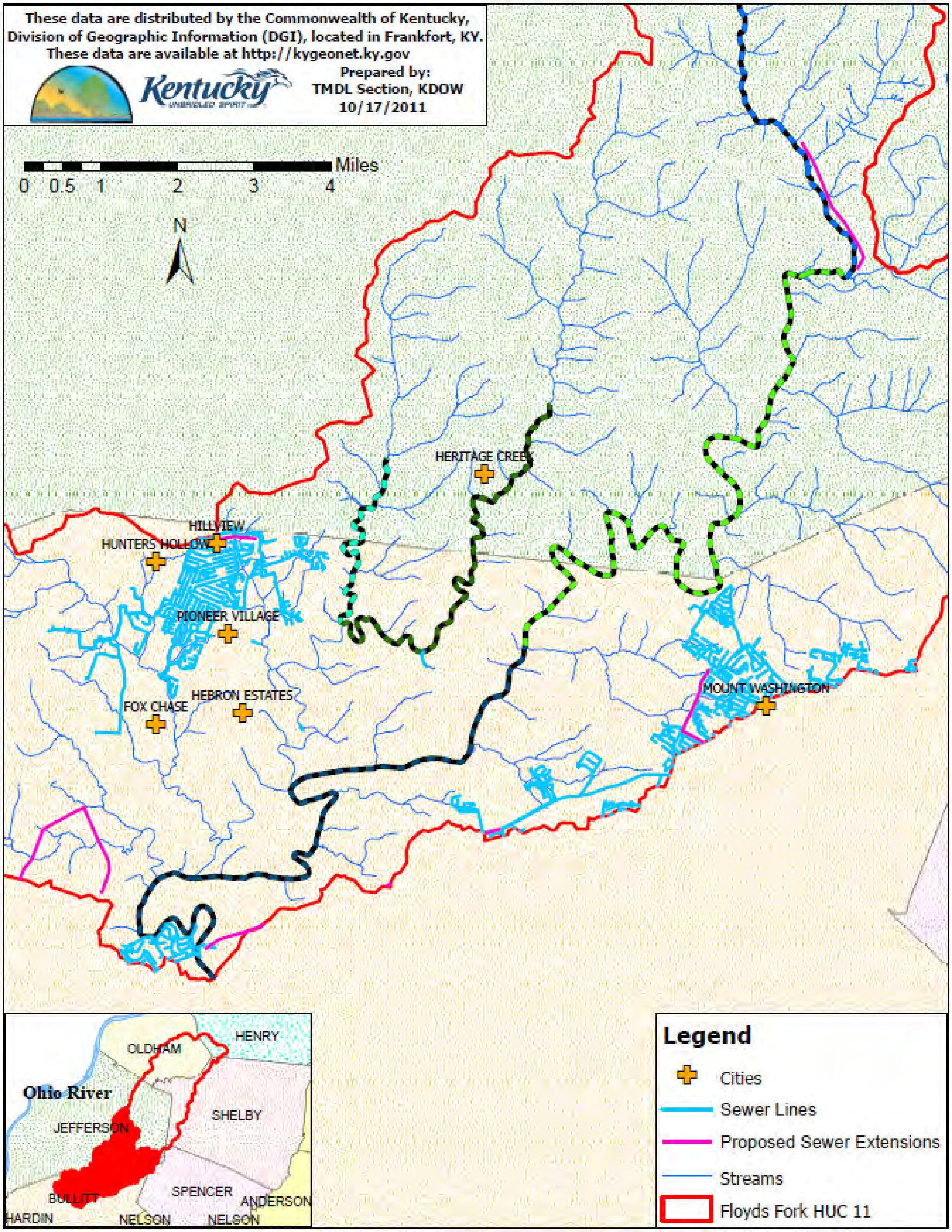

Figure 5.9 Existing and Proposed Sewer Lines Floyds Fork Fern Creek-Jeffersontown HUC 11
Notes: Information is not available for Jefferson County. Identification of the stream segments can be made by using the legend in Figure 5.2.

5.2.5 Household Pets

Although household pets undoubtedly exist in the Floyds Fork watershed, their contribution to the LA is deemed to be minimal compared to other sources. Pet waste may, however, be a larger contributor to bacteria runoff in areas where there is a higher density of households and less-permeable surfaces. According to the American Veterinary Medical Association, there are 1.7 dogs per household and 2.2 cats per household, nationally (U.S. Pet Ownership and Demographics Sourcebook, 2007).

5.3 Illegal Sources

Both KPDES-permitted and non KPDES-permitted sources can discharge bacteria to surface water illegally. This includes sources that are illegal simply by their existence, such as straight-pipes and SSOs, which receive no allocation. There are known SSOs in the Jefferson County portion of Floyds Fork watershed which are being addressed under a Consent Decree signed August 2005. There may also be legal sources that are operating illegally (e.g., outside of regulations, permit limits or conditions, etc.), such as a WWTP bypass or a failing OSTDSs, which receive no allocation above that of a properly functioning system (see Section 7.0 for TMDL allocations).

Another potential illegal source is livestock on farms that have no BMPs (as required under the AWQA) as well as farms where BMPs are present but are insufficient or failing in a manner that causes or contributes to surface water impairment; such farms receive no allocation above that of a farm with properly installed and functioning BMPs. Also included are KNDOPs, AFOs and CAFOs not in compliance with the appropriate regulations that cause or contribute to a surface water impairment.

KDOW expects implementation of these TMDLs to begin with the elimination of illegal sources. This is intended to prevent legally operating sources from having to effect reductions in order to accommodate the pollutant loading of illegal sources. Note this Section of the TMDL is not intended to summarize the universe of potential illegal sources that may discharge pollutants into surface waters, nor does it attempt to summarize the universe of legal sources that may be operating illegally. Instead, it gives examples of illegal sources known to be present or that could be present in the watersheds (e.g., straight-pipes).

6.0 Water-Quality Criterion

The WQC in 401 KAR 10:031 (Kentucky's Surface Water Standards) for the PCR and SCR designated uses are based on both fecal coliform and *E. coli*. May through October data for *E. coli* or fecal coliform were used to develop PCR loadings while year-round data for fecal coliform were used to develop SCR loadings for the bacteria impaired segments in Floyds Fork. Per 401 KAR 10:031:

"The following criteria shall apply to waters designated as primary contact recreation use during the primary contact recreation season of May 1 through October 31: Fecal coliform content or Escherichia coli content shall not exceed 200 colonies per 100 ml or 130 colonies per100 ml respectively as a geometric mean based on not less than five (5) samples taken during a thirty (30) day period. Content also shall not exceed 400 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period for fecal coliform or 240 colonies per 100 ml for Escherichia coli."

Additionally:

"The following criteria shall apply to waters designated for secondary contact recreation use during the entire year: Fecal coliform content shall not exceed 1000 colonies per 100 ml as a thirty (30) day geometric mean based on not less than five (5) samples; nor exceed 2000 colonies per 100 ml in twenty (20) percent or more of all samples taken during a thirty (30) day period."

Allowable loadings were calculated based upon the impaired designated use and the bacteria-indicator causing the use-impairment. For *E. coli* PCR impairments, the instantaneous criterion of 240 colonies/100 ml was applied to calculate allowable loadings. For fecal coliform PCR impairments, the instantaneous criterion of 400 colonies/100 ml was used. For fecal coliform SCR impairments, the instantaneous criterion of 2000 colonies/100 ml was applied. Additionally, when sufficient data were available, fecal coliform geometric means were calculated, but allocations were not calculated from geomean data. When multiple sample sites were located within an impaired segment, the site with the greatest bacteria exceedance was used to generate load duration curves and to establish the TMDL. TMDLs for the impaired stream segments within Floyds Fork can be found in Section 8.2 of this document.

7.0 Total Maximum Daily Load

7.1 TMDL Equation and Definitions:

A TMDL calculation is performed as follows:

TMDL = WLA + LA + MOS
(Equation 1)

The WLA has three components:

WLA = SWS WLA + MS4 WLA + Future Growth WLA
(Equation 2)

Definitions:

TMDL: the WQC, expressed as a load.

MOS: the Margin of Safety, which can be an implicit or explicit additional reduction applied to sources of pollutants that accounts for uncertainties in the relationship between effluent limits and water quality.

TMDL Target: the TMDL minus the MOS.

WLA: the Wasteload Allocation, which is the allowable loading of pollutants into the stream from KPDES-permitted sources, such as SWSs and MS4s.

SWS-WLA: the WLA for KPDES-permitted sources, which have discharge limits for pathogen indicators (including wastewater treatment plants, package plants and home units).

Future Growth-WLA: the allowable loading for future KPDES-permitted sources, including new SWSs, expansion of existing SWSs, new storm water sources, and growth of existing storm water sources (such as MS4s). It also includes the allocation for the KPDES-permitted sources that existed but were not known at the time the TMDL was written.

Remainder: the TMDL minus the MOS and minus the SWS WLA (also equal to Future Growth- WLA plus the MS4-WLA and the LA).

MS4-WLA: the WLA for KPDES-permitted municipal separate storm water sewer systems (including cities, counties, roads and right-of-ways owned by the Kentucky Transportation Cabinet (KYTC), universities and military bases).

Urbanized Boundary of MS4: Even though the census defined urbanized area does not extend throughout Jefferson County (see Figure 5.4), the urbanized boundary of the MS4 for the Louisville Metro MS4 is defined in this document as the area of Jefferson County within the Floyds Fork watershed. For Phase II MS4 communities, the urbanized boundary is the area of census defined urban area within the incorporated city or county limit.

MS4 Area: Land area within the urbanized boundary of MS4; excluding agriculture land.

LA: the Load Allocation, which is the allowable loading of pollutants into the stream from sources not permitted by KPDES and from natural background.

Seasonality: yearly factors that affect the relationship between pollutant inputs and the ability of the stream to meet its designated uses.

Critical Condition: the time period when the pollutant conditions are expected to be at their worst.

Critical Flow: the flow used to calculate the TMDL as a load

Existing Conditions: the load that exists in the watershed at the time of TMDL development (i.e., sampling) and is causing the impairment.

Load: concentration * flow * conversion factor

Concentration: colonies per 100 milliliters (colonies/100ml)

Flow (i.e. stream discharge): cubic feet per second (cfs)

Conversion Factor: the value that converts the product of concentration and flow to load (in units of colonies per day); it is derived from the calculation of the following components: (28.31685L/f^3 * 86400seconds/day * 1000ml/L)/ (100ml) and is equal to 24,465,758.4.

Calculation Procedure:

1) The MOS, if an explicit value, is calculated and subtracted from the TMDL first, giving the TMDL Target;
2) The SWS-WLA is calculated and subtracted from the TMDL Target, leaving the Remainder;
3) The Future Growth-WLA is calculated and subtracted from the Remainder;
4) If there are one or more MS4s present upstream of the impaired segment, the sum of all the individual MS4-WLAs is subtracted from the Remainder based on percent land use, leaving the LA.

The TMDL calculation must take into account seasonality and other factors that affect the relationship between pollutant inputs and the ability of the stream to meet its designated uses. Once a critical flow is obtained (see Section 7.6), it is then multiplied by the Water-Quality Criteria (WQC) minus the MOS (10%) times the appropriate conversion factors to obtain the TMDL Target load. Allowable loadings from KPDES-permitted sources (if present) are then subtracted from the Target load to produce the Remainder. Future Growth calculations are then performed and subtracted from the Remainder, leaving the LA.

Regardless of the procedure used to calculate the TMDL, reductions from existing conditions ultimately must be effected within the watershed only until all stream segments meet the PCR and SCR uses.

7.2 Margin of Safety

There are two methods for incorporating a MOS in the TMDL analysis: implicitly include the MOS using conservative assumptions, or explicitly designate a (numerical) portion of the TMDL as the MOS and divide the remainder of the allowable load (i.e., the TMDL Target load) between the LA and WLA. For this TMDL, a 10% explicit MOS (i.e., 10% of the WQC, expressed as a load) was reserved to address uncertainties involving loading from non-SWS sources. SWS sources have an implicit MOS based on the fact that they seldom operate at their design flow. The explicit MOS load was calculated using the following equation:

$$\underset{\text{(colonies/100ml)}}{\text{WQC x 10\%}} \times \underset{\text{(cfs)}}{\text{Critical Flow}} \times \underset{24{,}465{,}758.4}{\text{Conversion Factor}} = \text{MOS (colonies/day)}$$

(Equation 3)

7.3 WLA

The WLA is the portion of the TMDL allocated to KPDES-permitted sources within the watershed(s).

7.3.1 SWS-WLA

The SWS-WLA load was calculated using the following equation:

$$\underset{\text{(colonies/100ml)}}{\text{WQC}} \times \underset{\text{(cfs)}}{\text{Design Flow}} \times \underset{24{,}465{,}758.4}{\text{Conversion Factor}} = \underset{\text{(colonies/day)}}{\text{WLA}}$$

(Equation 4)

The individual SWS WLAs for each facility that discharges above or to an impaired segment are summed to create a final SWS WLA for that segment.

Equation 4 was used to set the WLA for all continuous bacteria dischargers (SWSs). Because KPDES permitting sets the discharge limit at the WQC for SWSs, the SWS-WLA does not receive an explicit MOS. However, it does receive an implicit MOS because SWSs typically do not discharge at their design capacity.

SWS-sources are expected to rapidly change in this watershed, with smaller facilities going off-line. As facilities go off-line, their SWS-WLA will be set to 0 and their load re-portioned to the Remainder to be allocated to the Future-Growth WLA, the MS4-WLA, and the LA as described below.

7.3.2 Remainder

The Remainder is not part of the TMDL; however, it is used in the TMDL calculations. It is calculated as the Target Load minus the sum of all individual SWS-WLAs.

7.3.3 Future Growth-WLA

Because the WLA must include all KPDES-permitted sources, often a TMDL will anticipate future growth of these sources (i.e., an increase in the number of WLA sources or in the loading per discharger) in order to avoid having to re-open the TMDL and change the WLA when new sources begin discharging. Future growth is represented by a portion of the Remainder that is set aside (i.e., is not part of the LA nor is it part of the WLA for current/known sources). It can also include existing storm water sources that are later discovered to discharge the pollutant of concern, even though this fact was not known at the time the TMDL was written. The amount reserved for future growth is determined using Table 7.1, which assumes that growth occurs more rapidly in developed areas (which is determined by the sum of Developed Open Space, Developed Low Intensity, Developed Medium Intensity and Developed High Intensity areas as defined by the USGS NLCD) than in rural areas:

The Future Growth WLA is calculated using the following formula:

$$\text{Remainder} \times \text{Future Growth WLA percentage} = \text{Future Growth WLA}$$

(Equation 5)

Table 7.1 Future Growth

Percent Developed Area in the Subwatershed	Future Growth WLA Percentage
≥25%	5%
≥20% – <25%	4%
≥15% – <20%	3%
≥10% – <15%	2%
≥5% – <10%	1%
<5%	0.5%

7.3.4 MS4-WLA

If there is a MS4 within the upstream area of the impaired segment, a MS4-WLA must be calculated. A larger MS4 will not be responsible for other MS4s present within its boundaries (e.g., a City-MS4 is not responsible for a University-MS4 within its permitted boundary) unless they are co-permittees. The MS4-WLA is calculated using the following equation:

$$\text{Remainder} \times (\text{MS4 Area}) \div \text{Watershed Area} = \text{MS4-WLA}$$
(Equation 6)

KDOW used the 2010 census defined urban area and existing or pending MS4 permits to determine MS4 entities in the Floyds Fork watershed. For Phase II MS4s, which are not county-wide, the urbanized areas were overlain with the incorporated city or county limit to determine the urbanized boundary of the Phase II MS4. The urbanized boundary for the Phase I MS4 Louisville Metro is defined in this document as the area of Jefferson County within the Floyds Fork watershed. The MS4 Area was then determined as the area within the MS4 urban boundary that was not an agricultural (pastureland or cropland) or open water land coverage. Table 7.2 shows the percentage of watershed area designated as MS4 Area in each subwatershed. Section 8.2 provides information for each MS4 permittee by subwatershed. While this is the most accurate source of information available, it is subject to error and urbanized boundaries of MS4s and permit conditions are subject to change as Storm Water Permits are renewed. Therefore, any area must meet the TMDL Target regardless of whether it lies within the urbanized boundary of a MS4 or not. Only the balance between the MS4-WLA and the LA will shift if the urbanized boundary of a MS4 is different from that depicted in Figure 5.5.

While the MS4 receives an in-stream pollutant allocation as part of the TMDL process and its point of compliance is ultimately the surface water(s) to which it discharges, KDOW interprets this to mean the MS4 must comply with the conditions of its MS4 Storm Water Permit in order to be deemed in compliance with 401 KAR Chapter 10.

Table 7.2 Percent MS4 Area by Watershed

Waterbody Segment	Watershed Area (acres)	MS4 Area within Urbanized Boundary of MS4 (acres)	(MS4 Area within Urbanized Boundary of MS4) ÷ Watershed Area (%)
Ashers Run 0.0 to 4.8	2,144	958	44.7
Cane Run 0.0 to 7.3	9,149	4,792	52.4
Cedar Creek 4.3 to 11.1	8,693	6,095	70.1
Chenoweth Run 0.0 to 5.25	10,694	8,705	81.4
Chenoweth Run 5.25 to 9.2	3,522	3,230	91.7

Waterbody Segment	Watershed Area (acres)	MS4 Area within Urbanized Boundary of MS4 (acres)	(MS4 Area within Urbanized Boundary of MS4) ÷ Watershed Area (%)
Currys Fork 0.0 to 4.8	18,279	8,479	46.4
Floyds Fork 0.0 to 11.7[1]	181,927	86,570	47.6
Floyds Fork 11.7 to 24.2[1]	142,320	63,363	44.5
Floyds Fork 24.2 to 34.1[1]	109,972	42,952	39.1
Floyds Fork 34.1 to 61.9[1]	66,754	22,318	33.4
Long Run 0.0 to 9.9	18,489	4,765	25.8
North Fork Currys Fork 0.0 to 6.0	6,413	3,431	53.5
Pennsylvania Run 0.0 to 3.3	5,374	4,187	77.9
Pope Lick Creek 0.0 to 2.1	6,197	4,853	78.3
Pope Lick Creek 2.1 to 5.5	3,211	2,432	75.7
South Fork Currys Fork 0.0 to 6.1	5,949	1,981	33.3
South Long Run 0.0 to 3.35	4,884	986	20.2
UT of South Fork Currys Fork 0.0 to 1.8	730	37.3	5.1

Note:[1]The MS4 Area within Urbanized Boundary of MS4 includes the area of Shelby County Fiscal Court pending MS4 permit.

7.4 LA

The LA is where non KPDES-permitted sources (i.e., nonpoint sources, or those sources not permitted by KPDES) receive their allocation within the TMDL. Non KPDES-permitted sources include properly functioning OSTDSs (e.g., septic systems), wildlife, household pets and facilities (e.g., farms, landfarms for municipal STP sludge) with properly functioning BMPs. The LA is calculated using the following equation:

$$\text{Remainder} - \text{Future Growth WLA} - \text{Sum of MS4-WLAs} = \text{LA}$$

(Equation 7)

The available sampling data were insufficient to apportion the existing loading among the various LA sources; therefore, it was attributed to all LA sources.

7.5 Seasonality

Seasonality is defined as the yearly factors such as temporal variations on source behavior and stream loading that can affect the relationship between pollutant inputs and the ability of the stream to meet its designated uses. This TMDL addresses seasonality by only using samples collected within the PCR season (i.e., May through October) to calculate PCR TMDLs and using year-round data to calculate SCR TMDLs. See Section 6.0 for a citation of Kentucky's WQSs for the PCR and SCR seasons.

7.6 Critical Condition

The critical condition for nonpoint source bacteria loadings is typically an extended dry period followed by a rainfall runoff event. During the dry weather period, bacteria build up on the land surface, and are washed off by subsequent rainfall. Conversely, the critical condition for point source loading typically occurs during periods of low stream flow when dilution is minimized. The Floyds Fork watershed contains both types of sources; therefore the critical condition for each bacteria-impaired segment is defined by flow for the sample showing the highest exceedance from the appropriate WQC.

7.7 Existing Conditions

The maximum exceedance of all samples was selected to represent existing conditions. This concentration was converted to a load using the following equation:

$$\underset{\text{(colonies/100ml)}}{\text{Maximum Exceedance}} \times \underset{\text{(cfs)}}{\text{Critical Flow}} \times \underset{24{,}465{,}758.4}{\text{Conversion Factor}} = \underset{\text{(colonies/day)}}{\text{Existing Load}}$$

(Equation 8)

7.8 TMDLs Calculated as a Daily Load

TMDLs were calculated for each flow duration zone within the LDC of each impaired segment. The LDCs that follow in Section 8.2. show a graphical display of the data relative to the TMDL. Not every zone had a sample (or samples) within it, and not all of the samples showed exceedances of the WQC. Calculation of the TMDL and target loads followed the methodology found in KDOW's *Pathogen Indicator TMDL SOP* (KDOW 2011). Additionally, when sufficient data were available, fecal coliform geometric means were calculated, but allocations were not determined from geomean data.

The CWA requires a TMDL to be expressed in terms of a daily load. The TMDL is represented by a continuous curve on the LDC graph while observed loads (i.e., sample data) are expressed as point data, thus samples that plot above the curve exceed the TMDL and those below are less than the WQC.

The *Pathogen Indicator TMDL SOP* (KDOW, 2011) states, "If there is an appropriate USGS flow gage with which to generate a flow record for the sampling station(s) used in the TMDL, this will be used in conjunction with the [LDC method]… to set the TMDL Target and allocate loads." See Section 8.2 for an explanation of the LDC procedure. Because appropriate USGS gages were available, the LDC approach was used to display the existing conditions and determine the critical conditions and allowable loading for the development of TMDLs.

In the case where two or more stations existed within an impaired segment, the station with the highest exceedance was used to set TMDL allocations for that segment. The LDC (and TMDL allocations) were calculated at this sampling station (see Section 8.2) However, EPA requires that loading calculations reflect the entire listed segment, not only the portion of the segment represented by (i.e., upstream of) a given sampling station. This is necessary because there may be additional sources of the pollutant of concern below the sampling station but still within the watershed area of the impaired segment. Therefore, upon completion of the LDC, the allocations were extrapolated from the station to the bottom of the impaired segment using the proportional area method. This involves dividing the upstream drainage area at the end of the impaired segment by the upstream drainage area of the station, then multiplying the TMDL allocations (including the existing conditions) at the station by this ratio of areas. Additionally, the SWS-WLA was adjusted by any facilities present below the TMDL site but within the impaired watershed. These segment-based allocations represent the final TMDLs for this report. Section 8.2. contains LDC and site and segment TMDLs for the TMDL sampling station with the greatest exceedance.

In many cases the station used to represent the impaired segment was coterminous with the bottom of the impaired segment (e.g., the sampling station North Fork Currys Fork is at RM 0.0, which represents the segment North Fork Currys Fork RM 0.0 to 6.0). In such cases, no additional calculations were necessary to extend the loading allocations to the bottom of the segment. Also, several stations, while not precisely coterminous with the segment they represent, had such a small watershed area difference that they were deemed functionally coterminous and no additional calculations were performed to extend their loads: The criterion used was whether the ratio of the upstream watershed areas of the segment to the station was greater than or equal to 1.01 (i.e., the difference in areas was greater than or equal to 1%); if so, then calculations to extrapolate the station data to the segment were performed. However, if the ratio of the watershed area of the segment to the watershed area of the station was less than 1.01 (i.e., the difference in areas was 1% or lower), then the segment was assumed to be sufficiently similar to represent the impaired segment with no adjustment of loading allocations. Details of this calculation were also included in the individual segment descriptions in Section 8.2.

8.0 TMDL Calculations

A Load Duration Curve approach was utilized for development of these bacteria TMDLs. The best available data from various sources was analyzed and spatial analysis was performed within a Geographic Information System (GIS) framework to assess KPDES-permitted and non-KPDES-permitted sources, and appropriately assign TMDL loads. Development of these TMDLs follows the procedures outlined in Kentucky's *Quality Assurance Project Plan (QAPP) for Data Analysis for TMDL Development* and maintains the guidelines set in the *Pathogen TMDL Standard Operating Procedures* for evaluating the TMDL approach (KDOW, 2009d; KDOW, 2011).

The *Kentucky Pathogen TMDL SOP* (KDOW, 2011) states if there is an appropriate USGS flow gage with which to generate a flow record for the sampling station(s) used in the TMDL, data from this gage is to be used in conjunction with the LDC method set the TMDL Target and allocate loads.

The appropriateness of a given USGS gage to generate a flow record for the sampling stations in the watershed is evaluated based on the how well the following conditions are met: 1) the flows at the sampling station and the flows at the gage should be from the same dates and times and are well correlated (i.e., there is a high 'R^2' coefficient), 2) the watershed area upstream of the gage is within 0.5 to 1.9 times the area of the watershed upstream of the sampling station, 3) there are no flow regulating structures present above either the sampling station or the gage, 4) the land use upstream of the station is similar to that upstream of the gage, 5) the sampling station and gage are in the same major watershed, and 6) there is a sufficiently long period of record available at the gage to smooth out the effects of very wet and/or very dry years. In practice, it is difficult or impossible to meet all of the above conditions explicitly. Because USGS gages are often placed on larger streams and streams of all sizes can be impaired (and require TMDLs), the ratio of the watershed area to the gage area is unlikely to fall within the 0.5 to 1.9 range specified. The *Kentucky Pathogen TMDL SOP* (KDOW, 2011) specifies that, if in the best professional judgment of KDOW an appropriate gage is available, the TMDL information will be shown based on the LDC method.

For the Floyds Fork Watershed, several USGS gages are in the watershed. Table 8.0 presents the gage used in representing flow for stations used in TMDL analysis, along with the maximum exceedance and critical flow associated with the maximum exceedance. If in-stream flow data was collected at the time of the maximum exceedance sample collection, the measured in-stream flow was used; otherwise the gage was used to determine the critical flow.

Table 8.0 USGS Gages Used to Represent Flow at the TMDL Sample Sites

Segment	Station with Maximum Exceedance	*E. coli* (EC) or Fecal Coliform (FC)	Maximum Exceedance (colonies/100 ml)	Critical Flow (cfs)	USGS Flow Gage Station #	Gage Period of Record
Ashers Run 0.0 to 4.8	TB1	FC	13,000	0.2	03297900	6/1/1991-12/31/2010
Ashers Run 0.0 to 4.8	AR-1	EC	21,000	8.3	03297900	6/1/1991-12/31/2010
Cane Run 0.0 to 7.3	CANE-1	EC	36,000	7.8	03298000	8/4/1944-12/31/2010
Cedar Creek 4.3 to 11.1	ECCCC001	FC	58,400	19.0	03298250	1/1/1999-12/31/2010
Cedar Creek 4.3 to 11.1	CC-2	EC	9,500	205.0	03298250	1/1/1999-12/31/2010
Chenoweth Run 0.0 to 5.25	EFFCR001	FC	15,000	45.0	03298150	1/23/1996-12/31/2010
Chenoweth Run 0.0 to 5.25	CR-3	EC	18,000	414.0	03298150	1/23/1996-12/31/2010
Chenoweth Run 5.25 to 9.2	EFFCR002	FC	29,400	143.0	03298135	1/16/1996-12/31/2010
Chenoweth Run 5.25 to 9.2	CR-1	EC	23,000	69.0	03298135	1/16/1996-12/31/2010
Currys Fork 0.0 to 4.8	CF-1	EC	20,000	82.9	03297900	6/1/1991-12/31/2010
Floyds Fork 0.0 to 11.7	FF-6	EC	19,000	7,380.1	03298200	11/1/2000-12/31/2010
[1]Floyds Fork 11.7 to 24.2	EFFFF002	FC	31,350	15.0	03298200	11/1/2000-12/31/2010
[1]Floyds Fork 11.7 to 24.2	EFFFF002	FC	22,400	1,140	03298200	11/1/2000-12/31/2010
Floyds Fork 24.2 to 34.1	FF-8	EC	21,000	4,231.5	03298000	8/4/1944-12/31/2010
Floyds Fork 34.1 to 61.9	EFFFF001	FC	33,429	23.0	03297900	6/1/1991-12/31/2010
Floyds Fork 34.1 to 61.9	FF-2	EC	52,000	1,332.0	03297900	6/1/1991-12/31/2010
Long Run 0.0 to 9.9	LR-2	EC	8,900	7.8	03298000	8/4/1944-12/31/2010
North Fork Currys Fork 0.0 to 6.0	NFCF-1	EC	14,000	30.3	03297900	6/1/1991-12/31/2010
Pennsylvania Run 0.0 to 3.3	EPRPR001	FC	45,600	148.0	03298300	10/1/1998-12/31/2010

Segment	Station with Maximum Exceedance	*E. coli* (EC) or Fecal Coliform (FC)	Maximum Exceedance (colonies/100 ml)	Critical Flow (cfs)	USGS Flow Gage Station #	Gage Period of Record
Pennsylvania Run 0.0 to 3.3	PR-1	EC	14,000	1.1	03298300	10/1/1998-12/31/2010
Pope Lick 0.0 to 2.1	PL-2	EC	20,000	48.8	03298250	1/1/1999-12/31/2010
Pope Lick Creek 2.1 to 5.5	PL-1	EC	17,000	52.8	03298250	1/1/1999-12/31/2010
South Fork Currys Fork 0.0 to 6.1	SFCF-2	EC	22,000	21.4	03297900	6/1/1991-12/31/2010
South Long Run 0.0 to 3.35	SLR-1	EC	9,900	0.4	03298000	8/4/1944-12/31/2010
UT of South Fork Currys Fork 0.0 to 1.8	SFCF-1	EC	3,300	18.7	03297900	6/1/1991-12/31/2010

Note: [1]For Floyds Fork 11.7 to 24.2, the flow associated with the greatest exceedance was insufficient to allocate to all sources in the watershed, therefore, the flow associated with the second highest fecal coliform count was used to develop the TMDL and allocations. Information for both samples is reported in the table. See Section 8.2.8 for a discussion on this.

The flows at the gage were normalized to represent the catchment area of sampling stations on the TMDL streams. The Area-Weighted Flow (AWF) at each sampling station was determined by dividing the upstream drainage area of the sampling station by the upstream drainage area of the gage then multiplying the average daily flows at the gage by this ratio of areas.

According to *Kentucky Pathogen TMDL SOP*, a Flow Duration Curve (FDC) must be constructed first. Creating a FDC involves finding all recorded flow values within a creek at a particular sampling station and calculating the percent rank of each value. This percent rank is plotted on the X-axis of a graph, and the corresponding flow is plotted on the Y-axis using a log10 scale. This procedure displays higher flows on the left part of the graph, and lower flows (and the period where the creek goes dry, if any) on the right part of the graph. The FDC is divided into five flow zones (also called flow conditions); High Flows (which are flows that are not exceeded for more than 10% of the period of record, on the far left part of the graph), Moist Conditions (with flows exceeded between 10% and 40% of the period of record), Mid-Range Flows (which are exceeded between 40% and 60% of the period of record), Dry Conditions (with flows exceeded between 60% and 90% of the period of record), and Low Flows (which are exceeded between 90% and 100% of the period of record, on the far right part of the graph).

The FDC was then converted to a LDC by multiplying all flows by the WQC and by a conversion factor to convert the units from (colonies-ft3)/(100ml-second) to colonies per day. To complete the LDC, the sample results were plotted at their corresponding flow values, thus exceedances of the WQC plotted above the curve, and vice versa. The critical condition was defined as the sample (plotted as a load) with the highest exceedance of the WQC.

For PCR use impairments, only the recreational season's flows were used to build the FDCs for each impaired segments. Using only May through October gage data to construct the FDC has the effect of deleting the (mostly higher) winter flows, which artificially shifts the FDC to the left. As a result, a sample that was taken during the Low Flow period may erroneously plot to the left, inside the Dry Conditions zone, etc. This can hamper TMDL implementation, since each zone tends to be associated with a different group of sources (although overlap does occur). For instance, point sources and cattle standing in the creek most often produce their greatest impact at the lowest flows, and any sample taken on a Low Flow day should be plotted as such so an initial list of potential source types can be inferred. Therefore, the x-axis location of the vertical lines on the graph that denote the flow zones were calculated using the entire year's flows, and then plotted on the FDC showing only May through October flows.

The TMDL Target load was calculated for each flow zone within the LDC. However, existing conditions were only calculated for zones with samples exceeding the WQC. Two different methods were used to set the TMDL Target load within each zone and to calculate existing conditions, if applicable:

<u>No exceedances within a zone</u>: If there were no samples showing exceedances within a flow zone at a station, the TMDL Target load for that zone was set at the 90th percentile of the TMDL Target loads for each percent Flow Rank within that zone. Since no samples exceed the WQC, no existing condition was calculated. This is denoted by an "*" in the Site TMDL Tables in Section 8.2.

<u>One or more exceedances within a zone</u>: The existing condition was set at the highest exceedance of all sample loads from within the zone. The TMDL Target load for the zone was also set using the flow associated with the sample showing the highest exceedance within the zone (the TMDL Target load is the load at the sample's flow multiplied by the TMDL target concentration (i.e., the TMDL minus the MOS) and by the conversion factor.

The critical condition was decided based on the flow zone with the greatest exceedance of the WQC. The critical condition zone determines the overall TMDL and TMDL Target for the impaired segment.

Sample points are often labeled on Load Duration Curves in a way that illustrates whether a sample was taken during the runoff portion of a storm's hydrograph. This allows further insight into critical conditions: For instance, although the high-flow portion of the duration curve might be the period with the greatest loading from a source, it may also be that samples taken during high-flow conditions subsequent to rain events show more loading than samples taken during high-flow conditions which are not immediately connected with rain events. This information can point to the types of BMPs that would best address the delivery of pollutant loading to the system.

To determine whether a sample is taken during the runoff portion of a storm hydrograph, the percent storm flow was calculated using the Hydrograph Separation (or HYSEP) method developed by the USGS (1996). HYSEP includes different mathematical protocols to separate baseflow from storm flow on a given day, and KDOW used the Sliding Interval approach, see

USGS (1996) for further discussion. After subtracting baseflow, HYSEP determines the flow on a given day compared to the lowest flow in a 5-day period around that day, and if this change is greater than 50%, the sample taken on that day is considered to be from the runoff portion of a storm's hydrograph.

Load Duration Curves can assist in the identification of potential sources impacting water quality in a watershed. Table 8.01 shows flow zones under which different sources are expected to have high or medium impacts (Table from EPA, 2007).

Table 8.01 Sources Associated with Flow Zones

Contributing Source Area	Duration Curve Zone				
	High Flow	Moist	Mid-Range	Dry	Low Flow
Point Source				*M*	*H*
On-site wastewater systems			*H*	*M*	
Riparian Areas		*H*	*H*	*H*	
Storm water: Impervious Areas		*H*	*H*	*H*	
Combined sewer overflows	*H*	*H*	*H*		
Storm water: Upland	*H*	*H*	*M*		
Bank erosion	*H*	*M*			
Note: Potential relative importance of source area to contribute loads under given hydrologic condition *(H: High; M: Medium)*					

It should be noted that a Load Duration Curve must be well populated with sample data to determine potential sources impacting an upstream watershed. If exceedances are not identified within a flow zone, it could be due to a lack of sufficient sample collection within that flow zone and source contributions from that zone could be occurring.

8.1 Data Validation

Data validation was performed as follows:

- Only samples collected from a flowing stream were considered in analysis.
- Quality Analysis/Quality Control Samples (e.g. duplicates and blanks) were excluded from the dataset.
- Some samples were reported using either the *less than* (denoted using the "<") symbol or the *greater than* (denoted using the ">") symbol, indicating the true concentration was unknown but it was either below or above the reported value, respectively. For a sample *less than* the reported value, the reported value was used verbatim if the reported value was below the WQC, and the sample was therefore not an exceedance. If the value was above the WQC it was unclear whether the sample actually exceeded the WQC or not, therefore it was excluded from the analysis. For *greater than* values, the reported value was used verbatim if the reported value was above the WQC, and the sample was an exceedance. If the value was below the WQC it was unclear whether the sample actually exceeded the WQC or not, therefore it was excluded from the analysis. While in such cases the exact value of the exceedance is

unknown and likely higher than the number reported, the sample still gave insight into the status of the waterbody at the time the sample was taken.

8.2 Individual Stream Segment Analysis

Data collection and analysis from various sources (including Federal, State and local government, and public entities) was carried out for each individually listed stream segment and its associated drainage area. Spatial analysis was also performed within a GIS framework. Most of the data collected for the development of this document can be accessed and downloaded from the Kentucky Geography Network (http://kygeonet.ky.gov).

8.2.1 Ashers Run 0.0 to 4.8.

Ashers Run at RM 0.0 is a first order stream located in Oldham County (Figure 8.1). The subwatershed for the impaired segment has a total drainage area of approximately 3.4 square miles. Ashers Run 0.0 to 4.8 does not support the PCR use due to *E. coli* and fecal coliform; therefore two TMDLs were calculated. Information about Ashers Run RM 0.0 to 4.8, including its WBID and MS4 area is shown in Table 8.1. The MS4 areas in this subwatershed are permitted under KYG200005 and the KYTC permit KYS000003 (Figure 8.2). There are no KPDES permitted SWS dischargers within the subwatershed boundary. The land cover in this subwatershed is predominantly agricultural (50%, mostly pasture) followed by mixed forest (38%) and urban/residential development (9.3%) as shown in Table 8.2.

Table 8.1 Ashers Run 0.0 to 4.8 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Asher Run	Asher Run 0.0 to 4.8	KY486083_01	Oldham	2,144	3.35	1
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed					
957.72	44.67					

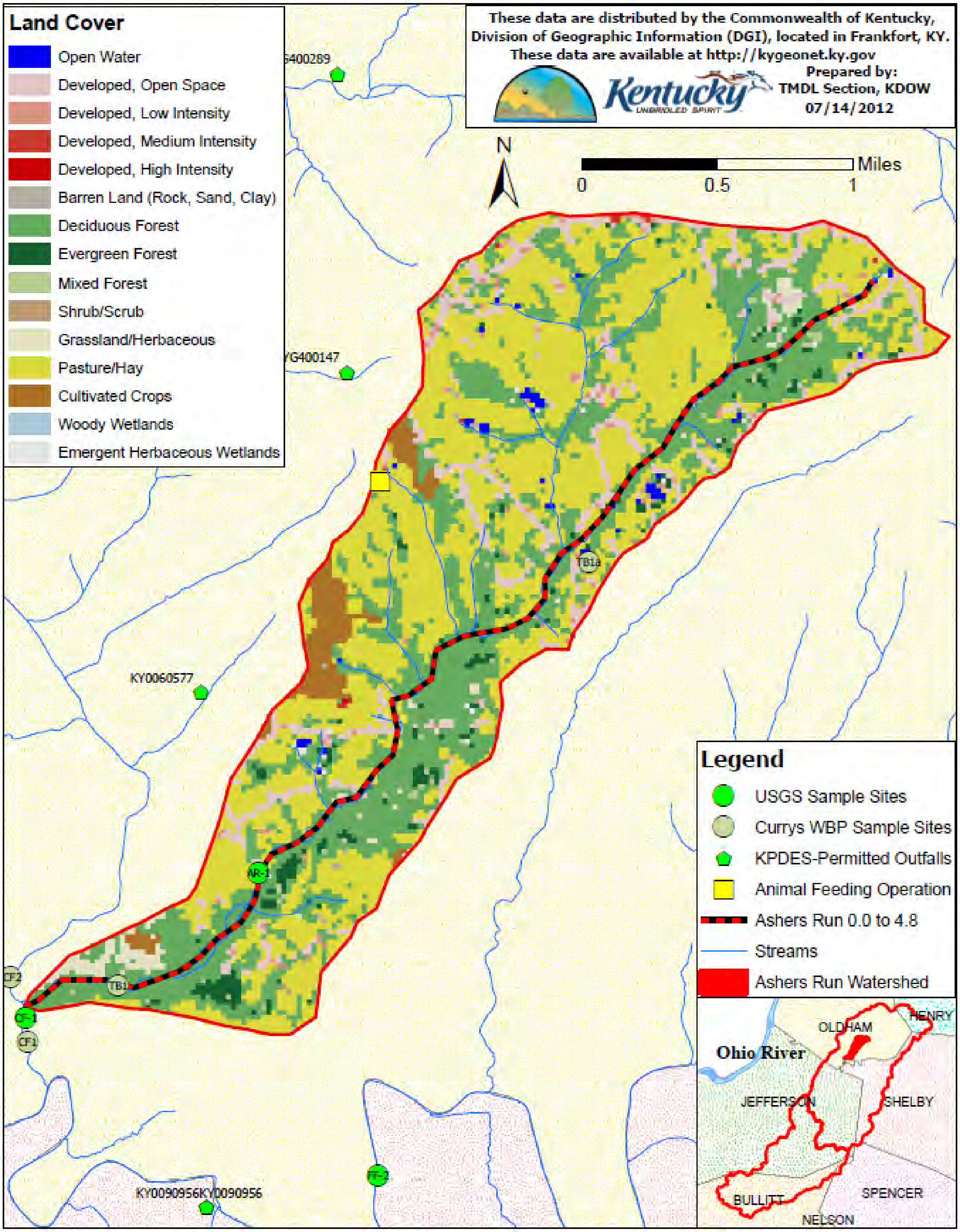

Figure 8.1 Land Cover and Sampling Sites in the Ashers Run 0.0 to 4.8 Subwatershed

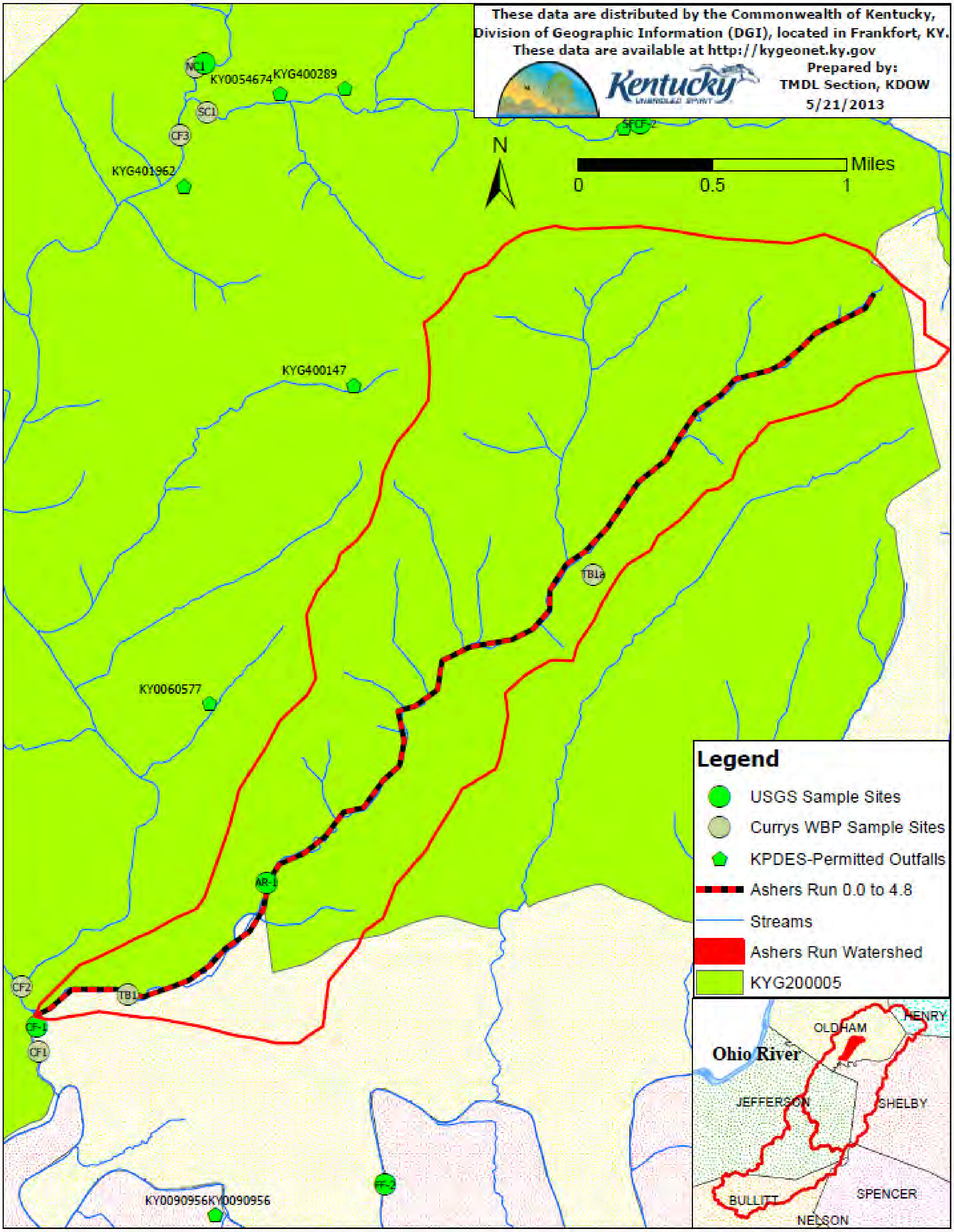

Figure 8.2 Urbanized Boundary of MS4 Entities in Ashers Run 0.0 to 4.8 Subwatershed

Table 8.2 Land Cover in the Ashers Run 0.0 to 4.8 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	9.32	200	0.3	1%
Agriculture (total)	50.11	1,074	1.7	
Pasture	47.03	1,008	1.6	
Row Crop	3.08	66	0.1	
Forest	38.12	817	1.3	
Natural Grassland	1.53	33	0.1	
Water	0.58	12	0.0	
Wetland	0.25	5	0.0	
Barren	0.10	2	0.0	
Total	100.00	2,144	3.3	

Site information is shown in Table 8.3; site TB1 was used to develop the fecal coliform LDC (Figure 8.3) while site AR-1 was used to develop the *E. coli* LDC (Figure 8.4). Data from sites TB1 and AR-1 are presented in Appendix B. The critical condition was the dry zone for fecal coliform and the moist zone for *E. coli* although exceedances were found in other zones. Table 8.4 shows the TMDLs for the flow zones associated with fecal coliform at site TB1 while Table 8.5 does the same for *E. coli* at site AR-1 (the yellow highlight indicates the critical condition TMDL).

Table 8.3 Sample Sites Located Along Ashers Run RM 0.0 to 4.8

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
TB1	38.308944	-85.444	0.4	Currys Fork WBP	Fecal Coliform	Yes-PCR
TB1a	38.33167	-85.412	3.25	Currys Fork WBP	Fecal Coliform	No
AR-1	38.315	-85.435	1.2	USGS	*E. coli*	Yes-PCR

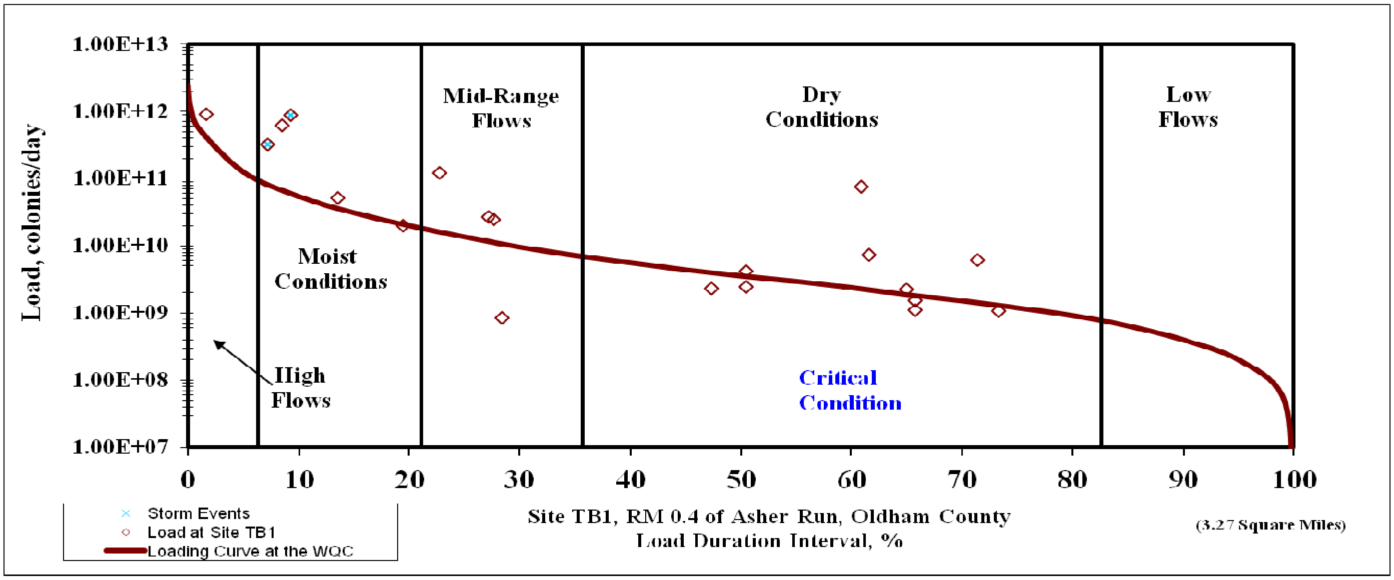

Figure 8.3 PCR Fecal Coliform LDC for Site TB1

Table 8.4 PCR Fecal Coliform TMDLs by Flow Zone for Site TB1

Flow Zone	Existing Load (colonies/ day)	TMDL (colonies / day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	9.10E+11	4.13E+11	4.13E+10	3.71E+11	0	3.71E+11
Moist	8.79E+11	6.17E+10	6.17E+09	5.55E+10	0	5.55E+10
Mid	1.23E+11	1.64E+10	1.64E+09	1.48E+10	0	1.48E+10
Dry	7.68E+10	2.36E+09	2.36E+08	2.13E+09	0	2.13E+09
Low	*	6.81E+08	6.81E+07	6.13E+08	0	6.13E+08

*No exceedances within a zone—See Section 8.0

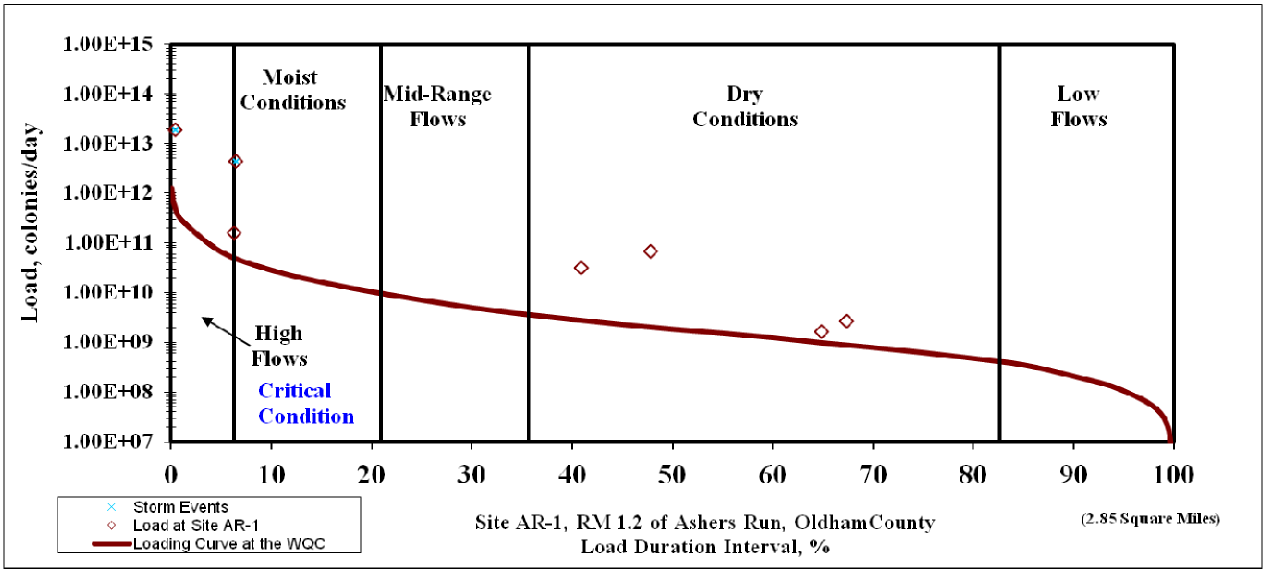

Figure 8.4 PCR *E. coli* LDC for Site AR-1

Table 8.5 PCR *E. coli* TMDLs by Flow Zone for Site AR-1

Flow Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.87E+13	4.78E+11	4.78E+10	4.30E+11	0	4.30E+11
Moist	4.27E+12	4.88E+10	4.88E+09	4.39E+10	0	4.39E+10
Mid	*	8.59E+09	8.59E+08	7.73E+09	0	7.73E+09
Dry	6.84E+10	2.05E+09	2.05E+08	1.85E+09	0	1.85E+09
Low	*	3.56E+08	3.56E+07	3.20E+08	0	3.20E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Ashers Run at RM 0.0 has an upstream watershed area of 3.35 square miles while sites TB1 and AR-1 have upstream watershed areas of 3.27 and 2.85 square miles, respectively. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.02 and 1.17 for TB1 and AR-1, respectively) to generate the final fecal coliform and *E. coli* TMDL allocations for the impaired segment (Table 8.6). The breakdown of WLAs assigned to permitted entities is presented in Table 8.7.

Table 8.6 Fecal Coliform (PCR) and *E. coli* (PCR) TMDL Allocations for Ashers Run 0.0 to 4.8

Pollutant (Use)	Fecal coliform (PCR)	*E. coli* (PCR)
Existing Load (colonies/day)	7.83E+10	5.00E+12
TMDL (colonies/day)	2.41E+09	5.71E+10
MOS (colonies/day)	2.41E+08	5.71E+09
TMDL Target (colonies/day)	2.17E+09	5.14E+10
SWS-WLA (colonies/day)	0	0
Remainder (colonies/day)	2.17E+09	5.14E+10
Future Growth-WLA (colonies/day)	2.17E+07	5.14E+08
MS4-WLA (colonies/day)	9.69E+08	2.30E+10
LA (colonies/day)	1.18E+09	2.79E+10

Table 8.7 WLAs Assigned to Permitted Entities in Ashers Run 0.0 to 4.8 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	9.69E+08	2.30E+10

8.2.2 Cane Run 0.0 to 7.3

Cane Run at RM 0.0 is a second order stream located in Jefferson County (Figure 8.5). The subwatershed for the impaired segment has a total drainage area of approximately 14.3 square miles. Cane Run 0.0 to 7.3 does not support the PCR use due to *E. coli*. Information about Cane Run RM 0.0 to 7.3, including its WBID and MS4 area is shown in Table 8.8. The MS4 area in this subwatershed is permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.6). There is one KPDES permitted SWS discharger within the subwatershed boundary (see Table 8.13). The land cover in this subwatershed is predominantly forested (55.5%) followed by agriculture (34.8%, mostly pasture) as shown in Table 8.9.

Table 8.8 Cane Run 0.0 to 7.3 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Cane Run	Cane Run 0.0 to 7.3	KY488794_01	Jefferson	9,149	14.3	2
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
4,791.85	52.38					

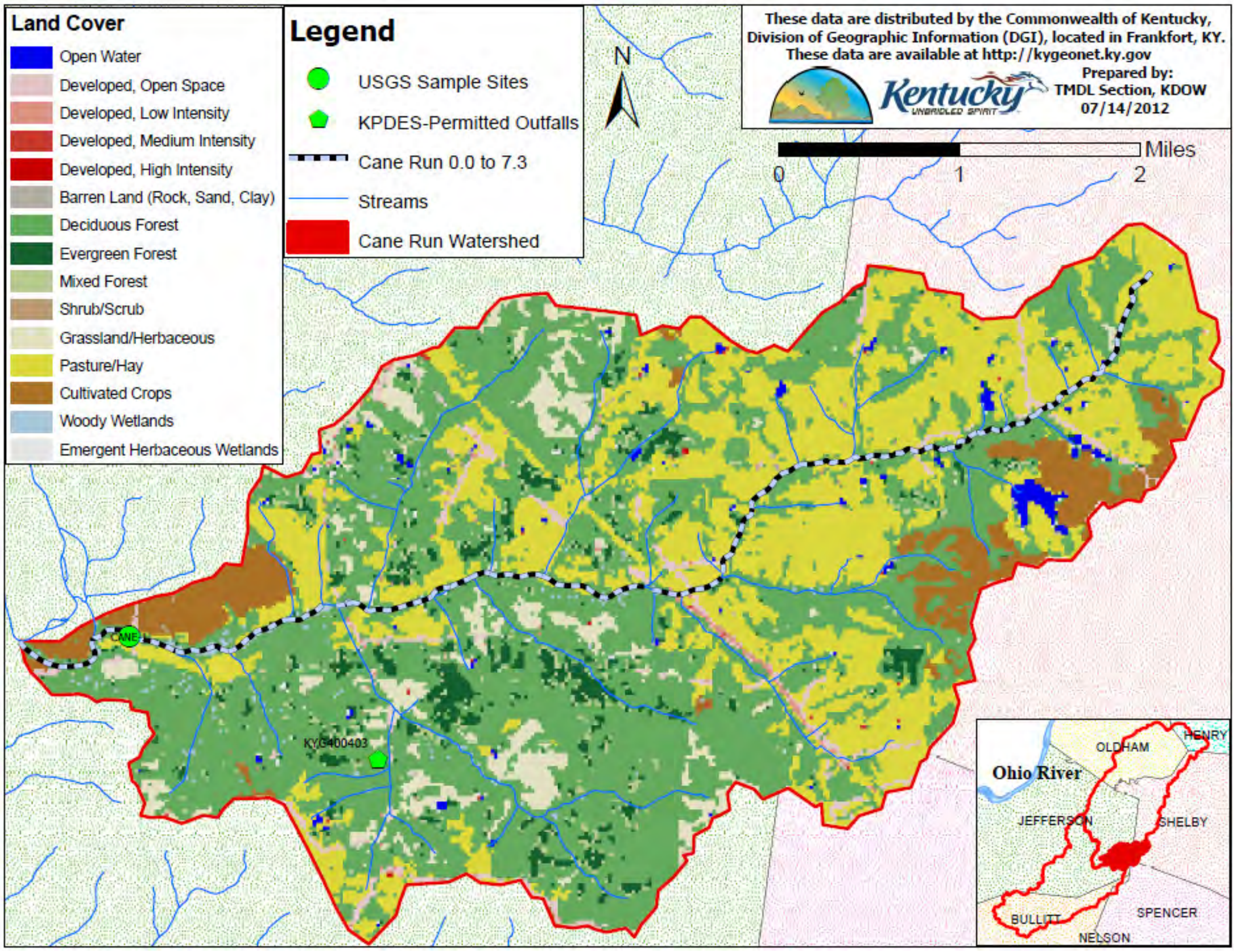

Figure 8.5 Land Cover, Sampling Sites, and KPDES-permitted Facility in the Cane Run RM 0.0 to 7.3 Subwatershed

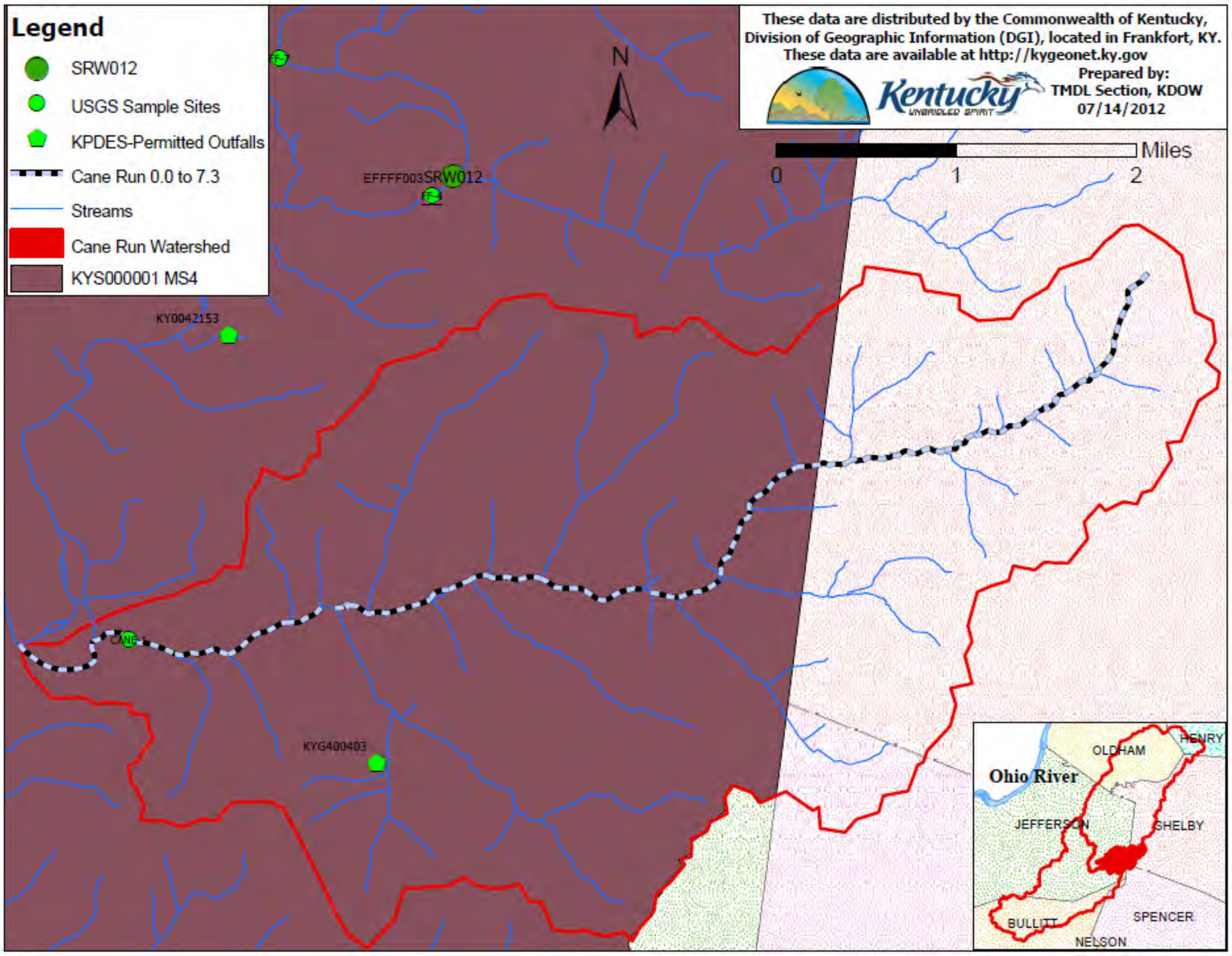

Figure 8.6 Urbanized Boundary of MS4 Entities in Cane Run 0.0 to 7.3 Subwatershed

Table 8.9 Land Cover in Cane Run 0.0 to 7.3 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	2.71	248	0.4	0.5%
Agriculture (total)	34.79	3,183	5.0	
Pasture	29.32	2,682	4.2	
Row Crop	5.47	501	0.8	
Forest	55.51	5,078	7.9	
Natural Grassland	5.39	494	0.8	
Water	0.78	71	0.1	
Wetland	0.74	67	0.1	
Barren	0.08	7	0.0	
Total	100.00	9,149	14.3	

Site information is shown in Table 8.10; site CANE-1 was used to develop the *E. coli* LDC (Figure 8.7). Data from site CANE-1 are presented in Appendix B. The critical condition was the moist zone, although exceedances were found in other zones and no samples were collected in the low flow zone. Table 8.11 shows the TMDLs for the flow zones associated with site CANE-1 (the yellow highlight indicates the critical condition TMDL).

Table 8.10 Sample Sites Located Along Cane Run 0.0 to 7.3

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
CANE-1	38.1528	-85.4914	0.25	USGS	*E. coli*	Yes-PCR

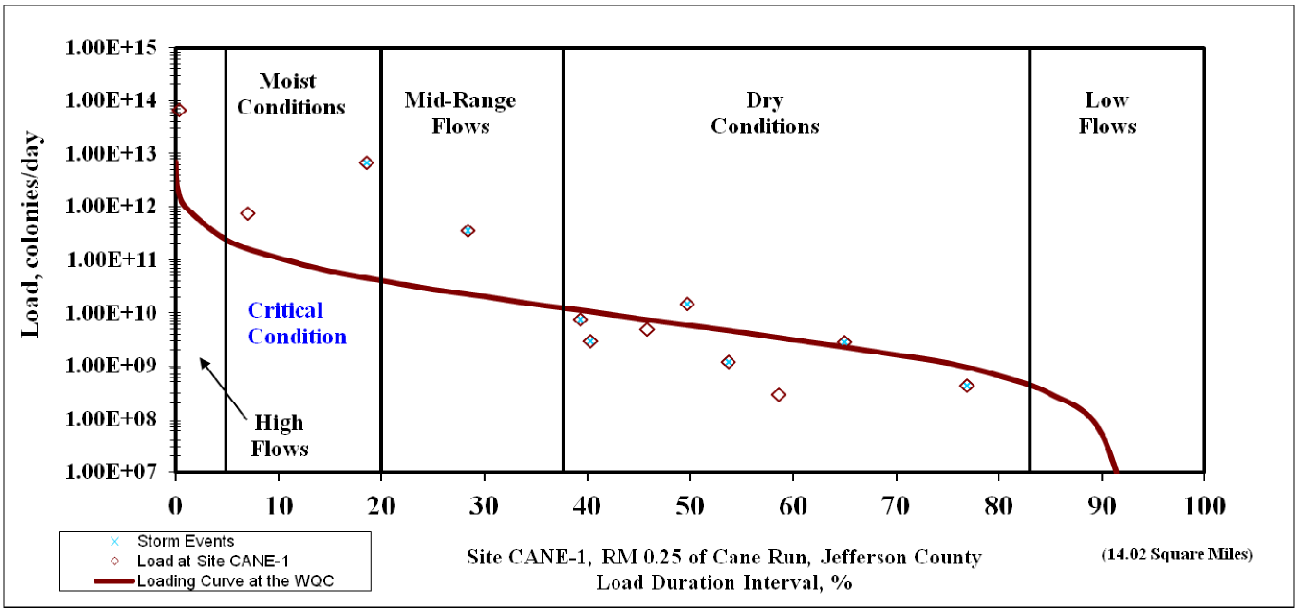

Figure 8.7 PCR *E. coli* Load Duration Curve for Site CANE-1

Table 8.11 PCR E. coli TMDLs by Flow Zone for Site CANE-1

Flow Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	6.68E+13	2.03E+12	2.03E+11	1.83E+12	4.54E+06	1.83E+12
Moist	6.87E+12	4.58E+10	4.58E+09	4.12E+10	4.54E+06	4.12E+10
Mid	3.58E+11	2.26E+10	2.26E+09	2.03E+10	4.54E+06	2.03E+10
Dry	1.46E+10	5.95E+09	5.95E+08	5.35E+09	4.54E+06	5.35E+09
Low	*	2.97E+08	2.97E+07	2.67E+08	4.54E+06	2.63E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Cane Run at RM 0.0 has an upstream watershed area of 14.29 square miles while site CANE-1 has an upstream watershed area of 14.02 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.02) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.12). The breakdown of WLAs assigned to permitted entities is presented in Table 8.13.

Table 8.12 *E. coli* (PCR) TMDL Calculations for Cane Run 0.0 to 7.3

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	7.01E+12
TMDL (colonies/day)	4.67E+10
MOS (colonies/day)	4.67E+09
TMDL Target (colonies/day)	4.20E+10
SWS-WLA (colonies/day)	4.54E+06
Remainder (colonies/day)	4.20E+10
Future Growth-WLA (colonies/day)	2.10E+08
MS4-WLA (colonies/day)	2.20E+10
LA (colonies/day)	1.98E+10

Table 8.13 WLAs Assigned to Permitted Entities in Cane Run 0.0 to 7.3 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/day)
KYG400403	FREUDENBERGER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	2.20E+10

8.2.3 Cedar Creek 4.3 to 11.1

Cedar Creek at RM 4.3 is a second order stream located in Jefferson County (Figure 8.8). The subwatershed for the impaired segment has a total drainage area of approximately 13.6 square miles. Cedar Creek 4.3 to 11.1 does not support the PCR use due to *E. coli* and fecal coliform; therefore two TMDLs were calculated. Information about Cedar Creek RM 4.3 to 11.1, including its WBID and MS4 area is shown in Table 8.14. The MS4 areas in this subwatershed are permitted under KYS000001, KYG200039 and the KYTC permit KYS000003 (Figure 8.9). There are six KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.21). The land cover in this subwatershed is a mixture of forested (35.7%), developed (33.8%) and agriculture (27.3%, mostly pasture) as shown in Table 8.15.

Table 8.14 Cedar Creek 4.3 to 11.1 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Cedar Creek	Cedar Creek 4.3 to 11.1	KY489183_01	Jefferson	8,693	13.6	2
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed	KYG200039 and KYS000003 MS4 Area (acres)	KYG200039 and KYS000003 % MS4 in Watershed			
5,367	61.7	728	8.4			

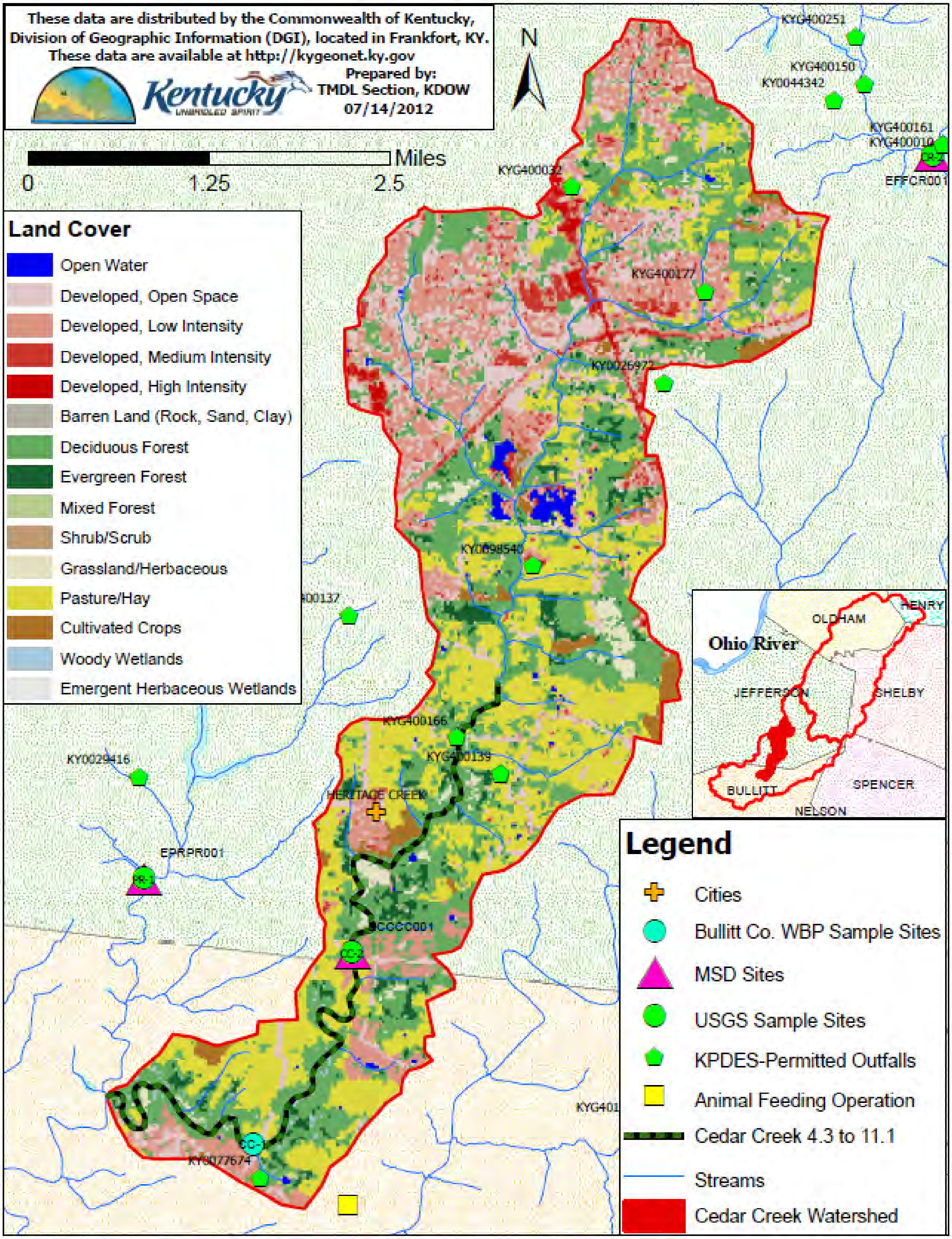

Figure 8.8 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Cedar Creek 4.3 to 11.1 Subwatershed

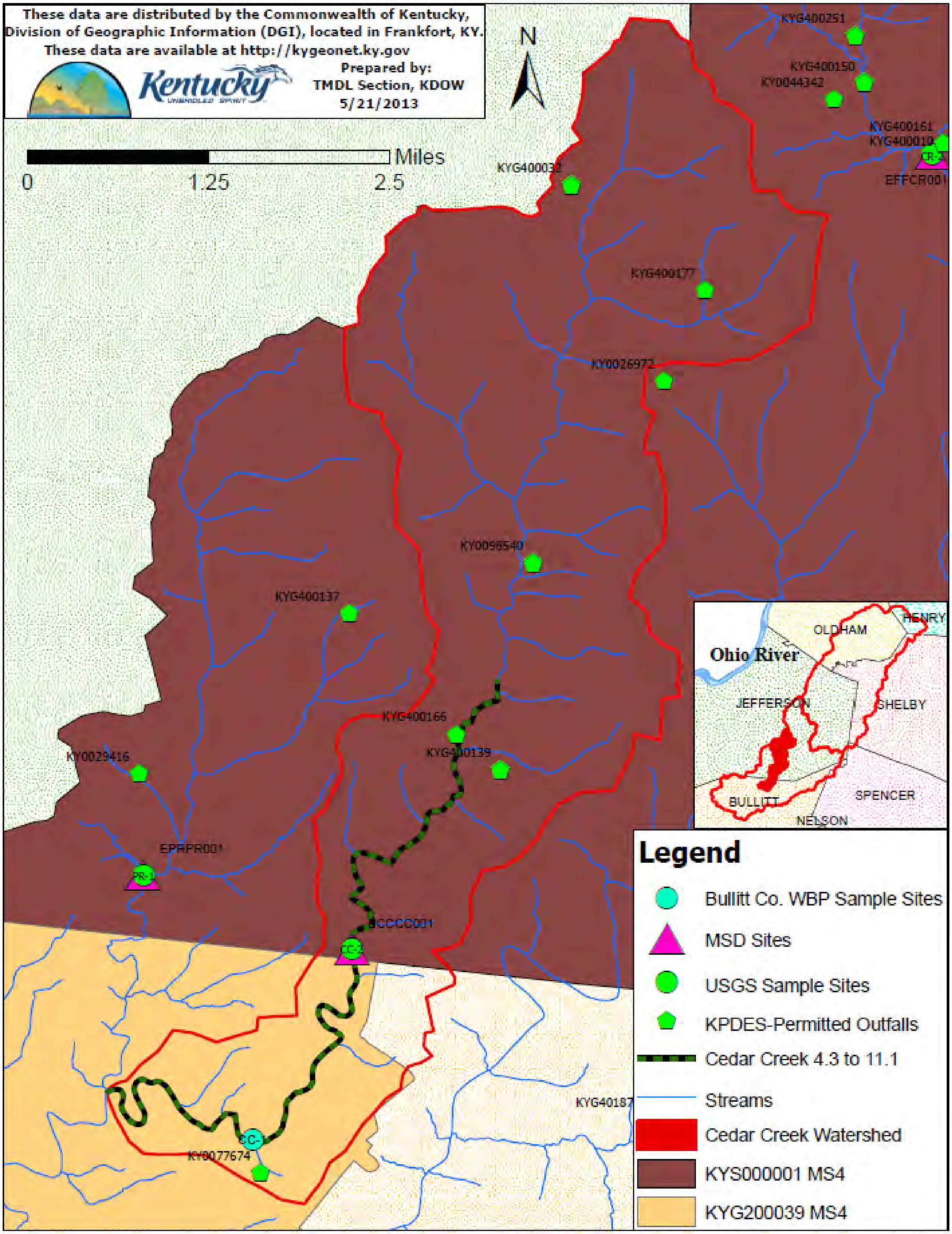

Figure 8.9 Urbanized Boundary of MS4 Entities in Cedar Creek 4.3 to 11.1 Subwatershed

Table 8.15 Land Cover in the Cedar Creek 4.3 to 11.1 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	33.81	2,939	4.6	5%
Agriculture (total)	27.29	2,372	3.7	
Pasture	25.01	2,174	3.4	
Row Crop	2.27	198	0.3	
Forest	35.74	3,107	4.9	
Natural Grassland	1.52	132	0.2	
Water	0.89	77	0.1	
Wetland	0.65	57	0.1	
Barren	0.10	9	0.0	
Total	100.00	8,693	13.6	

Site information is shown in Table 8.16; site ECCCC001 was used to develop the fecal coliform LDC (Figure 8.10) while site CC-2 was used to develop the *E. coli* LDC (Figure 8.11). Data from sites ECCCC001 and CC-2 are presented in Appendix B. The critical condition was the moist flow zone for fecal coliform and the high flow zone for *E. coli*, although exceedances were found in other zones. Table 8.17 shows the TMDLs for the flow zones associated with fecal coliform at site ECCCC001 while Table 8.18 does the same for *E. coli* at site CC-2 (the yellow highlight indicates the critical condition TMDLs).

Table 8.16 Sample Sites Located Along Cedar Creek 4.3 to 11.1

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
ECCCC001	38.08	-85.616111	8.3	Louisville MSD	Fecal Coliform	Yes-PCR
CC-1	38.060798	-85.6287	6.2	Bullitt County WBP	Fecal Coliform	No
CC-2	38.08	-85.616111	8.3	USGS	*E. coli*	Yes-PCR

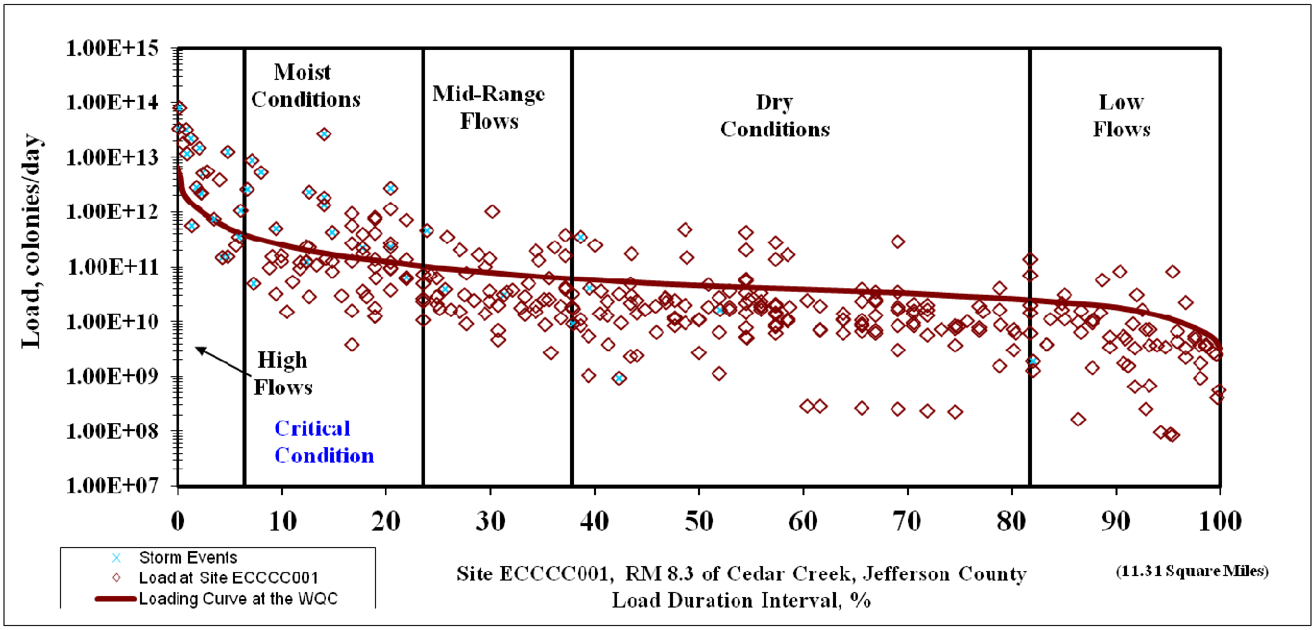

Figure 8.10 Fecal Coliform LDC for Site ECCCC001

Table 8.17 Fecal Coliform TMDLs by Flow Zone for Site ECCCC001

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.27E+13	5.28E+11	5.28E+10	4.76E+11	1.14E+11	3.62E+11
Moist	2.71E+13	1.86E+11	1.86E+10	1.67E+11	1.14E+11	5.37E+10
Mid	1.04E+12	8.02E+10	8.02E+09	7.22E+10	1.14E+11	-4.14E+10
Dry	4.92E+11	4.80E+10	4.80E+09	4.32E+10	1.14E+11	-7.05E+10
Low	8.25E+10	1.14E+10	1.14E+09	1.02E+10	1.14E+11	-1.03E+11

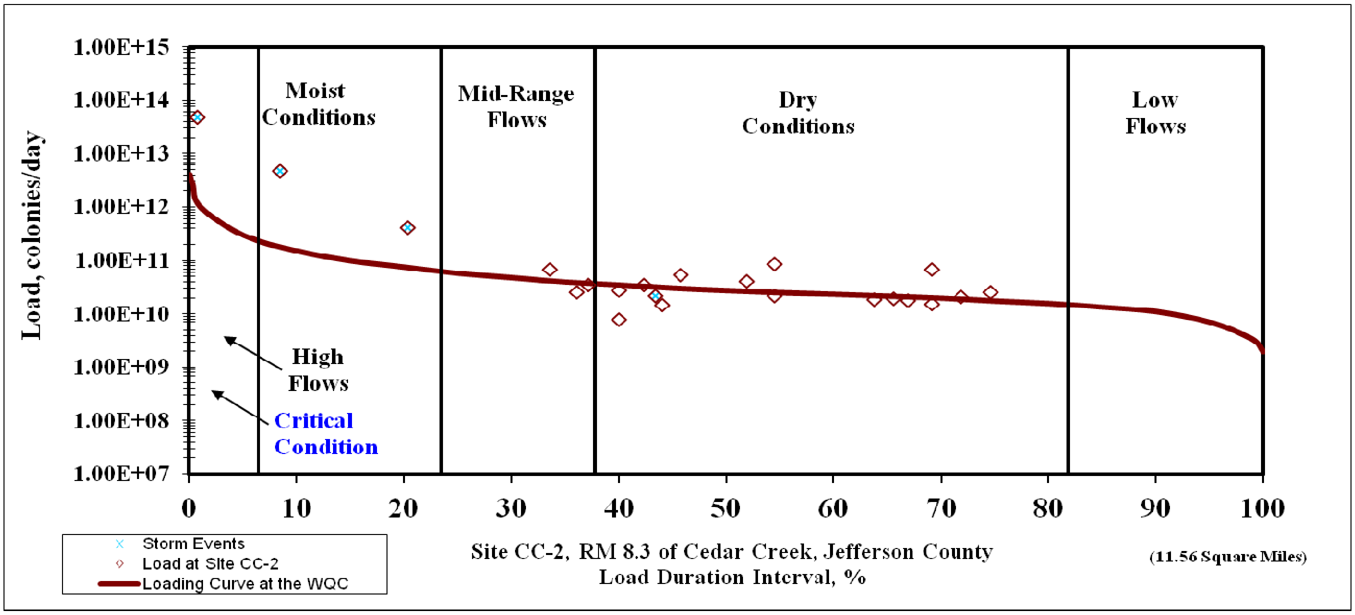

Figure 8.11 *E. coli* LDC for Site CC-2

Table 8.18 *E. coli* TMDLs by Flow Zone for Site CC-2

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies /day)
High	4.76E+13	1.20E+12	1.20E+11	1.08E+12	6.82E+10	1.02E+12
Moist	4.70E+12	1.82E+11	1.82E+10	1.64E+11	6.82E+10	9.57E+10
Mid	6.95E+10	4.17E+10	4.17E+09	3.75E+10	6.82E+10	-3.06E+10
Dry	6.94E+10	2.06E+10	2.06E+09	1.85E+10	6.82E+10	-4.97E+10
Low	*	1.43E+10	1.43E+09	1.29E+10	6.82E+10	-5.53E+10

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Cedar Creek at RM 4.3 has an upstream watershed area of 13.58 square miles while sites ECCCC001 and CC-2 have an upstream watershed area of 11.31 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.2) and the individual WLA for permit #KY0077674 Lake Columbia Subdivision (which is located below both sites ECCCC001 and CC-2) was added to the SWS-WLAs to generate the final fecal coliform and *E. coli* TMDL allocations for the impaired segment (Table 8.19). Because site ECCCC001 had sufficient data to calculate geometric means, the greatest geometric mean was determined (Table 8.20). The breakdown of WLAs assigned to permitted entities is presented in Table 8.21.

Table 8.19 Fecal Coliform (PCR) and *E. coli* (PCR) TMDL Allocations for Cedar Creek 4.3 to 11.1

Pollutant (Use)	Fecal Coliform (PCR)	*E. coli* (PCR)
Existing Load (colonies/day)	3.26E+13	5.72E+13
TMDL (colonies/day)	2.23E+11	1.44E+12
MOS (colonies/day)	2.23E+10	1.44E+11
TMDL Target (colonies/day)	2.01E+11	1.30E+12
SWS-WLA (colonies/day)	1.14E+11	6.83E+10
Remainder (colonies/day)	8.70E+10	1.23E+12
Future Growth-WLA (colonies/day)	4.35E+09	6.16E+10
MS4-WLA (colonies/day)	6.10E+10	8.64E+11
LA (colonies/day)	2.17E+10	3.06E+11

Table 8.20 Greatest Geometric Mean for Fecal Coliform at Site ECCCC001

Sample Date	Fecal Coliform (colonies/100 ml)	Geomean (colonies/100 ml)
8/11/2006	>58,400	1,286.5
8/17/2006	272	
8/23/2006	184	
8/29/2006	800	
9/5/2006	202	
9/11/2006	>9,600	

Table 8.21 WLAs Assigned to Permitted Entities in Cedar Creek 4.3 to 11.1 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	Fecal Coliform WLA (colonies/day)	*E. coli* WLA (colonies/ day)
KY0077674	LAKE COLUMBIA SUBDIVISION[1]	SWS	1.20E-02	1.86E-02	1.82E+08	1.09E+08
KY0098540	MSD CEDAR CREEK WQTC	SWS	7.50E+00	1.16E+01	1.14E+11	6.81E+10
KYG400032	WILLIAMS RESIDENCE	SWS	7.50E-04	1.16E-03	1.14E+07	6.81E+06
KYG400139	ENTIN RESIDENCE	SWS	1.00E-03	1.55E-03	1.51E+07	9.08E+06
KYG400166	SHIPP RESIDENCE	SWS	1.00E-03	1.55E-03	1.51E+07	9.08E+06
KYG400177	BERRYMAN RESIDENCE	SWS	4.00E-04	6.19E-04	6.06E+06	3.63E+06

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	Fecal Coliform WLA (colonies/day)	*E. coli* WLA (colonies/ day)
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	5.37E+10	7.60E+11
KYG200039 and KYS000003	Bullitt County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	7.29E+09	1.03E+11

Note: [1]This facility is located below sites ECCCC001 and CC-2.

8.2.4 Chenoweth Run 0.0 to 5.25

Chenoweth Run at RM 0.0 is a second order stream located in Jefferson County (Figure 8.12). The subwatershed for the impaired segment has a total drainage area of approximately 16.7 square miles. Chenoweth Run 0.0 to 5.25 does not support the PCR use due to *E. coli* and fecal coliform and the SCR use due to fecal coliform; therefore three TMDLs were calculated. Information about Chenoweth Run RM 0.0 to 5.25, including its WBID and MS4 area is shown in Table 8.22. The MS4 area in this subwatershed is permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.13). There are seven KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.30). The land cover in this subwatershed is a mixture of developed (39.8%), forested (38.2%) followed by agriculture (18%, mostly pasture) as shown in Table 8.23.

Table 8.22 Chenoweth Run 0.0 to 5.25 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Chenoweth Run	Chenoweth Run 0.0 to 5.25	KY489391_01	Jefferson	10,694	16.7	2
KYS0000001 and KYS000003 MS4 Area (acres)	KYS0000001 and KYS000003 % MS4 in Watershed					
8,705	81.4					

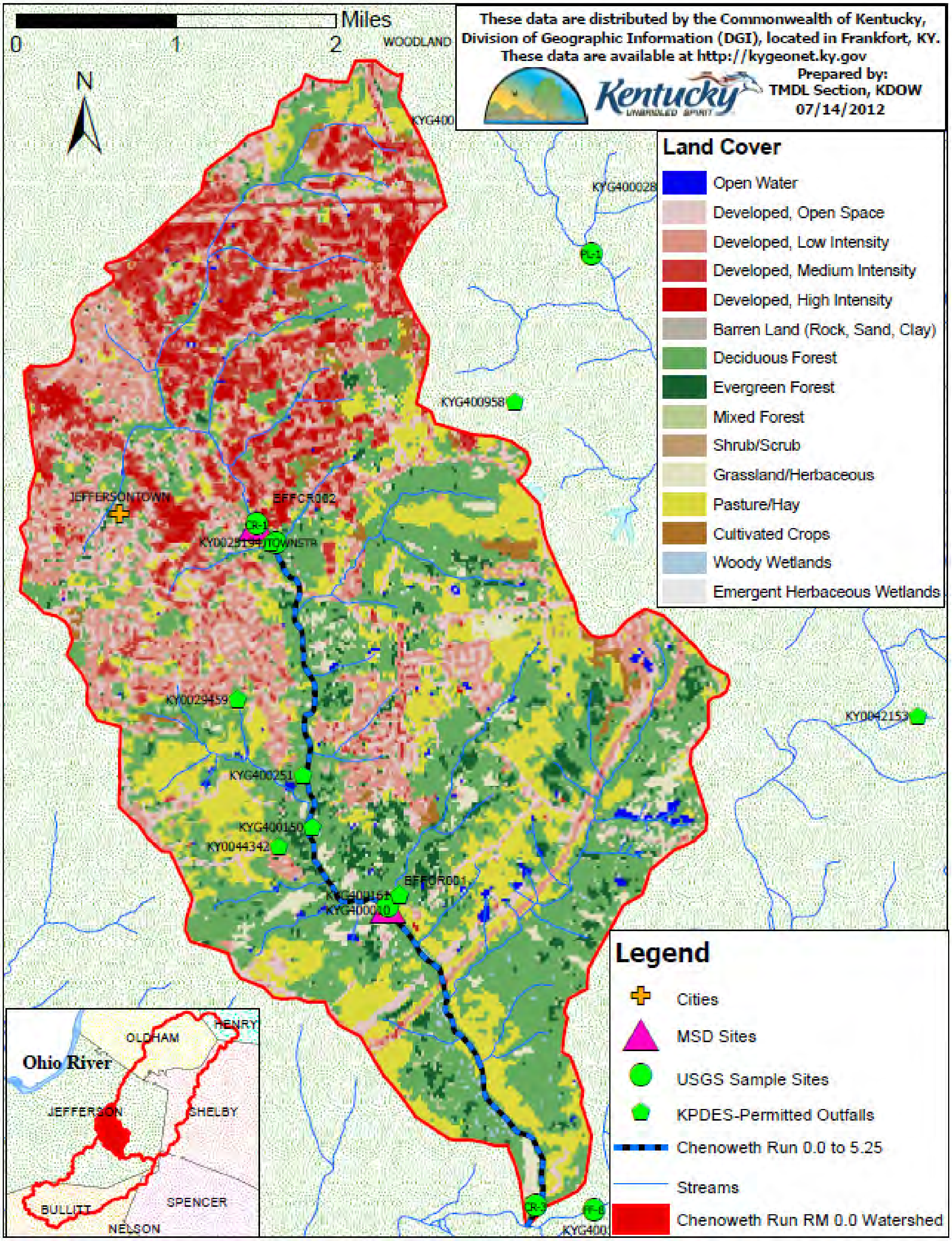

Figure 8.12 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Chenoweth Run 0.0 to 5.25 Subwatershed

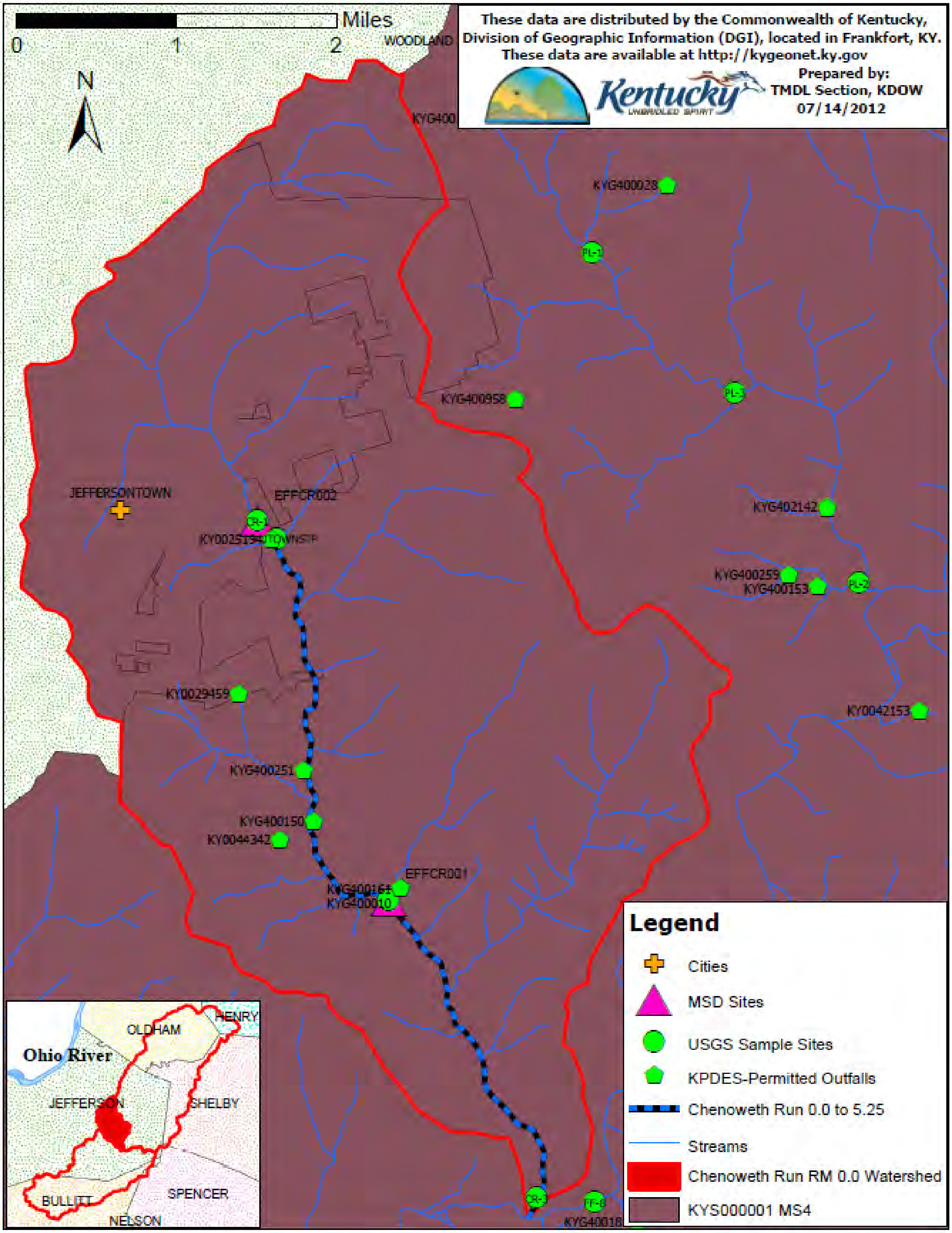

Figure 8.13 Urbanized Boundary of MS4 Entities in Chenoweth Run 0.0 to 5.25 Subwatershed

Table 8.23 Land Cover in the Chenoweth Run 0.0 to 5.25 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	39.79	4,256	6.6	5.0%
Agriculture (total)	18.02	1,927	3.0	
Pasture	16.75	1,791	2.8	
Row Crop	1.27	136	0.2	
Forest	38.21	4,087	6.4	
Natural Grassland	2.63	281	0.4	
Water	0.58	62	0.1	
Wetland	0.71	76	0.1	
Barren	0.05	6	0.0	
Total	100.00	10,694	16.7	

Site information is shown in Table 8.24; site EFFCR001 was used to develop the fecal coliform LDCs (Figures 8.14 and 8.15) while site CR-3 was used to develop the *E. coli* LDC (Figure 8.16). Data from sites EFFCR001 and CR-3 are presented in Appendix B. The critical condition was the moist flow zone for fecal coliform and the high flow zone for *E. coli*, although exceedances were found in other zones. Tables 8.25 and 8.26 shows the TMDLs for the flow zones associated with fecal coliform at site EFFCR001 for PCR and SCR, respectively, while Table 8.27 does the same for *E. coli* at site CR-3 (the yellow highlight indicates the critical condition TMDLs).

Table 8.24 Sample Sites Located Along Chenoweth Run 0.0 to 5.25

Stream Segment	Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
Chenoweth Run 0.0 to 5.25	EFFCR001	38.16	-85.5422	2.4	Louisville MSD	Fecal Coliform	Yes-PCR and SCR
Chenoweth Run 0.0 to 5.25	CR-2	38.16	-85.5422	2.4	USGS	*E. coli*	No
Chenoweth Run 0.0 to 5.25	CR-3	38.13278	-85.5253	0.15	USGS	*E. coli*	Yes-PCR
Chenoweth Run 0.0 to 5.25	JTOWNSTP	38.19306	-85.555	5.2	USGS	*E. coli*	No

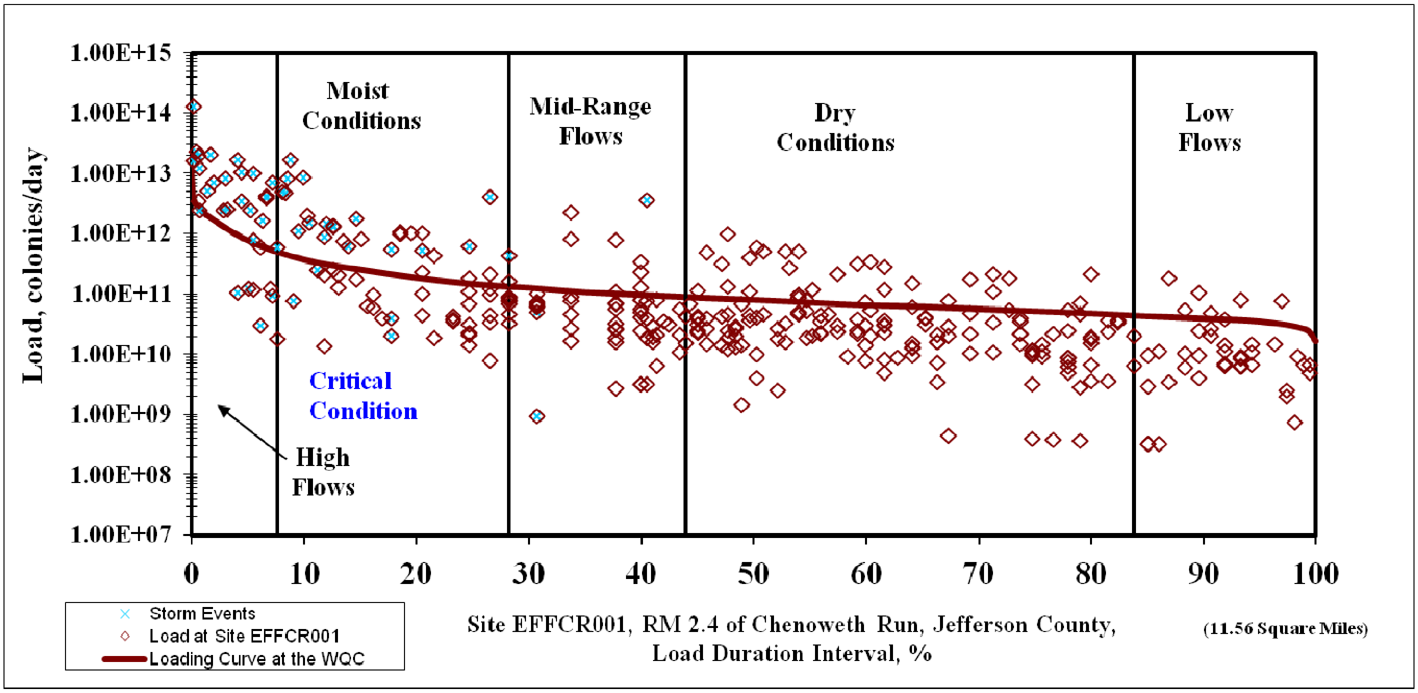

Figure 8.14 PCR Fecal Coliform LDC for Site EFFCR001

Table 8.25 PCR Fecal Coliform TMDLs by Flow Zone for Site EFFCR001

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies /day)
High	1.30E+14	4.27E+12	4.27E+11	3.84E+12	6.43E+10	3.78E+12
Moist	1.65E+13	4.40E+11	4.40E+10	3.96E+11	6.43E+10	3.32E+11
Mid	3.55E+12	9.69E+10	9.69E+09	8.72E+10	6.43E+10	2.29E+10
Dry	9.78E+11	8.42E+10	8.42E+09	7.57E+10	6.43E+10	1.15E+10
Low	1.79E+11	4.21E+10	4.21E+09	3.79E+10	6.43E+10	-2.64E+10

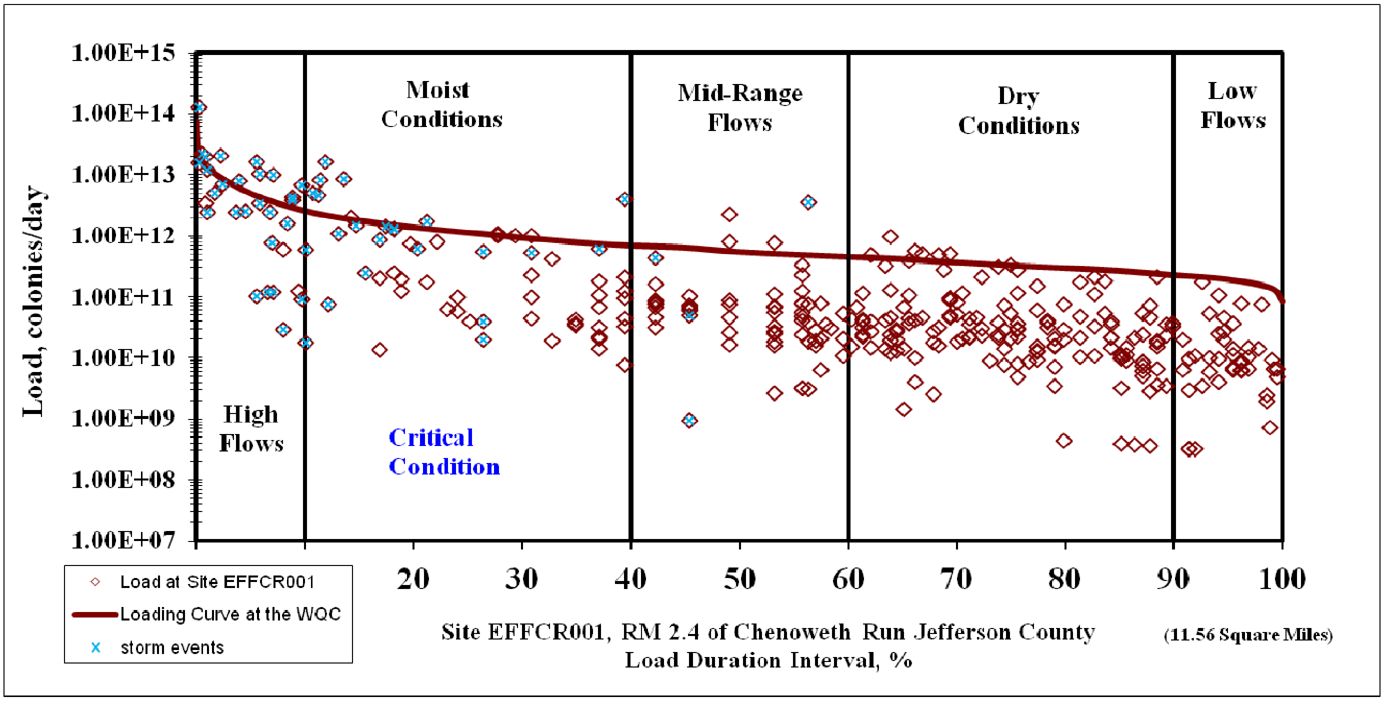

Figure 8.15 SCR Fecal Coliform LDC for Site EFFCR001

Table 8.26 SCR Fecal Coliform TMDLs by Flow Zone for Site EFFCR001

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies /day)
High	1.30E+14	2.13E+13	2.13E+12	1.92E+13	6.43E+10	1.91E+13
Moist	1.65E+13	2.20E+12	2.20E+11	1.98E+12	6.43E+10	1.92E+12
Mid	3.55E+12	4.84E+11	4.84E+10	4.36E+11	6.43E+10	3.72E+11
Dry	9.78E+11	4.21E+11	4.21E+10	3.79E+11	6.43E+10	3.14E+11
Low	*	2.15E+10	1.93E+11	1.93E+11	6.43E+10	1.29E+11

*No exceedances within a zone—See Section 8.0

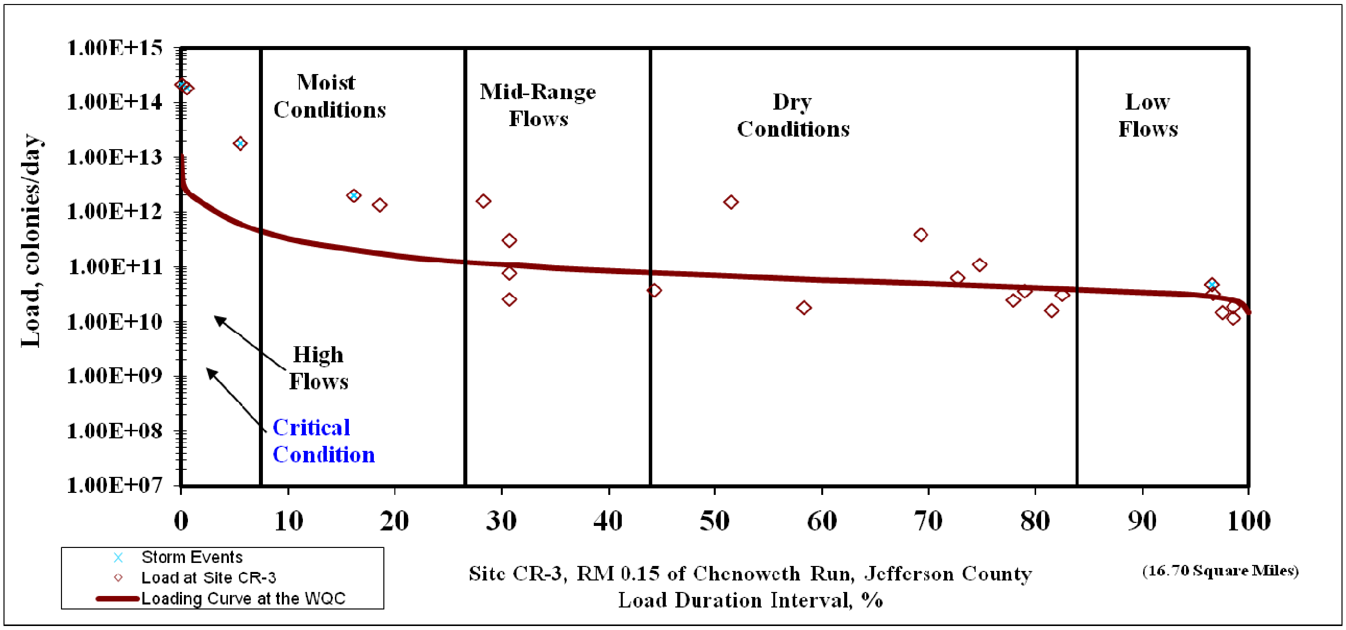

Figure 8.16 PCR *E. coli* LDC for Site CR-3

Table 8.27 PCR *E. coli* TMDLs by Flow Zone for Site CR-3

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.82E+14	2.43E+12	2.43E+11	2.19E+12	3.86E+10	2.15E+12
Moist	2.04E+12	1.96E+11	1.96E+10	1.76E+11	3.86E+10	1.37E+11
Mid	1.56E+12	1.10E+11	1.10E+10	9.89E+10	3.86E+10	6.03E+10
Dry	1.51E+12	6.69E+10	6.69E+09	6.02E+10	3.86E+10	2.16E+10
Low	4.83E+10	2.76E+10	2.76E+09	2.48E+10	3.86E+10	-1.38E+10

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Chenoweth Run at RM 0.0 has an upstream watershed area of 16.71 square miles while sites EFFCR001 and CR-3 have upstream watershed areas of 11.56 and 16.7 square miles, respectively. The Existing Load and TMDL allocations for site EFFCR001 was multiplied by the ratio of these areas (1.44) and the individual fecal coliform WLAs for permit #s KYG400010 and KYG400161 (which are located below EFFCR001) was added to the fecal coliform PCR and SCR SWS-WLA to generate the final fecal coliform PCR and SCR allocations for the segment. The ratio of segment to site areas was 1.00 for site CR-3, thus the site *E. coli* TMDL is the same as the segment *E. coli* TMDL. The segment fecal coliform and *E. coli* TMDLs are presented in Table 8.28. Because site EFFCR001 had sufficient data to calculate geometric means, the greatest geometric mean was determined (Table 8.29). The breakdown of WLAs assigned to permitted entities is presented in Table 8.30.

Table 8.28 Fecal Coliform (PCR and SCR) and *E. coli* (PCR) TMDL Allocations for Chenoweth Run 0.0 to 5.25

Pollutant (Use)	Fecal Coliform (PCR)	Fecal Coliform (SCR)	*E. coli* (PCR)
Existing Load (colonies/day)	2.38E+13	2.38E+13	1.82E+14
TMDL (colonies/day)	6.34E+11	3.17E+12	2.43E+12
MOS (colonies/day)	6.34E+10	3.17E+11	2.43E+11
TMDL Target (colonies/day)	5.71E+11	2.85E+12	2.19E+12
SWS-WLA (colonies/day)	6.43E+10	6.43E+10	3.86E+10
Remainder (colonies/day)	5.06E+11	2.79E+12	2.15E+12
Future Growth-WLA (colonies/day)	2.53E+10	1.39E+11	1.07E+11
MS4-WLA (colonies/day)	4.12E+11	2.27E+12	1.75E+12
LA (colonies/day)	6.89E+10	3.79E+11	2.92E+11

Table 8.29 Greatest Geometric Mean for Fecal Coliform at Site EFFCR001

Sample Date	Fecal Coliform (colonies/100 ml)	Geomean (colonies/100ml)
7/2/2010	280	1,327.6
7/9/2010	>5250	
7/14/2010	264	
7/20/2010	>5450	
7/29/2010	1950	

Table 8.30 WLAs Assigned to Permitted Entities in Chenoweth Run 0.0 to 5.25 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	PCR Fecal Coliform WLA (colonies/ day)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KY0025194	JEFFERSONTOWN WQTC MSD	SWS	4.00E+00	6.19E+00	6.06E+10	6.06E+10	3.63E+10
KY0029459	CHENOWETH HILLS WQTC MSD	SWS	2.00E-01	3.09E-01	3.03E+09	3.03E+09	1.82E+09
KY0044342	LAKE OF THE WOODS MSD	SWS	4.40E-02	6.81E-02	6.66E+08	6.66E+08	4.00E+08
KYG400010	ZUERCHER RESIDENCE[1]	SWS	8.00E-04	1.24E-03	1.21E+07	1.21E+07	7.27E+06
KYG400150	MILLER RESIDENCE	SWS	7.00E-04	1.08E-03	1.06E+07	1.06E+07	6.36E+06
KYG400161	MCKEE RESIDENCE[1]	SWS	7.50E-04	1.16E-03	1.14E+07	1.14E+07	6.81E+06

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	PCR Fecal Coliform WLA (colonies/ day)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KYG400251	WEBER RESIDENCE	SWS	7.00E-04	1.08E-03	1.06E+07	1.06E+07	6.36E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	4.12E+11	2.27E+12	1.75E+12

Note: [1]Indicates that these facilities are located below site EFFCR001.

8.2.5 Chenoweth Run 5.25 to 9.2

Chenoweth Run at RM 5.25 is a first order stream located in Jefferson County (Figure 8.17). The subwatershed for the impaired segment has a total drainage area of approximately 5.5 square miles. Chenoweth Run 5.25 to 9.2 does not support the PCR use due to *E. coli* and fecal coliform and the SCR use due to fecal coliform; therefore three TMDLs were calculated. Information about Chenoweth Run RM 5.25 to 9.2, including its WBID and MS4 area is shown in Table 8.31. The MS4 area in this subwatershed is permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.18). There is one KPDES permitted SWS discharger within the subwatershed boundary (see Table 8.39). The land cover in this subwatershed is primarily developed (74.7%) followed by forested (16.6%) as shown in Table 8.32.

Table 8.31 Chenoweth Run 5.25 to 9.2 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Chenoweth Run	Chenoweth Run 5.25 to 9.2	KY489391_02	Jefferson	3,522	5.5	1
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
3,230	91.7					

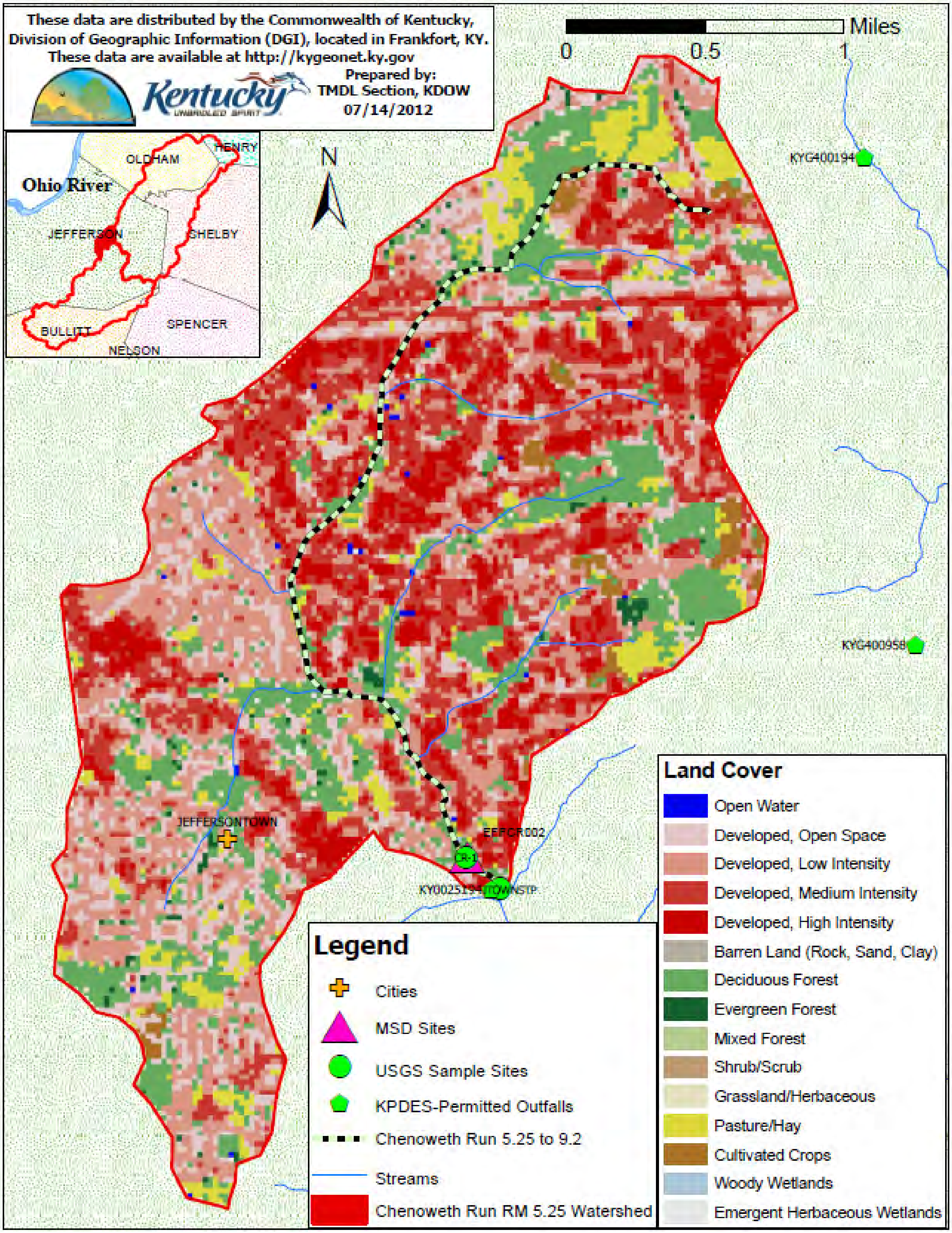

Figure 8.17 Land Cover, Sampling Sites, KPDES-permitted Facilities in the Chenoweth Run 5.25 to 9.2 Subwatershed

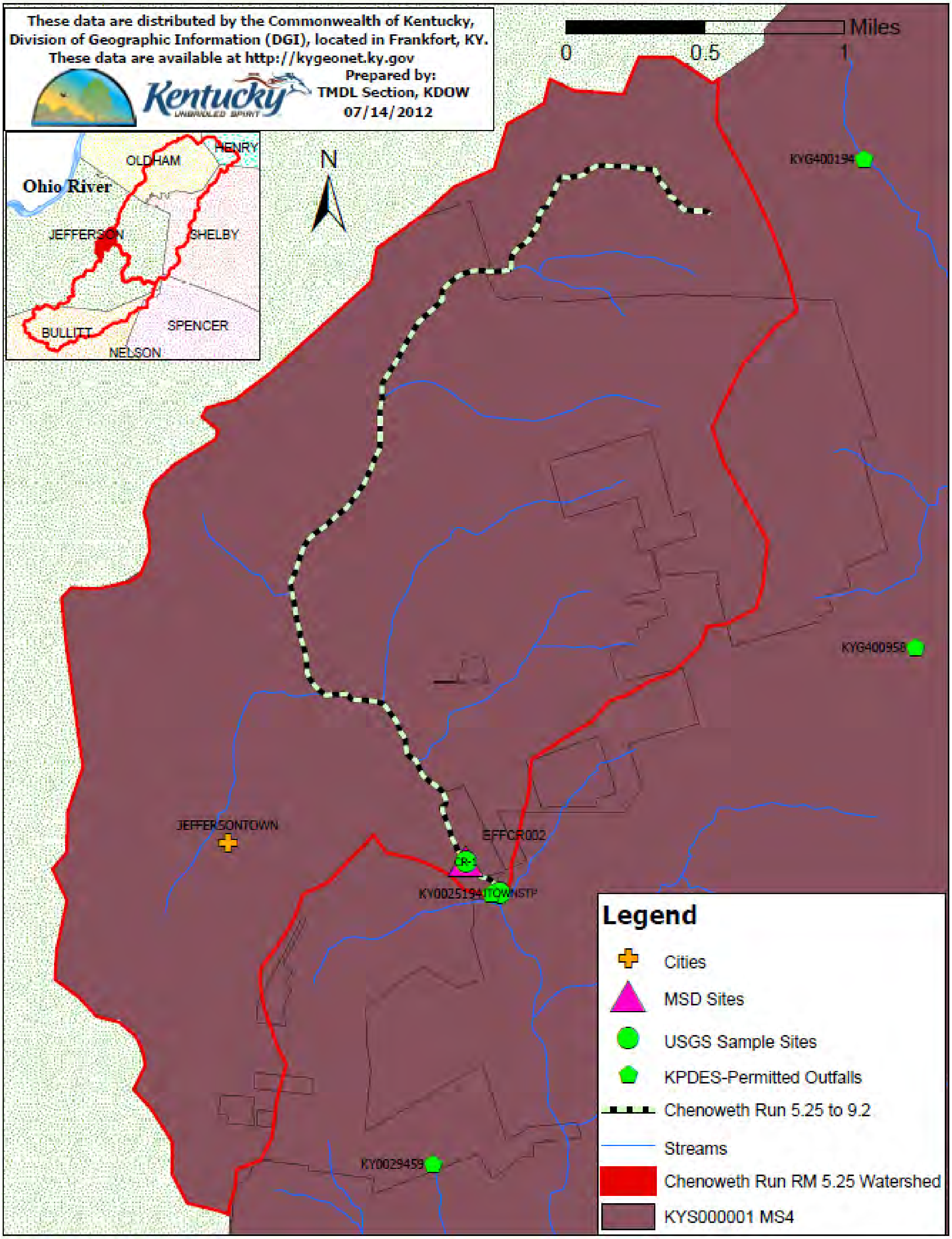

Figure 8.18 Urbanized Boundary of MS4 Entities in Chenoweth Run 5.25 to 9.2 Subwatershed

Table 8.32 Land Cover in the Chenoweth Run 5.25 to 9.2 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	74.71	2,631	4.1	5.0%
Agriculture (total)	8.09	285	0.4	
Pasture	6.51	229	0.4	
Row Crop	1.58	56	0.1	
Forest	16.57	583	0.9	
Natural Grassland	0.19	7	0.0	
Water	0.18	6	0.0	
Wetland	0.19	7	0.0	
Barren	0.07	2	0.0	
Total	100.00	3,522	5.5	

Site information is shown in Table 8.33; site EFFCR002 was used to develop the fecal coliform LDCs (Figures 8.19 and 8.20) while site CR-1 was used to develop the *E. coli* LDC (Figure 8.21). Data from sites EFFCR002 and CR-1 are presented in Appendix B. The critical condition was the high flow zone for both fecal coliform and *E. coli*, although exceedances were found in other zones. Tables 8.34 and 8.35 show the TMDLs for the flow zones associated with fecal coliform at site EFFCR002 for PCR and SCR, respectively, while Table 8.36 does the same for *E. coli* at site CR-1 (the yellow highlight indicates the critical condition TMDLs).

Table 8.33 Sample Sites Located Along Chenoweth Run 5.25 to 9.2

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
EFFCR002	38.1947	-85.557	5.35	Louisville MSD	Fecal Coliform	Yes-PCR and SCR
CR-1	38.1947	-85.557	5.35	USGS	*E. coli*	Yes-PCR

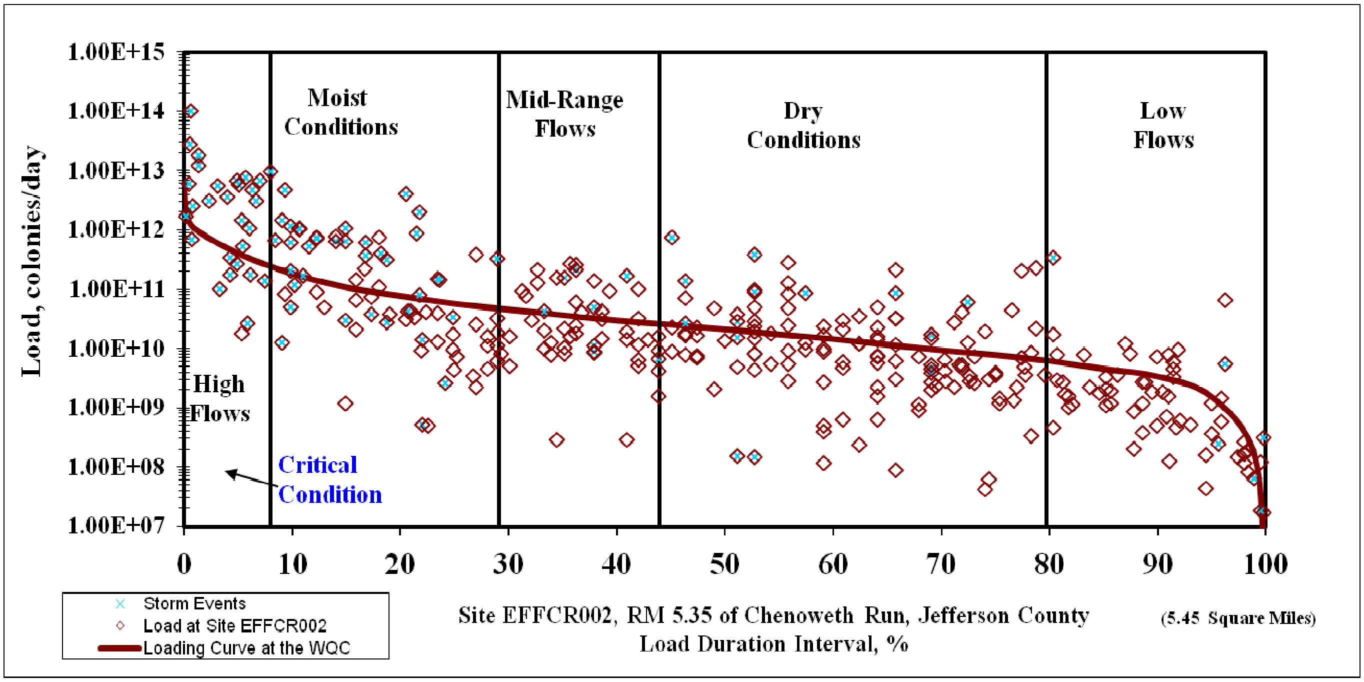

Figure 8.19 PCR Fecal Coliform LDC for Site EFFCR002

Table 8.34 PCR Fecal Coliform TMDLs by Flow Zone for Site EFFCR002

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.03E+14	1.40E+12	1.40E+11	1.26E+12	0.0	1.26E+12
Moist	4.04E+12	7.63E+10	7.63E+09	6.87E+10	0.0	6.87E+10
Mid	3.90E+11	5.28E+10	5.28E+09	4.76E+10	0.0	4.76E+10
Dry	2.27E+11	6.65E+09	6.65E+08	5.99E+09	0.0	5.99E+09
Low	6.49E+10	1.17E+09	1.17E+08	1.06E+09	0.0	1.06E+09

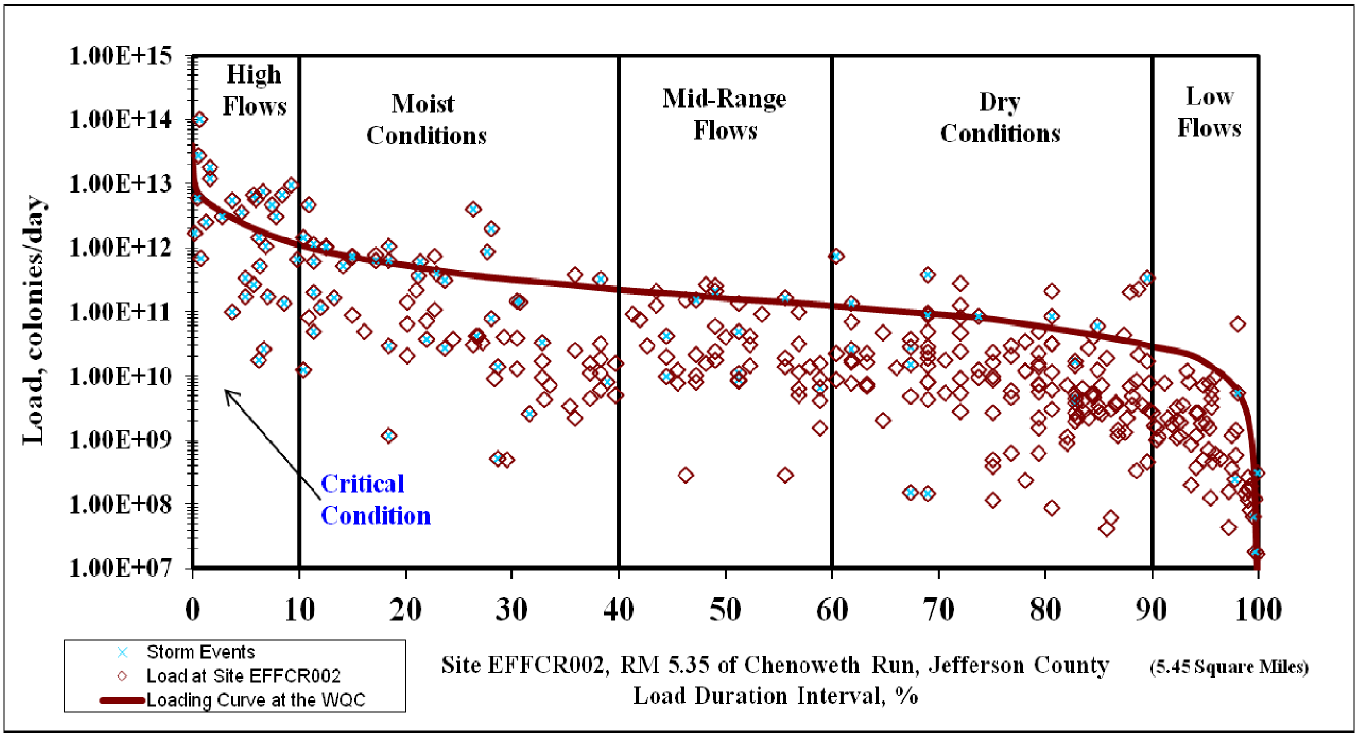

Figure 8.20 SCR Fecal Coliform LDC for Site EFFCR002

Table 8.35 SCR Fecal Coliform TMDLs by Flow Zone for Site EFFCR002

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.03E+14	7.00E+12	7.00E+11	6.30E+12	0.0	6.30E+12
Moist	4.04E+12	3.82E+11	3.82E+10	3.43E+11	0.0	3.43E+11
Mid	2.67E+11	1.81E+11	1.81E+10	1.63E+11	0.0	1.63E+11
Dry	3.42E+11	3.13E+10	3.13E+09	2.82E+10	0.0	2.82E+10
Low	6.49E+10	5.87E+09	5.87E+08	5.28E+09	0.0	5.28E+09

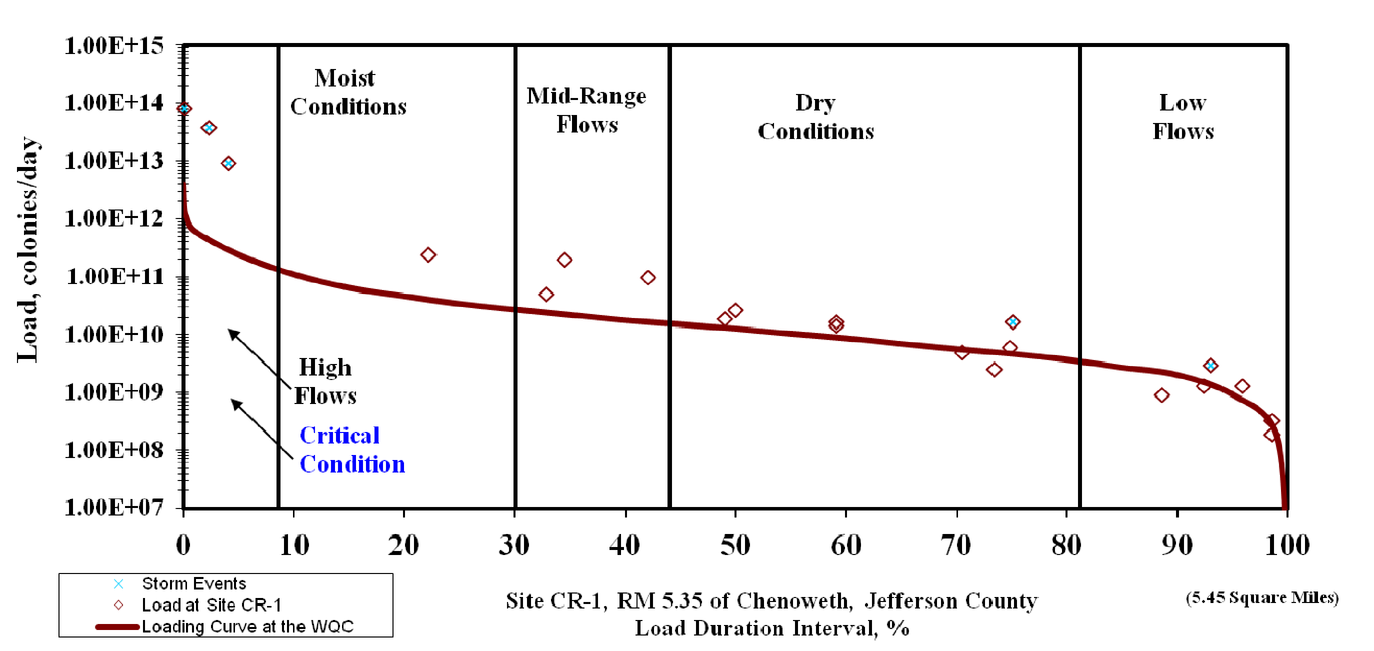

Figure 8.21 PCR *E. coli* LDC for Site CR-1

Table 8.36 PCR *E. coli* TMDLs by Flow Zone for Site CR-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	3.88E+13	4.05E+11	4.05E+10	3.65E+11	0.0	3.65E+11
Moist	2.39E+11	4.09E+10	4.09E+09	3.68E+10	0.0	3.68E+10
Mid	1.95E+11	2.23E+10	2.23E+09	2.00E+10	0.0	2.00E+10
Dry	1.66E+10	4.70E+09	4.70E+08	4.23E+09	0.0	4.23E+09
Low	2.91E+09	1.29E+09	1.29E+08	1.16E+09	0.0	1.16E+09

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Chenoweth Run at RM 5.25 has an upstream watershed area of 5.5 square miles while sites EFFCR002 and CR-1 have an upstream watershed area of 5.45 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.01) and the individual WLA for permit # KY0025194 Jeffersontown WQTC MSD (which is located below both sites EFFCR002 and CR-1) was added to the fecal coliform PCR and SCR and *E. coli* PCR SWS-WLAs to generate the final fecal coliform and *E. coli* TMDL allocations for the impaired segment (Table 8.37). Because site EFFCR002 had sufficient data to calculate geometric means, the greatest geometric mean was determined (Table 8.38). The breakdown of WLAs assigned to permitted entities is presented in Table 8.39.

Table 8.37 Fecal Coliform (PCR and SCR) and *E. coli* (PCR) TMDL Allocations for Chenoweth Run 5.25 to 9.2

Pollutant (Use)	Fecal Coliform (PCR)	Fecal Coliform (SCR)	*E. coli* (PCR)
Existing Load (colonies/day)	1.04E+14	1.04E+14	3.92E+13
TMDL (colonies/day)	1.41E+12	7.07E+12	4.09E+11
MOS (colonies/day)	1.41E+11	7.07E+11	4.09E+10
TMDL Target (colonies/day)	1.27E+12	6.36E+12	3.68E+11
SWS-WLA (colonies/day)	6.06E+10	6.06E+10	3.63E+10
Remainder (colonies/day)	1.21E+12	6.30E+12	3.32E+11
Future Growth-WLA (colonies/day)	6.06E+10	3.15E+11	1.66E+10
MS4-WLA (colonies/day)	1.11E+12	5.78E+12	3.04E+11
LA (colonies/day)	3.96E+10	2.06E+11	1.09E+10

Table 8.38 Greatest Geometric Mean for Fecal Coliform at Site EFFCR002

Sample Date	Fecal Coliform (colonies/100 ml)	Geomean (colonies/100 ml)
6/22/2005	644	2,854.8
6/28/2005	2750	
7/8/2005	>22,100	
7/11/2005	700	
7/15/2005	1,450	
7/21/2005	>13,625	

Table 8.39 WLAs Assigned to Permitted Entities in Chenoweth Run 5.25 to 9.2 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	PCR Fecal Coliform WLA (colonies/ day)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KY0025194	JEFFERSONTOWN WQTC MSD[1]	SWS	4.00E+00	6.19E+00	6.06E+10	6.06E+10	3.63E+10
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	1.11E+12	5.78E+12	3.04E+11

Note: [1]Indicates that this facility is below both sites EFFCR002 and CR-1.

8.2.6 Currys Fork 0.0 to 4.8

Currys Fork at RM 0.0 is a second order stream located in Oldham County (Figure 8.22). The subwatershed for the impaired segment has a total drainage area of approximately 28.6 square miles. Currys Fork 0.0 to 4.8 does not support the PCR use due to *E. coli*. Information about Currys Fork RM 0.0 to 4.8, including its WBID and MS4 area is shown in Table 8.40. The MS4 area in this subwatershed is permitted under KYG200005 and the KYTC permit KYS000003 (Figure 8.23). There are eleven KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.45). The land cover in this subwatershed is a mixture of forested (45.3%) and agriculture (35.1%, mostly pasture), followed by developed (16.2%) as shown in Table 8.41.

Table 8.40 Currys Fork 0.0 to 4.8 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Currys Fork	Currys Fork 0.0 to 4.8	KY490506_01	Oldham	18,279	28.6	2
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed					
2,956	46.39					

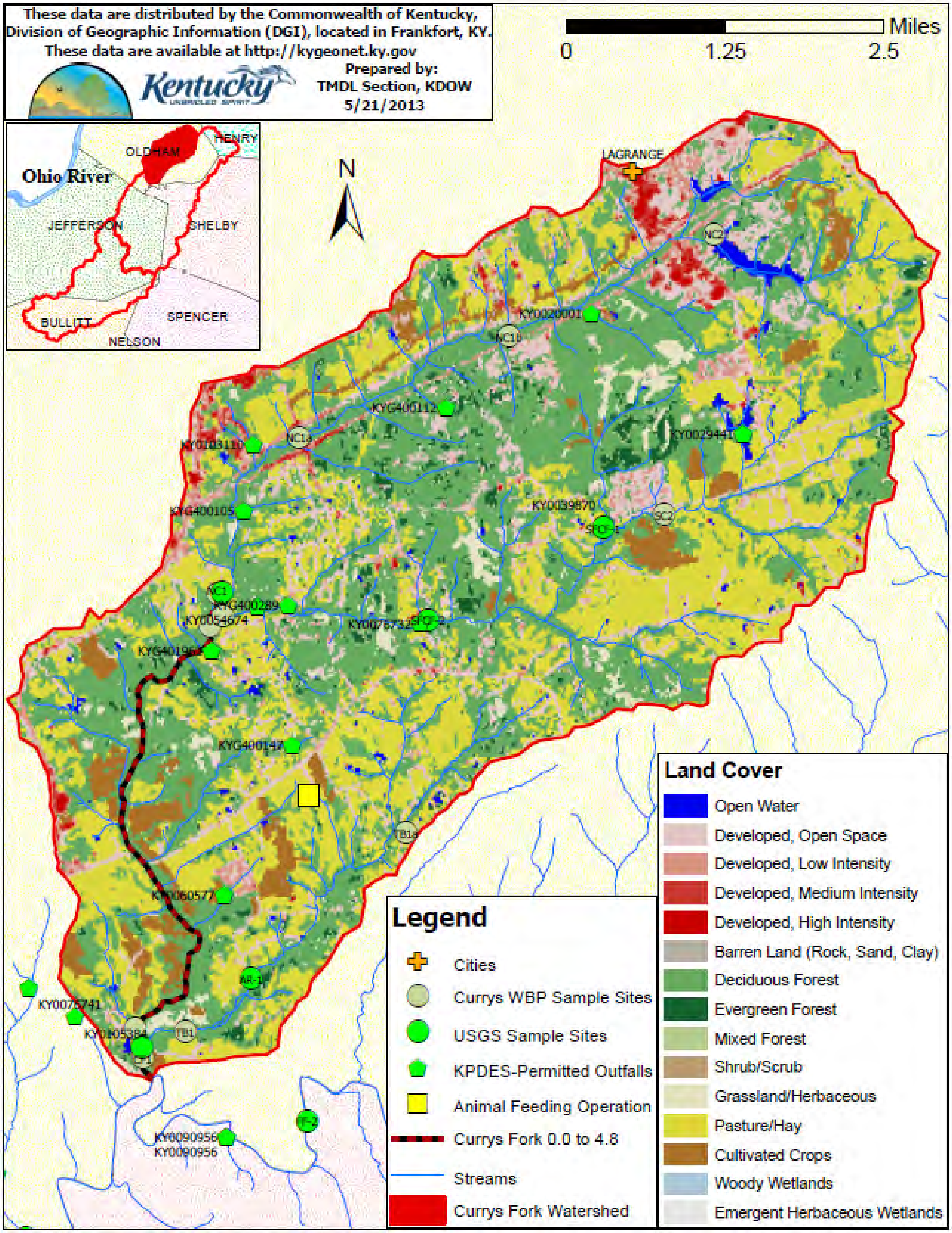

Figure 8.22 Land Cover, Sampling Sites, KPDES-permitted Facilities in the Currys Fork 0.0 to 4.8 Subwatershed

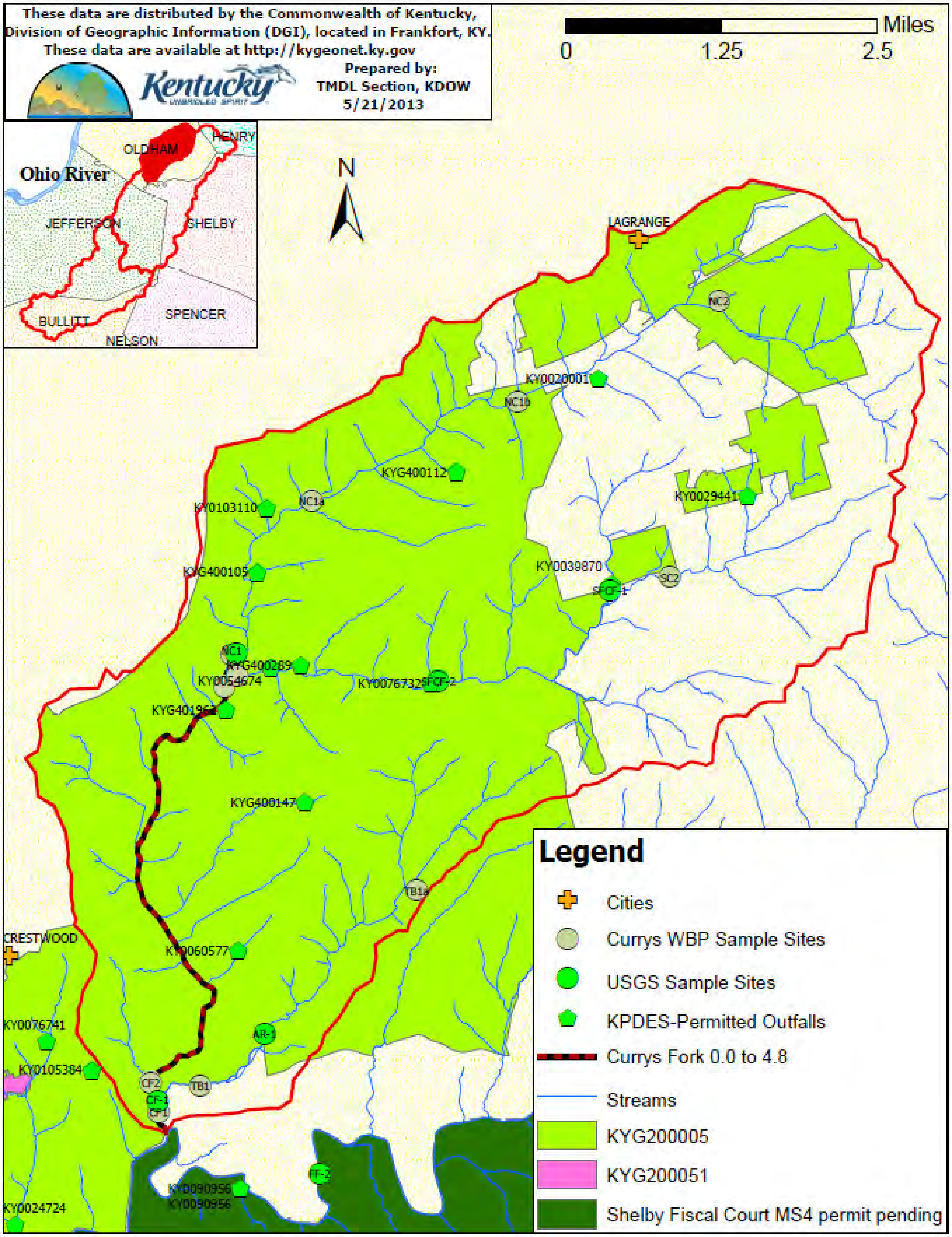

Figure 8.23 Urbanized Boundary of MS4 Entities in Currys Fork 0.0 to 4.8 Subwatershed

Table 8.41 Land Cover in the Currys Fork 0.0 to 4.8 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	16.17	2,956	4.6	3.0%
Agriculture (total)	35.10	6,415	10.0	
Pasture	30.61	5,595	8.7	
Row Crop	4.49	820	1.3	
Forest	45.25	8,271	12.9	
Natural Grassland	2.19	401	0.6	
Water	0.93	170	0.3	
Wetland	0.21	39	0.1	
Barren	0.15	27	0.0	
Total	100.00	18,279	28.6	

Site information is shown in Table 8.42; site CF-1 was used to develop the *E. coli* LDC (Figure 8.24). Data from site CF-1 is presented in Appendix B. The critical condition was the moist flow zone, although exceedances were found in other zones. Table 8.43 shows the TMDLs for the flow zones associated with *E. coli* at site CF-1 (the yellow highlight indicates the critical condition TMDL).

Table 8.42 Sample Sites Located Along Currys Fork 0.0 to 4.8

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
CF1	38.305884	-85.45	0.2	Currys Fork WBP	Fecal Coliform	No
CF2	38.309383	-85.45	0.45	Currys Fork WBP	Fecal Coliform	No
CF3	38.355536	-85.44	4.65	Currys Fork WBP	Fecal Coliform	No
CF-1	38.307222	-85.45	0.3	USGS	*E. coli*	Yes-PCR

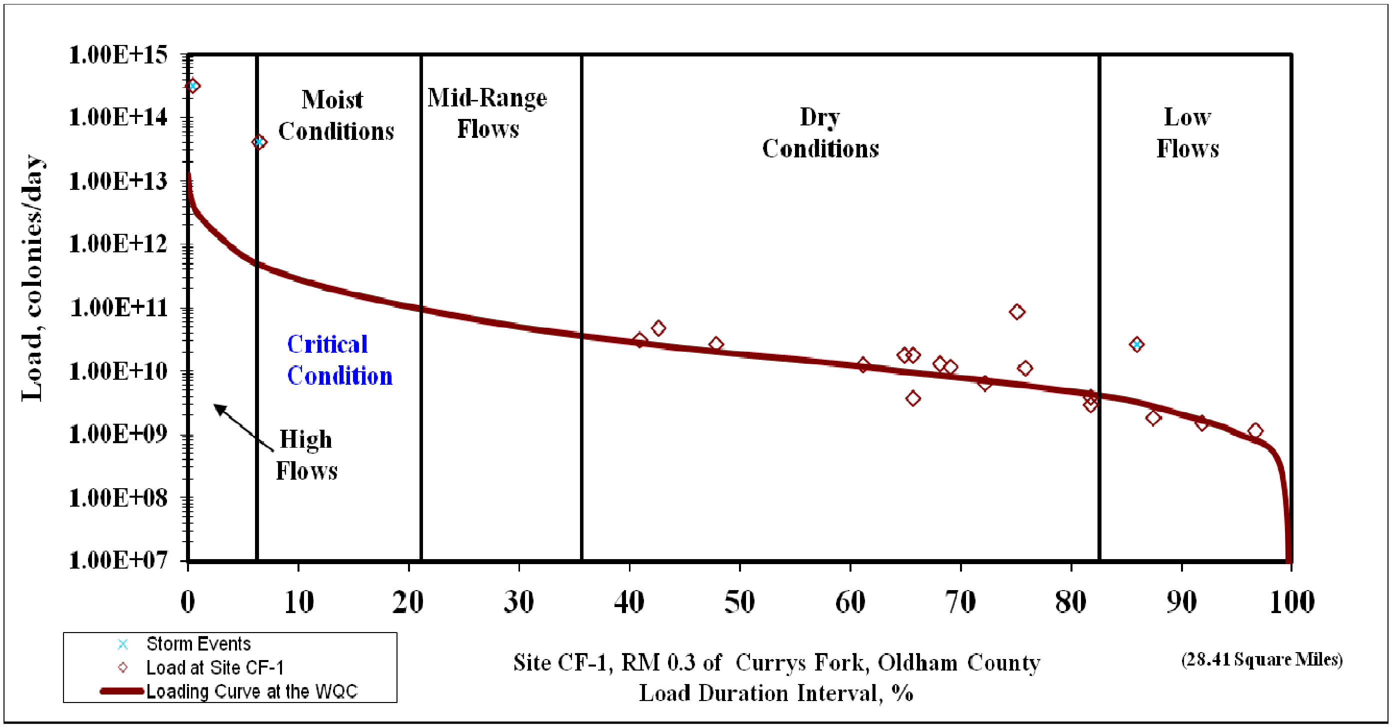

Figure 8.24 PCR *E. coli* LDC for Site CF-1

Table 8.43 PCR *E. coli* TMDLs by Flow Zone for Site CF-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies /day)
High	3.17E+14	4.76E+12	4.76E+11	4.28E+12	2.05E+10	4.26E+12
Moist	4.05E+13	4.86E+11	4.86E+10	4.38E+11	2.05E+10	4.17E+11
Mid	*	8.56E+10	8.56E+09	7.70E+10	2.05E+10	5.66E+10
Dry	8.61E+10	6.26E+09	6.26E+08	5.64E+09	2.05E+10	-1.48E+10
Low	2.64E+10	3.34E+09	3.34E+08	3.01E+09	2.05E+10	-1.75E+10

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Currys Fork at RM 0.0 has an upstream watershed area of 28.56 square miles while site CF-1 has an upstream watershed area of 28.41 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of this area (1.01) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.44). The breakdown of WLAs assigned to permitted entities is presented in Table 8.45.

Table 8.44 *E. coli* (PCR) TMDL Allocations for Currys Fork 0.0 to 4.8

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	4.09E+13
TMDL (colonies/day)	4.91E+11
MOS (colonies/day)	4.91E+10
TMDL Target (colonies/day)	4.42E+11
SWS-WLA (colonies/day)	2.05E+10
Remainder (colonies/day)	4.22E+11
Future Growth-WLA (colonies/day)	1.27E+10
MS4-WLA (colonies/day)	1.96E+11
LA (colonies/day)	2.13E+11

Table 8.45 WLAs Assigned to Permitted Entities in Currys Fork 0.0 to 4.8 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0020001	LAGRANGE, CITY OF	SWS	1.90E+00	2.94E+00	1.73E+10
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	9.08E+08
KY0054674	LOCKWOOD ESTATES SUBDIVISION	SWS	4.50E-02	6.96E-02	4.09E+08
KY0060577	COUNTRY VILLAGE	SWS	6.00E-02	9.28E-02	5.45E+08
KY0076732	CENTERFIELD ELEMENTARY	SWS	1.00E-02	1.55E-02	9.08E+07
KY0103110	BUCKNER WWTP	SWS	1.35E-01	2.09E-01	1.23E+09
KYG400105	MCCARSON RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400112	PARROTT RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400147	EBBS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400289	GIBSON RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG401962	YOUNG RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	1.96E+11

8.2.7 Floyds Fork 0.0 to 11.7

Floyds Fork at RM 0.0 is a fourth order stream located in Bullitt County (Figure 8.25). The watershed for the impaired segment has a total drainage area of approximately 284.3 square miles. Floyds Fork 0.0 to 11.7 does not support the PCR use due to *E. coli*. Information about Floyds Fork 0.0 to 11.7, including its WBID and MS4 area is shown in Table 8.46. The MS4 areas in this watershed are permitted under KYG200039, KYG200010, KYG200036, KYG200005, KYS000001, KYG200051, the Shelby County Fiscal Court MS4 pending permit, and the KYTC permit KYS000003 (Figure 8.26). There are sixty-nine KPDES permitted SWS dischargers within the watershed boundary (see Table 8.51). The land cover in this watershed is a mixture of forested (43.7%), and agriculture (32.9%, mainly pasture) followed by developed (17.6%) as shown in Table 8.47.

Table 8.46 Floyds Fork 0.0 to 11.7 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order	
Floyds Fork	Floyds Fork 0.0 to 11.7	KY492778_01	Bullitt	181,927	284.3	4	
KYG200039 and KYS000003 MS4 Area (acres)	KYG200039 and KYS000003 % MS4 in Watershed	KYG200010 and KYS000003 MS4 Area (acres)	KYG200010 and KYS000003 % MS4 in Watershed	KYG200036 and KYS000003 MS4 Area (acres)	KYG200036 and KYS000003 % MS4 in Watershed	Shelby County and KYS000003 MS4 Area (acres)	Shelby County and KYS000003 % MS4 in Watershed
12,510	6.88	1,010	0.56	625	0.3438	885	0.4866
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed	KYG200051 and KYS000003 MS4 Area (acres)	KYG200051 and KYS000003 % MS4 in Watershed	KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed		
10,737	5.90	545	0.2995	60,257	33.12		

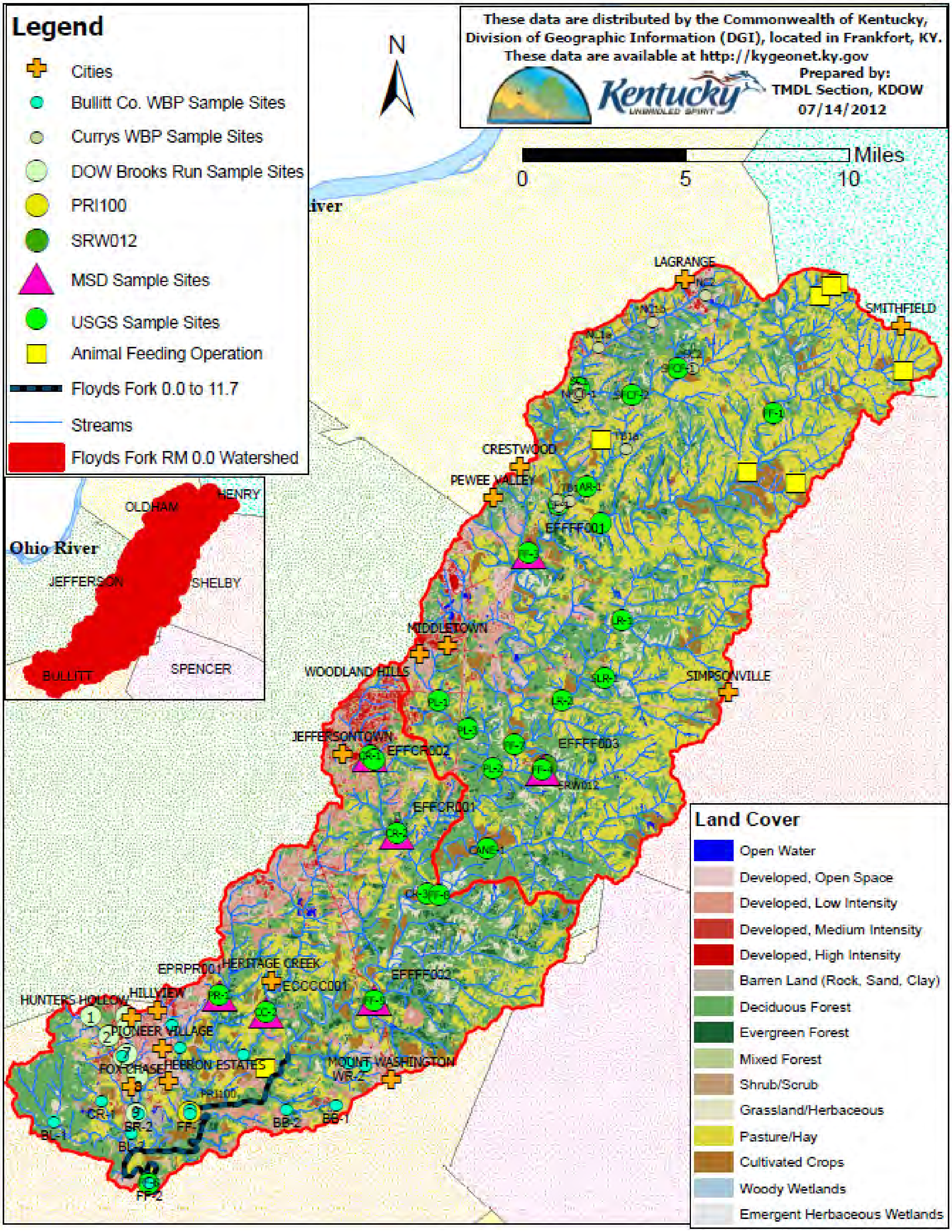

Figure 8.25 Land Cover and Sampling Sites in the Floyds Fork 0.0 to 11.7 Watershed

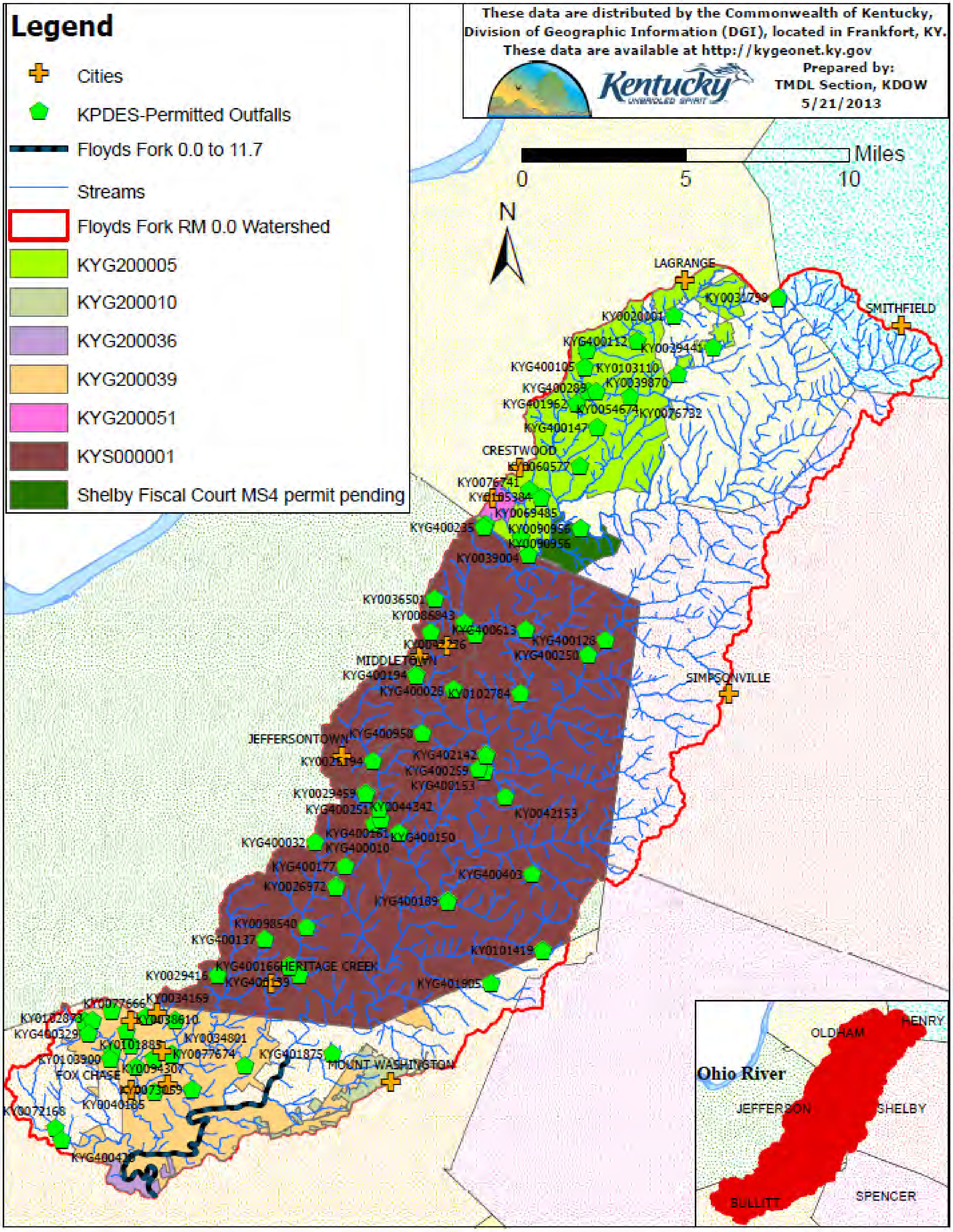

Figure 8.26 Urbanized Boundary of MS4 Entities and KPDES-permitted Facilities in Floyds Fork 0.0 to 11.7 Watershed

Table 8.47 Land Cover in the Floyds Fork 0.0 to 11.7 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	17.62	32,059	50.1	3.0%
Agriculture (total)	32.93	59,900	93.6	
Pasture	27.99	50,927	79.6	
Row Crop	4.93	8,973	14.0	
Forest	43.68	79,475	124.2	
Natural Grassland	3.66	6,662	10.4	
Water	0.73	1,332	2.1	
Wetland	0.99	1,801	2.8	
Barren	0.38	699	1.1	
Total	100.00	181,927	284.3	

Site information is shown in Table 8.48; site FF-6 was used to develop the *E. coli* LDC (Figure 8.27). Data from site FF-6 is presented in Appendix B. The critical condition was the high flow zone, although exceedances were also found in the dry zone and no samples were collected in the moist and mid-range zones. Table 8.49 shows the TMDLs for the flow zones associated site FF-6 (the yellow highlight indicates the critical condition TMDLs).

Table 8.48 Sample Sites Located Along Floyds Fork 0.0 to 11.7

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
PRI100	38.035	-85.659444	7.55	KDOW	Fecal Coliform and *E. coli*	No
FF-1	38.034599	-85.658996	7.5	Bullitt County WBP	Fecal Coliform	No
FF-2	38.003799	-85.6819	0.45	Bullitt County WBP	Fecal Coliform	No
FF-6	38.003333	-85.682222	0.4	USGS	*E. coli*	Yes-PCR

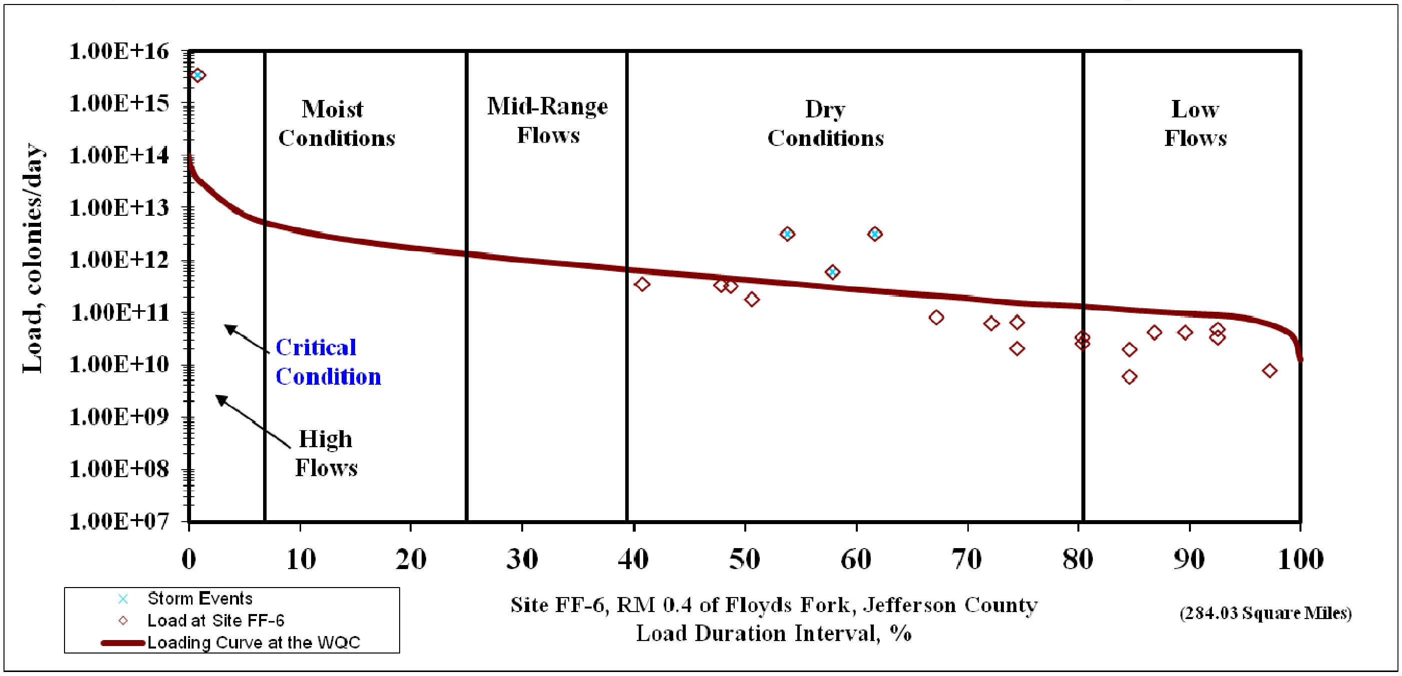

Figure 8.27 PCR *E. coli* LDC for Site FF-6

Table 8.49 PCR *E. coli* TMDLs by Flow Zone for Site FF-6

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	3.43E+15	4.33E+13	4.33E+12	3.90E+13	2.21E+11	3.88E+13
Moist	*	4.21E+12	4.21E+11	3.79E+12	2.21E+11	3.57E+12
Mid	*	1.22E+12	1.22E+11	1.10E+12	2.21E+11	8.77E+11
Dry	3.23E+12	2.59E+11	2.59E+10	2.33E+11	2.21E+11	1.19E+10
Low	*	1.18E+11	1.18E+10	1.06E+11	2.21E+11	-1.15E+11

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Floyds Fork at RM 0.0 has an upstream watershed area of 284.3 square miles while site FF-6 has an upstream watershed area of 284.03 square miles. The ratio of these areas was 1.00 and there were no dischargers below the site, therefore the site TMDL was the same as the segment TMDL (Table 8.50). The breakdown of WLAs assigned to permitted entities is presented in Table 8.51.

Table 8.50 *E. coli* (PCR) TMDL Allocations for Floyds Fork 0.0 to 11.7

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	3.43E+15
TMDL (colonies/day)	4.33E+13
MOS (colonies/day)	4.33E+12
TMDL Target (colonies/day)	3.90E+13
SWS-WLA (colonies/day)	2.21E+11
Remainder (colonies/day)	3.88E+13
Future Growth-WLA (colonies/day)	1.16E+12
MS4-WLA (colonies/day)	1.85E+13
LA (colonies/day)	1.92E+13

Table 8.51 WLAs Assigned to Permitted Entities in Floyds Fork 0.0 to 11.7 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG402142	CARPENTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG401962	YOUNG RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG401905	VORMBROCK RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG401875	WOOD RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400958	PORTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400613	MURRELL RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400420	SEALS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400403	FREUDENBERGER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400329	CARLISLE RESIDENCE	SWS	1.30E-03	2.01E-03	1.18E+07
KYG400289	GIBSON RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400259	BALLARD RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400251	WEBER RESIDENCE	SWS	7.00E-04	1.08E-03	6.36E+06
KYG400250	BROOKS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400235	POWERS RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400194	SEBA RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400189	WEIS RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400177	BERRYMAN RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400166	SHIPP RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400161	MCKEE RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400153	DIORIO RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400150	MILLER RESIDENCE	SWS	7.00E-04	1.08E-03	6.36E+06
KYG400147	EBBS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400139	ENTIN RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400137	PETERS RESIDENCE	SWS	8.00E-04	1.24E-03	7.27E+06
KYG400128	FATHALIZADEH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400112	PARROTT RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400105	MCCARSON RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400032	WILLIAMS RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400028	AULBACH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400010	ZUERCHER RESIDENCE	SWS	8.00E-04	1.24E-03	7.27E+06
KY0103900	PROLOGIS-HILLVIEW WWTP	SWS	1.50E-01	2.32E-01	1.36E+09
KY0103110	BUCKNER WWTP	SWS	1.35E-01	2.09E-01	1.23E+09
KY0102873	COUNTRY LIVING MHP	SWS	1.50E-02	2.32E-02	1.36E+08

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0102784	MSD FLOYDS FORK WQTC	SWS	6.50E+00	1.01E+01	5.91E+10
KY0101885	RIEDLING BUILDING	SWS	5.00E-04	7.74E-04	4.54E+06
KY0101419	KINGSWOOD SUBD	SWS	1.00E-01	1.55E-01	9.08E+08
KY0098540	MSD CEDAR CREEK WQTC	SWS	7.50E+00	1.16E+01	6.81E+10
KY0094307	BCSD WILLABROOK SANITATION	SWS	5.25E-01	8.12E-01	4.77E+09
KY0090956	PERSIMMON RIDGE	SWS	1.42E-01	2.20E-01	1.29E+09
KY0086843	MIDDLETOWN INDUSTRIAL PARK	SWS	1.60E-01	2.48E-01	1.45E+09
KY0077674	LAKE COLUMBIA SUBDIVISION	SWS	1.20E-02	1.86E-02	1.09E+08
KY0077666	CROSSINGS GOLF COURSE	SWS	5.00E-03	7.74E-03	4.54E+07
KY0076741	CHERRYTREE APARTMENTS	SWS	7.50E-03	1.16E-02	6.81E+07
KY0076732	CENTERFIELD ELEMENTARY	SWS	1.00E-02	1.55E-02	9.08E+07
KY0073059	CAMP SHANTITUCK GIRL SCOUT (BULLITT)	SWS	1.00E-02	1.55E-02	9.08E+07
KY0072168	BIG VALLEY MHP	SWS	7.00E-02	1.08E-01	6.36E+08
KY0069485	FRIENDSHIP MANOR	SWS	1.70E-02	2.63E-02	1.54E+08
KY0060577	COUNTRY VILLAGE	SWS	6.00E-02	9.28E-02	5.45E+08
KY0054674	LOCKWOOD ESTATES SUBDIVISION	SWS	4.50E-02	6.96E-02	4.09E+08
KY0044342	LAKE OF THE WOODS MSD	SWS	4.40E-02	6.81E-02	4.00E+08
KY0042153	CEDAR RIDGE CAMP	SWS	5.00E-03	7.74E-03	4.54E+07
KY0040185	HEBRON MIDDLE SCHOOL	SWS	3.10E-02	4.80E-02	2.82E+08
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	9.08E+08
KY0039004	KY DOJ WOMENS CORRECT	SWS	1.25E-01	1.93E-01	1.14E+09
KY0038610	HUNTERS HOLLOW	SWS	2.40E-01	3.71E-01	2.18E+09
KY0036501	MSD BERRYTOWN SD	SWS	7.50E-02	1.16E-01	6.81E+08
KY0034801	BCSD BULLITT HILLS SUBDIVISION	SWS	3.50E-01	5.42E-01	3.18E+09
KY0034185	PIONEER VILLAGE (MARYVILLE #4)	SWS	3.10E-01	4.80E-01	2.82E+09
KY0034177	BCSD HILLVIEW #3 (MARYVILLE #3)	SWS	1.48E-01	2.29E-01	1.34E+09
KY0034169	BCSD HILLVIEW #2 (MARYVILLE #2)	SWS	3.17E-01	4.90E-01	2.88E+09
KY0034151	HILLVIEW #1 (MARYVILLE #1) (BULLITT)	SWS	2.31E-01	3.57E-01	2.10E+09
KY0031798	CEDAR LAKE LODGE	SWS	2.00E-02	3.09E-02	1.82E+08
KY0031712	STARVIEW ESTATES MSD	SWS	1.00E-01	1.55E-01	9.08E+08
KY0029459	CHENOWETH HILLS WQTC MSD	SWS	2.00E-01	3.09E-01	1.82E+09
KY0029416	MCNEELY LAKE WQTC MSD	SWS	2.05E-01	3.17E-01	1.86E+09
KY0025194	JEFFERSONTOWN WQTC MSD	SWS	4.00E+00	6.19E+00	3.63E+10
KY0024724	ASH AVENUE WWTP	SWS	3.00E-01	4.64E-01	2.73E+09
KY0023078	WHISPERING OAKS MHP	SWS	1.25E-01	1.93E-01	1.14E+09
KY0020001	LAGRANGE, CITY OF	SWS	1.90E+00	2.94E+00	1.73E+10
KYG200039 and KYS000003	Bullitt County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	2.67E+12
KYG200010 and KYS000003	Mount Washington and KY Transportation Cabinet	MS4	N/A	N/A	2.17E+11
KYG200036 and KYS000003	Shepherdsville and KY Transportation Cabinet	MS4	N/A	N/A	1.33E+11
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	1.28E+13

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	2.29E+12
KYG200051 and KYS000003	PeeWee Valley and KY Transportation Cabinet	MS4	N/A	N/A	1.16E+11
Shelby County and KYS000003	Shelby County and KY Transportation Cabinet	MS4	N/A	N/A	1.89E+11

8.2.8 Floyds Fork 11.7 to 24.2

Floyds Fork at RM 11.7 is a fourth order stream located in Jefferson County (Figure 8.28). The subwatershed for the impaired segment has a total drainage area of approximately 222.4 square miles. Floyds Fork 11.7 to 24.2 does not support the PCR use due to Fecal coliform. Information about Floyds Fork 11.7 to 24.2, including its WBID and MS4 area is shown in Table 8.52. The MS4 areas in this subwatershed are permitted under KYG200039, KYG200010, KYS000001, KYG200005, , the Shelby County Fiscal Court MS4 pending permit, and the KYTC permit KYS000003 (Figure 8.29). There are forty-three KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.57). The land cover in this subwatershed is a mixture of forested (44.7%) and agriculture (35.7%, mostly pasture) followed by developed (13.7%) as shown in Table 8.53.

Table 8.52 Floyds Fork 11.7 to 24.2 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order	
Floyds Fork	Floyds Fork 11.7 to 24.2	KY492278_02	Jefferson	142,320	222.4	4	
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed	KYG200039 and KYS000003 MS4 Area (acres)	KYG200039 and KYS000003 % MS4 in Watershed	KYG200010 and KYS000003 MS4 Area (acres)	KYG200010 and KYS000003 % MS4 in Watershed	KYS000001 MS4 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed
10,737	7.54	338	0.24	205	0.14	50,652	35.59
KYG200051 MS4 and KYS000003 MS4 Area (acres)	KYG200051 and KYS000003 % MS4 in Watershed	Shelby County MS4 and KYS000003 MS4 Area (acres)	Shelby County and KYS000003 % MS4 in Watershed				
545	0.38	885	0.62				

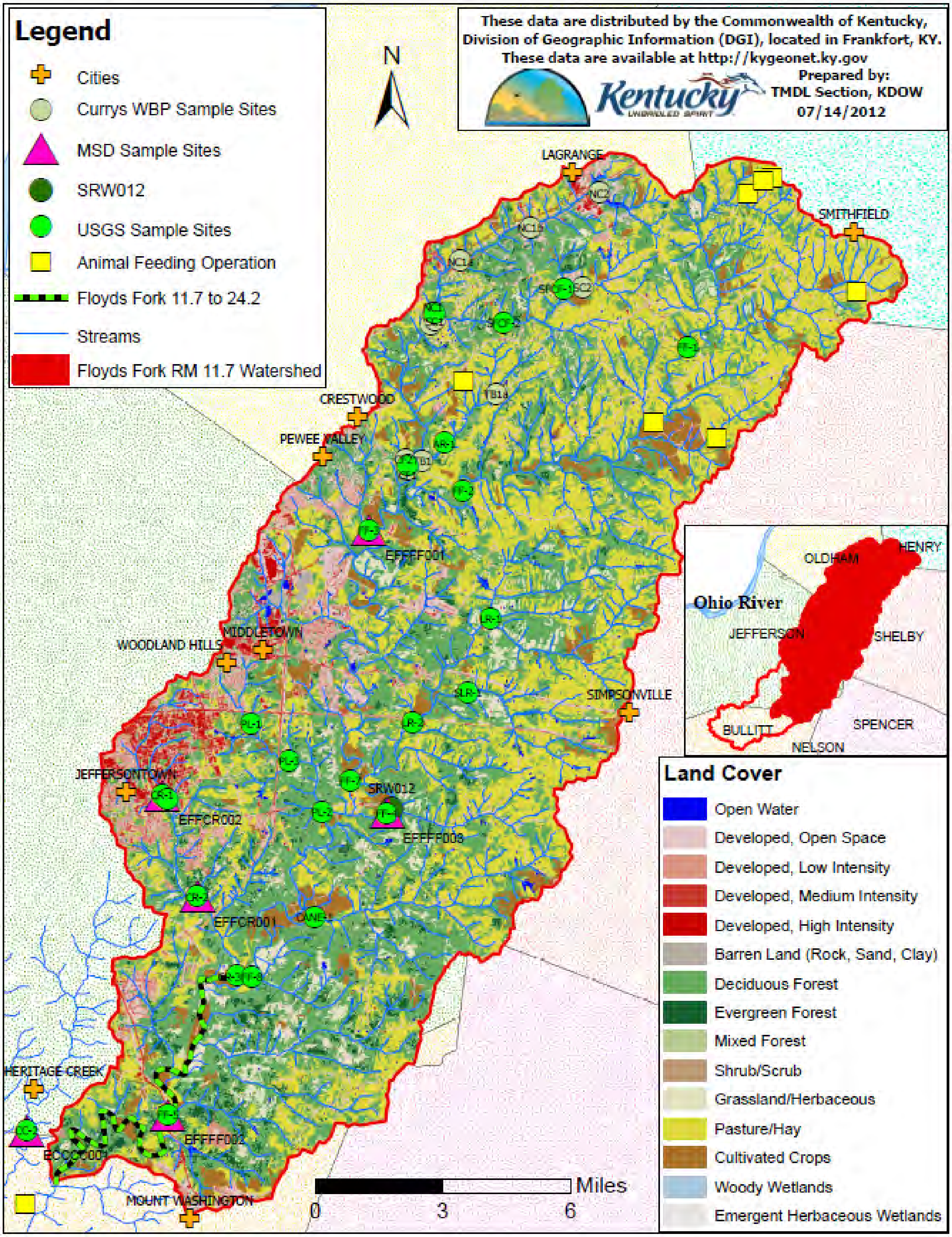

Figure 8.28 Land Cover and Sampling Sites in the Floyds Fork 11.7 to 24.2 Subwatershed

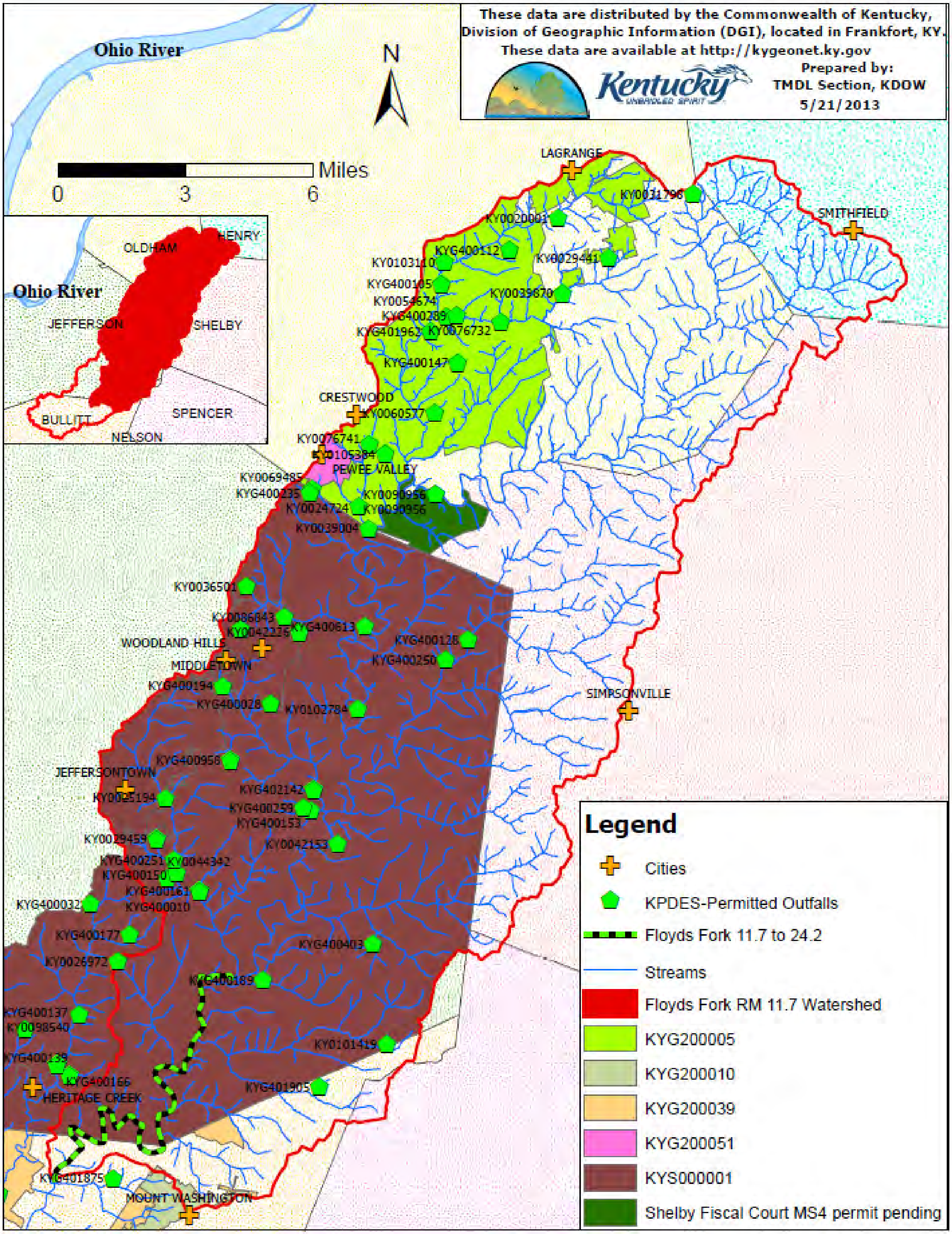

Figure 8.29 Urbanized Boundary of MS4 Entities and KPDES-permitted Facilities in Floyds Fork 11.7 to 24.2 Subwatershed

Table 8.53 Land Cover in the Floyds Fork 11.7 to 24.2 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	13.70	19,492	30.5	2.0%
Agriculture (total)	35.73	50,852	79.5	
Pasture	30.54	43,460	67.9	
Row Crop	5.19	7,392	11.5	
Forest	44.71	63,633	99.4	
Natural Grassland	4.24	6,037	9.4	
Water	0.76	1,076	1.7	
Wetland	0.64	911	1.4	
Barren	0.23	320	0.5	
Total	100.00	142,320	222.4	

Site information is shown in Table 8.54; site EFFFF002 was used to develop the Fecal coliform LDC (Figure 8.30). Data from site EFFFF002 is presented in Appendix B. The critical condition was the low flow zone, although exceedances were found in other zones. Table 8.55 shows the TMDLs for the flow zones associated with fecal coliform at site EFFFF002 (the yellow highlight indicates the critical condition TMDL). After allocation to the SWS sources, the remainder under the low flow zone TMDL was negative. This means that the SWS sources receive all of the available allocation and that there is insufficient allocation to divide to all the SWS sources, much less the MS4 and LA sources. This is due to the low flow condition associated with the greatest exceedance sample (flow of 15 cfs). For this reason, the flow associated with the second highest exceedance was used to develop the segment TMDL. This sample occurred during the high flow zone and had a flow of 1140 cfs. Choosing this as the critical condition to set the segment TMDL allowed allocations to all sources in the watershed. This second critical condition is highlighted in orange in Table 8.55.

Table 8.54 Sample Sites Located along Floyds Fork 11.7 to 24.2

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
EFFFF002	38.085278	-85.555	18.85	Louisville MSD	Fecal Coliform	Yes (PCR)
FF-5	38.085278	-85.555	18.85	USGS	*E. coli*	No

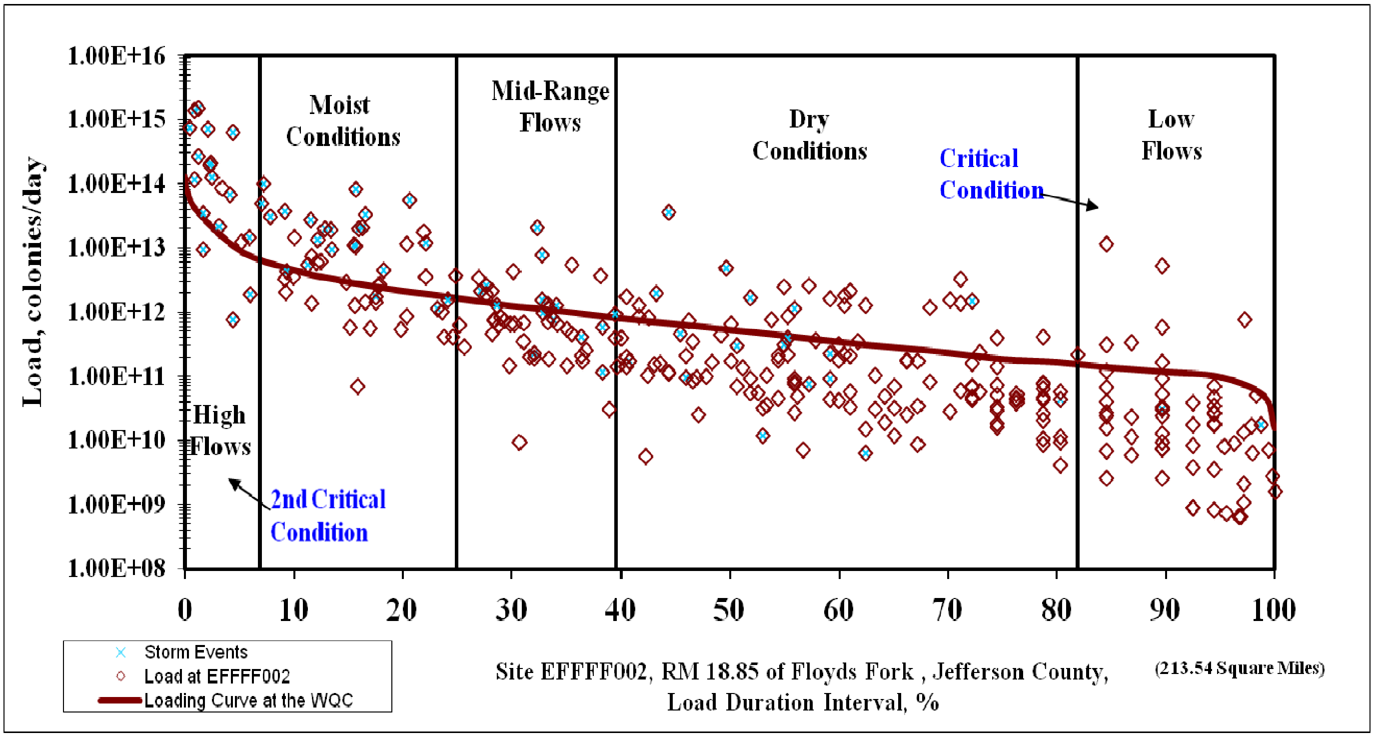

Figure 8.30 PCR Fecal coliform LDC for Site EFFFF002

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High Flows	6.25E+14	1.12E+13	1.12E+12	1.00E+13	2.13E+11	9.83E+12
Moist	8.23E+13	2.86E+12	2.86E+11	2.57E+12	2.13E+11	2.36E+12
Mid-Range	2.08E+13	1.15E+12	1.15E+11	1.04E+12	2.13E+11	8.26E+11
Dry	3.64E+13	6.75E+11	6.75E+10	6.08E+11	2.13E+11	3.95E+11
Low Flows	1.15E+13	1.47E+11	1.47E+10	1.32E+11	2.13E+11	-8.08E+10

Table 8.55 PCR Fecal coliform TMDLs by Flow Zone for Site EFFFF002

The critical condition TMDL (or in this case, second critical condition TMDL) for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Floyds Fork at RM 11.7 has an upstream watershed area of 222.37 square miles while site EFFFF002 has an upstream watershed area of 213.54 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of this area (1.04) to generate the final fecal coliform TMDL allocations for the impaired segment (Table 8.56). The breakdown of WLAs assigned to permitted entities is presented in Table 8.57.

Table 8.56 Fecal coliform (PCR) TMDL Allocations for Floyds Fork 11.7 to 24.2

Pollutant (Use)	Fecal coliform[1] (PCR)
Existing Load (colonies/day)	6.50E+14
TMDL (colonies/day)	1.16E+13
MOS (colonies/day)	1.16E+12
TMDL Target (colonies/day)	1.05E+13
SWS-WLA (colonies/day)	2.13E+11
Remainder (colonies/day)	1.03E+13
Future Growth-WLA (colonies/day)	2.05E+11
MS4-WLA (colonies/day)	4.57E+12
LA (colonies/day)	5.49E+12

Note: [1]Due to an administrative error, the pollutant was listed as E. coli on the 2012 Integrated Report. This will be corrected to fecal coliform on the 2014 Integrated Report. A TMDL was calculated for the correct pollutant, fecal coliform.

Table 8.57 WLAs Assigned to Permitted Entities in Floyds Fork 11.7 to 24.2 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	Fecal coliform (PCR) WLA (colonies/ day)
KY0020001	LAGRANGE, CITY OF	SWS	1.90E+00	2.94E+00	2.88E+10
KY0024724	ASH AVENUE WWTP	SWS	3.00E-01	4.64E-01	4.54E+09
KY0025194	JEFFERSONTOWN WQTC MSD	SWS	4.00E+00	6.19E+00	6.06E+10
KY0029459	CHENOWETH HILLS WQTC MSD	SWS	2.00E-01	3.09E-01	3.03E+09
KY0031712	STARVIEW ESTATES MSD	SWS	1.00E-01	1.55E-01	1.51E+09
KY0031798	CEDAR LAKE LODGE	SWS	2.00E-02	3.09E-02	3.03E+08
KY0036501	MSD BERRYTOWN SD	SWS	7.50E-02	1.16E-01	1.14E+09
KY0039004	KY DOJ WOMENS CORRECT	SWS	1.25E-01	1.93E-01	1.89E+09
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	1.51E+09
KY0042153	CEDAR RIDGE CAMP	SWS	5.00E-03	7.74E-03	7.57E+07
KY0044342	LAKE OF THE WOODS MSD	SWS	4.40E-02	6.81E-02	6.66E+08
KY0054674	LOCKWOOD ESTATES SUBDIVISION	SWS	4.50E-02	6.96E-02	6.81E+08
KY0060577	COUNTRY VILLAGE	SWS	6.00E-02	9.28E-02	9.08E+08
KY0069485	FRIENDSHIP MANOR	SWS	1.70E-02	2.63E-02	2.57E+08
KY0076732	CENTERFIELD ELEMENTARY	SWS	1.00E-02	1.55E-02	1.51E+08
KY0076741	CHERRYTREE APARTMENTS	SWS	7.50E-03	1.16E-02	1.14E+08
KY0086843	MIDDLETOWN INDUSTRIAL PARK	SWS	1.60E-01	2.48E-01	2.42E+09
KY0090956	PERSIMMON RIDGE	SWS	1.42E-01	2.20E-01	2.15E+09
KY0101419	KINGSWOOD SUBD	SWS	1.00E-01	1.55E-01	1.51E+09
KY0102784	MSD FLOYDS FORK WQTC	SWS	6.50E+00	1.01E+01	9.84E+10
KY0103110	BUCKNER WWTP	SWS	1.35E-01	2.09E-01	2.04E+09
KYG400010	ZUERCHER RESIDENCE	SWS	8.00E-04	1.24E-03	1.21E+07
KYG400028	AULBACH RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG400105	MCCARSON RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG400112	PARROTT RESIDENCE	SWS	4.00E-04	6.19E-04	6.06E+06
KYG400128	FATHALIZADEH RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG400147	EBBS RESIDENCE	SWS	4.00E-04	6.19E-04	6.06E+06

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	Fecal coliform (PCR) WLA (colonies/ day)
KYG400150	MILLER RESIDENCE	SWS	7.00E-04	1.08E-03	1.06E+07
KYG400153	DIORIO RESIDENCE	SWS	7.50E-04	1.16E-03	1.14E+07
KYG400161	MCKEE RESIDENCE	SWS	7.50E-04	1.16E-03	1.14E+07
KYG400189	WEIS RESIDENCE	SWS	7.50E-04	1.16E-03	1.14E+07
KYG400194	SEBA RESIDENCE	SWS	1.00E-03	1.55E-03	1.51E+07
KYG400235	POWERS RESIDENCE	SWS	1.00E-03	1.55E-03	1.51E+07
KYG400250	BROOKS RESIDENCE	SWS	4.00E-04	6.19E-04	6.06E+06
KYG400251	WEBER RESIDENCE	SWS	7.00E-04	1.08E-03	1.06E+07
KYG400259	BALLARD RESIDENCE	SWS	7.50E-04	1.16E-03	1.14E+07
KYG400289	GIBSON RESIDENCE	SWS	4.00E-04	6.19E-04	6.06E+06
KYG400403	FREUDENBERGER RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG400613	MURRELL RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG401905	VORMBROCK RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG402142	CARPENTER RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG401962	YOUNG RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG400958	PORTER RESIDENCE	SWS	5.00E-04	7.74E-04	7.57E+06
KYG200039 and KYS000003	Bullitt County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	2.43E+10
KYG200010 and KYS000003	Mount Washington and KY Transportation Cabinet	MS4	N/A	N/A	1.48E+10
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	3.65E+12
KYG200051 and KYS000003	PeeWee Valley and KY Transportation Cabinet	MS4	N/A	N/A	3.93E+10
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	7.74E+11
Shelby County and KYS000003	Shelby County and KY Transportation Cabinet	MS4	N/A	N/A	6.37E+10

8.2.9 Floyds Fork 24.2 to 34.1

Floyds Fork at RM 24.2 is a fourth order stream located in Jefferson County (Figure 8.31). The subwatershed for the impaired segment has a total drainage area of approximately 171.8 square miles. Floyds Fork 24.2 to 34.1 does not support the PCR use due to *E. coli*. Information about Floyds Fork 24.2 to 34.1, including its WBID and MS4 area is shown in Table 8.58. The MS4 areas in this subwatershed are permitted under KYG200005, KYS000001, KYG200051, the Shelby County Fiscal Court MS4 pending permit, and the KYTC permit KYS000003 (Figure 8.32). There are thirty-four KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.63). The land cover in this subwatershed is a mixture of forested (43.7%) and agriculture (39.2%, mostly pasture) followed by developed (11.8%) as shown in Table 8.59.

Table 8.58 Floyds Fork 24.2 to 34.1 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Floyds Fork	Floyds Fork 24.2 to 34.1	KY492278_03	Jefferson	109,972	171.8	4
KYG2000005 and KYS000003 MS4 Area (acres)	KYG2000005 and KYS000003 % MS4 in Watershed	KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed	KYG000051 and KYS000003 MS4 Area (acres)	KYG000051 and KYS000003 % MS4 in Watershed	
1,0737	9.76	30,785	27.99	545	0.50	
Shelby County MS4 and KYS000003 MS4 Area (acres)	Shelby County and KYS000003 % MS4 in Watershed					
885	0.80					

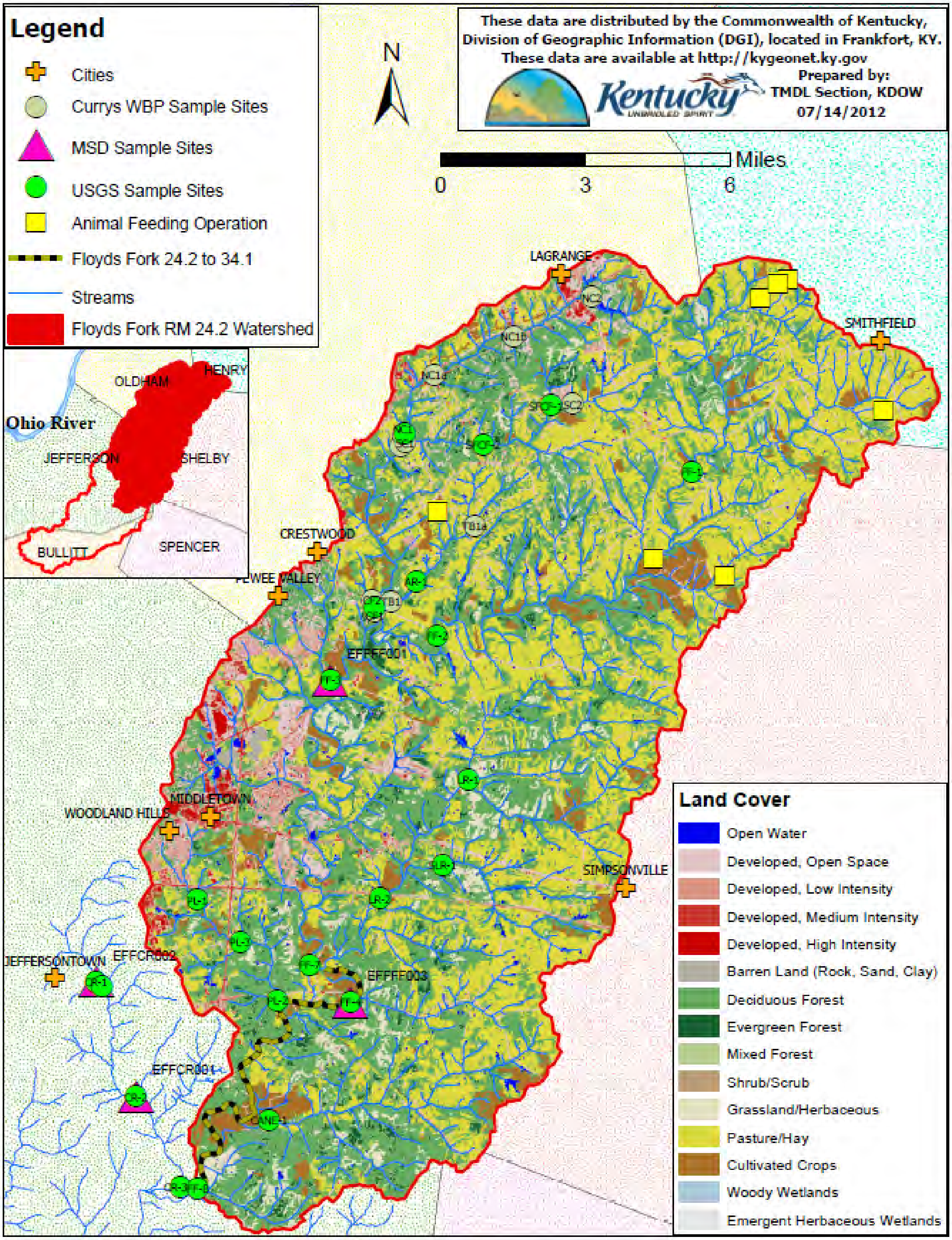

Figure 8.31 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Floyds Fork 24.2 to 34.1 Watershed (upper mid-section)

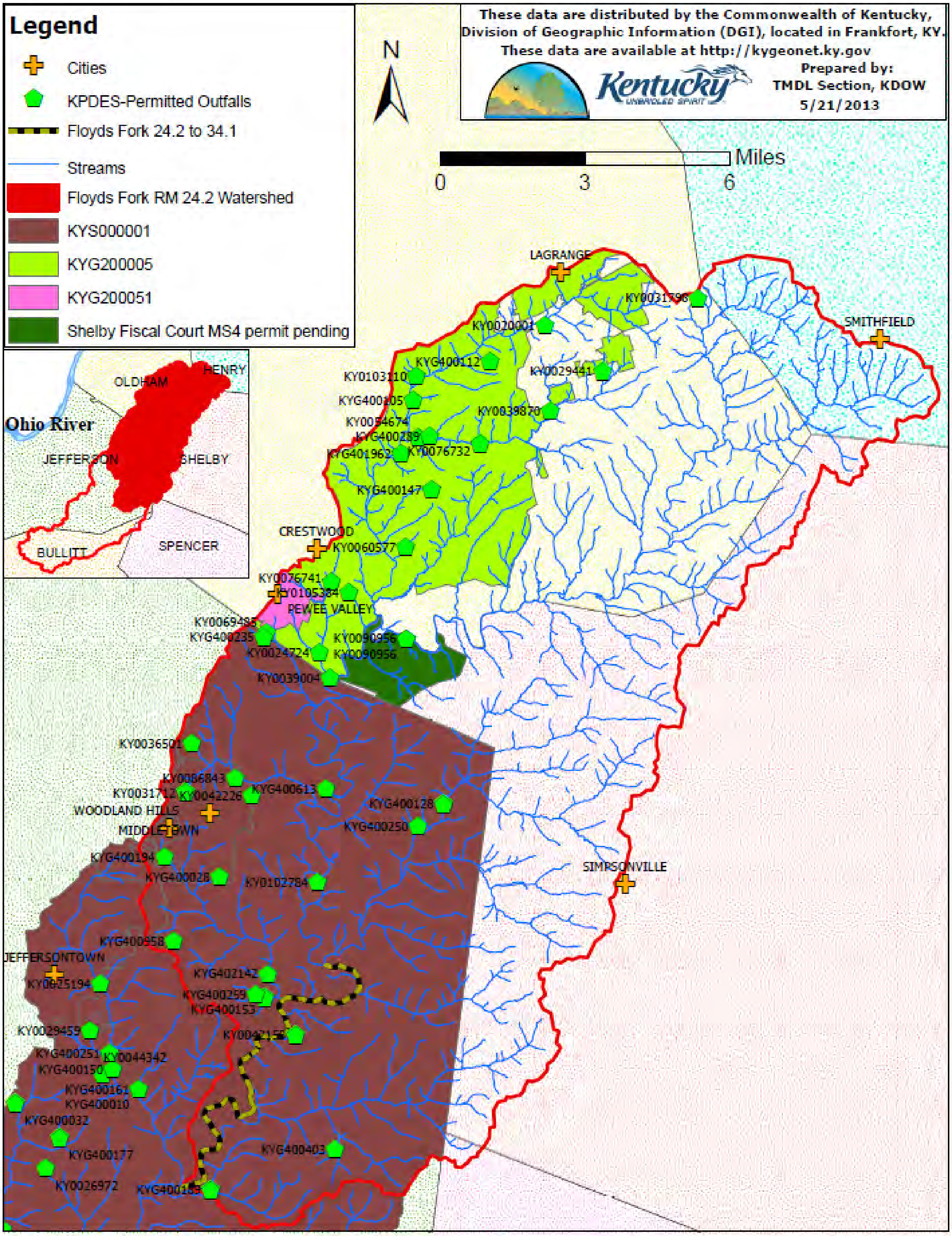

Figure 8.32 Urbanized Boundary of MS4 Entities in Floyds Fork 24.2 to 34.1 Subwatershed

Table 8.59 Land Cover in the Floyds Fork 24.2 to 34.1 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	11.79	12,968	20.3	2.0%
Agriculture (total)	39.22	43,133	67.4	
Pasture	33.84	37,210	58.1	
Row Crop	5.39	5,922	9.3	
Forest	43.67	48,020	75.0	
Natural Grassland	3.78	4,156	6.5	
Water	0.84	920	1.4	
Wetland	0.44	479	0.7	
Barren	0.27	295	0.5	
Total	100.00	109,972	171.8	

Site information is shown in Table 8.60; site FF-8 was used to develop the *E. coli* LDC (Figure 8.33). Data from site FF-8 is presented in Appendix B. The critical condition was the high flow zone, although exceedances were found in other zones. Table 8.61 shows the TMDLs for the flow zones associated with *E. coli* at site FF-8 (the yellow highlight indicates the critical condition TMDLs).

Table 8.60 Sample Sites Located Along Floyds Fork 24.2 to 34.1

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
EFFFF003	38.188333	-85.46	32.8	Louisville MSD	Fecal Coliform	No
SRW012	38.1899	-85.458	33	KDOW	Fecal Coliform	No
FF-4	38.188333	-85.46	32.8	USGS	*E. coli*	No
FF-8	38.13239	-85.519	24.65	USGS	*E. coli*	Yes-PCR

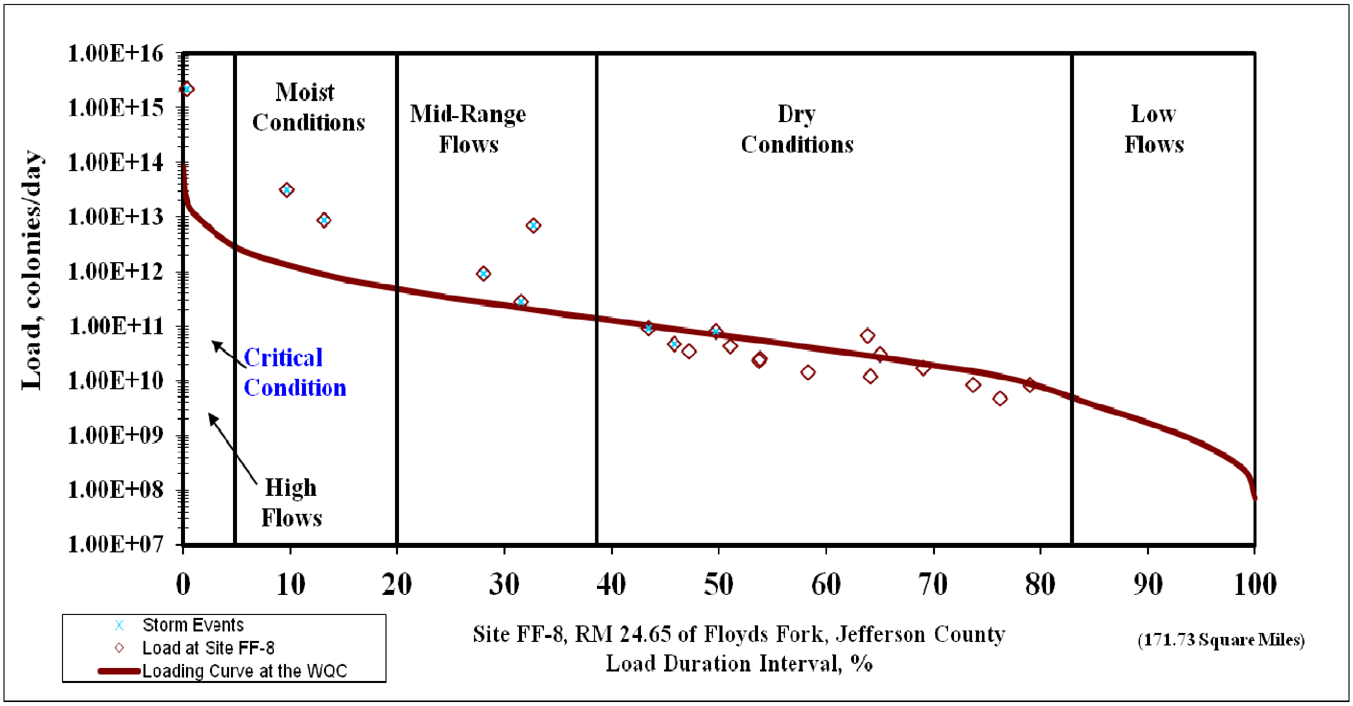

Figure 8.33 PCR *E. coli* LDC for Site FF-8

Table 8.61 PCR *E. coli* TMDLs by Flow Zone for Site FF-8

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.75E+15	2.00E+13	2.00E+12	1.80E+13	8.82E+10	1.79E+13
Moist	2.56E+13	1.10E+12	1.10E+11	9.88E+11	8.82E+10	9.00E+11
Mid	3.52E+12	1.06E+11	1.06E+10	9.51E+10	8.82E+10	6.89E+09
Dry	7.80E+10	3.41E+10	3.41E+09	3.07E+10	8.82E+10	-5.76E+10
Low	*	3.97E+09	3.97E+08	3.57E+09	8.82E+10	-8.47E+10

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Floyds Fork at RM 24.2 has an upstream watershed area of 171.83 square miles while site FF-8 has an upstream watershed area of 171.73 square miles. The ratio of these areas was 1.00 and there were no dischargers below the site, therefore the site TMDL was the same as the segment TMDL (Table 8.62). The breakdown of WLAs assigned to permitted entities is presented in Table 8.63.

Table 8.62 *E. coli* (PCR) TMDL Allocations for Floyds Fork 24.2 to 34.1

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	1.75E+15
TMDL (colonies/day)	2.00E+13
MOS (colonies/day)	2.00E+12
TMDL Target (colonies/day)	1.80E+13
SWS-WLA (colonies/day)	8.82E+10
Remainder (colonies/day)	1.79E+13
Future Growth-WLA (colonies/day)	3.59E+11
MS4-WLA (colonies/day)	7.00E+12
LA (colonies/day)	1.06E+13

Table 8.63 WLAs Assigned to Permitted Entities in Floyds Fork 24.2 to 34.1 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0020001	LAGRANGE, CITY OF	SWS	1.90E+00	2.94E+00	1.73E+10
KY0024724	ASH AVENUE WWTP	SWS	3.00E-01	4.64E-01	2.73E+09
KY0031712	STARVIEW ESTATES MSD	SWS	1.00E-01	1.55E-01	9.08E+08
KY0031798	CEDAR LAKE LODGE	SWS	2.00E-02	3.09E-02	1.82E+08
KY0036501	MSD BERRYTOWN SD	SWS	7.50E-02	1.16E-01	6.81E+08
KY0039004	KY DOJ WOMENS CORRECT	SWS	1.25E-01	1.93E-01	1.14E+09
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	9.08E+08
KY0042153	CEDAR RIDGE CAMP	SWS	5.00E-03	7.74E-03	4.54E+07
KY0054674	LOCKWOOD ESTATES SUBDIVISION	SWS	4.50E-02	6.96E-02	4.09E+08
KY0060577	COUNTRY VILLAGE	SWS	6.00E-02	9.28E-02	5.45E+08
KY0069485	FRIENDSHIP MANOR	SWS	1.70E-02	2.63E-02	1.54E+08
KY0076732	CENTERFIELD ELEMENTARY	SWS	1.00E-02	1.55E-02	9.08E+07
KY0076741	CHERRYTREE APARTMENTS	SWS	7.50E-03	1.16E-02	6.81E+07
KY0086843	MIDDLETOWN INDUSTRIAL PARK	SWS	1.60E-01	2.48E-01	1.45E+09
KY0090956	PERSIMMON RIDGE	SWS	1.42E-01	2.20E-01	1.29E+09
KY0102784	MSD FLOYDS FORK WQTC	SWS	6.50E+00	1.01E+01	5.91E+10
KY0103110	BUCKNER WWTP	SWS	1.35E-01	2.09E-01	1.23E+09
KYG400028	AULBACH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400105	MCCARSON RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400112	PARROTT RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400128	FATHALIZADEH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400147	EBBS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400153	DIORIO RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400189	WEIS RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400194	SEBA RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400235	POWERS RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400250	BROOKS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400259	BALLARD RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400289	GIBSON RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYG400403	FREUDENBERGER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400613	MURRELL RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG402142	CARPENTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG401962	YOUNG RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400958	PORTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	5.02E+12
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	1.75E+12
KYG200051 and KYS000003	Peewee Valley and KY Transportation Cabinet	MS4	N/A	N/A	8.88E+10
Shelby County and KYS000003	Shelby County and KY Transportation Cabinet	MS4	N/A	N/A	1.43E+11

8.2.10 Floyds Fork 34.1 to 61.9

Floyds Fork at RM 34.1 is a third order stream located in Jefferson County (Figure 8.34). The subwatershed for the impaired segment has a total drainage area of approximately 104.3 square miles. Floyds Fork 34.1 to 61.9 does not support the PCR use due to *E. coli* and the SCR use due to fecal coliform; therefore two TMDLs were calculated. Information about Floyds Fork 34.1 to 61.9, including its WBID and MS4 area is shown in Table 8.64. The MS4 areas in this subwatershed are permitted under KYG200005, KYS000001, KYG200051, the Shelby County Fiscal Court MS4 pending permit, and the KYTC permit KYS000003 (Figure 8.35). There are twenty-three KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.71). The land cover in this subwatershed is a mixture of agriculture (42.3%, mostly pasture) and forested (39.2%) followed by developed (14.8%) as shown in Table 8.65.

Table 8.64 Floyds Fork 34.1 to 61.9 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Floyds Fork	Floyds Fork 34.1 to 61.9	KY492278_04	Shelby	66,682	104.2	3
KYG2000005 and KYS000003 MS4 Area (acres)	KYG2000005 and KYS000003 % MS4 in Watershed	KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed	KYG2000051 and KYS000003 MS4 Area (acres)	KYG2000051 and KYS000003 % MS4 in Watershed	
10,737	16.09	10,150	15.21	545	0.82	
Shelby County MS4 and KYS000003 MS4 Area (acres)	Shelby County and KYS000003 % MS4 in Watershed					
885	1.33					

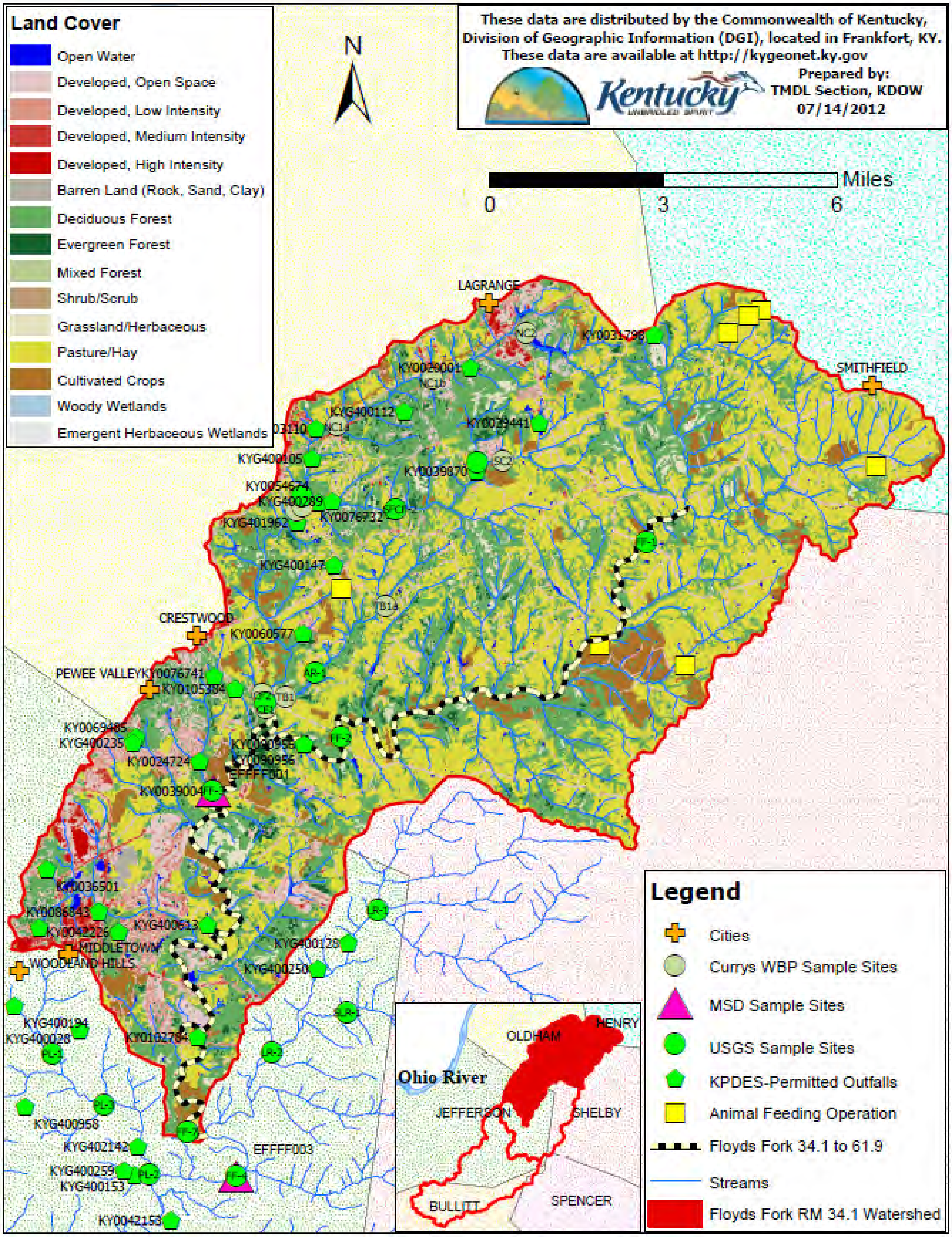

Figure 8.34 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Floyds Fork 34.1 to 61.9 Subwatershed

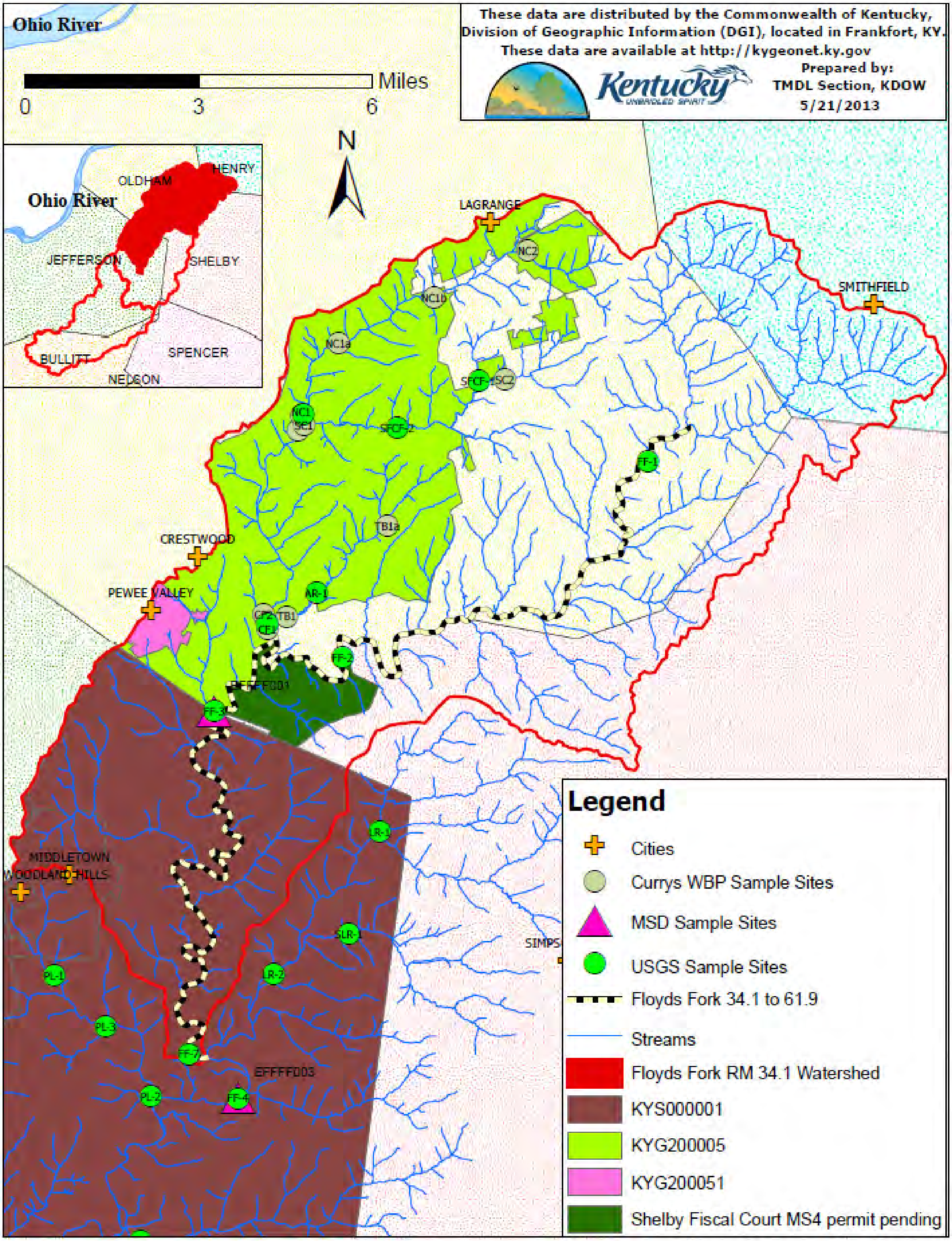

Figure 8.35 Urbanized Boundary of MS4 Entities in Floyds Fork 34.1 to 61.9 Subwatershed

Table 8.65 Land Cover in the Floyds Fork 34.1 to 61.9 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	14.87	9,923	15.5	2.0%
Agriculture (total)	42.37	28,282	44.2	
Pasture	36.71	24,503	38.3	
Row Crop	5.66	3,779	5.9	
Forest	39.19	26,160	40.9	
Natural Grassland	2.17	1,452	2.3	
Water	0.79	526	0.8	
Wetland	0.22	148	0.2	
Barren	0.40	264	0.4	
Total	100.00	66,754	104.3	

Site information is shown in Table 8.66; site EFFFF001 was used to develop the fecal coliform LDC (Figure 8.36) while site FF-2 was used to develop the *E. coli* LDC (Figure 8.37). Data from sites EFFFF001 and FF-2 are presented in Appendix B. The critical condition was the mid-range flow zone for fecal coliform and the high flow zone for *E. coli*, although exceedances were found in other zones. Table 8.67 shows the TMDLs for the flow zones associated with fecal coliform at site EFFFF001 while Table 8.68 does the same for *E. coli* at site FF-2 (the yellow highlight indicates the critical condition TMDLs).

Table 8.66 Sample Sites Located Along Floyds Fork 34.1 to 61.9

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
EFFFF001	38.285278	-85.4675	45.7	Louisville MSD	Fecal Coliform	Yes-SCR
FF-1	38.3475	-85.329167	60.8	USGS	*E. coli*	No
FF-2	38.298611	-85.426667	50.85	USGS	*E. coli*	Yes-PCR
FF-3	38.285278	-85.4675	45.7	USGS	*E. coli*	No
FF-7	38.199444	-85.475833	34.5	USGS	*E. coli*	No

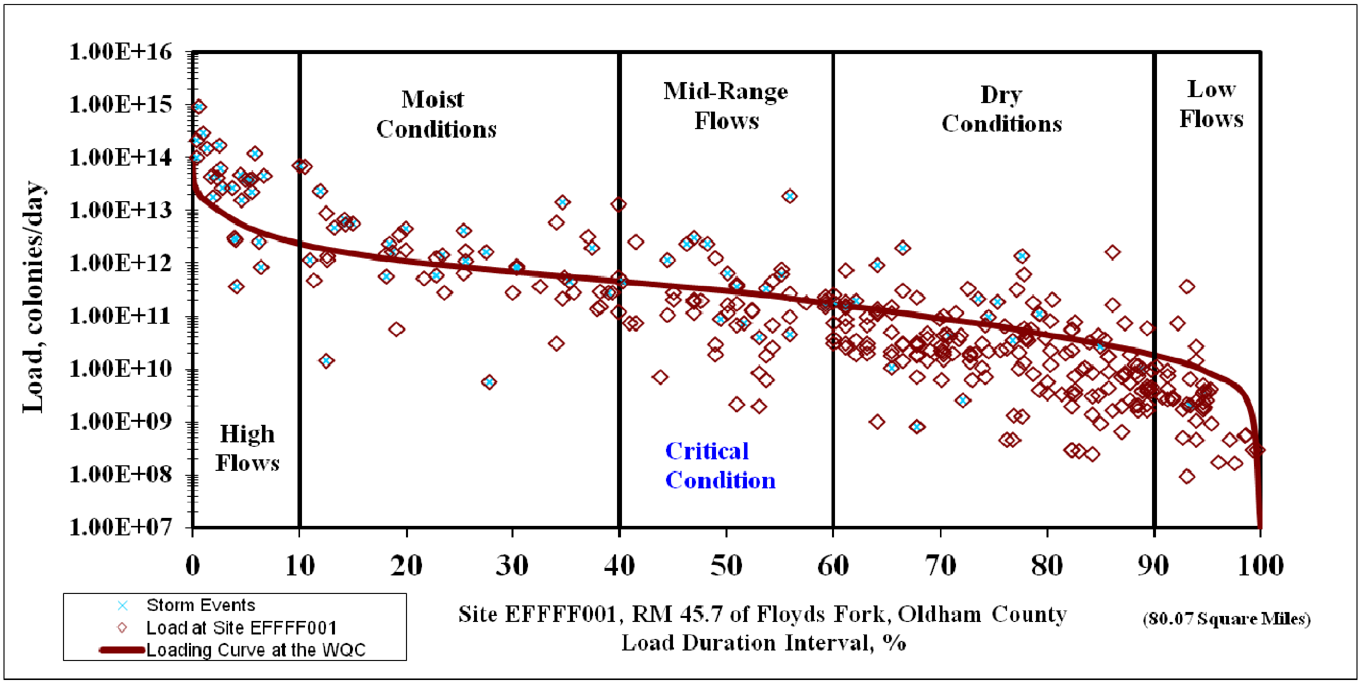

Figure 8.36 SCR Fecal Coliform LDC for Site EFFFF001

Table 8.67 SCR Fecal Coliform TMDLs by Flow Zone for Site EFFFF001

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	8.98E+14	1.12E+14	1.12E+13	1.00E+14	3.84E+10	1.00E+14
Moist	6.78E+13	1.13E+13	1.13E+12	1.02E+13	3.84E+10	1.01E+13
Mid	1.88E+13	1.13E+12	1.13E+11	1.01E+12	3.84E+10	9.74E+11
Dry	1.64E+12	1.42E+11	1.42E+10	1.28E+11	3.84E+10	8.93E+10
Low	3.58E+11	6.36E+10	6.36E+09	5.72E+10	3.84E+10	1.88E+10

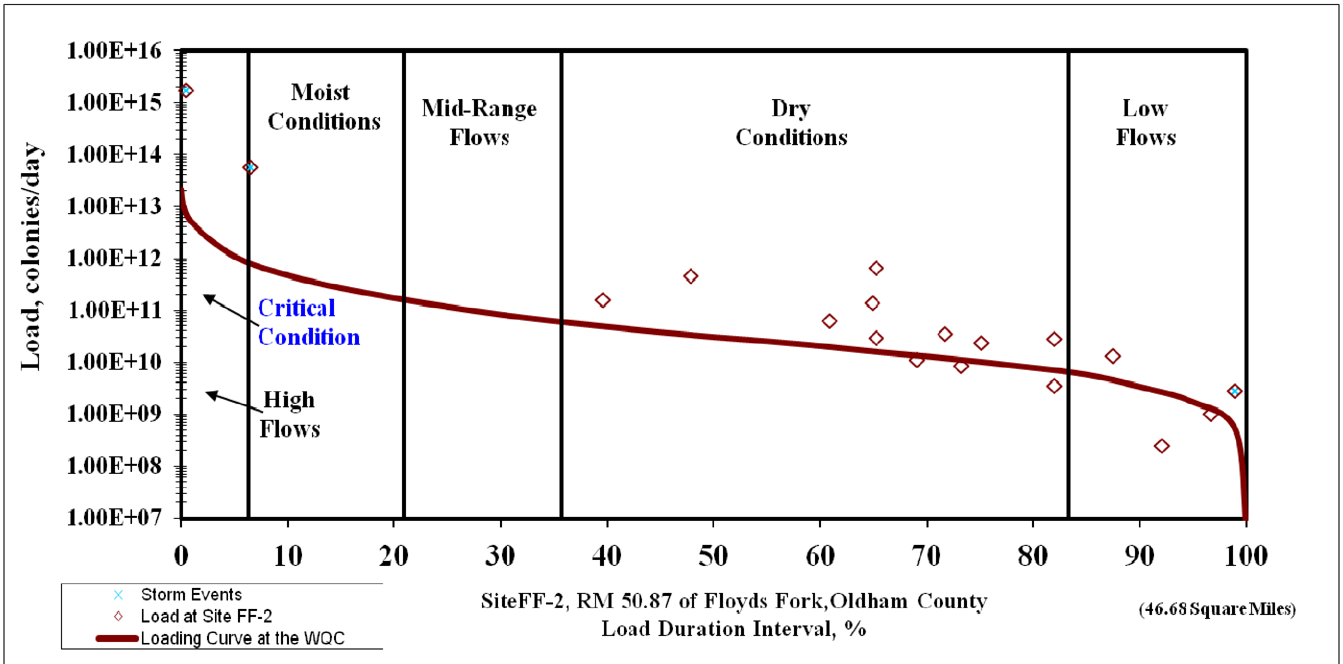

Figure 8.37 PCR *E. coli* LDC for Site FF-2

Table 8.68 PCR *E. coli* TMDLs by Flow Zone for Site FF-2

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.69E+15	7.82E+12	7.82E+11	7.04E+12	1.82E+08	7.04E+12
Moist	5.66E+13	7.99E+11	7.99E+10	7.19E+11	1.82E+08	7.19E+11
Mid	*	1.41E+11	1.41E+10	1.27E+11	1.82E+08	1.27E+11
Dry	6.54E+11	1.59E+10	1.59E+09	1.43E+10	1.82E+08	1.41E+10
Low	2.86E+09	5.28E+08	5.28E+07	4.76E+08	1.82E+08	2.94E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Floyds Fork at RM 34.1 has an upstream watershed area of 104.19 square miles while sites EFFFF001 and FF-2 have upstream watershed areas of 80.7 and 46.68 square miles, respectively. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.3 and 2.23 for site EFFFF001 and FF-2, respectively) and the individual SWS-WLA for any facility located below the sites was added to the segment SWS-WLA to generate the final fecal coliform and *E. coli* TMDL allocations for the impaired segment (Table 8.69). Because site EFFFF001 had sufficient data to calculate geometric means, the greatest geometric mean was determined (Table 8.70). The breakdown of WLAs assigned to permitted entities is presented in Table 8.71.

Table 8.69 Fecal Coliform (SCR) and *E. coli* (PCR) TMDL Allocations for Floyds Fork 34.1 to 61.9

Pollutant (Use)	Fecal Coliform (SCR)	*E. coli* (PCR)
Existing Load (colonies/day)	2.45E+13	3.78E+15
TMDL (colonies/day)	1.46E+12	1.74E+13
MOS (colonies/day)	1.46E+11	1.74E+12
TMDL Target (colonies/day)	1.32E+12	1.57E+13
SWS-WLA (colonies/day)	1.47E+11	8.81E+10
Remainder (colonies/day)	1.17E+12	1.56E+13
Future Growth-WLA (colonies/day)	2.34E+10	3.12E+11
MS4-WLA (colonies/day)	3.91E+11	5.22E+12
LA (colonies/day)	7.55E+11	1.01E+13

Table 8.70 Greatest Geometric Mean for Fecal Coliform at Site EFFFF001

Sample Date	Fecal Coliform (colonies/100 ml)
5/8/2001	>4,600
5/15/2001	360
5/22/2001	1,450
5/29/2001	495
6/5/2001	>12,000

Table 8.71 WLAs Assigned to Permitted Entities in Floyds Fork 34.1 to 61.9 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KY0031798	CEDAR LAKE LODGE	SWS	2.00E-02	3.09E-02	3.03E+08	1.82E+08
KY0020001	LAGRANGE, CITY OF[1]	SWS	1.90E+00	2.94E+00	2.88E+10	1.73E+10
KY0024724	ASH AVENUE WWTP[1,2]	SWS	3.00E-01	4.64E-01	4.54E+09	2.73E+09
KY0031712	STARVIEW ESTATES MSD[1,2]	SWS	1.00E-01	1.55E-01	1.51E+09	9.08E+08
KY0036501	MSD BERRYTOWN SD[1,2]	SWS	7.50E-02	1.16E-01	1.14E+09	6.81E+08
KY0039004	KY DOJ WOMENS CORRECT[1]	SWS	1.25E-01	1.93E-01	1.89E+09	1.14E+09
KY0039870	LAKEWOOD VALLEY[1]	SWS	1.00E-01	1.55E-01	1.51E+09	9.08E+08
KY0054674	LOCKWOOD ESTATES SUBDIVISION[1]	SWS	4.50E-02	6.96E-02	6.81E+08	4.09E+08
KY0060577	COUNTRY VILLAGE[1]	SWS	6.00E-02	9.28E-02	9.08E+08	5.45E+08
KY0069485	FRIENDSHIP MANOR[1,2]	SWS	1.70E-02	2.63E-02	2.57E+08	1.54E+08
KY0076732	CENTERFIELD ELEMENTARY[1]	SWS	1.00E-02	1.55E-02	1.51E+08	9.08E+07
KY0076741	CHERRYTREE APARTMENTS[1,2]	SWS	7.50E-03	1.16E-02	1.14E+08	6.81E+07

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KY0086843	MIDDLETOWN INDUSTRIAL PARK[1,2]	SWS	1.60E-01	2.48E-01	2.42E+09	1.45E+09
KY0090956	PERSIMMON RIDGE[1]	SWS	1.42E-01	2.20E-01	2.15E+09	1.29E+09
KY0102784	MSD FLOYDS FORK WQTC[1,2]	SWS	6.50E+00	1.01E+01	9.84E+10	5.91E+10
KY0103110	BUCKNER WWTP[1]	SWS	1.35E-01	2.09E-01	2.04E+09	1.23E+09
KYG400105	MCCARSON RESIDENCE[1]	SWS	5.00E-04	7.74E-04	7.57E+06	4.54E+06
KYG400112	PARROTT RESIDENCE[1]	SWS	4.00E-04	6.19E-04	6.06E+06	3.63E+06
KYG400147	EBBS RESIDENCE[1]	SWS	4.00E-04	6.19E-04	6.06E+06	3.63E+06
KYG400235	POWERS RESIDENCE[1,2]	SWS	1.00E-03	1.55E-03	1.51E+07	9.08E+06
KYG400289	GIBSON RESIDENCE[1]	SWS	4.00E-04	6.19E-04	6.06E+06	3.63E+06
KYG400613	MURRELL RESIDENCE[1,2]	SWS	5.00E-04	7.74E-04	7.57E+06	4.54E+06
KYG401962	YOUNG RESIDENCE[1]	SWS	5.00E-04	7.74E-04	7.57E+06	4.54E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	1.78E+11	2.37E+12
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	1.88E+11	2.51E+12
KYG200051 and KYS000003	PeeWee Valley and KY Transportation Cabinet	MS4	N/A	N/A	9.58E+09	1.28E+11
Shelby County and KYS000003	Shelby County and KY Transportation Cabinet	MS4	N/A	N/A	1.55E+10	2.08E+11

Note: [1]Indicates that these facilities are below site FF-2 and [2] indicates that these facilities are below site EFFFF001.

8.2.11 Long Run 0.0 to 9.9

Long run at RM 0.0 is a third order stream located in Jefferson County (Figure 8.38). The subwatershed for the impaired segment has a total drainage area of approximately 28.9 square miles. Long Run 0.0 to 9.9 does not support the PCR use due to *E. coli*. Information about Long Run 0.0 to 9.9, including its WBID and MS4 area is shown in Table 8.72. The MS4 areas in this subwatershed are permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.39). There are two KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.77). The land cover in this subwatershed is a mixture of forested (45.9%) and agriculture (42.2%, mostly pasture) as shown in Table 8.73.

Table 8.72 Long Run 0.0 to 9.9 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Long Run	Long Run 0.0 to 9.9	KY497142_01	Jefferson	18,489	28.9	3
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
4,765	25.77					

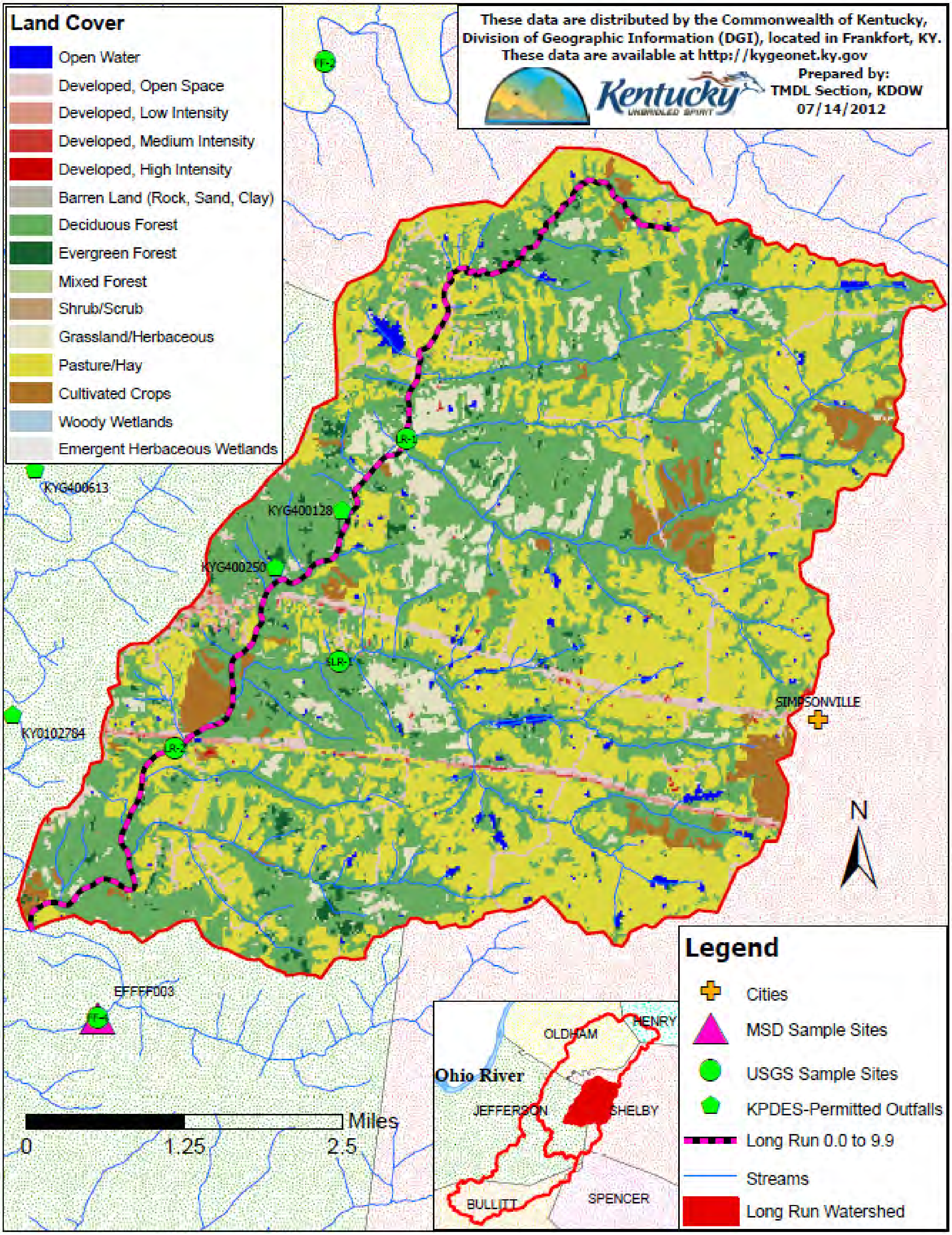

Figure 8.38 Land Cover, Sampling Sites, KPDES-permitted Facilities in the Long Run 0.0 to 9.9 Subwatershed

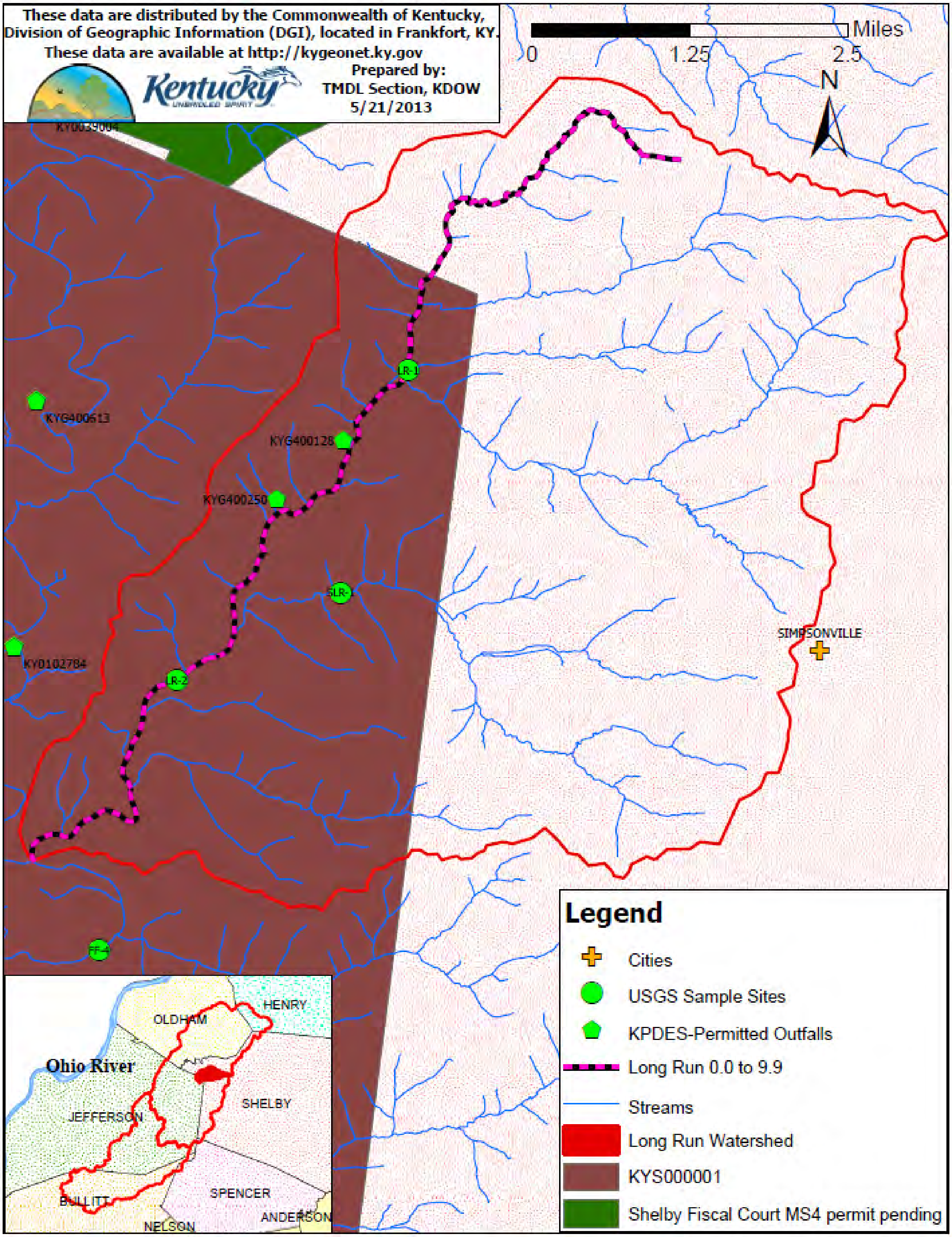

Figure 8.39 Urbanized Boundary of MS4 Entities in Long Run 0.0 to 9.9 Subwatershed

Table 8.73 Land Cover in the Long Run 0.0 to 9.9 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	4.88	903	1.4	0.5%
Agriculture (total)	42.15	7,793	12.2	
Pasture	38.37	7,093	11.1	
Row Crop	3.78	699	1.1	
Forest	45.89	8,484	13.3	
Natural Grassland	5.84	1,079	1.7	
Water	0.99	183	0.3	
Wetland	0.18	32	0.1	
Barren	0.08	14	0.0	
Total	100.00	18,489	28.9	

Site information is shown in Table 8.74; site LR-2 was used to develop the *E. coli* LDC (Figure 8.40). Data from site LR-2 are presented in Appendix B. The critical condition was the mid flow zone, although exceedances were found in other zones. Table 8.75 shows the TMDLs for the flow zones associated with *E. coli* at site LR-2 (the yellow highlight indicates the critical condition TMDLs).

Table 8.74 Sample Sites Located Along Long Run 0.0 to 9.9

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
LR-1	38.25506	-85.415	5.9	USGS	*E. coli*	No
LR-2	38.21944	-85.449	2.4	USGS	*E. coli*	Yes-PCR

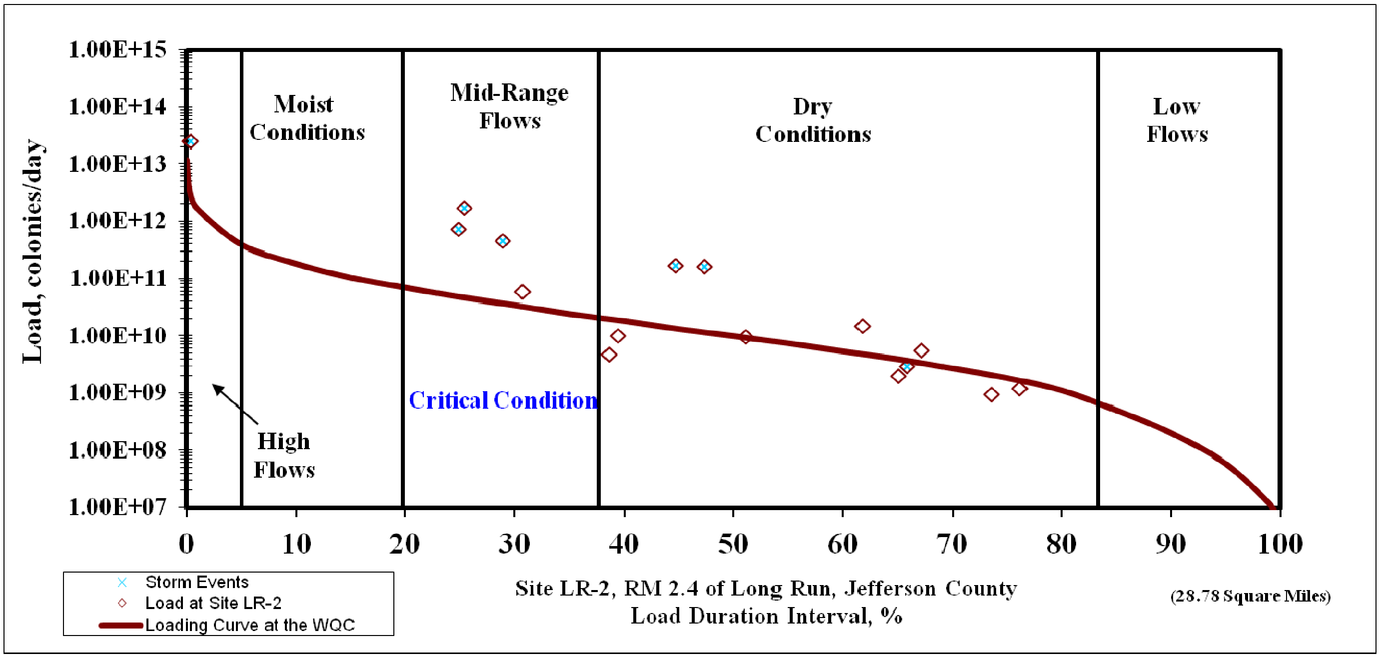

Figure 8.40 PCR *E. coli* LDC for Site LR-2

Table 8.75 PCR *E. coli* TMDLs by Flow Zone for Site LR-2

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	6.1E+12	8.67E+11	8.67E+10	7.80E+11	8.18E+06	7.80E+11
Moist	*	2.99E+11	2.99E+10	2.69E+11	8.18E+06	2.69E+11
Mid	1.69E+12	4.56E+10	4.56E+09	4.11E+10	8.18E+06	4.11E+10
Dry	1.65E+11	1.16E+10	1.16E+09	1.05E+10	8.18E+06	1.05E+10
Low	*	5.04E+08	5.04E+07	4.54E+08	8.18E+06	4.45E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Long Run at RM 0.0 has an upstream watershed area of 28.89 square miles while site LR-2 has an upstream watershed area of 23.78 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of this area (1.21) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.76). The breakdown of WLAs assigned to permitted entities is presented in Table 8.77.

Table 8.76 *E. coli* (PCR) TMDL Allocations for Long Run 0.0 to 9.9

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	2.05E+12
TMDL (colonies/day)	5.52E+10
MOS (colonies/day)	5.52E+09
TMDL Target (colonies/day)	4.97E+10
SWS-WLA (colonies/day)	8.18E+06
Remainder (colonies/day)	4.97E+10
Future Growth-WLA (colonies/day)	2.48E+08
MS4-WLA (colonies/day)	1.28E+10
LA (colonies/day)	3.66E+10

Table 8.77 WLAs Assigned to Permitted Entities in Long Run 0.0 to 9.9 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG400128	FATHALIZADEH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400250	BROOKS RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	1.28E+10

8.2.12 North Fork Currys Fork 0.0 to 6.0

North Fork Currys Fork at RM 0.0 is a second order stream located in Oldham County (Figure 8.41). The subwatershed for the impaired segment has a total drainage area of approximately 10 square miles. North Fork Currys Fork 0.0 to 6.0 does not support the PCR use due to *E. coli*. Information about North Fork Currys Fork 0.0 to 6.0, including its WBID and MS4 area is shown in Table 8.78. The MS4 areas in this subwatershed are permitted under KYG200005 and the KYTC permit KYS000003 (Figure 8.42). There are four KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.83). The land cover in this subwatershed is a mixture of forested (46.7%), agriculture (25.6%, mostly pasture) and developed (24.8%) and as shown in Table 8.79.

Table 8.78 North Fork Currys Fork 0.0 to 6.0 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
North Fork Currys Fork	North Fork Currys Fork 0.0 to 6.0	KY499547_01	Oldham	6,413	10	2
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed					
3,431	53.51					

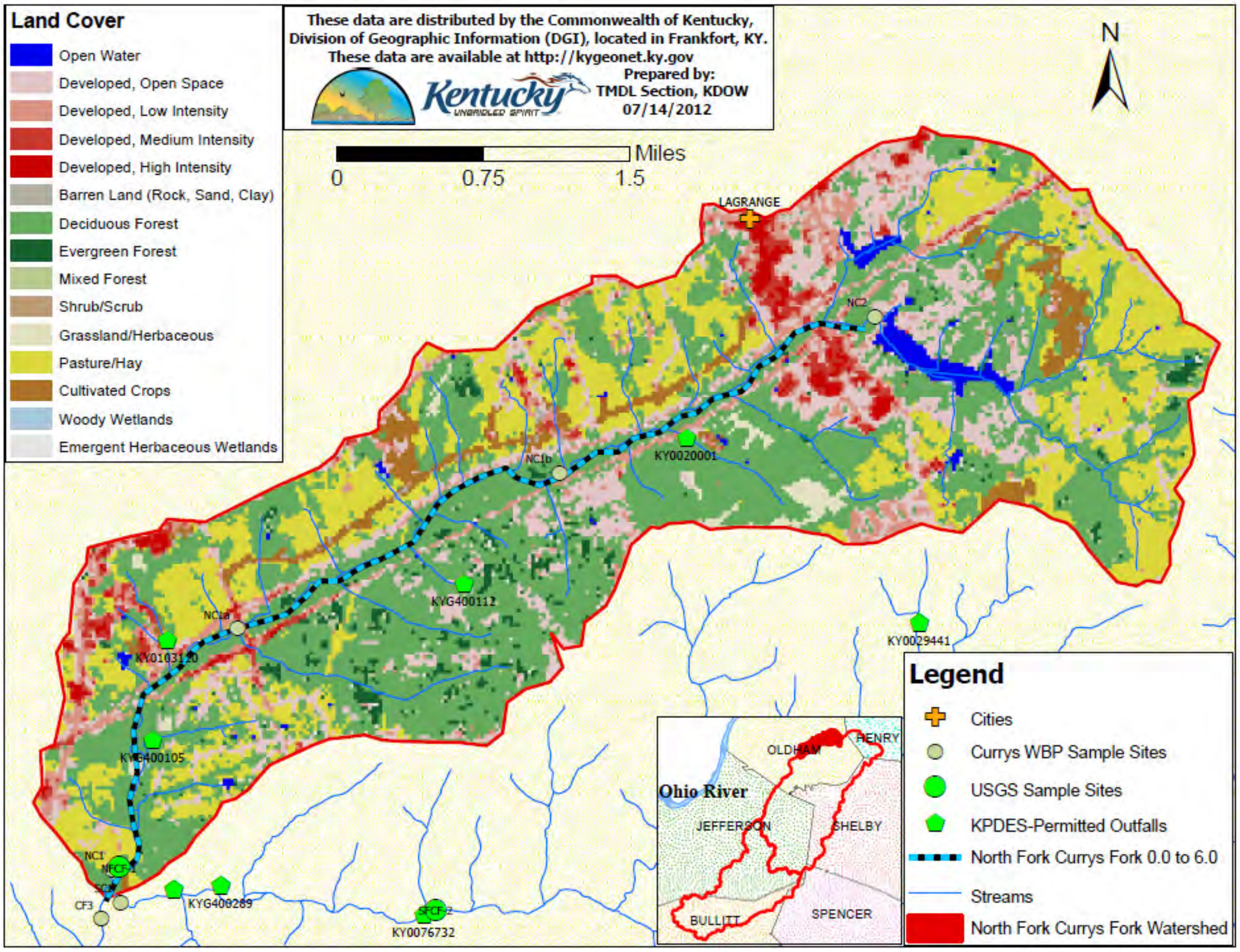

Figure 8.41 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the North Fork Currys Fork 0.0 to 6.0 Subwatershed

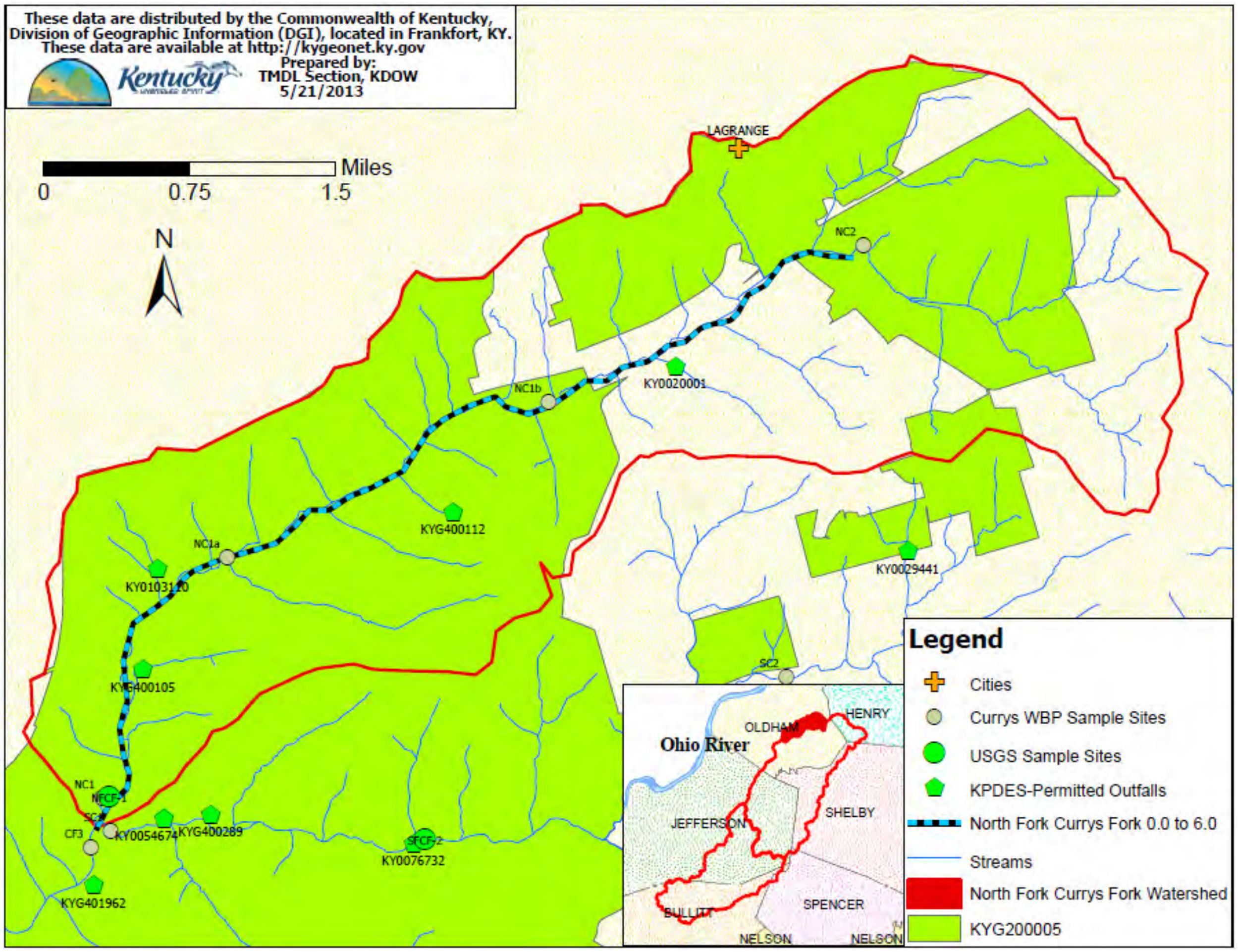

Figure 8.42 Urbanized Boundary of MS4 Entities in North Fork Currys Fork 0.0 to 6.0 Subwatershed

Table 8.79 Land Cover in the North Fork Currys Fork 0.0 to 6.0 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	24.80	1,590	2.5	4.0%
Agriculture (total)	25.58	1,640	2.6	
Pasture	22.06	1,414	2.2	
Row Crop	3.52	226	0.4	
Forest	46.67	2,993	4.7	
Natural Grassland	1.12	72	0.1	
Water	1.32	85	0.1	
Wetland	0.24	16	0.0	
Barren	0.27	18	0.0	
Total	100.00	6,413	10.0	

Site information is shown in Table 8.80; site NFCF-1 was used to develop the *E. coli* LDC (Figure 8.43). Data from site NFCF-1 are presented in Appendix B. The critical condition was the moist flow zone, although exceedances were found in other zones. Table 8.81 shows the TMDLs for the flow zones associated with *E. coli* at site NFCF-1 (the yellow highlight indicates the critical condition TMDLs).

Table 8.80 Sample Sites Located Along North Fork Currys Fork 0.0 to 6.0

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
NC1	38.359264	-85.4394	0.2	Currys Fork WBP	Fecal Coliform	No
NC1a	38.37722	-85.4275	2	Currys Fork WBP	Fecal Coliform	No
NC1b	38.38872	-85.397	4.05	Currys Fork WBP	Fecal Coliform	No
NC2	38.400327	-85.3672	6	Currys Fork WBP	Fecal Coliform	No
NFCF-1	38.35944	-85.4388	0.2	USGS	*E. coli*	Yes-PCR

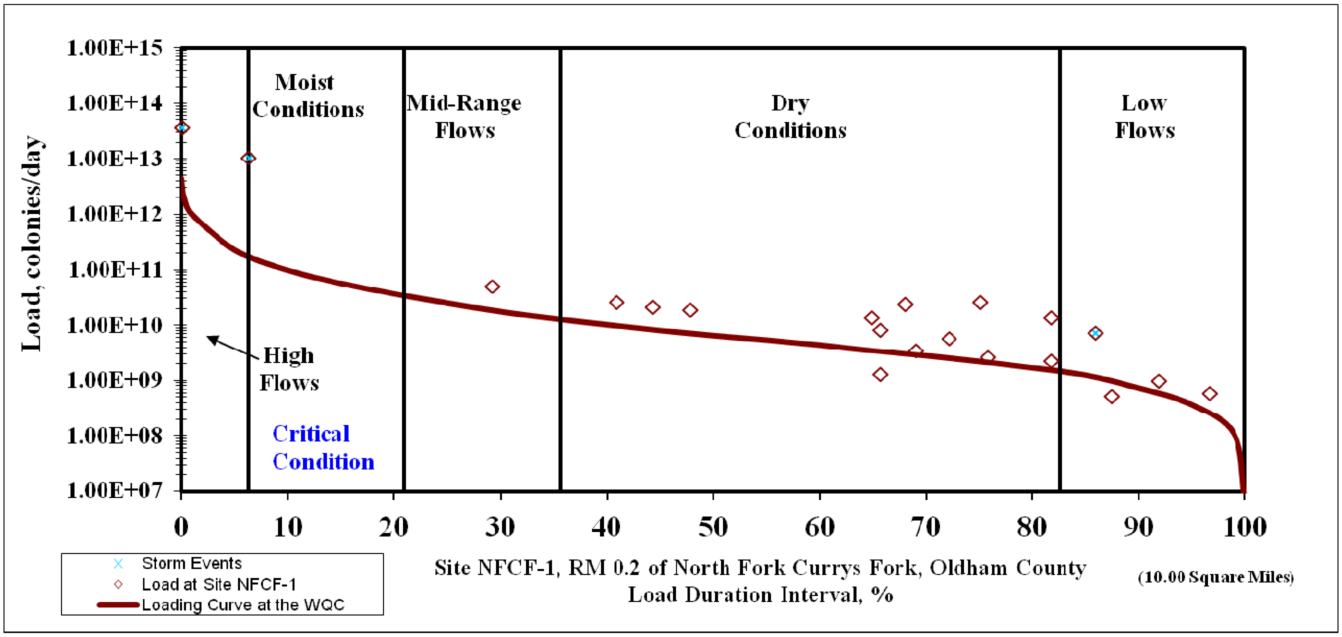

Figure 8.43 PCR *E. coli* LDC for Site NFCF-1

Table 8.81 PCR *E. coli* TMDLs by Flow Zone for Site NFCF-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	3.67E+13	1.04E+12	1.04E+11	9.33E+11	1.85E+10	9.14E+11
Moist	1.04E+13	1.78E+11	1.78E+10	1.60E+11	1.85E+10	1.42E+11
Mid	5.00E+10	1.87E+10	1.87E+09	1.69E+10	1.85E+10	-1.63E+09
Dry	2.57E+10	2.20E+09	2.20E+08	1.98E+09	1.85E+10	-1.65E+10
Low	7.35E+09	1.18E+09	1.18E+08	1.06E+09	1.85E+10	-1.74E+10

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. North Fork Currys Fork at RM 0.0 has an upstream watershed area of 10.02 square miles while site NFCF-1 has an upstream watershed area of 10.00 square miles. The ratio of these areas was 1.00 and there were no dischargers below the site, therefore the site TMDL was the same as the segment TMDL (Table 8.82). The breakdown of WLAs assigned to permitted entities is presented in Table 8.83.

Table 8.82 *E. coli* (PCR) TMDL Allocations for North Fork Currys Fork 0.0 to 6.0

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	1.04E+13
TMDL (colonies/day)	1.78E+11
MOS (colonies/day)	1.78E+10
TMDL Target (colonies/day)	1.60E+11
SWS-WLA (colonies/day)	1.85E+10
Remainder (colonies/day)	1.42E+11
Future Growth-WLA (colonies/day)	5.67E+09
MS4-WLA (colonies/day)	7.58E+10
LA (colonies/day)	6.02E+10

Table 8.83 WLAs Assigned to Permitted Entities in North Fork Currys Fork 0.0 to 6.0 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0020001	LAGRANGE, CITY OF	SWS	1.90E+00	2.94E+00	1.73E+10
KYG400105	MCCARSON RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400112	PARROTT RESIDENCE	SWS	4.00E-04	6.19E-04	3.63E+06
KY0103110	BUCKNER WWTP	SWS	1.35E-01	2.09E-01	1.23E+09
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	7.58E+10

8.2.13 Pennsylvania Run 0.0 to 3.3

Pennsylvania Run at RM 0.0 is a second order stream located in Jefferson County (Figure 8.44). The subwatershed for the impaired segment has a total drainage area of approximately 8.4 square miles. Pennsylvania Run 0.0 to 3.3 does not support the PCR use due to *E. coli* and SCR use due to fecal coliform; therefore two TMDLs were calculated. Information about Pennsylvania Run RM 0.0 to 3.3, including its WBID and MS4 area is shown in Table 8.84. The MS4 areas in this subwatershed are permitted under KYS000001, KYG200039 and the KYTC permit KYS000003 (Figure 8.45). There are two KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.91). The land cover in this subwatershed is a mixture of forested (41.2%), developed (33.6%) and agriculture (20.9%, mostly pasture) as shown in Table 8.85.

Table 8.84 Pennsylvania Run 0.0 to 3.3 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Pennsylvania Run	Pennsylvania Run 0.0 to 3.3	KY500387_01	Jefferson	5,374	8.4	2
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed	KYG200039 MS4 Area (acres)	KYG200039 % MS4 in Watershed			
3,688	68.62	499	9.29			

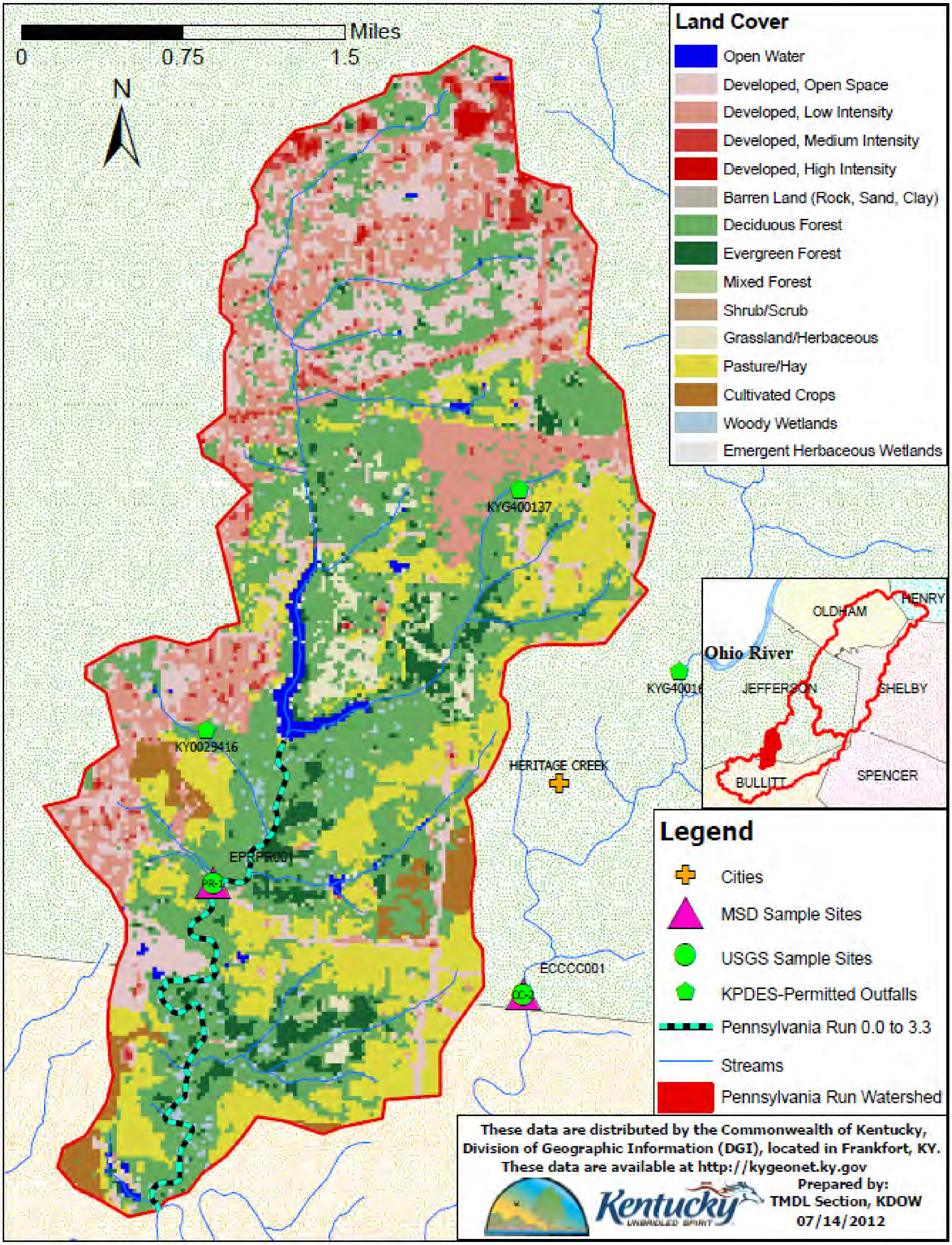

Figure 8.44 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Pennsylvania Run 0.0 to 3.3 Subwatershed

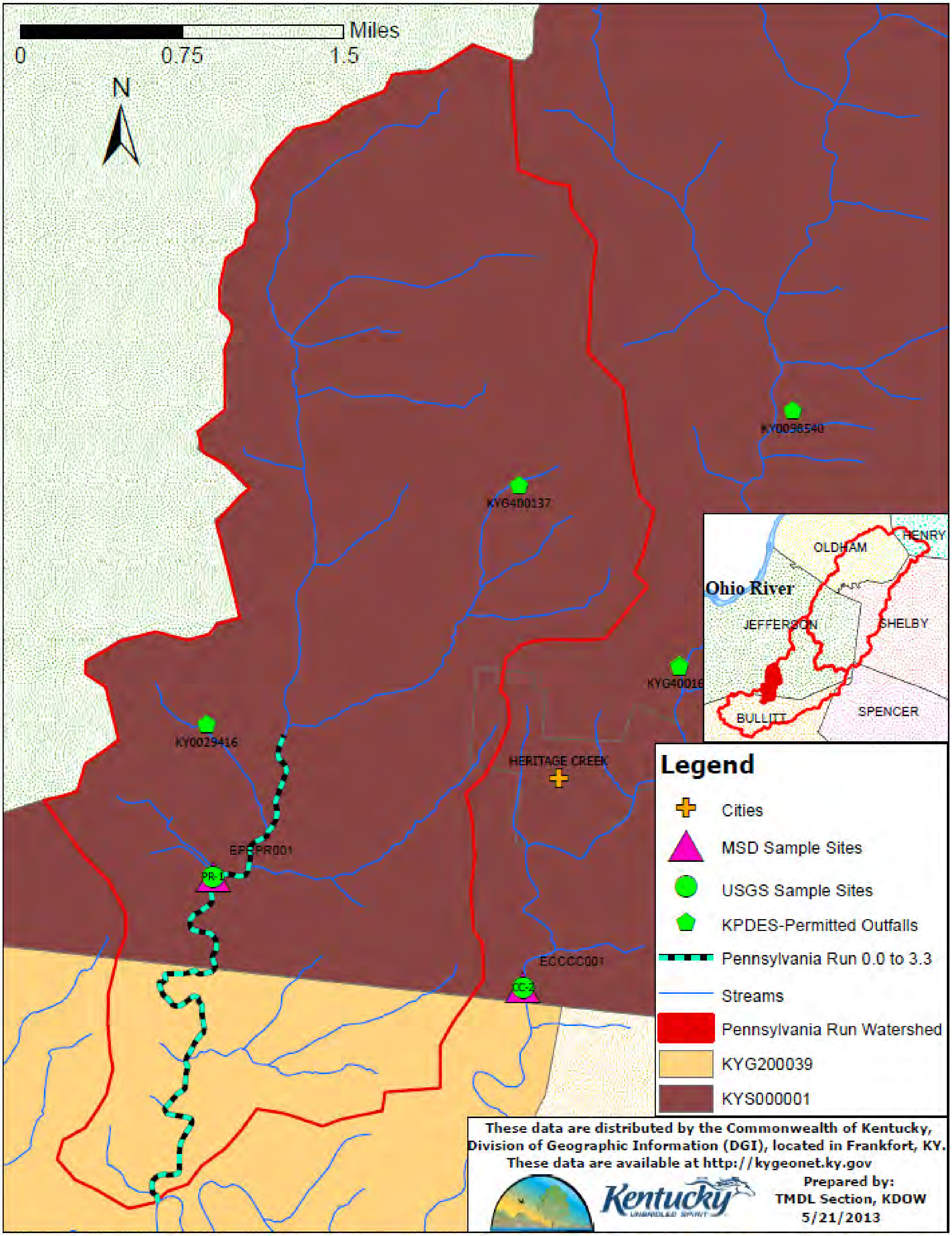

Figure 8.45 Urbanized Boundary of MS4 Entities in Pennsylvania Run 0.0 to 3.3 Subwatershed

Table 8.85 Land Cover in the Pennsylvania Run 0.0 to 3.3 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	33.57	1,804	2.8	5.0%
Agriculture (total)	20.86	1,121	1.8	
Pasture	18.37	987	1.5	
Row Crop	2.49	134	0.2	
Forest	41.15	2,212	3.5	
Natural Grassland	1.80	97	0.2	
Water	1.18	63	0.1	
Wetland	1.43	77	0.1	
Barren	0.02	1	0.0	
Total	100.00	5,374	8.4	

Site information is shown in Table 8.86; site EPRPR001 was used to develop the fecal coliform LDC (Figure 8.46) while site PR-1 was used to develop the *E. coli* LDC (Figure 8.47). Data from sites EPRPR001 and PR-1 are presented in Appendix B. The critical condition was the high flow zone for fecal coliform and the dry zone for *E. coli*, although exceedances were found in other zones. Table 8.87 shows the TMDLs for the flow zones associated with fecal coliform at site EPRPR001 while Table 8.88 does the same for *E. coli* at site PR-1 (the yellow highlight indicates the critical condition TMDLs).

Table 8.86 Sample Sites Located Along Pennsylvania Run 0.0 to 3.3

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
EPRPR001	38.0875	-85.643	2.4	Louisville MSD	Fecal Coliform	Yes-SCR
PR-1	38.0875	-85.643	2.4	USGS	*E. coli*	Yes-PCR

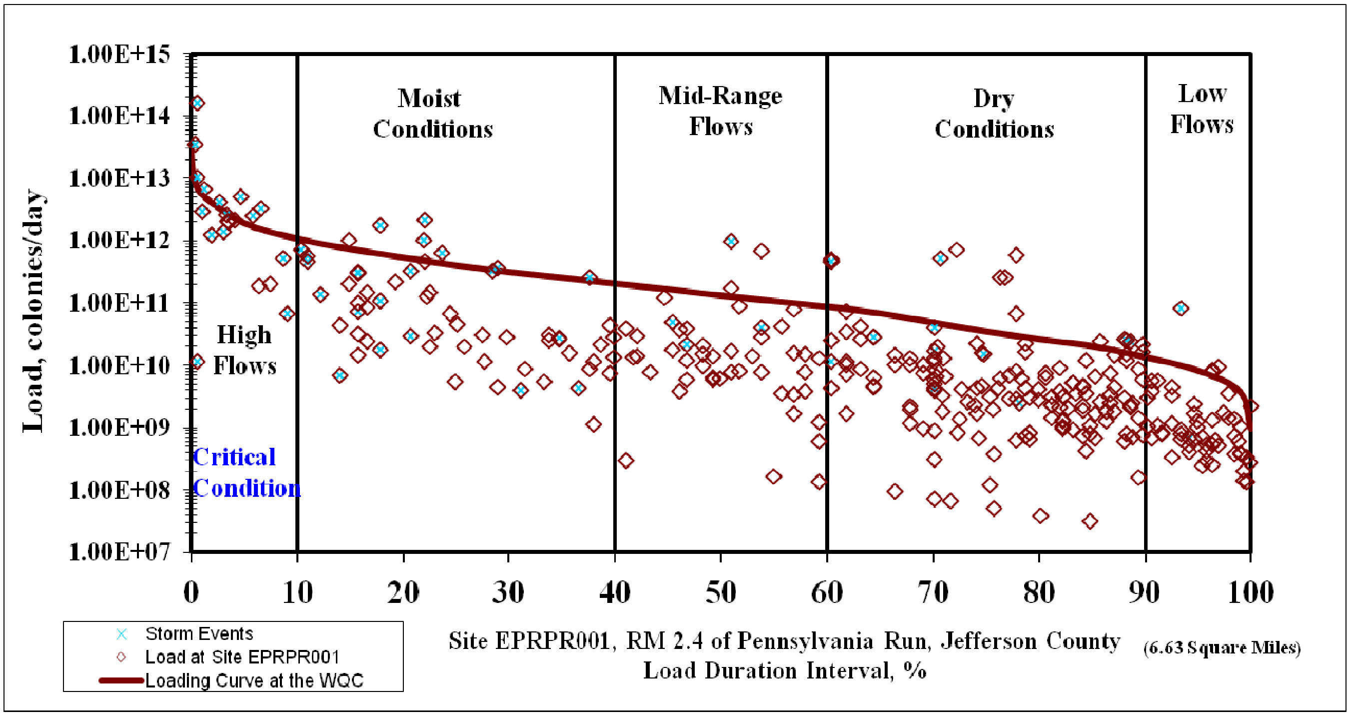

Figure 8.46 SCR Fecal Coliform LDC for Site EPRPR001

Table 8.87 SCR Fecal Coliform TMDLs by Flow Zone for Site EPRPR001

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.65E+14	7.24E+12	7.24E+11	6.52E+12	3.12E+09	6.51E+12
Moist	2.17E+12	4.75E+11	4.75E+10	4.27E+11	3.12E+09	4.24E+11
Mid	9.91E+11	1.32E+11	1.32E+10	1.19E+11	3.12E+09	1.16E+11
Dry	5.97E+11	2.98E+10	2.98E+09	2.69E+10	3.12E+09	2.37E+10
Low	8.35E+10	1.03E+10	1.03E+09	9.25E+09	3.12E+09	6.13E+09

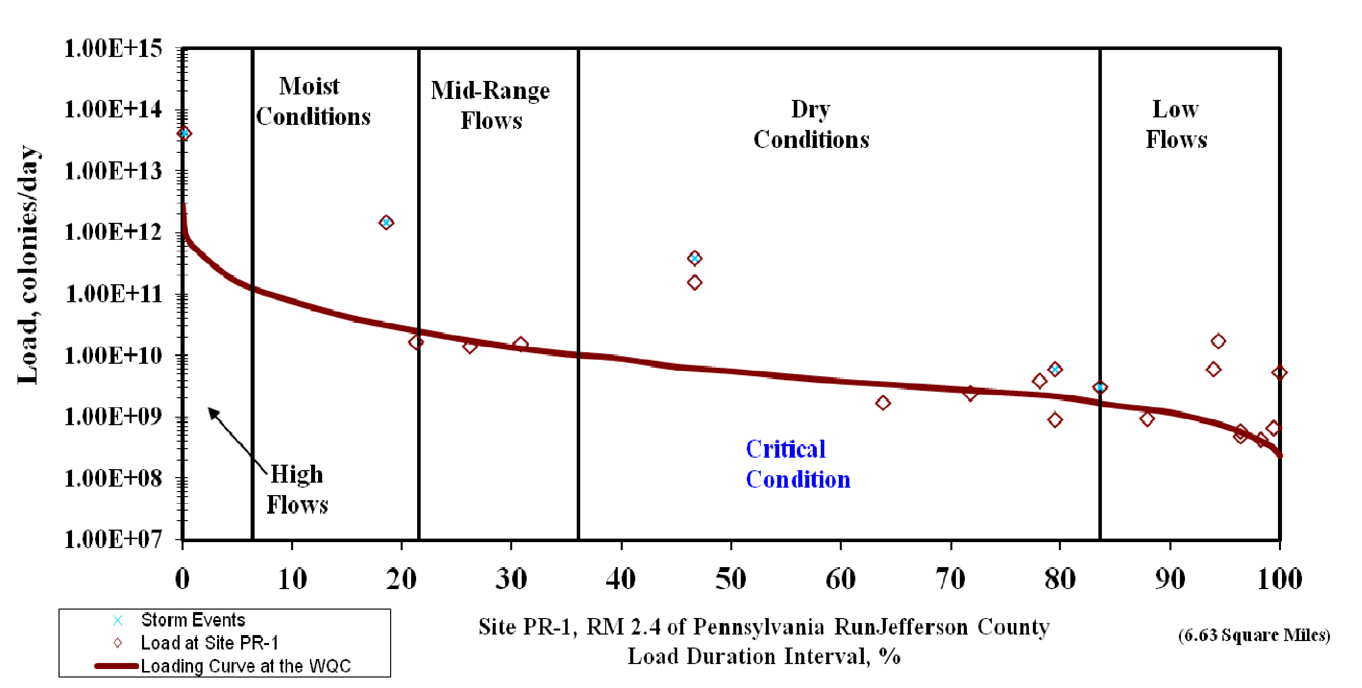

Figure 8.47 PCR *E. coli* LDC for Site PR-1

Table 8.88 PCR *E. coli* TMDLs by Flow Zone for Site PR-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	4.09E+13	1.31E+12	1.31E+11	1.18E+12	1.87E+09	1.18E+12
Moist	1.45E+12	3.17E+10	3.17E+09	2.85E+10	1.87E+09	2.67E+10
Mid	1.52E+10	1.35E+10	1.35E+09	1.22E+10	1.87E+09	1.03E+10
Dry	3.77E+11	6.46E+09	6.46E+08	5.81E+09	1.87E+09	3.94E+09
Low	1.71E+10	8.22E+08	8.22E+07	7.40E+08	1.87E+09	-1.13E+09

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Pennsylvania Run at RM 0.0 has an upstream watershed area of 8.40 square miles while sites EPRPR001 and PR-1 have an upstream watershed area of 6.63 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of this area (1.27) to generate the final fecal coliform and *E. coli* TMDL allocations for the impaired segment (Table 8.89). Because site EPRPR001 had sufficient data to calculate geometric means, the greatest geometric mean was determined (Table 8.90). The breakdown of WLAs assigned to permitted entities is presented in Table 8.91.

Table 8.89 Fecal Coliform (SCR) and *E. coli* (PCR) TMDL Allocations for Pennsylvania Run 0.0 to 3.3

Pollutant (Use)	Fecal Coliform (SCR)	*E. coli* (PCR)
Existing Load (colonies/day)	2.10E+14	4.79E+11
TMDL (colonies/day)	9.20E+12	8.20E+09
MOS (colonies/day)	9.20E+11	8.20E+08
TMDL Target (colonies/day)	8.28E+12	7.38E+09
SWS-WLA (colonies/day)	3.12E+09	1.87E+09
Remainder (colonies/day)	8.27E+12	5.51E+09
Future Growth-WLA (colonies/day)	4.14E+11	2.76E+08
MS4-WLA (colonies/day)	6.45E+12	4.30E+09
LA (colonies/day)	1.41E+12	9.42E+08

Table 8.90 Greatest Geometric Mean for Fecal Coliform at Site EPRPR001

Sample Date	Fecal Coliform (colonies/100 ml)	Geomean (colonies/100 ml)
9/15/2005	643	2,080.0
9/21/2005	16,250	
9/27/2005	290	
10/3/2005	2,950	
10/7/2005	>33,550	
10/13/2005	270	

Table 8.91 WLAs Assigned to Permitted Entities in Pennsylvania Run 0.0 to 3.3 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	SCR Fecal Coliform WLA (colonies/ day)	*E. coli* WLA (colonies/ day)
KY0029416	MCNEELY LAKE WQTC MSD	SWS	2.05E-01	3.17E-01	3.10E+09	1.86E+09
KYG400137	PETERS RESIDENCE	SWS	8.00E-04	1.24E-03	1.21E+07	7.27E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	5.68E+12	3.78E+09
KYG200039	Bullitt County Fiscal Court	MS4	N/A	N/A	7.69E+11	5.12E+08

8.2.14 Pope Lick 0.0 to 2.1

Pope Lick at RM 0.0 is a second order stream located in Jefferson County (Figure 8.48). The subwatershed for the impaired segment has a total drainage area of approximately 9.7 square miles. Pope Lick 0.0 to 2.1 does not support the PCR use due to *E. coli*. Information about Pope Lick 0.0 to 2.1, including its WBID and MS4 area is shown in Table 8.92. The MS4 areas in this subwatershed are permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.49). There are six KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.97). The land cover in this subwatershed is a mixture of forested (48.6%), followed by developed (25.6%) and agriculture (20.8%, mostly pasture) as shown in Table 8.93.

Table 8.92 Pope Lick 0.0 to 2.1 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Pope Lick	Pope Lick 0.0 to 2.1	KY501089_01	Jefferson	6,197	9.7	2
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
4,853	78.32					

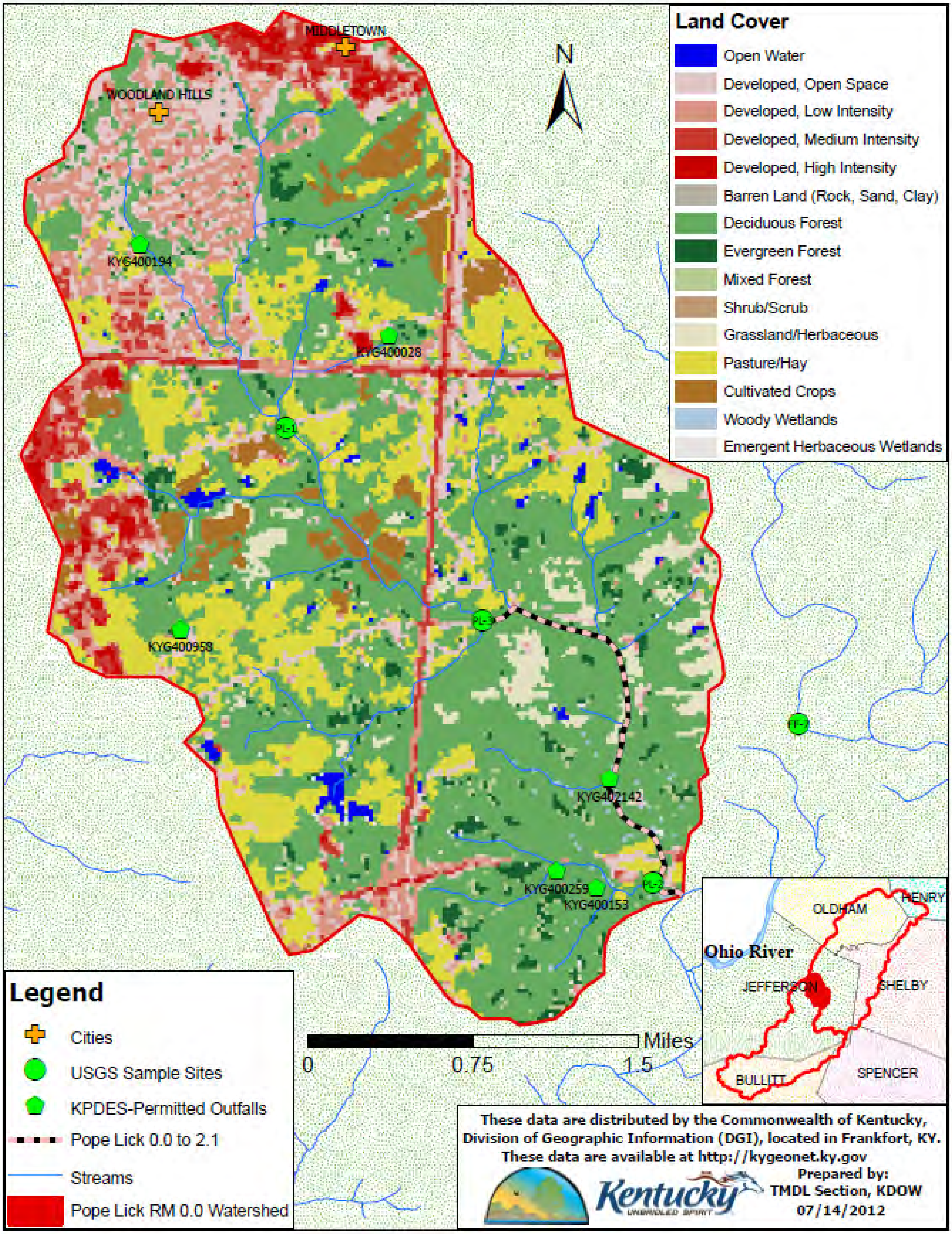

Figure 8.48 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Pope Lick 0.0 to 2.1 Subwatershed (lower portion)

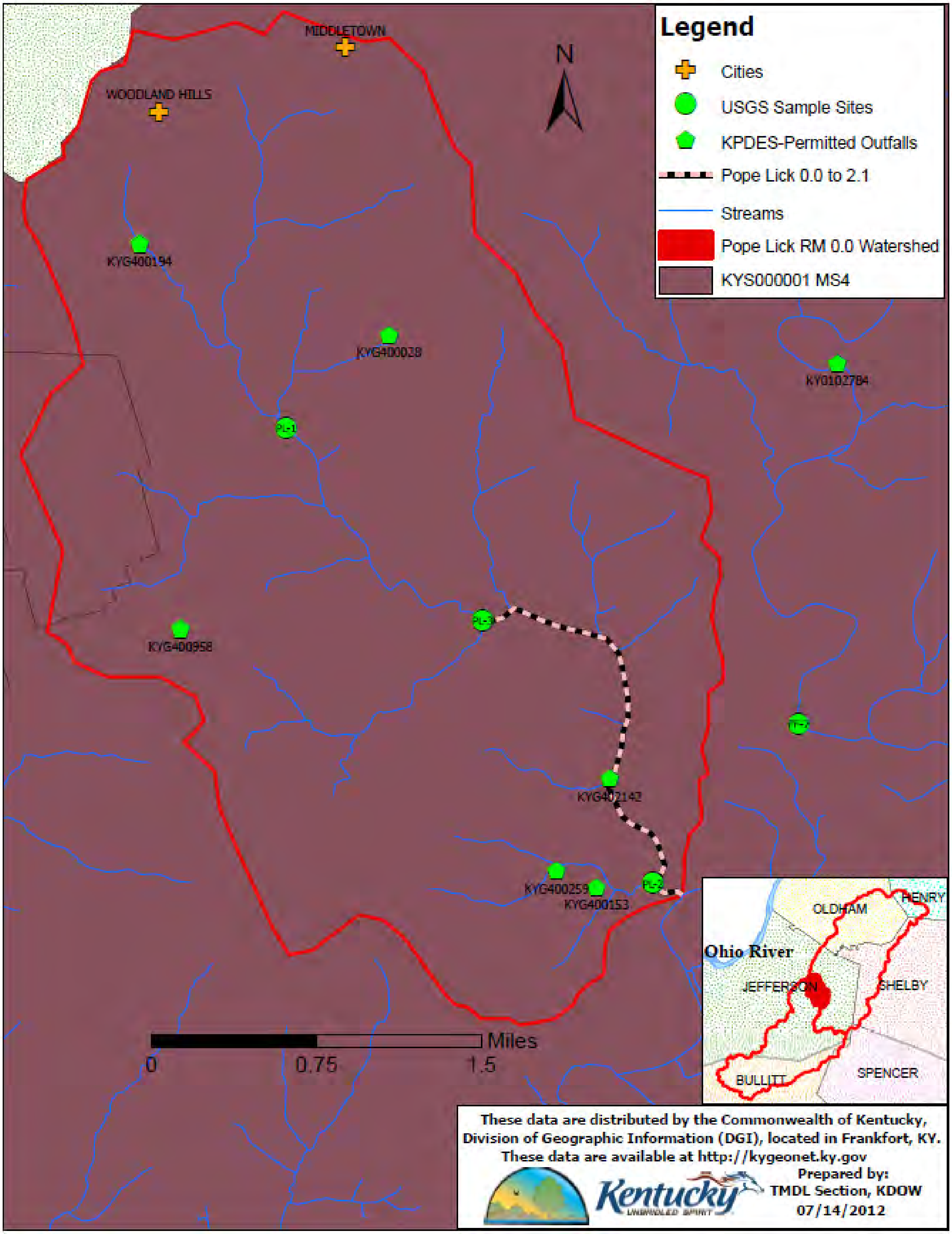

Figure 8.49 Urbanized Boundary of MS4 Entities in Pope Lick 0.0 to 2.1 Subwatershed

Table 8.93 Land Cover in the Pope Lick 0.0 to 2.1 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	25.58	1,585	2.5	5.0%
Agriculture (total)	20.79	1,288	2.0	
Pasture	16.97	1,052	1.6	
Row Crop	3.82	237	0.4	
Forest	48.61	3,012	4.7	
Natural Grassland	3.59	222	0.3	
Water	0.89	55	0.1	
Wetland	0.52	32	0.1	
Barren	0.03	2	0.0	
Total	100.00	6,197	9.7	

Site information is shown in Table 8.94; site PL-2 was used to develop the *E. coli* LDC (Figure 8.50). Data from site PL-2 are presented in Appendix B. The critical condition was the high flow zone, although exceedances were found in other zones. Table 8.95 shows the TMDLs for the flow zones associated with *E. coli* at site PL-2 (the yellow highlight indicates the critical condition TMDL).

Table 8.94 Sample Sites Located Along Pope Lick 0.0 to 2.1

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
PL-2	38.188889	-85.488	0.15	USGS	*E. coli*	Yes-PCR
PL-3	38.206389	-85.502	2.1	USGS	*E. coli*	No

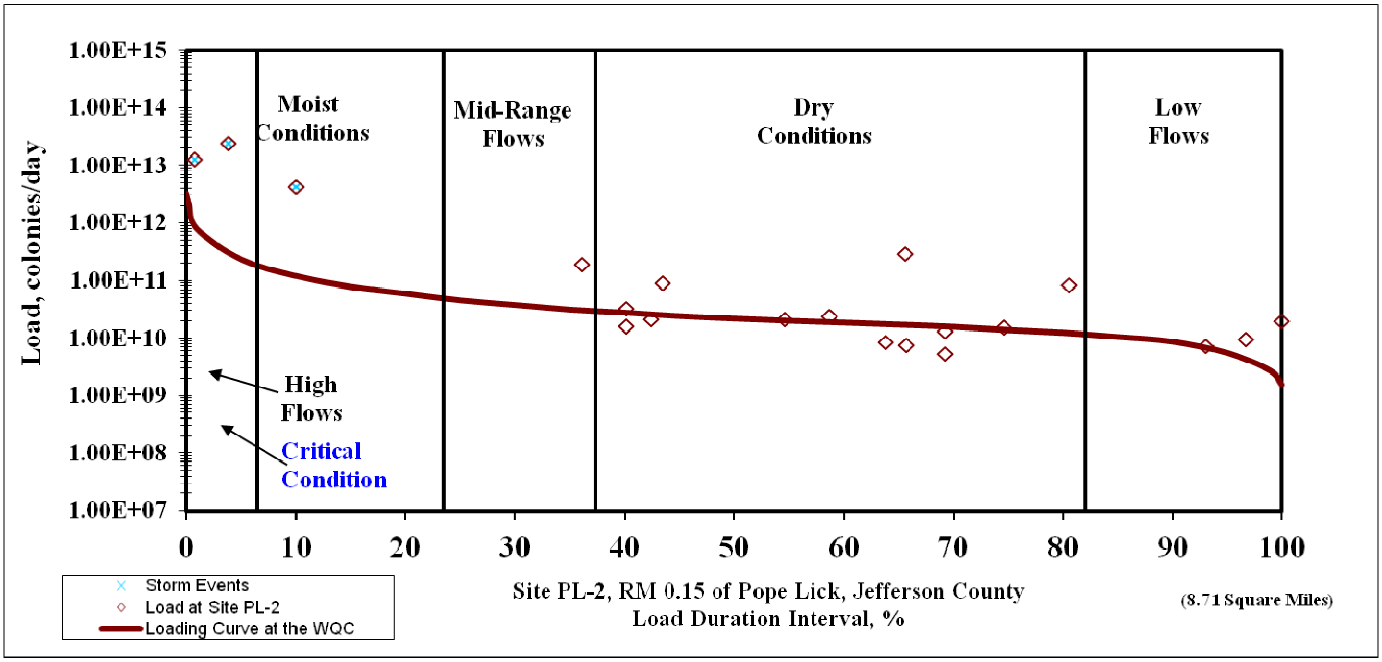

Figure 8.50 PCR *E. coli* LDC for Site PL-2

Table 8.95 PCR *E. coli* TMDLs by Flow Zone for Site PL-2

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	2.39E+13	2.87E+11	2.87E+10	2.58E+11	3.63E+07	2.58E+11
Moist	4.25E+12	1.18E+11	1.18E+10	1.07E+11	3.63E+07	1.07E+11
Mid	1.87E+11	2.99E+10	2.99E+09	2.70E+10	3.63E+07	2.69E+10
Dry	2.87E+11	1.68E+10	1.68E+09	1.51E+10	3.63E+07	1.51E+10
Low	1.91E+10	1.70E+09	1.70E+08	1.53E+09	3.63E+07	1.49E+09

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Pope Lick at RM 0.0 has an upstream watershed area of 9.68 square miles while site PL-2 has an upstream watershed area of 8.71 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of this area (1.11) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.96). The breakdown of WLAs assigned to permitted entities is presented in Table 8.97.

Table 8.96 *E. coli* (PCR) TMDL Allocations for Pope Lick 0.0 to 2.1

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	2.65E+13
TMDL (colonies/day)	3.18E+11
MOS (colonies/day)	3.18E+10
TMDL Target (colonies/day)	2.86E+11
SWS-WLA (colonies/day)	3.63E+07
Remainder (colonies/day)	2.86E+11
Future Growth-WLA (colonies/day)	1.43E+10
MS4-WLA (colonies/day)	2.24E+11
LA (colonies/day)	4.77E+10

Table 8.97 WLAs Assigned to Permitted Entities in Pope Lick 0.0 to 2.1 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG400028	AULBACH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400153	DIORIO RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400194	SEBA RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400259	BALLARD RESIDENCE	SWS	7.50E-04	1.16E-03	6.81E+06
KYG400958	PORTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG402142	CARPENTER RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	2.24E+11

8.2.15 Pope Lick 2.1 to 5.5

Pope Lick at RM 2.1 is a first order stream located in Jefferson County (Figure 8.51). The subwatershed for the impaired segment has a total drainage area of approximately 5 square miles. Pope lick 2.1 to 5.5 does not support the PCR use due to *E. coli*. Information about Pope Lick 2.1 to 5.5, including its WBID and MS4 area is shown in Table 8.98. The MS4 areas in this subwatershed are permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.52). There are three KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.103). The land cover in this subwatershed is a mixture of developed (37.6%) and forested (36.5%), followed by agriculture (23.6%, mostly pasture) as shown in Table 8.99.

Table 8.98 Pope Lick 2.1 to 5.5 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
Pope Lick	Pope Lick 2.1 to 5.5	KY501089_00	Jefferson	3,211	5	1
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
2,432	75.73					

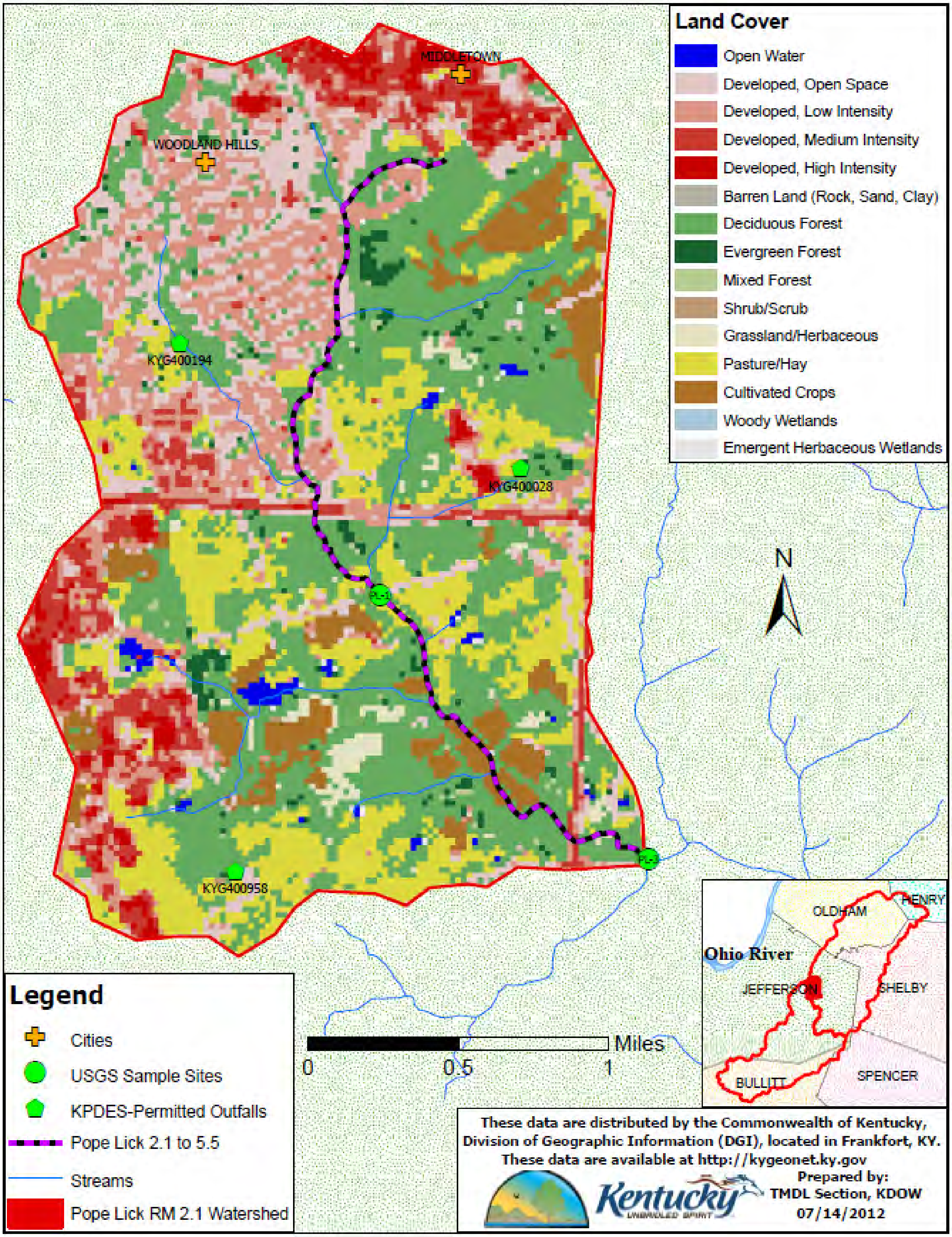

Figure 8.51 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the Pope Lick 2.1 to 5.5 Subwatershed (upper portion)

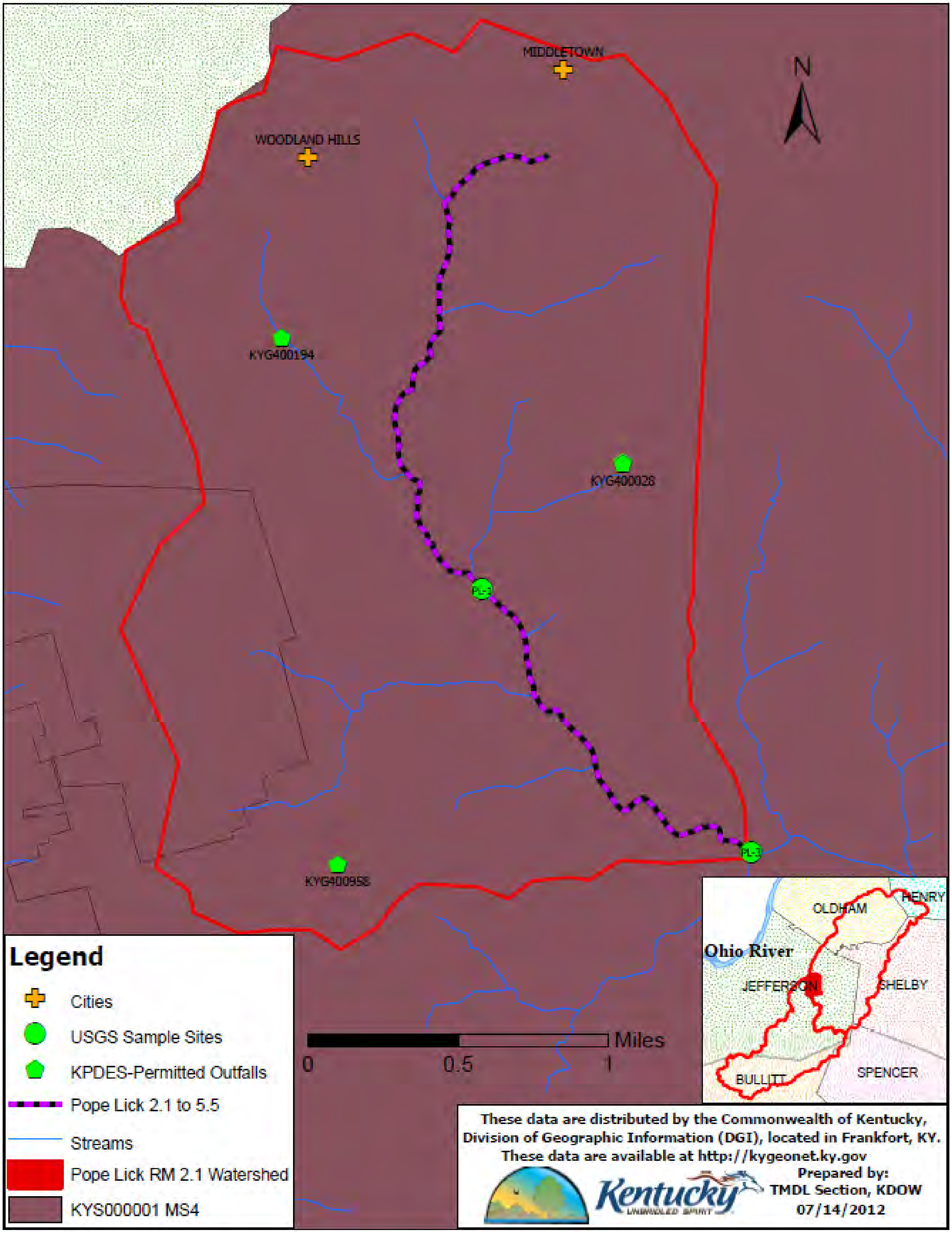

Figure 8.52 Urbanized Boundary of MS4 Entities in Pope Lick 2.1 to 5.5 Subwatershed

Table 8.99 Land Cover in the Pope Lick 2.1 to 5.5 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	37.58	1,207	1.9	5.0%
Agriculture (total)	23.58	757	1.2	
Pasture	16.89	542	0.8	
Row Crop	6.69	215	0.3	
Forest	36.45	1,170	1.8	
Natural Grassland	1.47	47	0.1	
Water	0.69	22	0.0	
Wetland	0.19	6	0.0	
Barren	0.04	1	0.0	
Total	100.00	3,211	5.0	

Site information is shown in Table 8.100; site PL-1 was used to develop the *E. coli* LDC (Figure 8.53). Data from site PL-1 are presented in Appendix B. The critical condition was the high flow zone, although exceedances were found in other zones. Table 8.101 shows the TMDLs for the flow zones associated with *E. coli* at site PL-1 (the yellow highlight indicates the critical condition TMDL).

Table 8.100 Sample Sites Located Along Pope Lick 2.1 to 5.5

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
PL-1	38.21916	-85.52	3.6	USGS	*E. coli*	Yes-PCR

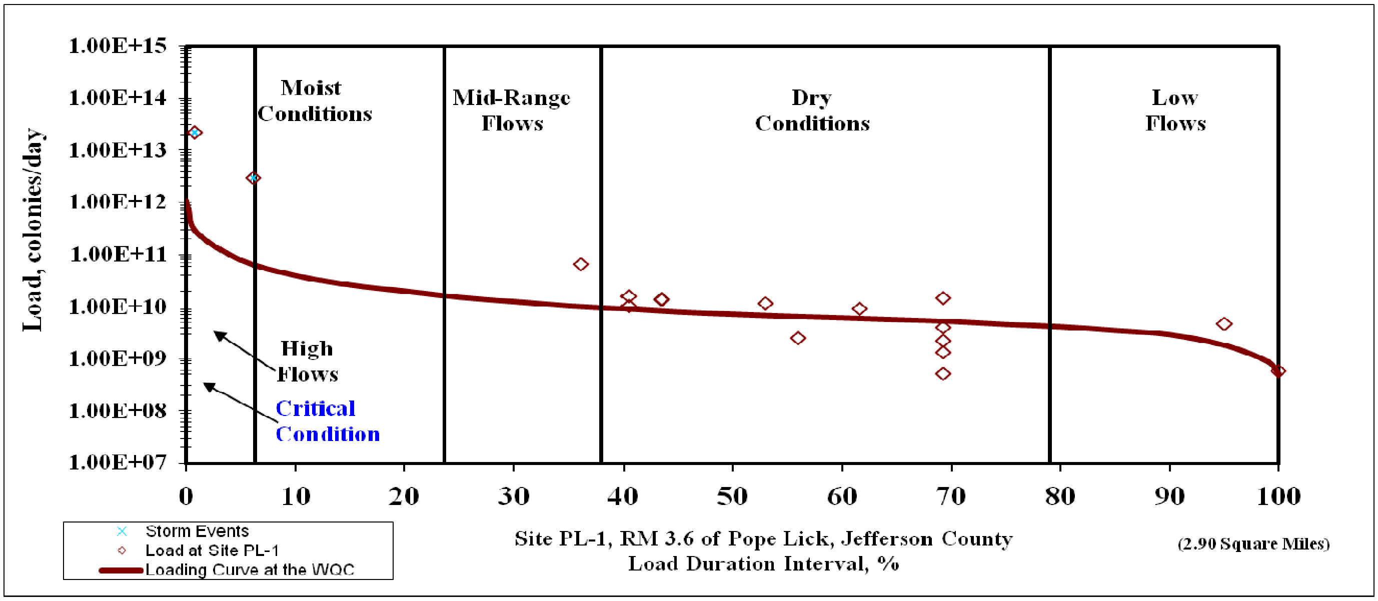

Figure 8.53 PCR *E. coli* LDC for Site PL-1

Table 8.101 PCR *E. coli* TMDLs by Flow Zone for Site PL-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	2.20E+13	3.10E+11	3.10E+10	2.79E+11	1.36E+07	2.79E+11
Moist	*	4.80E+10	4.80E+09	4.32E+10	1.36E+07	4.32E+10
Mid	6.65E+10	9.98E+09	9.98E+08	8.98E+09	1.36E+07	8.97E+09
Dry	1.50E+10	5.28E+09	5.28E+08	4.76E+09	1.36E+07	4.74E+09
Low	4.70E+09	1.82E+09	1.82E+08	1.64E+09	1.36E+07	1.62E+09

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. Pope Lick at RM 2.1 has an upstream watershed area of 5.02 square miles while site PL-1 has an upstream watershed area of 2.9 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.73) and the individual SWS-WLA for facility permit # KYG400958 (which is located below site PL-1) was added to the segment SWS-WLA to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.102). The breakdown of WLAs assigned to permitted entities is presented in Table 8.103.

Table 8.102 *E. coli* (PCR) TMDL Allocations for Pope Lick 2.1 to 5.5

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	3.80E+13
TMDL (colonies/day)	5.36E+11
MOS (colonies/day)	5.36E+10
TMDL Target (colonies/day)	4.83E+11
SWS-WLA (colonies/day)	1.82E+07
Remainder (colonies/day)	4.83E+11
Future Growth-WLA (colonies/day)	2.41E+10
MS4-WLA (colonies/day)	3.66E+11
LA (colonies/day)	9.30E+10

Table 8.103 WLAs Assigned to Permitted Entities in Pope Lick 2.1 to 5.5 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYG400028	AULBACH RESIDENCE	SWS	5.00E-04	7.74E-04	4.54E+06
KYG400194	SEBA RESIDENCE	SWS	1.00E-03	1.55E-03	9.08E+06
KYG400958	PORTER RESIDENCE[1]	SWS	5.00E-04	7.74E-04	4.54E+06
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	3.66E+11

Note: [1]Indicates that the facility is located below site PL-1.

8.2.16 South Fork Currys Fork 0.0 to 6.1

South Fork Currys Fork at RM 0.0 is a second order stream located in Oldham County (Figure 8.54). The subwatershed for the impaired segment has a total drainage area of approximately 9.3 square miles. South Fork Currys Fork 0.0 to 6.1 does not support the PCR use due to *E. coli*. Information about South Fork Currys Fork 0.0 to 6.1, including its WBID and MS4 area is shown in Table 8.104. The MS4 areas in this subwatershed are permitted under KYG200005 and the KYTC permit KYS000003 (Figure 8.55). There are four KPDES permitted SWS dischargers within the subwatershed boundary (see Table 8.109). The land cover in this subwatershed is a mixture of forested (46.7.7%) and agriculture (36%, mostly pasture), followed by developed (12.7%) as shown in Table 8.105.

Table 8.104 South Fork Currys Fork 0.0 to 6.1 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
South Fork Currys Fork	South Fork Currys Fork 0.0 to 6.1	KY503919_01	Oldham	5,949	9.3	2
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed					
1,981	33.30					

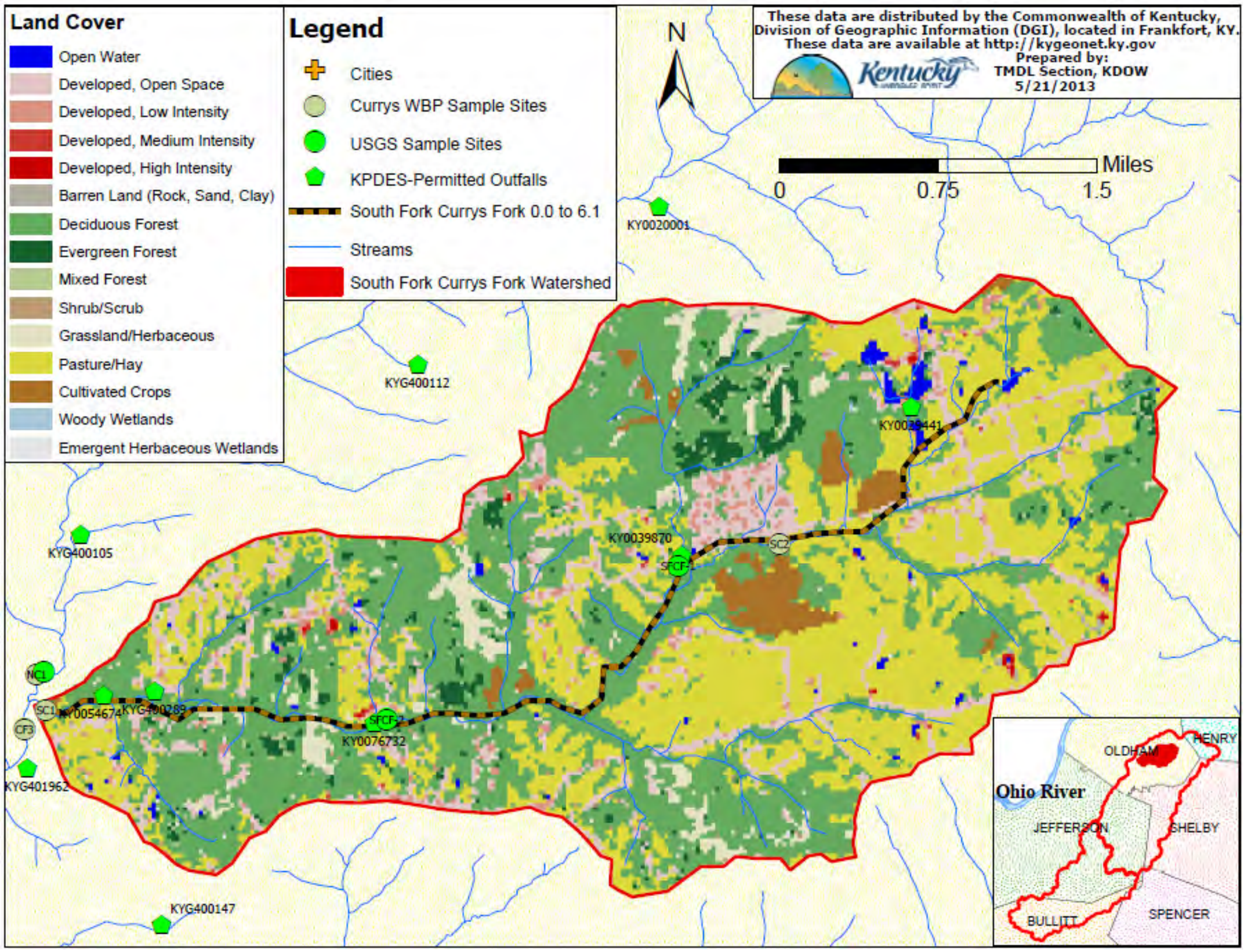

Figure 8.54 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the South Fork Currys Fork 0.0 to 6.1 Subwatershed

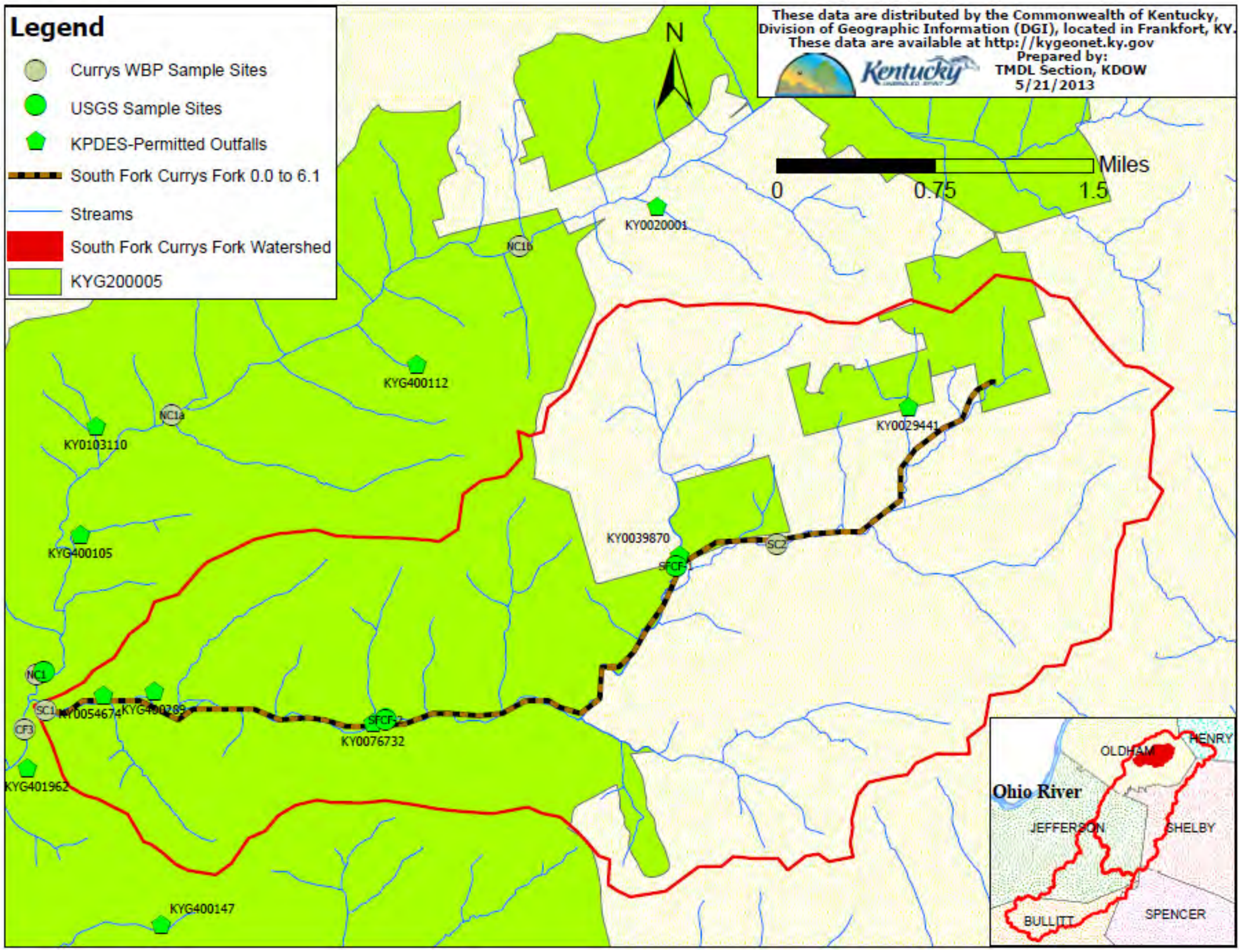

Figure 8.55 Urbanized Boundary of MS4 Entities in South Fork Currys Fork 0.0 to 6.1 Subwatershed

Table 8.105 Land Cover in the South Fork Currys Fork 0.0 to 6.1 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	12.68	754	1.2	2.0%
Agriculture (total)	35.95	2,139	3.3	
Pasture	33.35	1,984	3.1	
Row Crop	2.61	155	0.2	
Forest	46.69	2,777	4.3	
Natural Grassland	3.65	217	0.3	
Water	0.78	47	0.1	
Wetland	0.14	8	0.0	
Barren	0.10	6	0.0	
Total	100.00	5,949	9.3	

Site information is shown in Table 8.106; site SFCF-2 was used to develop the *E. coli* LDC (Figure 8.56). Data from site SFCF-2 are presented in Appendix B. The critical condition was the moist flow zone, although exceedances were found in other zones. Table 8.107 shows the TMDLs for the flow zones associated with *E. coli* at site SFCF-2 (the yellow highlight indicates the critical condition TMDLs).

Table 8.106 Sample Sites Located Along South Fork Currys Fork 0.0 to 6.1

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
SC1	38.356789	-85.4386	0.1	Currys Fork WBP	Fecal Coliform	No
SC2	38.36812	-85.3746	4.55	Currys Fork WBP	Fecal Coliform	No
SFCF-2	38.356111	-85.4089	1.9	USGS	*E. coli*	Yes-PCR

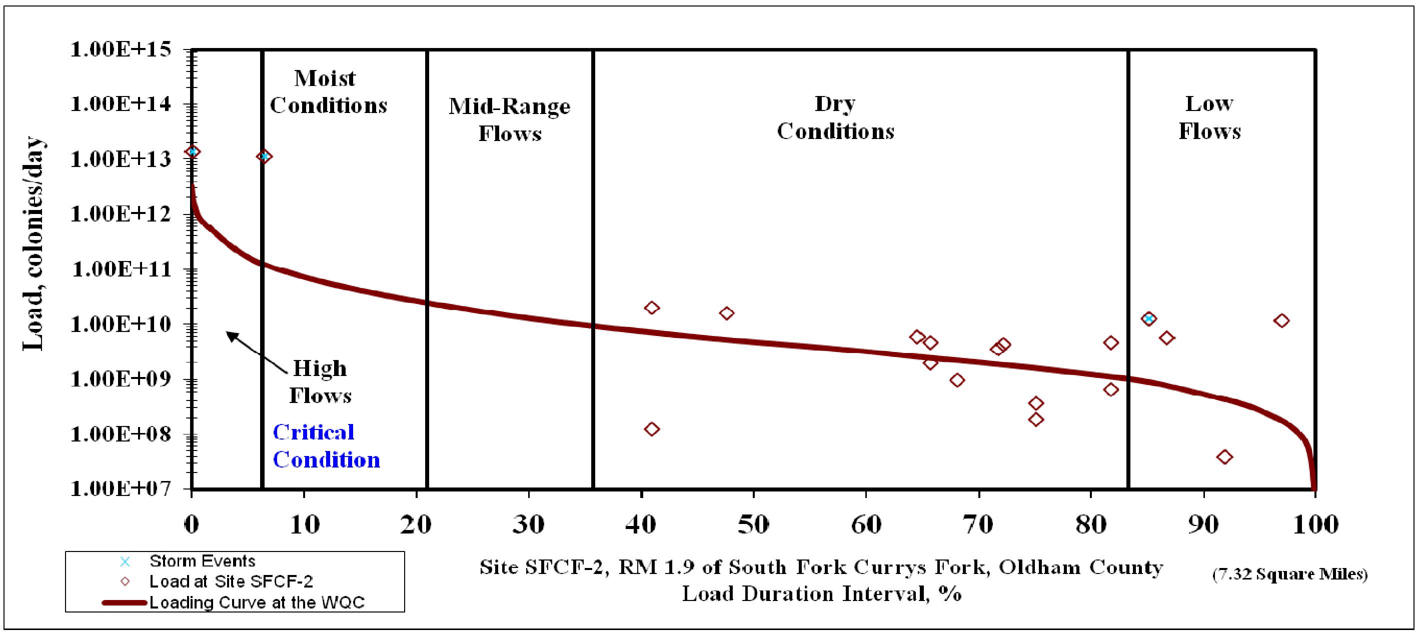

Figure 8.56 PCR *E. coli* LDC for Site SFCF-2

Table 8.107 PCR *E. coli* TMDLs by Flow Zone for Site SFCF-2

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.36E+13	7.59E+11	7.59E+10	6.83E+11	9.08E+08	6.82E+11
Moist	1.15E+13	1.25E+11	1.25E+10	1.13E+11	9.08E+08	1.12E+11
Mid	*	2.21E+10	2.21E+09	1.99E+10	9.08E+08	1.90E+10
Dry	4.65E+09	1.12E+09	1.12E+08	1.00E+09	9.08E+08	9.56E+07
Low	1.17E+10	1.76E+08	1.76E+07	1.59E+08	9.08E+08	-7.50E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. South Fork Currys Fork at RM 0.0 has an upstream watershed area of 9.30 square miles while site SFCF-2 has an upstream watershed area of 7.32 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.27) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.108). The breakdown of WLAs assigned to permitted entities is presented in Table 8.109.

Table 8.108 *E. coli* (PCR) TMDL Allocations for South Fork Currys Fork 0.0 to 6.1

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	1.46E+13
TMDL (colonies/day)	1.59E+11
MOS (colonies/day)	1.59E+10
TMDL Target (colonies/day)	1.43E+11
SWS-WLA (colonies/day)	1.41E+09
Remainder (colonies/day)	1.42E+11
Future Growth-WLA (colonies/day)	2.84E+09
MS4-WLA (colonies/day)	4.72E+10
LA (colonies/day)	9.18E+10

Table 8.109 WLAs Assigned to Permitted Entities in South Fork Currys Fork 0.0 to 6.1 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	9.08E+08
KY0054674	LOCKWOOD ESTATES SUBDIVISION[1]	SWS	4.50E-02	6.96E-02	4.09E+08
KY0076732	CENTERFIELD ELEMENTARY[1]	SWS	1.00E-02	1.55E-02	9.08E+07
KYG400289	GIBSON RESIDENCE[1]	SWS	4.00E-04	6.19E-04	3.63E+06
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	4.72E+10

Note: [1]Indicates that these facilities are below site SFCF-2.

8.2.17 South Long Run 0.0 to 3.35

South Long Run at RM 0.0 is a second order stream located in Jefferson County (Figure 8.57). The subwatershed for the impaired segment has a total drainage area of approximately 7.6 square miles. South long Run 0.0 to 3.35 does not support the PCR use due to *E. coli*. Information about South long Run 0.0 to 3.35, including its WBID and MS4 area is shown in Table 8.110. The MS4 areas in this subwatershed are permitted under KYS000001 and the KYTC permit KYS000003 (Figure 8.58). There are no KPDES permitted SWS dischargers within the subwatershed boundary. The land cover in this subwatershed is a mixture of agriculture (50%, mostly pasture) and forested (35.1%), followed by developed (7.7%) as shown in Table 8.111.

Table 8.110 South Long Run 0.0 to 3.35 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
South Long Run	South Long Run 0.0 to 3.35	KY503961_01	Jefferson	4,884	7.6	2
KYS000001 and KYS000003 MS4 Area (acres)	KYS000001 and KYS000003 % MS4 in Watershed					
986	20.19					

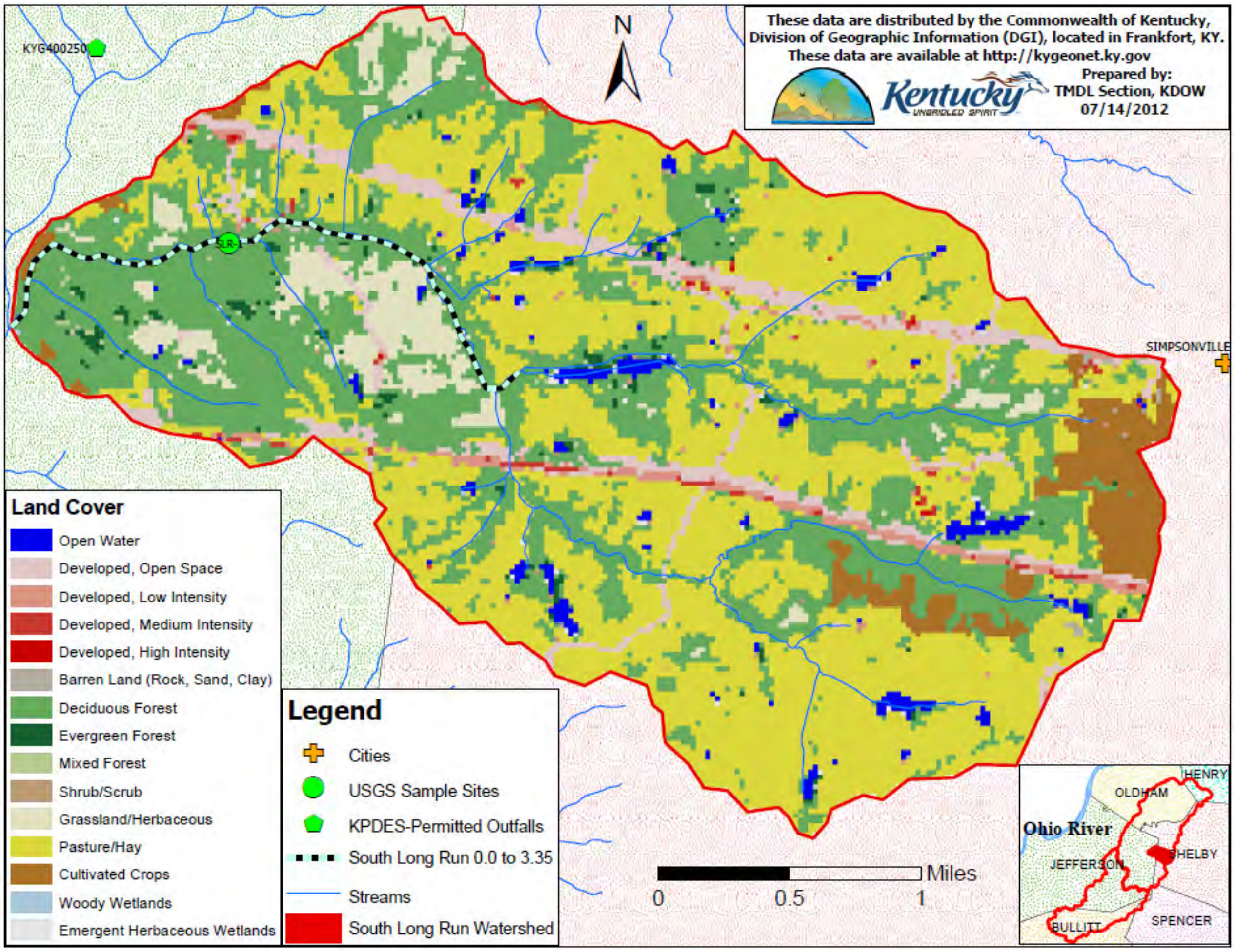

Figure 8.57 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the South Long Run 0.0 to 3.35 Subwatershed

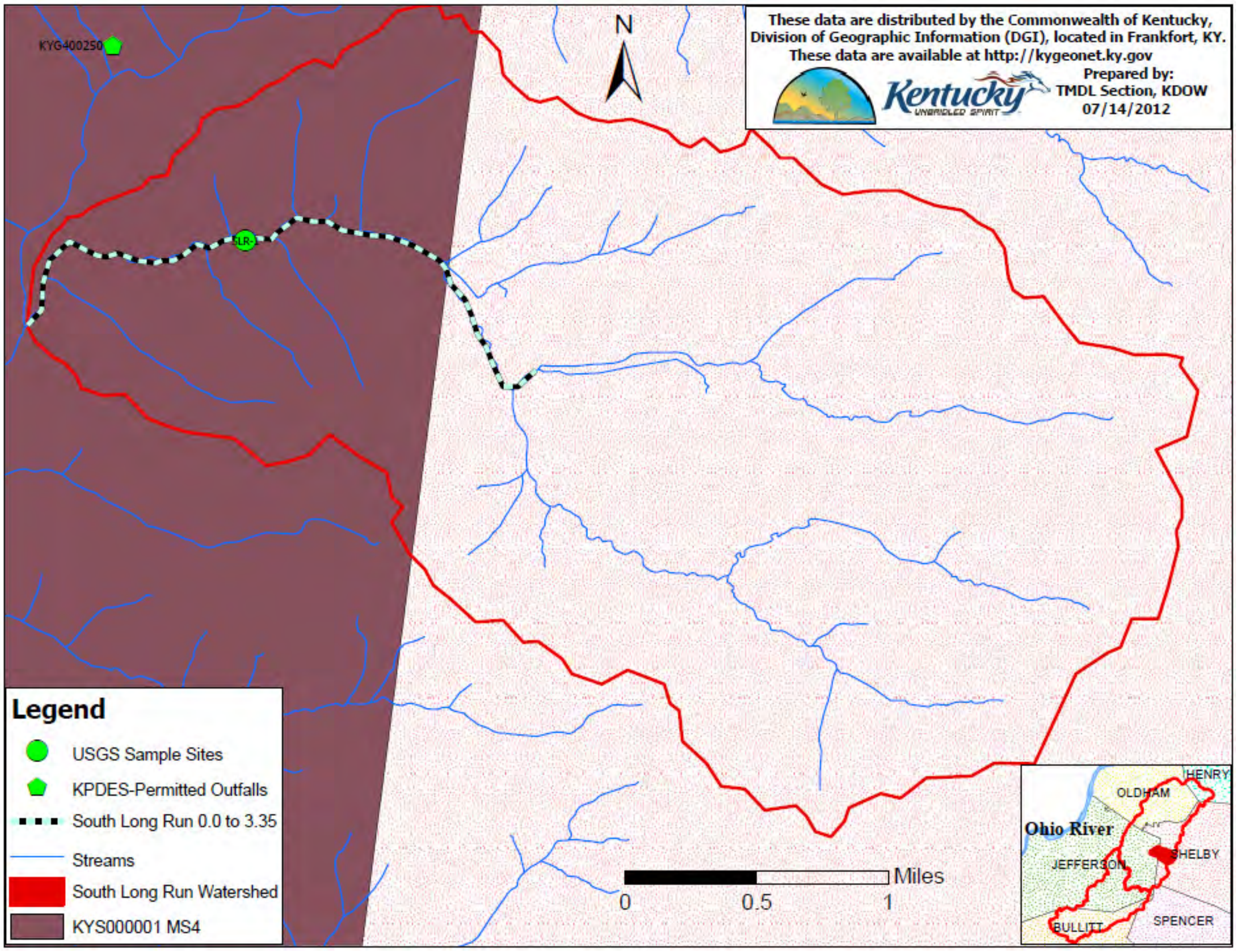

Figure 8.58 Urbanized Boundary of MS4 Entities in South Long Run 0.0 to 3.35 Subwatershed

Table 8.111 Land Cover in the South Long Run 0.0 to 3.35 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	7.69	375	0.6	1.0%
Agriculture (total)	49.99	2,441	3.8	
Pasture	45.68	2,231	3.5	
Row Crop	4.31	211	0.3	
Forest	35.11	1,715	2.7	
Natural Grassland	5.15	251	0.4	
Water	1.73	85	0.1	
Wetland	0.21	10	0.0	
Barren	0.12	6	0.0	
Total	100.00	4,884	7.6	

Site information is shown in Table 8.112; site SLR-1 was used to develop the *E. coli* LDC (Figure 8.59). Data from site SLR-2 are presented in Appendix B. The critical condition was the dry flow zone, although exceedances were found in other zones. Table 8.113 shows the TMDLs for the flow zones associated with *E. coli* at site SLR-1 (the yellow highlight indicates the critical condition TMDLs).

Table 8.112 Sample Sites Located Along South Long Run 0.0 to 3.35

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
SLR-1	38.229444	-85.42492	1.15	USGS	*E. coli*	Yes-PCR

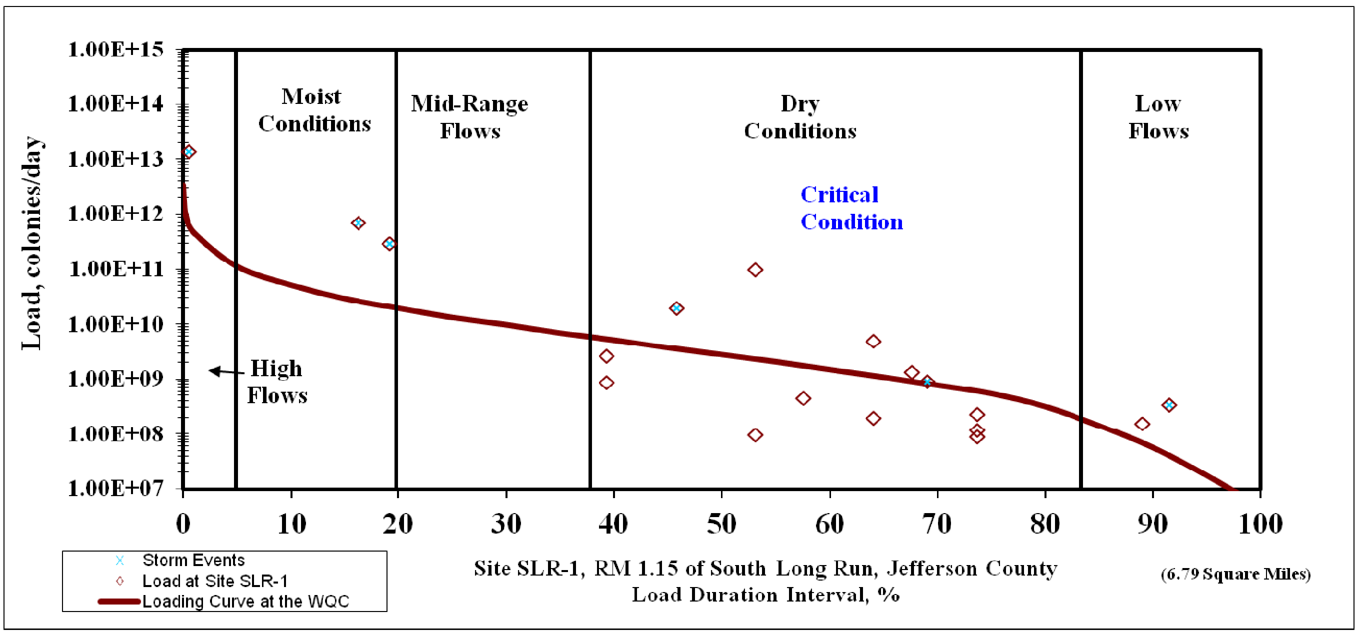

Figure 8.59 PCR *E. coli* LDC for Site SLR-1

Table 8.113 PCR *E. coli* TMDLs by Flow Zone for SLR-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies / day)	Remainder (colonies/ day)
High	1.38E+13	8.06E+11	8.06E+10	7.26E+11	0.0	7.26E+11
Moist	6.91E+11	2.63E+10	2.63E+09	2.37E+10	0.0	2.37E+10
Mid	*	1.73E+10	1.73E+09	1.56E+10	0.0	1.56E+10
Dry	9.69E+10	2.35E+09	2.35E+08	2.11E+09	0.0	2.11E+09
Low	3.43E+08	2.94E+07	2.94E+06	2.64E+07	0.0	2.64E+07

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. South Long Run at RM 0.0 has an upstream watershed area of 7.63 square miles while site SLR-1 has an upstream watershed area of 6.79 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.12) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.114). The breakdown of WLAs assigned to permitted entities is presented in Table 8.115.

Table 8.114 *E. coli* (PCR) TMDL Allocations for South Long Run 0.0 to 3.35

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	1.09E+11
TMDL (colonies/day)	2.63E+09
MOS (colonies/day)	2.63E+08
TMDL Target (colonies/day)	2.37E+09
SWS-WLA (colonies/day)	0.0
Remainder (colonies/day)	2.37E+09
Future Growth-WLA (colonies/day)	2.37E+07
MS4-WLA (colonies/day)	4.78E+08
LA (colonies/day)	1.87E+09

Table 8.115 WLAs Assigned to Permitted Entities in South Long Run 0.0 to 3.35 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KYS000001 and KYS000003	Louisville Metropolitan Sewer District and KY Transportation Cabinet	MS4	N/A	N/A	4.78E+08

8.2.18 UT of South Fork Currys Fork 0.0 to 1.8

UT of South Fork Currys fork at RM 0.0 is a first order stream (at the 1:24,000 scale) located in Oldham County (Figure 8.60). The subwatershed for the impaired segment has a total drainage area of approximately 1.14 square miles. UT of South Fork Currys Fork 0.0 to 1.8 does not support the PCR use due to *E. coli*. Information about UT of South Fork Currys Fork 0.0 to 1.8, including its WBID and MS4 area is shown in Table 8.116. The MS4 areas in this subwatershed are permitted under KYG200005 and the KYTC permit KYS000003 (Figure 8.61). There is one KPDES permitted SWS discharger within the subwatershed boundary (Figure 8.60). The land cover in this subwatershed is primarily forested (71.8%), followed by agriculture (12.4%, mostly pasture) and grasslands (9.3%) as shown in Table 8.117.

Table 8.116 UT of the South Fork Currys Fork 0.0 to 1.8 Segment Information

Stream	Stream Segment	WBID #	County	Acres	Square Miles	Stream Order
UT of South Fork Currys Fork	UT of South Fork Currys Fork 0.0 to 1.8	KY503919-3.9_01	Oldham	730	1.14	1*
KYG200005 and KYS000003 MS4 Area (acres)	KYG200005 and KYS000003 % MS4 in Watershed					
37	5.11					

Note: *Indicates that this stream segment does not display at the 1:100K scale. It is reported as first order on a 1:24K scale.

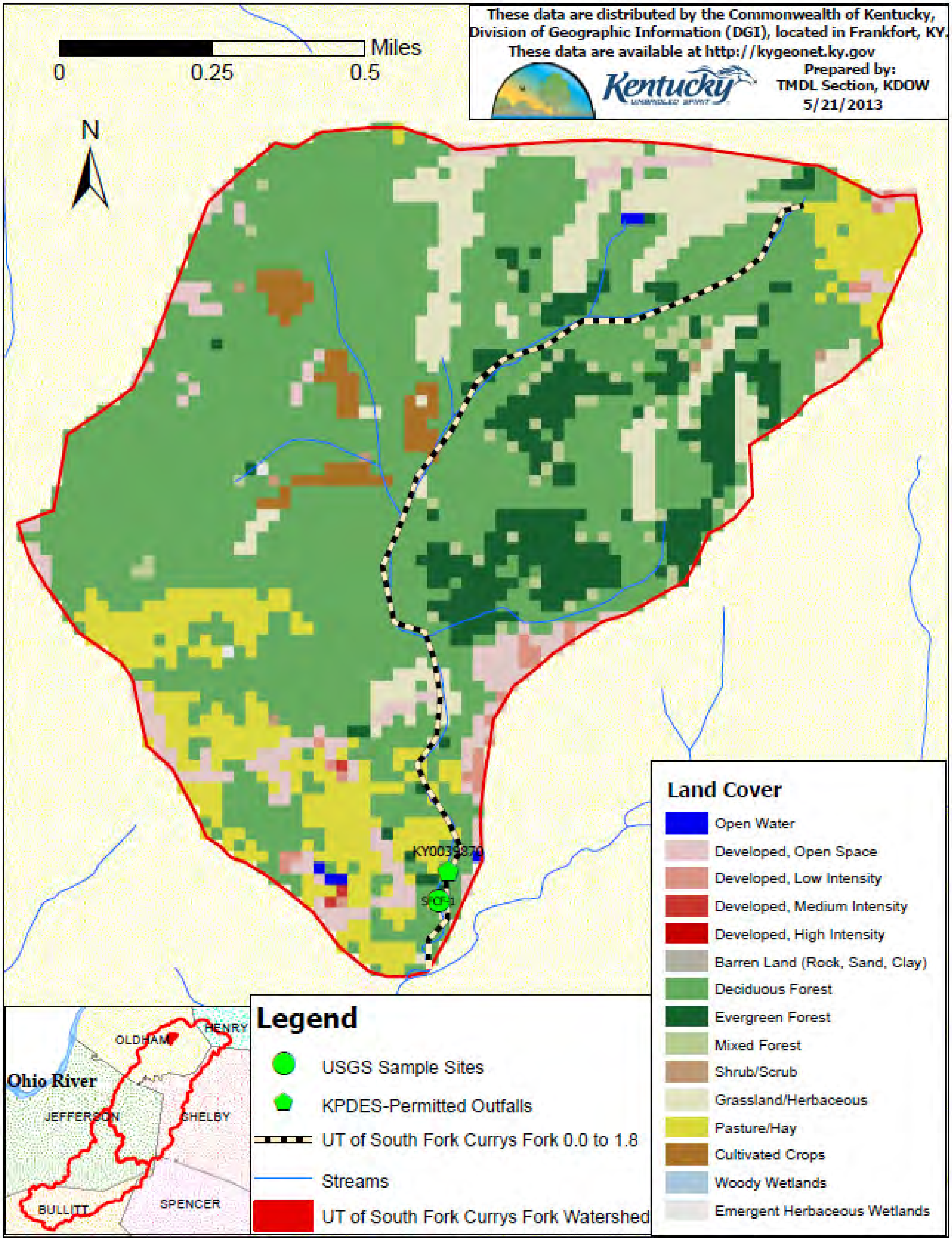

Figure 8.60 Land Cover, Sampling Sites, and KPDES-permitted Facilities in the UT of the South Fork Currys Fork 0.0 to 1.8 Subwatershed

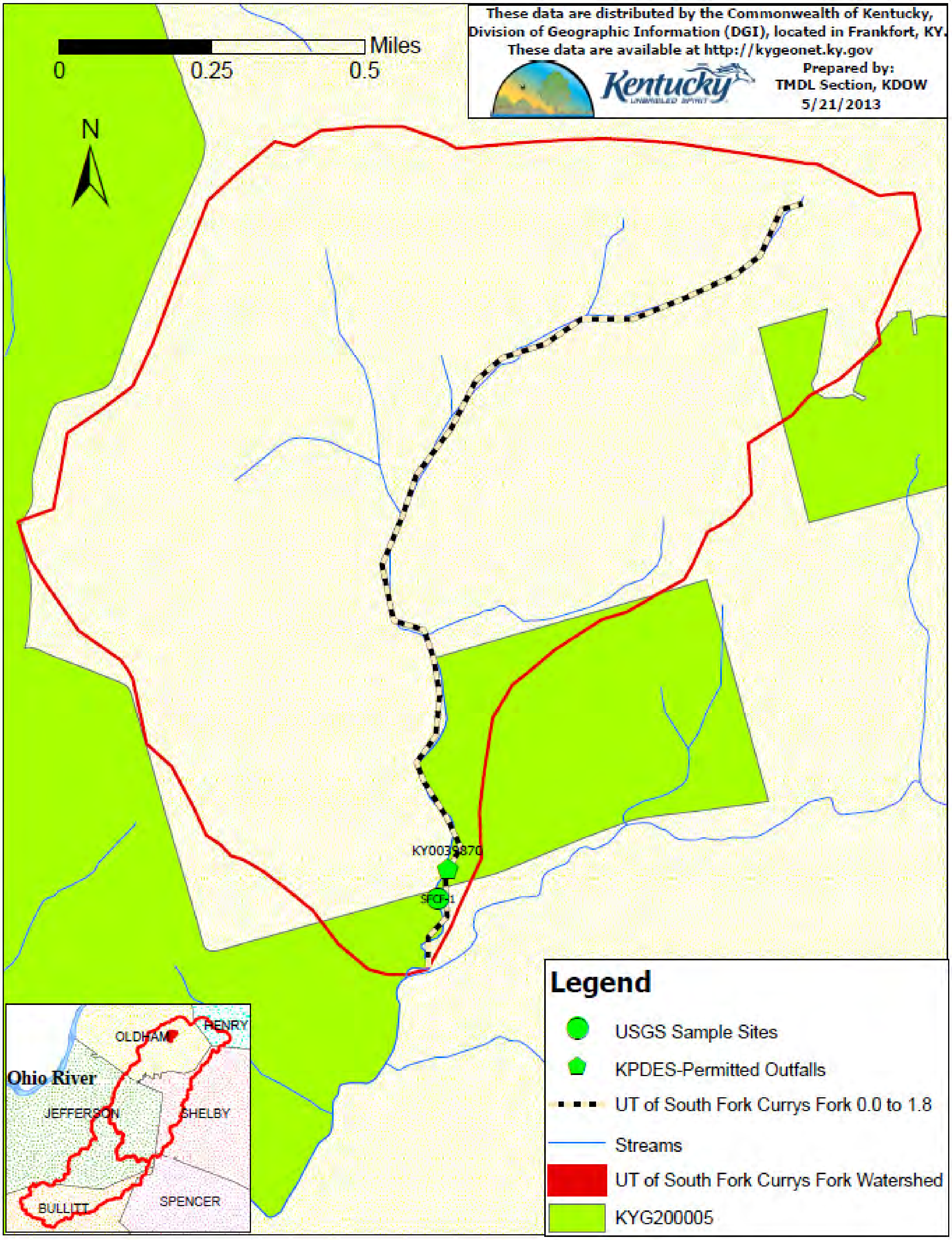

Figure 8.61 Urbanized Boundary of MS4 Entities in UT of the South Fork Currys Fork 0.0 to 1.8 Subwatershed

Table 8.117 Land Cover in the UT of the South Fork Currys Fork 0.0 to 1.8 Subwatershed

Land Cover	% of Total Area	Acres	Watershed Square Miles	Future Growth WLA %
Developed	6.18	45	0.1	1.0%
Agriculture (total)	12.43	91	0.1	
Pasture	10.48	76	0.1	
Row Crop	1.95	14	0.0	
Forest	71.82	524	0.8	
Natural Grassland	9.32	68	0.1	
Water	0.18	1	0.0	
Wetland	0.06	0	0.0	
Barren	0.00	0	0.0	
Total	100.00	730	1.1	

Site information is shown in Table 8.118; site SFCF-1 was used to develop the *E. coli* LDC (Figure 8.62). Data from site SFCF-1 are presented in Appendix B. The critical condition was the high flow zone, although exceedances were found in other zones. Table 8.119 shows the TMDLs for the flow zones associated with *E. coli* at site SFCF-1 (the yellow highlight indicates the critical condition TMDL).

Table 8.118 Sample Sites Located Along UT of the South Fork Currys Fork 0.0 to 1.8

Station Name	Latitude	Longitude	RM	Data Collector	Bacteria Indicator	Used to Develop LDC and TMDL?
SFCF-1	38.367778	-85.38	0.2	USGS	*E. coli*	Yes-PCR

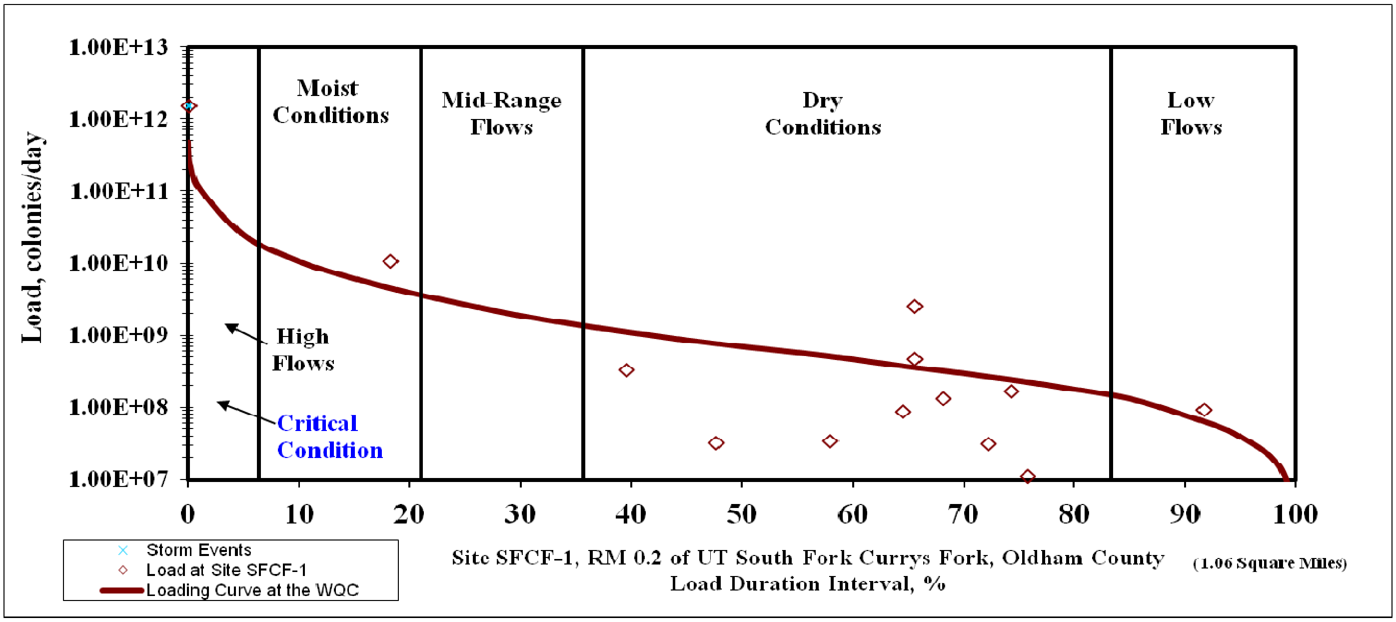

Figure 8.62 PCR *E. coli* LDC for Site SFCF-1

Table 8.119 PCR *E. coli* TMDLs by Flow Zone for Site SFCF-1

LDC Zone	Existing Load (colonies/ day)	TMDL (colonies/ day)	MOS (colonies/ day)	TMDL Target (colonies/ day)	SWS-WLA (colonies/ day)	Remainder (colonies/ day)
High	1.51E+12	1.10E+11	1.10E+10	9.89E+10	9.08E+08	9.79E+10
Moist	1.06E+10	4.61E+09	4.61E+08	4.15E+09	9.08E+08	3.24E+09
Mid	*	3.19E+09	3.19E+08	2.87E+09	9.08E+08	1.96E+09
Dry	2.54E+09	3.58E+08	3.58E+07	3.22E+08	9.08E+08	-5.86E+08
Low	9.39E+07	7.05E+07	7.05E+06	6.34E+07	9.08E+08	-8.45E+08

*No exceedances within a zone—See Section 8.0

The critical condition TMDL for a site must be extrapolated from the sampling station to the bottom of the impaired segment to account for any additional sources of the pollutant of concern and increases in discharge between the site and the bottom of the segment. UT South Fork Currys Fork at RM 0.0 has an upstream watershed area of 1.14 square miles while site SFCF-1 has an upstream watershed area of 1.06 square miles. The Existing Load and TMDL allocations were multiplied by the ratio of these areas (1.08) to generate the final *E. coli* TMDL allocations for the impaired segment (Table 8.120). The breakdown of WLAs assigned to permitted entities is presented in Table 8.121.

Table 8.120 *E. coli* (PCR) TMDL Allocations for UT of the South Fork Currys Fork 0.0 to 1.8

Pollutant (Use)	*E. coli* (PCR)
Existing Load (colonies/day)	1.62E+12
TMDL (colonies/day)	1.18E+11
MOS (colonies/day)	1.18E+10
TMDL Target (colonies/day)	1.06E+11
SWS-WLA (colonies/day)	9.08E+08
Remainder (colonies/day)	1.05E+11
Future Growth-WLA (colonies/day)	1.05E+09
MS4-WLA (colonies/day)	5.38E+09
LA (colonies/day)	9.89E+10

Table 8.121 WLAs Assigned to Permitted Entities in UT of the South Fork Currys Fork 0.0 to 1.8 Subwatershed

KPDES Permit Number	Permitted Entity	Type of WLA	Facility Design Flow (mgd)	Facility Design Flow (cfs)	*E. coli* WLA (colonies/ day)
KY0039870	LAKEWOOD VALLEY	SWS	1.00E-01	1.55E-01	9.08E+08
KYG200005 and KYS000003	Oldham County Fiscal Court and KY Transportation Cabinet	MS4	N/A	N/A	5.38E+09

8.3 Summary for all TMDLs and Allocations

Summary tables of the TMDL allocations for each segment are presented in Tables 8.122 through 8.125.

Table 8.122 TMDLs for *E. coli* PCR Impaired Segments

Waterbody Name	TMDL (colonies/ day)	MOS (colonies/ day)	SWS-WLA (colonies/ day)	Future Growth-WLA (colonies/ day)	MS4-WLA (colonies/ day)	LA (colonies/ day)
Asher Run 0.0 to 4.8	5.71E+10	5.71E+09	0	5.14E+08	2.30E+10	2.79E+10
Cane Run 0.0 to 7.3	4.67E+10	4.67E+09	4.54E+06	2.10E+08	2.20E+10	1.98E+10
Cedar Creek 4.3 to 11.1	1.44E+12	1.44E+11	6.83E+10	6.16E+10	8.64E+11	3.06E+11
Chenoweth Run 0.0 to 5.25	2.43E+12	2.43E+11	3.86E+10	1.07E+11	1.75E+12	2.92E+11
Chenoweth Run 5.25 to 9.2	4.09E+11	4.09E+10	3.63E+10	1.66E+10	3.04E+11	1.09E+10
Currys Fork 0.0 to 4.8	4.91E+11	4.91E+10	2.05E+10	1.27E+10	1.96E+11	2.13E+11
Floyds Fork 0.0 to 11.7	4.33E+13	4.33E+12	2.21E+11	1.16E+12	1.85E+13	1.92E+13
Floyds Fork 24.2 to 34.1	2.00E+13	2.00E+12	8.82E+10	3.59E+11	7.00E+12	1.06E+13
Floyds Fork 34.1 to 61.9	1.74E+13	1.74E+12	8.81E+10	3.12E+11	5.22E+12	1.01E+13
Long Run 0.0 to 10.0	5.52E+10	5.52E+09	8.18E+06	2.48E+08	1.28E+10	3.66E+10
North Fork Currys Fork 0.0 to 6.0	1.78E+11	1.78E+10	1.85E+10	5.67E+09	7.58E+10	6.02E+10
Pennsylvania Run 0.0 to 3.3	8.20E+09	8.20E+08	1.87E+09	2.76E+08	4.30E+09	9.42E+08
Pope Lick Creek 0.0 to 2.1	3.18E+11	3.18E+10	3.63E+07	1.43E+10	2.24E+11	4.77E+10
Pope Lick Creek 2.1 to 5.5	5.36E+11	5.36E+10	1.82E+07	2.41E+10	3.66E+11	9.30E+10
South Fork Currys Fork 0.0 to 6.1	1.59E+11	1.59E+10	1.41E+09	2.84E+09	4.72E+10	9.18E+10
South Long Run 0.0 to 3.35	2.63E+09	2.63E+08	0	2.37E+07	4.78E+08	1.87E+09
UT to South Fork Currys Fork 0.0 to 1.8	1.18E+11	1.18E+10	9.08E+08	1.05E+09	5.38E+09	9.89E+10

Table 8.123 TMDLs for Fecal Coliform PCR Impaired Segments

Waterbody Name	TMDL (colonies/day)	MOS (colonies/day)	SWS-WLA (colonies/day)	Future Growth-WLA (colonies/day)	MS4-WLA (colonies/day)	LA (colonies/day)
Asher Run 0.0 to 4.8	2.41E+09	2.41E+08	0	2.17E+07	9.69E+08	1.18E+09
Cedar Creek 4.3 to 11.1	2.23E+11	2.23E+10	1.14E+11	4.35E+09	6.10E+10	2.17E+10
Chenoweth Run 0.0 to 5.25	6.34E+11	6.34E+10	6.43E+10	2.53E+10	4.12E+11	6.89E+10
Chenoweth Run 5.25 to 9.2	1.41E+12	1.41E+11	6.06E+10	6.06E+10	1.11E+12	3.96E+10
Floyds Fork 11.7 to 24.2[(1)]	1.16E+13	1.16E+12	2.13E+11	2.05E+11	4.57E+12	5.49E+12

Note: [(1)]Due to an administrative error, the pollutant was listed as E. coli on the 2012 Integrated Report. This will be corrected to fecal coliform on the 2014 Integrated Report. A TMDL was calculated for the correct pollutant, fecal coliform.

Table 8.124 TMDLs for Fecal Coliform SCR Impaired Segments

Waterbody Name	TMDL (colonies/day)	MOS (colonies/day)	SWS-WLA (colonies/day)	Future Growth-WLA (colonies/day)	MS4-WLA (colonies/day)	LA (colonies/day)
Chenoweth Run 0.0 to 5.25	3.17E+12	3.17E+11	6.43E+10	1.39E+11	2.27E+12	3.79E+11
Chenoweth Run 5.25 to 9.2	7.07E+12	7.07E+11	6.06E+10	3.15E+11	5.78E+12	2.06E+11
Floyds Fork 34.1 to 61.9	1.46E+12	1.46E+11	1.47E+11	2.34E+10	3.91E+11	7.55E+11
Pennsylvania Run 0.0 to 3.3	9.20E+12	9.20E+11	3.12E+09	4.14E+11	6.45E+12	1.41E+12

8.4 Translation of WLAs into Permit Limits

All KPDES-permitted point sources must meet permit limits based on the Water Quality Standards in 401 KAR 10:031. SWS-WLAs will be translated into KPDES permit limits as an *E. coli* effluent gross limit of 130 colonies/100 ml as a monthly average and 240 colonies/100 ml as a maximum weekly average or as a fecal coliform effluent gross limit of 200 colonies/100 ml as a monthly average and 400 colonies/100 ml as a maximum weekly average.

The MS4-WLA is not a numerical end-of-outfall limit; the MS4-WLA is an in-stream allocation. This means that a MS4-WLA was not determined for individual MS4 outfalls. The MS4-WLA is an aggregate of the in-stream contribution of all MS4 outfalls within the MS4 jurisdiction, not the storm water contribution from individual MS4 outfalls. The MS4-WLA will be addressed through the MS4 permit and implemented through the Stormwater Quality Management Plan (SWQMP) to the Maximum Extent Practicable (MEP).

9.0 Implementation Options

Section 303(e) of the Clean Water Act and 40 CFR Part 130, Section 130.5, require states to have a continuing planning process (CPP) composed of several parts specified in the Act and the regulation. The CPP provides an outline of agency programs and the available authority to address water issues. Under the CPP umbrella, the Watershed Management Branch of KDOW will be available to provide assistance with technical support for developing and implementing watershed plans to address water quality and quantity problems and threats. Developing watershed plans enables more effective targeting of limited restoration funds and resources, thus improving environmental benefit, protection and recovery.

Watershed plans provide an integrative approach for identifying and describing how, when, who and what actions should be taken in order to meet water quality standards. At this time, a comprehensive watershed restoration plan for the Floyds Fork watershed has not been developed. This TMDL provides bacteria allocations that may assist with developing a detailed watershed plan to guide watershed restoration efforts.

A watershed plan for the Floyds Fork watershed should address both point and nonpoint sources of pollution in the watershed and should build on existing efforts as well as evaluate new approaches. Because of the specific landscape and location of the impairments in the Floyds Fork watershed, a watershed plan should incorporate all available restoration and protection mechanisms, including any existing Groundwater Protection Plans, storm water or wastewater KPDES permits. A comprehensive watershed plan should consider both voluntary and regulatory approaches to meet water quality standards. If such a plan is developed, pollutant trading may be a viable management strategy to consider for meeting the TMDL load goals.

While a Floyds Fork Watershed Plan does not exist, it is important to note that a comprehensive watershed restoration plan has been developed for Curry's Fork, a tributary of Floyds Fork. The Curry's Fork Watershed Plan details specific BMPs and solutions to be implemented in order to restore Curry's Fork to meet water quality standards. This plan can be downloaded at http://www.oldhamcounty.net/curry_fork/index.htm.

9.1 Kentucky Watershed Management Framework

A Watershed Management Framework approach to Water Quality Management was adopted by the KDOW in 1998. The plan divides Kentucky's major drainage basins into five groups of basins which are cycled through a five year staggered process which involves monitoring, assessment, prioritization, plan development, and plan implementation. The major basin that the Floyds Fork watershed lies within is the Salt River basin. The first phase of the process for the Salt River basin began in 1998 and in 2002 Floyds Fork was listed as a high priority watershed using the watershed management framework process. As part of the process, a basin coordinator is assigned to each river basin to work with the citizens of the basin to develop a local Watershed Management Team associated with each priority watershed. For more information about the Salt River basin see: http://water.ky.gov/watershed/Pages/SaltRiverBasin.aspx.

9.2 Non-Governmental Organizations

There are many Non-Governmental Organizations (NGO) that are operating in the Floyds Fork watershed that may help to implement the TMDL, particularly with regard to nonpoint source issues.

10.0 Public Participation

A listing of pollutant/waterbody combinations included in this bacteria TMDL was presented at a Floyds Fork public stakeholder meeting on July 24, 2012. In addition to this information, sample site data summaries, source assessment, TMDL calculation methodology, and TMDLs for each pollutant/waterbody combination in this document were presented at a Floyds Fork Technical Advisory Committee meeting on November 28, 2012. On that date, a preliminary draft of this TMDL document was made available to the Floyds Fork Technical Advisory Committee members and any stakeholders of their choosing for an “unofficial” comment period of 30-days, which was extended by request to February 15, 2013. The preliminary draft document was modified based upon comments received during this “unofficial” review and a proposed draft was developed.

The proposed draft TMDL was published for a 30-day public comment period ending July 29, 2013. A notification was sent to all newspapers in the Commonwealth of Kentucky and an advertisement was purchased in The Courier-Journal (Louisville, KY, Jefferson County, circulation 147,990). Additionally, the public notice was distributed electronically through the ‘Nonpoint Source Pollution Control’ mailing list of persons interested in water-quality issues.

All comments received during the public notice period were incorporated into the administrative record for this TMDL. Responses to comments were prepared and e-mailed to each individual/agency participating in the public notice process. Based upon comments made, some revisions were made to the final TMDL document.

11.0 References

33 U.S.C. § 1251, Section 303(d). 1972. Clean Water Act.

40 CFR 130.5. Continuing Planning Process. Available at URL: http://www.law.cornell.edu/cfr/text/40/130.5

401 KAR 5:002. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2005.

401 KAR 5:005. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2005.

401 KAR 5:037. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2005.

401 KAR 10:001. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2009.

401 KAR 10:026. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2009.

401 KAR 10:031. Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water. 2009.

Energy and Environment Cabinet, Department for Environmental Protection, Division of Water, 2012. Basins available at URL: http://water.ky.gov/watershed/Pages/Basins.aspx

Energy and Environment Cabinet, Department for Environmental Protection, Division of Water, 2012. Watershed Watch available at URL: http://water.ky.gov/wsw/Pages/default.aspx.

Gerba, Charles P., Wallace, Craig and Melnick, Joseph, 1975. Fate of Wastewater Bacteria and Viruses in Soil. Journal of the Irrigation and Drainage Division 101:3. 157-174.

Homer, C., Huang, C., Yang, L., Wylie, B., and Coan M, 2004. Development of a 2001 National Land-Cover Database for the United States. Photogrammetric Engineering & Remote Sensing 70:7 829-840.

Kentucky Department of Fish and Wildlife Resources. 2011. Personal Communication with David C. Yancy, Senior Wildlife Biologist, August 2, 2011.

Kentucky Division of Geographic Information. 2012. Kentucky Geonet accessed at URL http://kygeonet.ky.gov

Kentucky Division of Water. 1990. Section 303(d) List of Waters for Kentucky. Commonwealth of Kentucky, Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, October, 1990.

Kentucky Division of Water. 1992. Final 303(d) List for Kentucky. Department for Environmental Protection, October, 1992.

Kentucky Division of Water. 1995. 1994 303(d) List of Waters for Kentucky. Natural resources and Environmental Protection Cabinet, October, 1995.

Kentucky Division of Water. 1998. 1998 303(d) List of Waters for Kentucky. Kentucky Department for Environmental Protection.

Kentucky Division of Water. 2003. 2002 303(d) List of Waters for Kentucky. Natural Resources and Environmental Protection Cabinet.

Kentucky Division of Water. 2005. 2004 303(d) List of Waters for Kentucky. Environmental and Public Protection Cabinet.

Kentucky Division of Water. 2007. Final 2006 Integrated Report to Congress on the Condition of Water Resources in Kentucky Volume II. 303(d) List of Surface Water. Environmental and Public Protection Cabinet.

Kentucky Division of Water. 2008. Final 2008 Integrated Report to Congress on the Condition of Water Resources in Kentucky. Volume II. 303(d) List of Surface Waters. Environmental and Public Protection Cabinet.

Kentucky Division of Water. 2009. Quality Assurance Project Plan for Data Analysis for TMDL Development, Section 106 Funds, FFY 2009, Version 1.0. Kentucky Department for Environmental Protection, Division of Water, Frankfort, Kentucky.

Kentucky Division of Water. 2011, Standard Operating Procedure Pathogen Indicator TMDL SOP. Commonwealth of Kentucky, Energy and Environment Cabinet, Kentucky Department for Environmental Protection, Division of Water, Water Quality Branch, TMDL Section, Frankfort, Kentucky. May 4, 2011.

Kentucky Division of Water. 2013. Final 2012 Integrated Report to Congress on the Condition of Water Resources in Kentucky. Volume II. 303(d) List of Surface Waters. Kentucky Energy and Environment Cabinet. October, 2013.

Kentucky Geological Survey. 1997-2005, University of Kentucky, (accessed at: http://www.uky.edu/KGS/)

Kentucky Geological Survey. 1997-2012, University of Kentucky, Strata of Ordovician Age (http://www.uky.edu/KGS/geoky/ordovician.htm, accessed 7/27/2011)

Kentucky Geological Survey. 1997-2012, University of Kentucky, Strata of Silurian Age (http://www.uky.edu/KGS/geoky/silurian.htm, accessed 7/27/2011)

Kentucky Geological Survey. 1997-2012, University of Kentucky, Strata of Devonian Age (http://www.uky.edu/KGS/geoky/devonian.htm, accessed 7/27/2011)

Kentucky Geological Survey. 1997-2012, University of Kentucky, Strata of Mississippian Age (http://www.uky.edu/KGS/geoky/mississippian.htm, accessed 7/27/2011)

Kentucky Geological Survey. 1997-2012, University of Kentucky, Karst Is a Landscape (accessed at: http://www.uky.edu/KGS/water/general/karst/karst_landscape.htm)

Kentucky Infrastructure Authority. 2000. Water Resource Development A Strategic Plan for Wastewater Treatment-Draft. Governor's Water Resource Development Commission. Accessed at http://kia.ky.gov.

Kentucky Waterways Alliance. 2012. Available at URL: http://www.kwalliance.org.

KRS 224.71-100 through 224.71-140. Kentucky Agriculture Water Quality Act. 1994.

Reddy, K.R., Khaleel, R., and Overcash, M.R. 1981. Behavior and Transport of Microbial Pathogens and Indicator Organisms in Soils Treated with Organic Wastes. Journal of Environmental Quality 10:3. 255-266.

Strahler, A.N. 1952. Hypsometric (area-altitude) analysis of erosional topography. Bull Geol Soc Am. 63, 1117-42.

U.S. Census Bureau. 2010. Accessed at http://factfinder2.census.gov/faces/nav/jsf/pages/searchresults.xhtml?refresh=t

U.S. Census Bureau maps accessed at: http://www2.census.gov/geo/maps/dc10map/UAUC_RefMap/ua/. Accessed 12/28/12.

United States Department of Agriculture, National Agricultural Statistics Service, 2007, 2007 Census of Agriculture. Accessed August 2011 at URL http://www.nass.usda.gov/census/

United States Department of Agriculture, National Resource Conservation Service. 2009. Part 630 Hydrology in National Engineering Handbook. Chapter 7: Hydrologic Soil Groups. Available at URL http://policy.nrcs.usda.gov/.

United States Department of Agriculture, National Resource Conservation Service, Web Soil Survey. Accessed at URL http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

U.S. Environmental Protection Agency. 1986. Ambient Water Quality Criteria for Bacteria-1986. Office of Water, regulations and Standards, Criteria and Standards Division, Washington, DC 20460. EPA440/5-84-002.

U.S. Environmental Protection Agency. 2007. An Approach for Using Load Duration Curves in the Development of TMDLs. EPA 841-B-07-006, U.S. Environmental Protection Agency.
U.S. Environmental Protection Agency. 2012. Impaired Waters and Total Maximum Daily Loads. Available at URL: http://www.epa.gov/owow/tmdl.

EPA Urbanized Maps information available at: http://cfpub.epa.gov/npdes/stormwater/urbanmaps.cfm. Accessed 12/28/2012.

United States Geological Survey, 1996, HYSEP: A Computer Program for Streamflow Hydrograph Separation and Analysis.

United States Geological Survey, 2003, 2001 National Landcover Database (NLCD). Available at URL http://kygeonet.ky.gov/geographicexplorer/

U.S. Geological Survey. 2004. Hydrologic Unit Codes. Available at URL http://kygeonet.ky.gov/geographicexplorer/.

U.S. Geological Survey. 2012. USGS 03298470 Floyds Fork near Shepherdsville, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298470

U.S. Geological Survey. 2012. USGS 03298250 Cedar Creek at Thixton Road Near Louisville, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298250

U.S. Geological Survey. 2012. USGS 03298200 Floyds Fork Near MT Washington, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298200

U.S. Geological Survey. 2012. USGS 03298300 Pennsylvania Run at MT Washington Rd NR Louisville. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298300

U.S. Geological Survey. 2012. USGS 03298150 Chenoweth Run at Gelhaus Lane Near Fern Creek, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298150

U.S. Geological Survey. 2012. USGS 03298000 Floyds Fork at Fisherville, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298000

U.S. Geological Survey. 2012. USGS 03298135 Chenoweth Run at Ruckriegal Parkway, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03298135

U.S. Geological Survey. 2012. USGS 03297900 Floyds Fork near Pewee Valley, KY. Accessed at URL: http://waterdata.usgs.gov/ky/nwis/inventory/?site_no=03297900

U.S. Pet Ownership and Demograhics Sourcebook. 2007. Publisher: Center for Information Management American Veterinary Medical Association: 135p. http://www.avma.org/reference/marketstats/sourcebook.asp

Woods, A.J., Omernik, J.M., Martin, W.H., Pond, G.J., Andrews, W.M., Call, S. M., Comstock, J.A., and Taylor, D.D., 2002. Ecoregions of Kentucky (color poster with map, descriptive text, summary tables, and photographs): Reston, VA., U.S. Geological Survey (map scale 1:1,000,000).

Appendixes

Appendix A. Land Cover Definitions

Table A.1 National Land-Cover Database Class Descriptions
(taken from Homer et. al., 2004)

11. **Open Water** - All areas of open water, generally with less than 25% cover of vegetation or soil.

21. **Developed, Open Space** - Includes areas with a mixture of some constructed materials, but mostly vegetation in the form of lawn grasses. Impervious surfaces account for less than 20 percent of total cover. These areas most commonly include large-lot single-family housing units, parks, golf courses, and vegetation planted in developed settings for recreation, erosion control, or aesthetic purposes

22. **Developed, Low Intensity** - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 20-49 percent of total cover. These areas most commonly include single-family housing units.

23. **Developed, Medium Intensity** - Includes areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50-79 percent of the total cover. These areas most commonly include single-family housing units.

24. **Developed, High Intensity** - Includes highly developed areas where people reside or work in high numbers. Examples include apartment complexes, row houses and commercial/industrial. Impervious surfaces account for 80 to100 percent of the total cover.

31. **Barren Land (Rock/Sand/Clay)** - Barren areas of bedrock, desert pavement, scarps, talus, slides, volcanic material, glacial debris, sand dunes, strip mines, gravel pits and other accumulations of earthen material. Generally, vegetation accounts for less than 15% of total cover.

41. **Deciduous Forest** - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species shed foliage simultaneously in response to seasonal change.

42. **Evergreen Forest** - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. More than 75 percent of the tree species maintain their leaves all year. Canopy is never without green foliage.

43. **Mixed Forest** - Areas dominated by trees generally greater than 5 meters tall, and greater than 20% of total vegetation cover. Neither deciduous nor evergreen species are greater than 75 percent of total tree cover.

52. **Shrub/Scrub** - Areas dominated by shrubs; less than 5 meters tall with shrub canopy typically greater than 20 percent of total vegetation. This class includes true shrubs, young trees in an early successional stage, or trees stunted from environmental conditions.

71. **Grassland/Herbaceous** - Areas dominated by grammanoid or herbaceous vegetation, generally greater than 80% of total vegetation. These areas are not subject to intensive management such as tilling, but can be utilized for grazing.

81. **Pasture/Hay** - Areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a perennial cycle. Pasture/hay vegetation accounts for greater than 20 percent of total vegetation.

82. **Cultivated Crops** - Areas used for the production of annual crops, such as corn, soybeans, vegetables, tobacco, and cotton, and also perennial woody crops such as orchards and vineyards. Crop vegetation accounts for greater than 20 percent of total vegetation. This class also includes all land being actively tilled.

90. **Woody Wetlands** - Areas where forest or shrubland vegetation accounts for greater than 20 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

95. **Emergent Herbaceous Wetlands** - Areas where perennial herbaceous vegetation accounts for greater than 80 percent of vegetative cover and the soil or substrate is periodically saturated with or covered with water.

Appendix B. Bacteria Data

Table B.1 shows the validated bacteria data for the TMDL study area, arranged by TMDL segment, as summarized in Section 4.0. Sites not located on a TMDL segment are at the bottom of the table. Any blanks in the table indicate that this information was not collected. Table B.2 indicates the meaning of the data quality flag for data collected by Louisville MSD. Table B.3 displays the data that was not validated and the reason it was not validated.

Table B.1. Bacteria Data in the Floyds Fork Watershed

Ashers Run 0.0 to 4.8			
USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
AR-1	6/25/2007		390
AR-1	7/31/2007		740
AR-1	10/23/2007		9400
AR-1	6/23/2008		>8000
AR-1	7/16/2008		2600
AR-1	7/31/2008		21000

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
TB1	5/7/2007		900
TB1	5/23/2007		240
TB1	6/11/2007		330
TB1	6/25/2007		470
TB1	7/11/2007		1300
TB1	7/25/2007		330
TB1	8/22/2007		1700
TB1	10/25/2007		1500
TB1	5/21/2009		30
TB1	6/5/2009		860
TB1	6/18/2009		3600
TB1	7/2/2009		230
TB1	7/15/2009		13000
TB1	7/30/2009		882
TB1	8/13/2009		370
TB1	8/27/2009		470

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
TB1	9/10/2009		280
TB1	9/24/2009		560
TB1	10/8/2009		5700
TB1	10/22/2009		3,000

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
TB1a	5/21/2009	1.00	200
TB1a	6/5/2009	1.68	750
TB1a	6/18/2009	0.98	3000
TB1a	7/2/2009	0.20	2700
TB1a	7/15/2009	0.00	1800
TB1a	7/30/2009	4.86	2000
TB1a	8/13/2009	0.00	560
TB1a	8/27/2009	0.00	470
TB1a	9/10/2009	0.19	550
TB1a	9/24/2009	1.20	690
TB1a	10/8/2009	44.04	5900
TB1a	10/22/2009	11.74	2,700

Cane Run 0.0 to 7.3			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CANE-1	5/23/2007		160
CANE-1	6/11/2007		66
CANE-1	6/25/2007		3800
CANE-1	8/21/2007		36000
CANE-1	9/20/2007		60
CANE-1	10/23/2007		7900
CANE-1	6/10/2008		290
CANE-1	6/23/2008		150
CANE-1	7/16/2008	0.16	110
CANE-1	7/22/2008		590
CANE-1	7/31/2008		1100
CANE-1	10/16/2008		20

Cedar Creek 4.3 to 11.1			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CC-2	5/23/2007	6.00	54
CC-2	6/11/2007	4.40	200
CC-2	6/25/2007	7.10	400
CC-2	7/17/2007	3.80	200
CC-2	8/1/2007	4.60	360
CC-2	8/14/2007	3.50	180
CC-2	8/17/2007	5.20	420
CC-2	8/21/2007	31.00	6200
CC-2	9/6/2007	3.10	330
CC-2	9/20/2007	3.60	200
CC-2	10/16/2007	4.40	790
CC-2	10/23/2007		9500
CC-2	6/10/2008		190
CC-2	6/23/2008		160
CC-2	7/16/2008		260
CC-2	7/31/2008		1300
CC-2	8/19/2008		210
CC-2	9/23/2008		220
CC-2	10/2/2008		110
CC-2	10/9/2008		160
CC-2	10/16/2008		810
CC-2	10/23/2008		260

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	5/2/2000	<A	<57
ECCCC001	5/9/2000	<A	<50
ECCCC001	5/18/2000		60
ECCCC001	5/25/2000		10
ECCCC001	5/31/2000		80
ECCCC001	6/2/2000		77
ECCCC001	6/5/2000		117
ECCCC001	6/13/2000		280
ECCCC001	6/21/2000	>B	>6800

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	6/29/2000		1200
ECCCC001	7/7/2000		220
ECCCC001	7/13/2000		320
ECCCC001	7/20/2000		150
ECCCC001	7/27/2000	<A	<63
ECCCC001	8/2/2000		117
ECCCC001	8/16/2000		127
ECCCC001	8/24/2000		2300
ECCCC001	8/30/2000		370
ECCCC001	9/8/2000		110
ECCCC001	9/13/2000		87
ECCCC001	9/21/2000		1000
ECCCC001	9/28/2000	<A	<7
ECCCC001	10/5/2000	<A	<3
ECCCC001	10/11/2000	<	<3
ECCCC001	10/19/2000	<A	<3
ECCCC001	10/26/2000	<A	<3
ECCCC001	10/30/2000	<A	<3
ECCCC001	5/1/2001	<A	<37
ECCCC001	5/8/2001		310
ECCCC001	5/22/2001		480
ECCCC001	5/30/2001		97
ECCCC001	6/5/2001		410
ECCCC001	6/12/2001		37
ECCCC001	6/19/2001	<A	<17
ECCCC001	6/26/2001	<A	<7
ECCCC001	7/3/2001	<A	<3
ECCCC001	7/10/2001	<	<40
ECCCC001	7/12/2001		450
ECCCC001	7/17/2001	<A	<3
ECCCC001	7/24/2001		250
ECCCC001	7/31/2001		163
ECCCC001	8/7/2001		110
ECCCC001	8/10/2001	<A	<3
ECCCC001	8/14/2001		270
ECCCC001	8/23/2001		290
ECCCC001	8/27/2001		1150
ECCCC001	9/6/2001		180

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	9/11/2001		2700
ECCCC001	9/18/2001		177
ECCCC001	9/21/2001		590
ECCCC001	9/26/2001		320
ECCCC001	10/2/2001		70
ECCCC001	10/9/2001	<A	<47
ECCCC001	10/18/2001		100
ECCCC001	10/24/2001		2600
ECCCC001	10/30/2001		70
ECCCC001	5/1/2002		93
ECCCC001	5/14/2002		1100
ECCCC001	5/21/2002	<A	<57
ECCCC001	5/30/2002		1100
ECCCC001	6/7/2002		725
ECCCC001	6/11/2002		370
ECCCC001	6/19/2002		330
ECCCC001	6/25/2002		1650
ECCCC001	7/2/2002		1350
ECCCC001	7/11/2002		143
ECCCC001	7/18/2002		120
ECCCC001	7/24/2002		70
ECCCC001	7/30/2002		2150
ECCCC001	8/6/2002		230
ECCCC001	8/9/2002		200
ECCCC001	8/20/2002	<A	<63
ECCCC001	8/29/2002	<A	<23
ECCCC001	9/5/2002		1100
ECCCC001	9/9/2002	<A	<27
ECCCC001	9/12/2002	<A	<3
ECCCC001	9/19/2002		86
ECCCC001	9/27/2002		2350
ECCCC001	10/1/2002		113
ECCCC001	10/8/2002		70
ECCCC001	10/15/2002		120
ECCCC001	10/22/2002		110
ECCCC001	10/28/2002	<A	<23
ECCCC001	5/7/2003		2995
ECCCC001	5/13/2003		197

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	5/20/2003		462
ECCCC001	5/23/2003		73
ECCCC001	5/28/2003		70
ECCCC001	6/3/2003		180
ECCCC001	6/10/2003		123
ECCCC001	6/17/2003		6000
ECCCC001	6/25/2003		143
ECCCC001	6/30/2003		550
ECCCC001	7/1/2003		1800
ECCCC001	7/9/2003		30
ECCCC001	7/15/2003		113
ECCCC001	7/22/2003	<A	<60
ECCCC001	7/29/2003	<A	<7
ECCCC001	8/5/2003		103
ECCCC001	8/12/2003	<A	<28
ECCCC001	8/19/2003		110
ECCCC001	8/22/2003	<A	<3
ECCCC001	8/27/2003	<A	<20
ECCCC001	9/3/2003	<A	<160
ECCCC001	9/10/2003	<A	<47
ECCCC001	9/16/2003		260
ECCCC001	9/26/2003		240
ECCCC001	9/30/2003		100
ECCCC001	10/7/2003	<A	<20
ECCCC001	10/14/2003	<A	<160
ECCCC001	10/17/2003		17
ECCCC001	10/20/2003		190
ECCCC001	10/28/2003	<A	<53
ECCCC001	5/4/2004		250
ECCCC001	5/11/2004		1500
ECCCC001	5/17/2004		187
ECCCC001	5/21/2004		320
ECCCC001	5/27/2004	>B	>2500
ECCCC001	6/7/2004		117
ECCCC001	6/11/2004		1300
ECCCC001	6/17/2004		1850
ECCCC001	6/23/2004		190
ECCCC001	6/29/2004		199

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	7/6/2004		277
ECCCC001	7/15/2004		237
ECCCC001	7/27/2004		1250
ECCCC001	8/2/2004		292
ECCCC001	8/6/2004		600
ECCCC001	8/12/2004		197
ECCCC001	8/18/2004		204
ECCCC001	8/24/2004		810
ECCCC001	8/30/2004		169
ECCCC001	9/3/2004		210
ECCCC001	9/10/2004		110
ECCCC001	9/15/2004		140
ECCCC001	9/21/2004		97
ECCCC001	9/27/2004	<A	<57
ECCCC001	10/1/2004	<A	<57
ECCCC001	10/7/2004	<A	<37
ECCCC001	10/13/2004		292
ECCCC001	10/19/2004		2550
ECCCC001	10/25/2004		83
ECCCC001	10/29/2004		300
ECCCC001	5/10/2005	<A	<50
ECCCC001	5/16/2005		140
ECCCC001	5/20/2005		6350
ECCCC001	5/25/2005		155
ECCCC001	5/26/2005		224
ECCCC001	6/1/2005		93
ECCCC001	6/6/2005		130
ECCCC001	6/10/2005		147
ECCCC001	6/16/2005		117
ECCCC001	6/22/2005		107
ECCCC001	6/28/2005		260
ECCCC001	7/8/2005		280
ECCCC001	7/11/2005		202
ECCCC001	7/15/2005		1140
ECCCC001	7/21/2005		220
ECCCC001	7/27/2005		975
ECCCC001	8/2/2005		230
ECCCC001	8/8/2005		253

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	8/12/2005		193
ECCCC001	8/18/2005		233
ECCCC001	8/24/2005		103
ECCCC001	8/30/2005		990
ECCCC001	9/6/2005		169
ECCCC001	9/15/2005		193
ECCCC001	9/21/2005		2900
ECCCC001	9/27/2005		255
ECCCC001	10/3/2005		1900
ECCCC001	10/7/2005	>B	>3400
ECCCC001	10/13/2005	<A	<80
ECCCC001	10/19/2005	<A	<100
ECCCC001	10/25/2005		310
ECCCC001	5/2/2006		2650
ECCCC001	5/8/2006		179
ECCCC001	5/12/2006		310
ECCCC001	5/18/2006		2150
ECCCC001	5/24/2006		127
ECCCC001	6/2/2006		6350
ECCCC001	6/8/2006		840
ECCCC001	6/14/2006		282
ECCCC001	6/20/2006	>P	>10000
ECCCC001	6/26/2006		257
ECCCC001	6/30/2006		380
ECCCC001	7/5/2006	>B	>4000
ECCCC001	7/10/2006		200
ECCCC001	7/14/2006		2600
ECCCC001	7/20/2006		702
ECCCC001	7/26/2006		199
ECCCC001	7/31/2006		272
ECCCC001	8/2/2006		1420
ECCCC001	8/7/2006		130
ECCCC001	8/11/2006	>P	>58400
ECCCC001	8/17/2006		272
ECCCC001	8/23/2006		184
ECCCC001	8/29/2006		800
ECCCC001	9/5/2006		202
ECCCC001	9/11/2006	>B	>9600

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	9/15/2006	P	823
ECCCC001	9/21/2006		73
ECCCC001	9/27/2006		100
ECCCC001	10/3/2006		290
ECCCC001	10/9/2006		103
ECCCC001	10/13/2006		157
ECCCC001	10/19/2006	<A	<47
ECCCC001	10/25/2006	<A	<40
ECCCC001	12/12/2006	<A	<40
ECCCC001	3/27/2007	<A	<10
ECCCC001	5/2/2007	<A	<37
ECCCC001	5/2/2007	<A	<37
ECCCC001	5/9/2007	<A	<40
ECCCC001	5/14/2007		70
ECCCC001	5/18/2007	<A	<43
ECCCC001	5/24/2007		93
ECCCC001	5/31/2007		97
ECCCC001	6/4/2007		93
ECCCC001	6/8/2007		410
ECCCC001	6/14/2007		252
ECCCC001	6/20/2007		569
ECCCC001	6/26/2007		155
ECCCC001	7/3/2007	O	521
ECCCC001	7/9/2007		185
ECCCC001	7/13/2007		270
ECCCC001	7/19/2007		224
ECCCC001	7/25/2007		157
ECCCC001	7/31/2007		90
ECCCC001	8/6/2007		202
ECCCC001	8/10/2007		260
ECCCC001	8/16/2007		189
ECCCC001	8/22/2007		920
ECCCC001	8/28/2007		180
ECCCC001	9/5/2007		204
ECCCC001	9/10/2007		1045
ECCCC001	9/14/2007		100
ECCCC001	9/20/2007		147
ECCCC001	9/26/2007		190

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	10/2/2007		73
ECCCC001	10/8/2007		220
ECCCC001	10/12/2007	O	50
ECCCC001	10/18/2007	B	>8650
ECCCC001	10/24/2007		985
ECCCC001	12/11/2007		100
ECCCC001	3/25/2008	O	25
ECCCC001	5/2/2008	A	<57
ECCCC001	5/8/2008		120
ECCCC001	5/14/2008		440
ECCCC001	5/20/2008		169
ECCCC001	5/27/2008	A	<86
ECCCC001	6/3/2008	B&P	>3700
ECCCC001	6/9/2008		123
ECCCC001	6/13/2008	A	<165
ECCCC001	6/19/2008		232
ECCCC001	6/25/2008		185
ECCCC001	7/1/2008		164
ECCCC001	7/7/2008		350
ECCCC001	7/11/2008		210
ECCCC001	7/17/2008		163
ECCCC001	7/23/2008		97
ECCCC001	7/30/2008		107
ECCCC001	8/5/2008		150
ECCCC001	8/11/2008		195
ECCCC001	8/15/2008		250
ECCCC001	8/21/2008		289
ECCCC001	8/27/2008		220
ECCCC001	9/3/2008	P	4100
ECCCC001	9/8/2008		172
ECCCC001	9/12/2008	>B	>3950
ECCCC001	9/18/2008		73
ECCCC001	9/24/2008		249
ECCCC001	9/30/2008		1700
ECCCC001	10/2/2008	A	<18
ECCCC001	10/8/2008		1500
ECCCC001	10/14/2008		167
ECCCC001	10/20/2008		430

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	10/24/2008	B&P	>731
ECCCC001	10/30/2008		117
ECCCC001	12/9/2008	<A	<3
ECCCC001	3/24/2009	<	<24
ECCCC001	5/5/2009		217
ECCCC001	5/11/2009		219
ECCCC001	5/15/2009		330
ECCCC001	5/21/2009		73
ECCCC001	5/28/2009		2450
ECCCC001	6/2/2009	<	<36
ECCCC001	6/8/2009		67
ECCCC001	6/12/2009	>B	>4550
ECCCC001	6/18/2009		945
ECCCC001	6/24/2009		2400
ECCCC001	7/2/2009		170
ECCCC001	7/9/2009		190
ECCCC001	7/15/2009	<	<81
ECCCC001	7/21/2009		252
ECCCC001	7/27/2009	<	<57
ECCCC001	7/31/2009		440
ECCCC001	8/10/2009		185
ECCCC001	8/14/2009		480
ECCCC001	8/20/2009		183
ECCCC001	8/26/2009		70
ECCCC001	8/31/2009	>B	>5200
ECCCC001	9/2/2009	<	<36
ECCCC001	9/8/2009		73
ECCCC001	9/17/2009		117
ECCCC001	9/23/2009		685
ECCCC001	9/29/2009		410
ECCCC001	10/6/2009		117
ECCCC001	10/12/2009		217
ECCCC001	10/16/2009		130
ECCCC001	10/22/2009		87
ECCCC001	10/28/2009	>B	>6000
ECCCC001	12/15/2009	<	<62
ECCCC001	3/22/2010	<A	<52
ECCCC001	5/4/2010		215

MSD Site ID	Date/ Time	Data Flag	Fecal Coliform (colonies/100 ml)
ECCCC001	5/10/2010		390
ECCCC001	5/14/2010		100
ECCCC001	5/20/2010		2450
ECCCC001	5/26/2010		2450
ECCCC001	6/2/2010		113
ECCCC001	6/7/2010		214
ECCCC001	6/11/2010		295
ECCCC001	6/17/2010		117
ECCCC001	6/23/2010		90
ECCCC001	6/29/2010		77
ECCCC001	7/2/2010	O	17
ECCCC001	7/9/2010		165
ECCCC001	7/14/2010		206
ECCCC001	7/20/2010		2900
ECCCC001	7/29/2010		222
ECCCC001	8/3/2010		199
ECCCC001	8/9/2010		390
ECCCC001	8/13/2010		103
ECCCC001	8/19/2010		137
ECCCC001	8/25/2010		110
ECCCC001	8/31/2010		93
ECCCC001	9/8/2010		103
ECCCC001	9/13/2010		70
ECCCC001	9/17/2010		110
ECCCC001	9/23/2010		239
ECCCC001	9/29/2010		100
ECCCC001	10/5/2010		100
ECCCC001	10/11/2010		113
ECCCC001	10/15/2010		93
ECCCC001	10/21/2010		73
ECCCC001	10/27/2010		490
ECCCC001	12/7/2010		94

Bullitt Co Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
CC-1	6/9/2005		500
CC-1	8/19/2005		500
CC-1	10/10/2005		560

Chenoweth Run 0.0 to 5.25			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CR-2	5/23/2007	12.00	40
CR-2	6/11/2007	7.30	80
CR-2	6/25/2007	14.00	3000
CR-2	7/17/2007	4.40	104
CR-2	8/1/2007	5.60	300
CR-2	8/14/2007	4.50	150
CR-2	9/6/2007	4.60	150
CR-2	9/20/2007	4.50	240
CR-2	10/16/2007	4.10	490
CR-2	10/23/2007		12000
CR-2	6/10/2008		96
CR-2	6/23/2008		1300
CR-2	7/16/2008		270
CR-2	7/22/2008		2000
CR-2	8/19/2008		190
CR-2	9/23/2008		96
CR-2	10/2/2008		250
CR-2	10/9/2008		630
CR-2	10/16/2008		110
CR-2	10/23/2008		180

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	5/3/2000		53
EFFCR001	5/3/2000		36
EFFCR001	5/9/2000		520
EFFCR001	5/18/2000		380
EFFCR001	5/24/2000		2105
EFFCR001	5/31/2000		390
EFFCR001	6/1/2000		590
EFFCR001	6/5/2000	<A	<30
EFFCR001	6/13/2000	<A	<33
EFFCR001	6/21/2000	>B	>15000
EFFCR001	6/29/2000		470
EFFCR001	7/7/2000		300

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	7/13/2000		1500
EFFCR001	7/20/2000		510
EFFCR001	7/27/2000		130
EFFCR001	8/2/2000		440
EFFCR001	8/16/2000		169
EFFCR001	8/24/2000	>B	>7250
EFFCR001	8/30/2000		320
EFFCR001	9/8/2000	<A	<10
EFFCR001	9/13/2000		103
EFFCR001	9/21/2000		1100
EFFCR001	9/28/2000	<A	<13
EFFCR001	10/5/2000	<A	<3
EFFCR001	10/11/2000		87
EFFCR001	10/19/2000	<A	<3
EFFCR001	10/26/2000	<A	<3
EFFCR001	10/30/2000	<A	<3
EFFCR001	5/1/2001		196
EFFCR001	5/15/2001		140
EFFCR001	5/22/2001		1100
EFFCR001	5/30/2001		470
EFFCR001	6/5/2001		410
EFFCR001	6/12/2001		103
EFFCR001	6/19/2001	<A	<160
EFFCR001	6/26/2001	<A	<50
EFFCR001	7/3/2001	<A	<3
EFFCR001	7/10/2001	<A	<50
EFFCR001	7/12/2001		1750
EFFCR001	7/17/2001	<A	<27
EFFCR001	7/24/2001	<A	<13
EFFCR001	7/31/2001		73
EFFCR001	8/7/2001	<A	<23
EFFCR001	8/10/2001		97
EFFCR001	8/14/2001		530
EFFCR001	8/23/2001		73
EFFCR001	8/27/2001		1500
EFFCR001	9/6/2001		480
EFFCR001	9/11/2001		123
EFFCR001	9/18/2001		163

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	9/21/2001		320
EFFCR001	9/26/2001		103
EFFCR001	10/2/2001		70
EFFCR001	10/9/2001		70
EFFCR001	10/18/2001	<A	<63
EFFCR001	10/24/2001		1800
EFFCR001	10/30/2001		137
EFFCR001	5/1/2002		1050
EFFCR001	5/7/2002		360
EFFCR001	5/14/2002		1300
EFFCR001	5/21/2002	<A	<43
EFFCR001	5/29/2002	<A	<47
EFFCR001	6/7/2002		1250
EFFCR001	6/11/2002		222
EFFCR001	6/19/2002		250
EFFCR001	6/25/2002		1350
EFFCR001	7/2/2002		130
EFFCR001	7/11/2002		380
EFFCR001	7/18/2002		1850
EFFCR001	7/24/2002	<A	<30
EFFCR001	7/30/2002		330
EFFCR001	8/6/2002		1200
EFFCR001	8/9/2002	<A	<57
EFFCR001	8/14/2002	<A	<60
EFFCR001	8/20/2002	<A	<30
EFFCR001	8/29/2002		70
EFFCR001	9/5/2002		87
EFFCR001	9/9/2002	<A	<3
EFFCR001	9/12/2002		87
EFFCR001	9/19/2002		86
EFFCR001	9/27/2002		1350
EFFCR001	10/1/2002		80
EFFCR001	10/8/2002		87
EFFCR001	10/15/2002		157
EFFCR001	10/22/2002		123
EFFCR001	5/7/2003		1600
EFFCR001	5/13/2003		70
EFFCR001	5/20/2003		332

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	5/23/2003		133
EFFCR001	5/28/2003		265
EFFCR001	6/3/2003		1150
EFFCR001	6/10/2003		520
EFFCR001	6/17/2003		2150
EFFCR001	6/25/2003		103
EFFCR001	6/30/2003		650
EFFCR001	7/1/2003		260
EFFCR001	7/9/2003		70
EFFCR001	7/15/2003	<A	<53
EFFCR001	7/22/2003		120
EFFCR001	7/29/2003	<A	<7
EFFCR001	8/5/2003		2100
EFFCR001	8/12/2003		320
EFFCR001	8/19/2003		83
EFFCR001	8/22/2003	<A	<3
EFFCR001	8/27/2003	<A	<23
EFFCR001	9/3/2003		430
EFFCR001	9/10/2003	<A	<180
EFFCR001	9/16/2003		200
EFFCR001	9/26/2003		180
EFFCR001	9/30/2003		100
EFFCR001	10/7/2003	<A	<20
EFFCR001	10/14/2003		1050
EFFCR001	10/17/2003		67
EFFCR001	10/20/2003		70
EFFCR001	10/30/2003		133
EFFCR001	5/4/2004		100
EFFCR001	5/11/2004	<A	<50
EFFCR001	5/17/2004		60
EFFCR001	5/21/2004		93
EFFCR001	5/27/2004		500
EFFCR001	6/7/2004		83
EFFCR001	6/11/2004		620
EFFCR001	6/17/2004		935
EFFCR001	6/23/2004		117
EFFCR001	6/29/2004		174
EFFCR001	7/6/2004	>B	>7500

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	7/15/2004		232
EFFCR001	7/21/2004	<A	<47
EFFCR001	7/27/2004		2750
EFFCR001	8/2/2004		252
EFFCR001	8/6/2004		1450
EFFCR001	8/12/2004		200
EFFCR001	8/18/2004		100
EFFCR001	8/24/2004		152
EFFCR001	8/30/2004		1750
EFFCR001	9/3/2004		260
EFFCR001	9/10/2004		1700
EFFCR001	9/15/2004		150
EFFCR001	9/21/2004		90
EFFCR001	9/27/2004		97
EFFCR001	10/1/2004		390
EFFCR001	10/7/2004		73
EFFCR001	10/13/2004		1275
EFFCR001	10/19/2004		2750
EFFCR001	10/25/2004		93
EFFCR001	10/29/2004		2200
EFFCR001	5/10/2005		143
EFFCR001	5/16/2005		190
EFFCR001	5/20/2005	B	>4700
EFFCR001	5/25/2005		100
EFFCR001	5/26/2005		150
EFFCR001	6/1/2005		77
EFFCR001	6/6/2005		140
EFFCR001	6/10/2005		90
EFFCR001	6/16/2005		513
EFFCR001	6/22/2005		80
EFFCR001	6/28/2005		2250
EFFCR001	7/8/2005		330
EFFCR001	7/11/2005		179
EFFCR001	7/15/2005		580
EFFCR001	7/21/2005		520
EFFCR001	7/27/2005		125
EFFCR001	8/2/2005		107
EFFCR001	8/8/2005	<A	<47

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	8/12/2005	<A	<60
EFFCR001	8/18/2005		272
EFFCR001	8/24/2005		205
EFFCR001	8/30/2005		1900
EFFCR001	9/6/2005		267
EFFCR001	9/15/2005		195
EFFCR001	9/21/2005		2900
EFFCR001	9/27/2005		2600
EFFCR001	10/3/2005		965
EFFCR001	10/7/2005		2050
EFFCR001	10/13/2005		140
EFFCR001	10/19/2005	<A	<55
EFFCR001	10/25/2005		93
EFFCR001	5/2/2006		2950
EFFCR001	5/8/2006		113
EFFCR001	5/12/2006		250
EFFCR001	5/18/2006		1015
EFFCR001	5/24/2006		127
EFFCR001	6/2/2006	>B	>12200
EFFCR001	6/8/2006		980
EFFCR001	6/14/2006		199
EFFCR001	6/20/2006	>B	>8750
EFFCR001	6/26/2006		130
EFFCR001	6/30/2006		1950
EFFCR001	7/5/2006	>P	>11100
EFFCR001	7/10/2006		113
EFFCR001	7/14/2006		2900
EFFCR001	7/20/2006		97
EFFCR001	7/26/2006		180
EFFCR001	7/31/2006		534
EFFCR001	8/2/2006		174
EFFCR001	8/7/2006		240
EFFCR001	8/11/2006		1850
EFFCR001	8/17/2006		324
EFFCR001	8/23/2006		257
EFFCR001	8/29/2006		1650
EFFCR001	9/5/2006		1245
EFFCR001	9/11/2006	>B	>4850

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	9/15/2006		470
EFFCR001	9/21/2006		167
EFFCR001	9/27/2006		250
EFFCR001	10/3/2006		257
EFFCR001	10/9/2006		110
EFFCR001	10/13/2006		90
EFFCR001	10/19/2006		173
EFFCR001	10/25/2006		169
EFFCR001	12/12/2006		175
EFFCR001	3/27/2007	<A	<17
EFFCR001	5/2/2007	<A	<57
EFFCR001	5/9/2007		97
EFFCR001	5/14/2007		220
EFFCR001	5/18/2007		199
EFFCR001	5/24/2007		257
EFFCR001	5/31/2007	<A	<13
EFFCR001	6/4/2007	<A	<27
EFFCR001	6/8/2007		230
EFFCR001	6/14/2007		440
EFFCR001	6/20/2007	>B	>4650
EFFCR001	6/26/2007		1400
EFFCR001	7/3/2007	O	1727
EFFCR001	7/9/2007		184
EFFCR001	7/13/2007		137
EFFCR001	7/19/2007	<A	<37
EFFCR001	7/25/2007		77
EFFCR001	7/31/2007		252
EFFCR001	8/6/2007		150
EFFCR001	8/10/2007		440
EFFCR001	8/16/2007		73
EFFCR001	8/22/2007		2900
EFFCR001	8/28/2007		860
EFFCR001	9/5/2007		100
EFFCR001	9/10/2007		1050
EFFCR001	9/14/2007		73
EFFCR001	9/20/2007		97
EFFCR001	9/26/2007		985
EFFCR001	10/2/2007	O	26

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	10/8/2007	O	10
EFFCR001	10/12/2007	O	33
EFFCR001	10/18/2007		289
EFFCR001	10/24/2007		960
EFFCR001	12/11/2007		90
EFFCR001	3/25/2008	<A	<3
EFFCR001	5/2/2008	A	<62
EFFCR001	5/8/2008		790
EFFCR001	5/14/2008	BP	>2780
EFFCR001	5/20/2008		262
EFFCR001	5/27/2008		90
EFFCR001	6/3/2008		2700
EFFCR001	6/9/2008	A	<57
EFFCR001	6/13/2008	A	<18
EFFCR001	6/19/2008		900
EFFCR001	6/25/2008		90
EFFCR001	7/1/2008		70
EFFCR001	7/7/2008		279
EFFCR001	7/11/2008		320
EFFCR001	7/17/2008		103
EFFCR001	7/23/2008		205
EFFCR001	7/30/2008		83
EFFCR001	8/5/2008		229
EFFCR001	8/11/2008		197
EFFCR001	8/15/2008	B	>7800
EFFCR001	8/21/2008		67
EFFCR001	8/27/2008	A	<67
EFFCR001	9/3/2008		790
EFFCR001	9/8/2008		295
EFFCR001	9/12/2008		307
EFFCR001	9/18/2008	<A	<40
EFFCR001	9/24/2008	A	<57
EFFCR001	9/30/2008	>P	>14650
EFFCR001	10/2/2008		180
EFFCR001	10/8/2008	B&P	>2642
EFFCR001	10/14/2008	A	<55
EFFCR001	10/20/2008	A	<24
EFFCR001	10/24/2008	B&P	>4117

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	10/30/2008		70
EFFCR001	12/9/2008		67
EFFCR001	3/24/2009	<	<13
EFFCR001	5/5/2009		103
EFFCR001	5/11/2009		167
EFFCR001	5/15/2009		215
EFFCR001	5/21/2009	<	<67
EFFCR001	5/28/2009		217
EFFCR001	6/2/2009		145
EFFCR001	6/8/2009		229
EFFCR001	6/12/2009	>B	>4150
EFFCR001	6/18/2009		380
EFFCR001	6/24/2009		2750
EFFCR001	7/2/2009		224
EFFCR001	7/9/2009		731
EFFCR001	7/15/2009		156
EFFCR001	7/21/2009		133
EFFCR001	7/27/2009	<	<57
EFFCR001	7/31/2009		1700
EFFCR001	8/10/2009		70
EFFCR001	8/14/2009		310
EFFCR001	8/20/2009		1600
EFFCR001	8/26/2009		77
EFFCR001	8/31/2009		160
EFFCR001	9/2/2009		87
EFFCR001	9/8/2009	O	333
EFFCR001	9/17/2009		110
EFFCR001	9/23/2009		490
EFFCR001	9/29/2009		196
EFFCR001	10/6/2009		232
EFFCR001	10/12/2009		80
EFFCR001	10/22/2009	<	<48
EFFCR001	10/28/2009		925
EFFCR001	12/15/2009	<	<21
EFFCR001	3/22/2010	<A	<14
EFFCR001	5/4/2010		274
EFFCR001	5/10/2010		330
EFFCR001	5/14/2010		130

MSD Site ID	Date/Time	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR001	5/20/2010		218
EFFCR001	5/26/2010		194
EFFCR001	6/2/2010		120
EFFCR001	6/7/2010		117
EFFCR001	6/11/2010		335
EFFCR001	6/17/2010		120
EFFCR001	6/23/2010		188
EFFCR001	6/29/2010		242
EFFCR001	7/2/2010		280
EFFCR001	7/9/2010	>B	>5250
EFFCR001	7/14/2010		264
EFFCR001	7/20/2010	>B	>5450
EFFCR001	7/29/2010		1950
EFFCR001	8/3/2010		160
EFFCR001	8/9/2010		207
EFFCR001	8/13/2010	O	470
EFFCR001	8/19/2010		197
EFFCR001	8/25/2010		160
EFFCR001	8/31/2010		97
EFFCR001	9/8/2010		287
EFFCR001	9/13/2010		117
EFFCR001	9/17/2010		67
EFFCR001	9/23/2010		67
EFFCR001	9/29/2010		207
EFFCR001	10/5/2010	A	<40
EFFCR001	10/11/2010		247
EFFCR001	10/15/2010		274
EFFCR001	10/21/2010		73
EFFCR001	10/27/2010		2600
EFFCR001	12/7/2010		94

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CR-3	5/23/2007		60
CR-3	6/11/2007		74
CR-3	6/25/2007		3400
CR-3	6/29/2007	33.30	2500
CR-3	7/17/2007		326

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CR-3	8/1/2007	4.32	140
CR-3	8/14/2007		96
CR-3	8/17/2007	11.40	5400
CR-3	8/21/2007	414.00	18000
CR-3	9/6/2007		120
CR-3	9/20/2007		190
CR-3	10/16/2007	4.70	420
CR-3	10/23/2007		8700
CR-3	6/10/2008		180
CR-3	6/23/2008		1900
CR-3	7/16/2008	4.66	280
CR-3	7/22/2008		720
CR-3	7/31/2008		7200
CR-3	8/19/2008		120
CR-3	9/23/2008		210
CR-3	10/2/2008		190
CR-3	10/9/2008	7.77	580
CR-3	10/16/2008		1900
CR-3	10/23/2008		140

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
JTOWNSTP	6/25/2007		11
JTOWNSTP	7/17/2007		40
JTOWNSTP	8/1/2007	3.15	770
JTOWNSTP	8/14/2007		80
JTOWNSTP	9/6/2007		50
JTOWNSTP	9/20/2007		68
JTOWNSTP	10/16/2007	3.07	12
JTOWNSTP	10/23/2007	15.85	13000
JTOWNSTP	6/10/2008		370
JTOWNSTP	6/23/2008	4.24	8
JTOWNSTP	7/16/2008	2.83	28
JTOWNSTP	7/22/2008	6.25	100
JTOWNSTP	8/19/2008		190
JTOWNSTP	9/23/2008	1.50	8
JTOWNSTP	10/2/2008	2.78	92
JTOWNSTP	10/9/2008		68

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
JTOWNSTP	10/16/2008	2.88	2500
JTOWNSTP	10/23/2008	3.58	200

Chenoweth Run 5.25 to 9.2			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CR-1	5/23/2007	0.95	210
CR-1	6/11/2007	0.24	217
CR-1	7/17/2007	0.38	96
CR-1	8/1/2007	0.22	540
CR-1	8/14/2007	0.04	190
CR-1	8/21/2007	69.00	23000
CR-1	9/6/2007	0.12	440
CR-1	9/20/2007	0.04	330
CR-1	10/16/2007	0.80	850
CR-1	10/23/2007		12000
CR-1	6/10/2008		490
CR-1	6/23/2008		1400
CR-1	7/16/2008		490
CR-1	7/22/2008		2100
CR-1	7/31/2008		7900
CR-1	8/19/2008		330
CR-1	9/23/2008		360
CR-1	10/2/2008		300
CR-1	10/9/2008		1400
CR-1	10/16/2008		420

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	5/3/2000		224
EFFCR002	5/8/2000		390
EFFCR002	5/9/2000		7300
EFFCR002	5/10/2000		240
EFFCR002	5/11/2000		340
EFFCR002	5/12/2000		2400
EFFCR002	5/13/2000		420
EFFCR002	5/15/2000		1540

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	7/17/2000		250
EFFCR002	7/19/2000		11600
EFFCR002	7/20/2000		1850
EFFCR002	7/21/2000	<A	<180
EFFCR002	9/19/2000		117
EFFCR002	9/20/2000		590
EFFCR002	9/20/2000		133
EFFCR002	9/22/2000		204
EFFCR002	10/23/2000	<A	<2
EFFCR002	10/24/2000		560
EFFCR002	10/25/2000	<A	<3
EFFCR002	10/26/2000	<A	<3
EFFCR002	3/26/2001	<A	<10
EFFCR002	3/28/2001	<A	<17
EFFCR002	3/29/2001		70
EFFCR002	3/30/2001		70
EFFCR002	5/1/2001		130
EFFCR002	5/8/2001		2350
EFFCR002	5/17/2001		450
EFFCR002	5/22/2001		2050
EFFCR002	5/30/2001		350
EFFCR002	6/5/2001		820
EFFCR002	6/12/2001		570
EFFCR002	6/19/2001	<A	<60
EFFCR002	6/26/2001		1050
EFFCR002	6/27/2001		67
EFFCR002	7/3/2001	<A	<10
EFFCR002	7/10/2001		187
EFFCR002	7/17/2001	<A	<37
EFFCR002	7/24/2001	<A	<13
EFFCR002	7/31/2001		73
EFFCR002	8/7/2001	<A	56
EFFCR002	8/10/2001	<A	3
EFFCR002	8/14/2001		510
EFFCR002	8/16/2001		17
EFFCR002	8/23/2001	<A	<3
EFFCR002	8/27/2001		1850
EFFCR002	9/6/2001		1150

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	9/11/2001		1900
EFFCR002	9/18/2001		330
EFFCR002	9/21/2001		1200
EFFCR002	9/26/2001		1850
EFFCR002	10/2/2001		123
EFFCR002	10/9/2001		110
EFFCR002	10/18/2001		87
EFFCR002	10/24/2001		7400
EFFCR002	10/30/2001		194
EFFCR002	11/9/2001		300
EFFCR002	5/1/2002		240
EFFCR002	5/14/2002		1150
EFFCR002	5/21/2002	<A	<30
EFFCR002	5/29/2002		550
EFFCR002	6/7/2002		160
EFFCR002	6/11/2002		845
EFFCR002	6/19/2002		430
EFFCR002	6/25/2002		270
EFFCR002	7/2/2002		1300
EFFCR002	7/11/2002	>B	>11400
EFFCR002	7/18/2002		2100
EFFCR002	7/24/2002		70
EFFCR002	7/30/2002		2300
EFFCR002	8/6/2002		2900
EFFCR002	8/9/2002		93
EFFCR002	8/14/2002		157
EFFCR002	8/20/2002	<A	<40
EFFCR002	8/29/2002		290
EFFCR002	9/5/2002		220
EFFCR002	9/9/2002		93
EFFCR002	9/12/2002		93
EFFCR002	9/27/2002		260
EFFCR002	10/1/2002		137
EFFCR002	10/8/2002	<A	<37
EFFCR002	10/15/2002		480
EFFCR002	10/22/2002		280
EFFCR002	5/7/2003		1520
EFFCR002	5/13/2003		117

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	5/20/2003		410
EFFCR002	5/23/2003		280
EFFCR002	5/28/2003		533
EFFCR002	6/3/2003		2050
EFFCR002	6/10/2003		400
EFFCR002	6/17/2003		2000
EFFCR002	7/1/2003		1100
EFFCR002	7/9/2003		23
EFFCR002	7/15/2003	<A	<20
EFFCR002	7/22/2003		2100
EFFCR002	7/29/2003		127
EFFCR002	8/5/2003		430
EFFCR002	8/12/2003		103
EFFCR002	8/19/2003		120
EFFCR002	8/22/2003	<A	<3
EFFCR002	8/27/2003	<A	<43
EFFCR002	9/3/2003		210
EFFCR002	9/10/2003	<A	<140
EFFCR002	9/16/2003		2950
EFFCR002	9/23/2003		2470
EFFCR002	9/26/2003		93
EFFCR002	9/30/2003	<A	<37
EFFCR002	10/7/2003	<A	<3
EFFCR002	10/14/2003		685
EFFCR002	10/17/2003		90
EFFCR002	10/20/2003	<A	<17
EFFCR002	10/30/2003	<	<53
EFFCR002	5/4/2004		80
EFFCR002	5/11/2004		167
EFFCR002	5/17/2004		110
EFFCR002	5/21/2004		360
EFFCR002	5/27/2004	>B	>7500
EFFCR002	6/7/2004		103
EFFCR002	6/11/2004		1650
EFFCR002	6/17/2004		840
EFFCR002	6/23/2004		350
EFFCR002	6/29/2004		282
EFFCR002	7/6/2004		73

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	7/15/2004		1600
EFFCR002	7/21/2004		140
EFFCR002	7/27/2004		2900
EFFCR002	8/2/2004		267
EFFCR002	8/6/2004		1450
EFFCR002	8/12/2004		155
EFFCR002	8/18/2004		169
EFFCR002	8/24/2004		179
EFFCR002	8/30/2004		2750
EFFCR002	9/3/2004		206
EFFCR002	9/10/2004		210
EFFCR002	9/15/2004		97
EFFCR002	9/21/2004		790
EFFCR002	9/27/2004		110
EFFCR002	10/1/2004		390
EFFCR002	10/7/2004	<A	<20
EFFCR002	10/13/2004		1550
EFFCR002	10/19/2004		915
EFFCR002	10/25/2004		130
EFFCR002	10/29/2004		3400
EFFCR002	5/10/2005		920
EFFCR002	5/16/2005		239
EFFCR002	5/20/2005	B	>3850
EFFCR002	5/25/2005		117
EFFCR002	5/26/2005		257
EFFCR002	6/1/2005		107
EFFCR002	6/6/2005		215
EFFCR002	6/10/2005		127
EFFCR002	6/16/2005		513
EFFCR002	6/22/2005		644
EFFCR002	6/28/2005		2750
EFFCR002	7/8/2005	>P	>22100
EFFCR002	7/11/2005		700
EFFCR002	7/15/2005		1450
EFFCR002	7/21/2005	>P	>13625
EFFCR002	7/27/2005		465
EFFCR002	8/2/2005		455
EFFCR002	8/8/2005	<A	<75

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	8/12/2005		67
EFFCR002	8/18/2005		287
EFFCR002	8/24/2005		300
EFFCR002	8/30/2005		1600
EFFCR002	9/6/2005		212
EFFCR002	9/15/2005		117
EFFCR002	9/21/2005	>B	>7750
EFFCR002	9/27/2005		233
EFFCR002	10/3/2005		591
EFFCR002	10/7/2005		935
EFFCR002	10/13/2005	<A	<80
EFFCR002	10/19/2005	<A	<20
EFFCR002	10/25/2005		270
EFFCR002	5/2/2006	>B	>4250
EFFCR002	5/8/2006		499
EFFCR002	5/12/2006		2950
EFFCR002	5/18/2006		2200
EFFCR002	5/24/2006		215
EFFCR002	6/2/2006	>P	>29400
EFFCR002	6/8/2006		915
EFFCR002	6/14/2006		227
EFFCR002	6/20/2006	>B	>9400
EFFCR002	6/26/2006		742
EFFCR002	6/30/2006		1950
EFFCR002	7/5/2006	>B	>4850
EFFCR002	7/10/2006		185
EFFCR002	7/14/2006	>B	>4950
EFFCR002	7/20/2006		302
EFFCR002	7/26/2006		598
EFFCR002	7/31/2006		711
EFFCR002	8/2/2006		613
EFFCR002	8/7/2006		147
EFFCR002	8/11/2006	>B	>3600
EFFCR002	8/17/2006	<A	<90
EFFCR002	8/23/2006		290
EFFCR002	8/29/2006		1240
EFFCR002	9/5/2006		1110
EFFCR002	9/11/2006	>B	>5550

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	9/15/2006		390
EFFCR002	9/21/2006		120
EFFCR002	9/27/2006		252
EFFCR002	10/3/2006		274
EFFCR002	10/9/2006		130
EFFCR002	10/13/2006	A	<33
EFFCR002	10/19/2006		180
EFFCR002	10/25/2006		177
EFFCR002	12/12/2006		100
EFFCR002	3/27/2007	<A	<50
EFFCR002	5/2/2007		269
EFFCR002	5/9/2007		90
EFFCR002	5/14/2007		179
EFFCR002	5/18/2007		200
EFFCR002	5/24/2007		245
EFFCR002	5/31/2007		390
EFFCR002	6/4/2007		170
EFFCR002	6/8/2007		580
EFFCR002	6/14/2007		194
EFFCR002	6/20/2007	>B	>6250
EFFCR002	6/26/2007		1170
EFFCR002	7/3/2007		1450
EFFCR002	7/9/2007		855
EFFCR002	7/13/2007		97
EFFCR002	7/19/2007		103
EFFCR002	7/25/2007		160
EFFCR002	7/31/2007		299
EFFCR002	8/6/2007		73
EFFCR002	8/10/2007		1300
EFFCR002	8/16/2007		164
EFFCR002	8/22/2007		2250
EFFCR002	8/28/2007		280
EFFCR002	9/5/2007		182
EFFCR002	9/10/2007	>P	>21850
EFFCR002	9/14/2007		80
EFFCR002	9/20/2007		113
EFFCR002	9/26/2007		237
EFFCR002	10/2/2007		67

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	10/8/2007	O	71
EFFCR002	10/12/2007	O	38
EFFCR002	10/18/2007	P	15600
EFFCR002	10/24/2007		1800
EFFCR002	12/11/2007		144
EFFCR002	3/25/2008	<A	<3
EFFCR002	5/2/2008		220
EFFCR002	5/8/2008		259
EFFCR002	5/14/2008	BP	>6490
EFFCR002	5/20/2008	A	<64
EFFCR002	5/27/2008		117
EFFCR002	6/3/2008	B	>9850
EFFCR002	6/9/2008		282
EFFCR002	6/13/2008		150
EFFCR002	6/19/2008		100
EFFCR002	6/25/2008		1190
EFFCR002	7/1/2008		209
EFFCR002	7/7/2008		199
EFFCR002	7/11/2008		450
EFFCR002	7/17/2008		380
EFFCR002	7/23/2008		1650
EFFCR002	7/30/2008		224
EFFCR002	8/5/2008		83
EFFCR002	8/11/2008	A	<64
EFFCR002	8/15/2008	P	11400
EFFCR002	8/21/2008		1015
EFFCR002	8/27/2008		580
EFFCR002	9/3/2008		480
EFFCR002	9/8/2008		2900
EFFCR002	9/12/2008		1015
EFFCR002	9/18/2008	<A	<63
EFFCR002	9/24/2008	A	<50
EFFCR002	9/30/2008	>P	>21150
EFFCR002	10/2/2008		195
EFFCR002	10/8/2008	B&P	>2400
EFFCR002	10/14/2008		97
EFFCR002	10/20/2008		103
EFFCR002	10/24/2008	P	>6158

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	10/30/2008		70
EFFCR002	12/9/2008	<A	<18
EFFCR002	3/24/2009	<	<7
EFFCR002	5/5/2009	<	<45
EFFCR002	5/11/2009		77
EFFCR002	5/15/2009		540
EFFCR002	5/21/2009	<	<26
EFFCR002	5/28/2009		242
EFFCR002	6/2/2009		720
EFFCR002	6/8/2009		1220
EFFCR002	6/12/2009		2450
EFFCR002	6/18/2009		206
EFFCR002	6/24/2009		130
EFFCR002	7/2/2009		248
EFFCR002	7/9/2009		123
EFFCR002	7/15/2009		455
EFFCR002	7/21/2009		160
EFFCR002	7/27/2009		73
EFFCR002	7/31/2009		1350
EFFCR002	8/10/2009	<	<30
EFFCR002	8/14/2009		167
EFFCR002	8/20/2009		2600
EFFCR002	8/26/2009		150
EFFCR002	8/31/2009		220
EFFCR002	9/2/2009	<	<30
EFFCR002	9/8/2009		430
EFFCR002	9/17/2009		87
EFFCR002	9/23/2009		244
EFFCR002	9/29/2009		180
EFFCR002	10/6/2009	<	<52
EFFCR002	10/12/2009	<	<17
EFFCR002	10/16/2009		230
EFFCR002	10/22/2009	<	<24
EFFCR002	10/28/2009		1250
EFFCR002	12/15/2009	<	<3
EFFCR002	3/22/2010	<A	<4
EFFCR002	5/4/2010		163
EFFCR002	5/10/2010		490

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFCR002	5/14/2010		80
EFFCR002	5/20/2010		895
EFFCR002	5/26/2010		318
EFFCR002	6/2/2010		185
EFFCR002	6/7/2010		240
EFFCR002	6/11/2010		156
EFFCR002	6/17/2010		127
EFFCR002	6/23/2010		550
EFFCR002	6/29/2010		1070
EFFCR002	7/2/2010		173
EFFCR002	7/9/2010	>B	>8300
EFFCR002	7/14/2010		192
EFFCR002	7/20/2010	>B	>2900
EFFCR002	7/29/2010		1850
EFFCR002	8/3/2010		97
EFFCR002	8/9/2010		97
EFFCR002	8/13/2010		290
EFFCR002	8/19/2010		232
EFFCR002	8/25/2010		238
EFFCR002	8/31/2010		825
EFFCR002	9/8/2010		2750
EFFCR002	9/13/2010		204
EFFCR002	9/17/2010		177
EFFCR002	9/23/2010		110
EFFCR002	9/29/2010		123
EFFCR002	10/5/2010	A	<74
EFFCR002	10/11/2010		172
EFFCR002	10/15/2010		1115
EFFCR002	10/21/2010		80
EFFCR002	10/27/2010		2450
EFFCR002	12/7/2010	<A	<4

Currys Fork 0.0 to 4.8			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CF-1	5/23/2007		92

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
CF-1	6/11/2007		450
CF-1	6/25/2007		430
CF-1	7/17/2007		214
CF-1	7/31/2007	2.06	250
CF-1	8/14/2007		210
CF-1	9/6/2007		450
CF-1	9/20/2007		370
CF-1	10/16/2007		3300
CF-1	10/23/2007		16000
CF-1	6/10/2008		260
CF-1	6/23/2008		310
CF-1	7/16/2008	4.36	440
CF-1	7/31/2008		20000
CF-1	8/19/2008		330
CF-1	9/23/2008		160
CF-1	10/2/2008		150
CF-1	10/9/2008		1900
CF-1	10/16/2008		380
CF-1	10/23/2008		200

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
CF1	5/7/2007		100
CF1	5/23/2007		50
CF1	6/11/2007		300
CF1	6/25/2007		1000
CF1	7/11/2007		1500
CF1	7/25/2007		500
CF1	8/9/2007		780
CF1	8/22/2007		490
CF1	9/11/2007		480
CF1	9/26/2007		310
CF1	10/10/2007		140
CF1	10/25/2007		3500
CF1	5/21/2009	23.70	200
CF1	6/5/2009	11.33	1800
CF1	6/18/2009	61.88	6500
CF1	7/2/2009	6.51	380

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
CF1	7/15/2009	0.47	300
CF1	7/30/2009	206.27	2200
CF1	8/13/2009	31.27	360
CF1	8/27/2009	3.99	200
CF1	9/10/2009	4.69	190
CF1	9/24/2009	182.64	3000
CF1	10/8/2009	1020.93	9900
CF1	10/22/2009	94.81	1,300

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
CF2	5/7/2007		100
CF2	5/23/2007		120
CF2	6/11/2007		2000
CF2	6/25/2007		1100
CF2	7/11/2007		1900
CF2	7/25/2007		590
CF2	8/9/2007		590
CF2	8/22/2007		780
CF2	9/11/2007		930
CF2	9/26/2007		860
CF2	10/10/2007		260
CF2	10/25/2007		4400
CF2	5/21/2009		210
CF2	6/5/2009		2300
CF2	6/18/2009		7200
CF2	7/2/2009		460
CF2	7/15/2009		25000
CF2	7/30/2009		2300
CF2	8/13/2009		350
CF2	8/27/2009		350
CF2	9/10/2009		60
CF2	9/24/2009		3700
CF2	10/8/2009		9600
CF2	10/22/2009		1,600

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
CF3	5/7/2007		200
CF3	5/23/2007		220
CF3	6/11/2007		1030
CF3	6/25/2007		1600
CF3	7/11/2007		88000
CF3	7/25/2007		790
CF3	8/9/2007		2000
CF3	8/22/2007		330
CF3	9/11/2007		230
CF3	9/26/2007		210
CF3	10/10/2007		200
CF3	10/25/2007		4100
CF3	5/21/2009	9.14	400
CF3	6/5/2009	11.07	940
CF3	6/18/2009	4.67	1800
CF3	7/2/2009	2.16	440
CF3	7/15/2009	3.46	2000
CF3	7/30/2009	89.51	2700
CF3	8/13/2009	7.34	760
CF3	8/27/2009	0.78	330
CF3	9/10/2009	27.69	1100
CF3	9/24/2009	11.91	1300
CF3	10/8/2009	568.19	8000
CF3	10/22/2009	25.96	1,000

Floyds Fork 0.0 to 11.7			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-6	5/23/2007		100
FF-6	6/11/2007		46
FF-6	6/25/2007		3000
FF-6	6/29/2007		2100
FF-6	7/17/2007		120
FF-6	8/1/2007		100
FF-6	8/14/2007		28
FF-6	9/6/2007		40
FF-6	9/20/2007		12

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-6	10/16/2007		92
FF-6	10/24/2007		19000
FF-6	6/10/2008		170
FF-6	6/23/2008		130
FF-6	7/16/2008		170
FF-6	7/22/2008		100
FF-6	8/19/2008		32
FF-6	9/23/2008		88
FF-6	10/2/2008		90
FF-6	10/9/2008		460
FF-6	10/16/2008		84
FF-6	10/23/2008		60

Bullitt Co Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
FF-2	6/9/2005		330
FF-2	8/19/2005		210
FF-2	10/10/2005		410
FF-2	10/16/2006		100
FF-2	10/17/2006		1600
FF-2	10/17/2006		6000
FF-2	10/17/2006		1100

DOW Site ID	Date	Fecal Coliform (colonies/100 ml)	*E. coli* (colonies/100 ml)
PRI100	6/30/1998	4000	
PRI100	8/18/1998	160	
PRI100	9/15/1998	30	
PRI100	10/14/1998	110	
PRI100	5/25/1999	60	
PRI100	6/21/1999	60	
PRI100	7/8/1999	160	
PRI100	8/13/1999	60	
PRI100	9/30/1999	50	
PRI100	10/28/1999	10	
PRI100	5/30/2000	100	

DOW Site ID	Date	Fecal Coliform (colonies/100 ml)	*E. coli* (colonies/100 ml)
PRI100	6/20/2000	200	
PRI100	7/11/2000	250	
PRI100	8/23/2000	450	
PRI100	8/24/2000	340	
PRI100	9/26/2000	12000	
PRI100	10/19/2000	40	
PRI100	5/30/2001	90	
PRI100	6/27/2001	1200	
PRI100	7/26/2001	520	
PRI100	8/14/2001	100	
PRI100	9/26/2001	60	
PRI100	10/10/2001	94	
PRI100	5/10/2002	270	
PRI100	6/19/2002	160	
PRI100	7/10/2002	200	
PRI100	8/27/2002	60	
PRI100	9/30/2002	570	
PRI100	10/17/2002	76	
PRI100	5/8/2003	600	
PRI100	6/18/2003	1400	
PRI100	8/13/2003	700	
PRI100	6/14/2004	2420	
PRI100	5/17/2006		62
PRI100	6/26/2006		210
PRI100	7/14/2006		3100
PRI100	8/24/2006		148
PRI100	10/19/2006		1986
PRI100	5/14/2007		88.2
PRI100	6/26/2007		114.5
PRI100	7/2/2007		290.9
PRI100	8/2/2007		224.7
PRI100	9/27/2007		>2400
PRI100	10/18/2007		920.8
PRI100	6/23/2008		95.9
PRI100	5/14/2009		39.90

DOW Site ID	Date	Fecal Coliform (colonies/100 ml)	*E. coli* (colonies/100 ml)
PRI100	6/2/2009		201.40
PRI100	7/29/2009		2419.00
PRI100	8/18/2009		144.00
PRI100	9/22/2009		>2419.2
PRI100	10/20/2009		71.20

Bullitt Co Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
FF-1	6/9/2005		270
FF-1	8/19/2005		1300
FF-1	10/10/2005		130
FF-1	10/16/2006		1300
FF-1	10/17/2006		4600
FF-1	10/17/2006		7900
FF-1	10/17/2006		3400

Floyds Fork 11.6 to 24.2			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-5	5/23/2007	20.00	80
FF-5	6/11/2007	17.00	88
FF-5	6/25/2007	33.00	560
FF-5	6/29/2007	298.00	2300
FF-5	7/17/2007	12.00	152
FF-5	8/1/2007	12.00	120
FF-5	8/14/2007	7.60	80
FF-5	8/17/2007	44.00	500
FF-5	9/6/2007	11.00	32
FF-5	9/20/2007	54.00	210
FF-5	10/16/2007	96.00	240
FF-5	10/24/2007		19000
FF-5	6/10/2008		220
FF-5	6/23/2008		120
FF-5	7/16/2008		100
FF-5	8/19/2008		52

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-5	9/23/2008		16
FF-5	10/2/2008		10
FF-5	10/9/2008		230
FF-5	10/16/2008		20
FF-5	10/23/2008		<4

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	5/1/2001		113
EFFFF002	5/8/2001	>B	>3100
EFFFF002	5/15/2001		660
EFFFF002	5/22/2001		1400
EFFFF002	5/30/2001		865
EFFFF002	6/5/2001		1300
EFFFF002	6/12/2001		17
EFFFF002	6/19/2001	<A	<37
EFFFF002	6/26/2001		460
EFFFF002	7/3/2001	<A	<3
EFFFF002	7/10/2001		8
EFFFF002	7/12/2001		10
EFFFF002	7/17/2001	<A	<3
EFFFF002	7/24/2001	<A	<7
EFFFF002	7/31/2001		103
EFFFF002	8/7/2001		77
EFFFF002	8/10/2001	<A	<13
EFFFF002	8/14/2001		150
EFFFF002	8/23/2001	<A	<3
EFFFF002	8/27/2001		280
EFFFF002	9/6/2001		70
EFFFF002	9/11/2001		1350
EFFFF002	9/18/2001	<A	<33
EFFFF002	9/21/2001		97
EFFFF002	9/26/2001		106
EFFFF002	10/2/2001		107
EFFFF002	10/9/2001	<A	<27
EFFFF002	10/18/2001		87
EFFFF002	10/24/2001		2300
EFFFF002	10/30/2001		87

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	5/1/2002		140
EFFFF002	5/7/2002	>B	>620
EFFFF002	5/21/2002		80
EFFFF002	5/30/2002	>B	>10600
EFFFF002	6/7/2002		4170
EFFFF002	6/11/2002		260
EFFFF002	6/19/2002		460
EFFFF002	6/25/2002		1850
EFFFF002	7/2/2002		1800
EFFFF002	7/11/2002		130
EFFFF002	7/18/2002		370
EFFFF002	7/24/2002		87
EFFFF002	7/30/2002		16400
EFFFF002	8/6/2002		130
EFFFF002	8/9/2002	<A	<40
EFFFF002	8/14/2002	<A	<63
EFFFF002	8/20/2002	<A	<10
EFFFF002	8/29/2002	<A	<3
EFFFF002	9/5/2002		1850
EFFFF002	9/9/2002	<A	<3
EFFFF002	9/12/2002	<A	<3
EFFFF002	9/19/2002		106
EFFFF002	9/27/2002	>B	>4350
EFFFF002	10/1/2002		67
EFFFF002	10/8/2002		210
EFFFF002	10/15/2002		220
EFFFF002	10/22/2002		320
EFFFF002	10/28/2002	<A	<53
EFFFF002	5/7/2003		2390
EFFFF002	5/13/2003		167
EFFFF002	5/20/2003		620
EFFFF002	5/23/2003		380
EFFFF002	5/28/2003		90
EFFFF002	6/3/2003		110
EFFFF002	6/10/2003		230
EFFFF002	6/17/2003		500
EFFFF002	6/25/2003		490
EFFFF002	6/30/2003		800

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	7/1/2003		2100
EFFFF002	7/9/2003		10
EFFFF002	7/15/2003	<A	<40
EFFFF002	7/22/2003		77
EFFFF002	7/29/2003	<A	<37
EFFFF002	8/5/2003	<A	<27
EFFFF002	8/19/2003		127
EFFFF002	8/22/2003		127
EFFFF002	8/27/2003	<A	<13
EFFFF002	9/3/2003		140
EFFFF002	9/10/2003	<A	<190
EFFFF002	9/16/2003		280
EFFFF002	9/23/2003		520
EFFFF002	9/26/2003	<A	<70
EFFFF002	9/30/2003		250
EFFFF002	10/7/2003	<A	<27
EFFFF002	10/14/2003		725
EFFFF002	10/17/2003	<A	<3
EFFFF002	10/20/2003	<A	<3
EFFFF002	10/30/2003		100
EFFFF002	5/4/2004		270
EFFFF002	5/11/2004		1500
EFFFF002	5/17/2004		420
EFFFF002	5/21/2004		1100
EFFFF002	5/27/2004		875
EFFFF002	6/7/2004		73
EFFFF002	6/11/2004		2200
EFFFF002	6/17/2004		2500
EFFFF002	6/23/2004		190
EFFFF002	6/29/2004		259
EFFFF002	7/6/2004		350
EFFFF002	7/15/2004		2750
EFFFF002	7/21/2004		127
EFFFF002	7/27/2004		1650
EFFFF002	8/2/2004		245
EFFFF002	8/6/2004	>B	>4800
EFFFF002	8/12/2004		200
EFFFF002	8/18/2004		260

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	8/24/2004		67
EFFFF002	8/30/2004		350
EFFFF002	9/3/2004		2600
EFFFF002	9/10/2004		2650
EFFFF002	9/15/2004		940
EFFFF002	9/21/2004		175
EFFFF002	9/27/2004		103
EFFFF002	10/1/2004		270
EFFFF002	10/7/2004		80
EFFFF002	10/13/2004		1100
EFFFF002	10/19/2004		3000
EFFFF002	10/25/2004		262
EFFFF002	10/29/2004		410
EFFFF002	5/10/2005		87
EFFFF002	5/16/2005		150
EFFFF002	5/25/2005		207
EFFFF002	5/26/2005		184
EFFFF002	6/1/2005		73
EFFFF002	6/6/2005		107
EFFFF002	6/10/2005		440
EFFFF002	6/16/2005		77
EFFFF002	6/22/2005	<A	<53
EFFFF002	6/28/2005		67
EFFFF002	7/8/2005	>P	>31350
EFFFF002	7/11/2005		67
EFFFF002	7/15/2005		380
EFFFF002	7/21/2005		225
EFFFF002	7/27/2005		145
EFFFF002	8/2/2005		130
EFFFF002	8/8/2005	<A	<60
EFFFF002	8/12/2005		33
EFFFF002	8/18/2005		135
EFFFF002	8/24/2005	<A	<23
EFFFF002	8/30/2005		702
EFFFF002	9/6/2005		103
EFFFF002	9/15/2005	<A	<65
EFFFF002	9/21/2005		2750
EFFFF002	9/27/2005	<A	<110

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	10/3/2005		985
EFFFF002	10/7/2005		290
EFFFF002	10/13/2005	<A	<100
EFFFF002	10/19/2005	<A	<30
EFFFF002	10/25/2005	<A	<80
EFFFF002	5/2/2006	>B	>3050
EFFFF002	5/8/2006		484
EFFFF002	5/12/2006		910
EFFFF002	5/18/2006		207
EFFFF002	5/24/2006		90
EFFFF002	6/2/2006	>P	>16400
EFFFF002	6/8/2006		740
EFFFF002	6/14/2006		217
EFFFF002	6/20/2006		2900
EFFFF002	6/26/2006		185
EFFFF002	6/30/2006		580
EFFFF002	7/5/2006		450
EFFFF002	7/10/2006	<A	<40
EFFFF002	7/14/2006	>P	>6400
EFFFF002	7/20/2006		70
EFFFF002	7/26/2006		130
EFFFF002	7/31/2006		660
EFFFF002	8/2/2006		207
EFFFF002	8/7/2006	<A	<33
EFFFF002	8/11/2006		7200
EFFFF002	8/17/2006		257
EFFFF002	8/23/2006		252
EFFFF002	8/29/2006		1540
EFFFF002	9/5/2006		170
EFFFF002	9/11/2006		550
EFFFF002	9/15/2006		260
EFFFF002	9/21/2006	<A	<60
EFFFF002	9/27/2006		210
EFFFF002	10/3/2006		219
EFFFF002	10/9/2006		117
EFFFF002	10/13/2006	A	<30
EFFFF002	10/19/2006		660
EFFFF002	10/25/2006	<A	<57

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	12/12/2006		73
EFFFF002	3/27/2007	<A	<43
EFFFF002	5/2/2007		97
EFFFF002	5/9/2007		67
EFFFF002	5/14/2007	<A	<47
EFFFF002	5/18/2007		87
EFFFF002	5/24/2007	<A	<47
EFFFF002	5/31/2007	<A	<43
EFFFF002	6/4/2007		252
EFFFF002	6/8/2007		41
EFFFF002	6/14/2007		547
EFFFF002	6/20/2007		77
EFFFF002	6/26/2007		110
EFFFF002	7/3/2007		330
EFFFF002	7/9/2007		300
EFFFF002	7/13/2007		140
EFFFF002	7/19/2007		83
EFFFF002	7/25/2007		174
EFFFF002	7/31/2007		180
EFFFF002	8/6/2007		67
EFFFF002	8/10/2007		23
EFFFF002	8/16/2007	O	31
EFFFF002	8/22/2007		1120
EFFFF002	8/28/2007		169
EFFFF002	9/5/2007	O	29
EFFFF002	9/10/2007		289
EFFFF002	9/14/2007		530
EFFFF002	9/20/2007		835
EFFFF002	9/26/2007	B	>3650
EFFFF002	10/2/2007		97
EFFFF002	10/8/2007	O	5
EFFFF002	10/12/2007	O	60
EFFFF002	10/18/2007		480
EFFFF002	10/24/2007	>P	>10500
EFFFF002	12/11/2007		1390
EFFFF002	3/25/2008	O	13
EFFFF002	5/2/2008		77
EFFFF002	5/8/2008		360

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	5/14/2008		550
EFFFF002	5/20/2008	A	<176
EFFFF002	5/27/2008	A	<69
EFFFF002	6/3/2008		410
EFFFF002	6/9/2008	A	<55
EFFFF002	6/13/2008	A	<65
EFFFF002	6/19/2008	A	<52
EFFFF002	6/25/2008	A	<45
EFFFF002	7/1/2008	A	<57
EFFFF002	7/7/2008		252
EFFFF002	7/11/2008		230
EFFFF002	7/17/2008	A	<88
EFFFF002	7/23/2008	A	<71
EFFFF002	7/30/2008		2600
EFFFF002	8/5/2008		1500
EFFFF002	8/11/2008	A	<48
EFFFF002	8/15/2008		360
EFFFF002	8/21/2008	A	<24
EFFFF002	8/27/2008		97
EFFFF002	9/3/2008		107
EFFFF002	9/8/2008	A	<93
EFFFF002	9/12/2008	B	>5800
EFFFF002	9/18/2008	<A	<20
EFFFF002	9/24/2008		252
EFFFF002	9/30/2008	P	>21550
EFFFF002	10/2/2008	A	<17
EFFFF002	10/8/2008		285
EFFFF002	10/14/2008	A	<8
EFFFF002	10/20/2008	A	<13
EFFFF002	10/24/2008	A	<60
EFFFF002	10/30/2008	A	<7
EFFFF002	12/9/2008	<A	<10
EFFFF002	3/24/2009	<	<74
EFFFF002	5/5/2009		67
EFFFF002	5/11/2009		305
EFFFF002	5/15/2009		83
EFFFF002	5/21/2009	<	<14
EFFFF002	5/28/2009		130

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	6/2/2009	<	<48
EFFFF002	6/8/2009	<	<26
EFFFF002	6/12/2009	>P	>22400
EFFFF002	6/18/2009		2650
EFFFF002	6/24/2009		2200
EFFFF002	7/2/2009	<	<45
EFFFF002	7/9/2009	<	<48
EFFFF002	7/15/2009	<	<45
EFFFF002	7/21/2009	<	<26
EFFFF002	7/27/2009		2250
EFFFF002	7/31/2009	>P	>12400
EFFFF002	8/10/2009		67
EFFFF002	8/14/2009	<	<118
EFFFF002	8/20/2009		67
EFFFF002	8/26/2009		350
EFFFF002	8/31/2009		2300
EFFFF002	9/2/2009	<	<19
EFFFF002	9/8/2009		173
EFFFF002	9/17/2009	<	<62
EFFFF002	9/23/2009		220
EFFFF002	9/29/2009		725
EFFFF002	10/6/2009		186
EFFFF002	10/12/2009		760
EFFFF002	10/16/2009		2050
EFFFF002	10/22/2009	<	<45
EFFFF002	10/28/2009	>B	>3700
EFFFF002	12/15/2009		93
EFFFF002	3/22/2010		67
EFFFF002	5/4/2010		440
EFFFF002	5/10/2010		206
EFFFF002	5/14/2010		160
EFFFF002	5/20/2010	>B	>3650
EFFFF002	5/26/2010		530
EFFFF002	6/2/2010		100
EFFFF002	6/7/2010		93
EFFFF002	6/11/2010		605
EFFFF002	6/17/2010		850
EFFFF002	6/23/2010		475

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF002	6/29/2010		160
EFFFF002	7/2/2010	O	17
EFFFF002	7/9/2010		2750
EFFFF002	7/14/2010		2200
EFFFF002	7/20/2010	>P	>11520
EFFFF002	7/29/2010		2950
EFFFF002	8/3/2010		440
EFFFF002	8/9/2010		97
EFFFF002	8/13/2010		1650
EFFFF002	8/19/2010		97
EFFFF002	8/25/2010		2450
EFFFF002	8/31/2010	A	<33
EFFFF002	9/8/2010		67
EFFFF002	9/13/2010	A	<19
EFFFF002	9/17/2010		260
EFFFF002	9/23/2010		73
EFFFF002	9/29/2010	A	<23
EFFFF002	10/5/2010		815
EFFFF002	10/11/2010	A	<40
EFFFF002	10/15/2010		70
EFFFF002	10/21/2010	A	<33
EFFFF002	10/27/2010	>B	>3600
EFFFF002	12/7/2010		77

Floyds Fork 24.2 to 34.1			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-4	5/23/2007	1.50	100
FF-4	6/11/2007	1.30	400
FF-4	6/29/2007	132.00	1500
FF-4	7/17/2007	1.20	132
FF-4	7/31/2007	24.00	200
FF-4	8/14/2007	0.14	68
FF-4	8/17/2007	114.00	2800
FF-4	9/6/2007	0.14	60
FF-4	9/20/2007	0.37	100
FF-4	10/16/2007	0.73	400

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-4	10/23/2007		14000
FF-4	6/10/2008		92
FF-4	6/23/2008		300
FF-4	7/16/2008		230
FF-4	7/22/2008		96
FF-4	8/19/2008		110
FF-4	9/23/2008		110
FF-4	10/2/2008		80
FF-4	10/9/2008		240
FF-4	10/16/2008		92
FF-4	10/23/2008		60

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	5/3/2000		183
EFFFF003	5/9/2000	<A	<33
EFFFF003	5/18/2000	>	>57
EFFFF003	5/24/2000		140
EFFFF003	6/1/2000		40
EFFFF003	6/5/2000		193
EFFFF003	6/13/2000		410
EFFFF003	6/21/2000		1050
EFFFF003	6/29/2000		470
EFFFF003	7/13/2000		137
EFFFF003	7/20/2000		880
EFFFF003	7/27/2000		110
EFFFF003	8/2/2000		280
EFFFF003	8/16/2000	<A	<13
EFFFF003	8/24/2000		560
EFFFF003	8/30/2000	<A	<47
EFFFF003	9/8/2000	<A	<20
EFFFF003	9/13/2000	<A	<50
EFFFF003	9/21/2000		1250
EFFFF003	9/28/2000	<A	<30
EFFFF003	10/5/2000	<A	<3
EFFFF003	10/11/2000	<20	7
EFFFF003	10/19/2000	<A	<3
EFFFF003	10/26/2000	<A	<3

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	10/31/2000	<A	<20
EFFFF003	5/1/2001		77
EFFFF003	5/8/2001		1550
EFFFF003	5/15/2001		80
EFFFF003	5/22/2001		320
EFFFF003	5/29/2001		208
EFFFF003	6/5/2001		2050
EFFFF003	6/11/2001		210
EFFFF003	6/19/2001	<A	<10
EFFFF003	6/25/2001	<A	<47
EFFFF003	6/26/2001	<A	<37
EFFFF003	7/3/2001	<A	<60
EFFFF003	7/10/2001	<A	<27
EFFFF003	7/17/2001	<A	<3
EFFFF003	7/24/2001		140
EFFFF003	7/31/2001		153
EFFFF003	8/7/2001	<A	<30
EFFFF003	8/10/2001		192
EFFFF003	8/14/2001		290
EFFFF003	8/23/2001		70
EFFFF003	8/27/2001		156
EFFFF003	9/6/2001		100
EFFFF003	9/11/2001		163
EFFFF003	9/18/2001		1950
EFFFF003	9/21/2001		113
EFFFF003	9/26/2001		53
EFFFF003	10/2/2001		157
EFFFF003	10/9/2001		106
EFFFF003	10/18/2001		70
EFFFF003	10/24/2001		6250
EFFFF003	10/30/2001		100
EFFFF003	5/1/2002		100
EFFFF003	5/7/2002	>B	>4450
EFFFF003	5/14/2002		2900
EFFFF003	5/21/2002	<A	<23
EFFFF003	5/29/2002	>B	>670
EFFFF003	6/7/2002		1450
EFFFF003	6/11/2002	<A	<170

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	6/19/2002		380
EFFFF003	6/25/2002		410
EFFFF003	7/2/2002		270
EFFFF003	7/11/2002	>B	>1080
EFFFF003	7/18/2002		1150
EFFFF003	7/24/2002		73
EFFFF003	7/30/2002		590
EFFFF003	8/6/2002		130
EFFFF003	8/9/2002	<	<27
EFFFF003	8/14/2002	<A	<27
EFFFF003	8/22/2002		140
EFFFF003	8/29/2002		120
EFFFF003	9/5/2002	<A	<23
EFFFF003	9/9/2002		1150
EFFFF003	9/12/2002		380
EFFFF003	9/19/2002		99
EFFFF003	9/27/2002	>B	>3100
EFFFF003	10/1/2002		420
EFFFF003	10/8/2002		137
EFFFF003	10/15/2002		410
EFFFF003	10/22/2002		113
EFFFF003	10/28/2002	<A	<33
EFFFF003	5/7/2003		2415
EFFFF003	5/13/2003		640
EFFFF003	5/20/2003		413
EFFFF003	5/23/2003		1100
EFFFF003	5/28/2003		325
EFFFF003	6/3/2003		90
EFFFF003	6/10/2003		230
EFFFF003	6/17/2003		950
EFFFF003	6/25/2003		2800
EFFFF003	6/30/2003		950
EFFFF003	7/1/2003		300
EFFFF003	7/9/2003		3
EFFFF003	7/15/2003		143
EFFFF003	7/22/2003	<A	<53
EFFFF003	7/29/2003	<A	<7
EFFFF003	8/5/2003		80

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	8/19/2003		210
EFFFF003	8/22/2003	<A	<170
EFFFF003	8/27/2003	<A	<13
EFFFF003	9/3/2003		310
EFFFF003	9/10/2003		200
EFFFF003	9/16/2003		280
EFFFF003	9/23/2003	<A	<50
EFFFF003	9/26/2003		157
EFFFF003	9/30/2003		103
EFFFF003	10/7/2003	<A	<10
EFFFF003	10/14/2003		1400
EFFFF003	10/17/2003	<A	<7
EFFFF003	10/20/2003	<A	<23
EFFFF003	10/30/2003		80
EFFFF003	5/4/2004		350
EFFFF003	5/11/2004		500
EFFFF003	5/17/2004		143
EFFFF003	5/21/2004		1600
EFFFF003	5/27/2004	>B	>5000
EFFFF003	6/7/2004	<A	<53
EFFFF003	6/11/2004		123
EFFFF003	6/17/2004		1350
EFFFF003	6/23/2004		100
EFFFF003	6/29/2004		87
EFFFF003	7/6/2004		3000
EFFFF003	7/15/2004		900
EFFFF003	7/21/2004		117
EFFFF003	7/27/2004		2400
EFFFF003	8/2/2004		785
EFFFF003	8/6/2004	>B	>5600
EFFFF003	8/12/2004		252
EFFFF003	8/18/2004		159
EFFFF003	8/24/2004		83
EFFFF003	8/30/2004		450
EFFFF003	9/3/2004		1100
EFFFF003	9/10/2004		160
EFFFF003	9/15/2004		127
EFFFF003	9/21/2004		110

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	9/27/2004		93
EFFFF003	10/1/2004		390
EFFFF003	10/7/2004	<A	<60
EFFFF003	10/13/2004		1225
EFFFF003	10/19/2004		1070
EFFFF003	10/25/2004		225
EFFFF003	10/29/2004		222
EFFFF003	5/10/2005		73
EFFFF003	5/16/2005		242
EFFFF003	5/20/2005	P	6900
EFFFF003	5/25/2005		157
EFFFF003	5/26/2005		150
EFFFF003	6/1/2005		73
EFFFF003	6/6/2005		70
EFFFF003	6/10/2005		97
EFFFF003	6/16/2005		185
EFFFF003	6/22/2005		83
EFFFF003	6/28/2005		2950
EFFFF003	7/8/2005	>P	>11950
EFFFF003	7/11/2005		280
EFFFF003	7/15/2005	>P	>4750
EFFFF003	7/21/2005		220
EFFFF003	7/27/2005		232
EFFFF003	8/2/2005		93
EFFFF003	8/8/2005		127
EFFFF003	8/12/2005		110
EFFFF003	8/18/2005		247
EFFFF003	8/24/2005		207
EFFFF003	8/30/2005		647
EFFFF003	9/6/2005		164
EFFFF003	9/15/2005		70
EFFFF003	9/21/2005	>B	>5100
EFFFF003	9/27/2005	<A	<60
EFFFF003	10/3/2005		850
EFFFF003	10/7/2005		195
EFFFF003	10/13/2005	<A	<55
EFFFF003	10/19/2005		67
EFFFF003	10/25/2005		93

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	5/2/2006	>B	>6650
EFFFF003	5/8/2006		73
EFFFF003	5/12/2006		203
EFFFF003	5/18/2006		210
EFFFF003	5/24/2006		73
EFFFF003	6/2/2006	>P	>64800
EFFFF003	6/8/2006		252
EFFFF003	6/14/2006		551
EFFFF003	6/20/2006		915
EFFFF003	6/26/2006		113
EFFFF003	6/30/2006		485
EFFFF003	7/5/2006		219
EFFFF003	7/10/2006	<A	<63
EFFFF003	7/14/2006		1350
EFFFF003	7/20/2006		160
EFFFF003	7/26/2006		164
EFFFF003	7/31/2006		73
EFFFF003	8/2/2006		204
EFFFF003	8/7/2006	<A	<50
EFFFF003	8/11/2006		2400
EFFFF003	8/17/2006	<A	<40
EFFFF003	8/23/2006		80
EFFFF003	8/29/2006		1340
EFFFF003	9/5/2006		195
EFFFF003	9/11/2006		1750
EFFFF003	9/15/2006		460
EFFFF003	9/21/2006		164
EFFFF003	9/27/2006		237
EFFFF003	10/3/2006		245
EFFFF003	10/9/2006		67
EFFFF003	10/13/2006		83
EFFFF003	10/19/2006		174
EFFFF003	10/25/2006	<A	<30
EFFFF003	12/12/2006		77
EFFFF003	3/27/2007	<A	<47
EFFFF003	5/2/2007		195
EFFFF003	5/9/2007	<A	<57
EFFFF003	5/14/2007		67

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	5/18/2007		77
EFFFF003	5/24/2007	<A	<50
EFFFF003	5/31/2007		73
EFFFF003	6/4/2007		277
EFFFF003	6/8/2007	A	<110
EFFFF003	6/14/2007		691
EFFFF003	6/20/2007		1155
EFFFF003	6/26/2007		90
EFFFF003	7/3/2007		460
EFFFF003	7/9/2007		405
EFFFF003	7/13/2007		100
EFFFF003	7/19/2007		190
EFFFF003	7/25/2007		147
EFFFF003	7/31/2007		187
EFFFF003	8/6/2007		180
EFFFF003	8/10/2007		77
EFFFF003	8/16/2007	O	79
EFFFF003	8/22/2007		500
EFFFF003	8/28/2007		93
EFFFF003	9/5/2007	O	43
EFFFF003	9/10/2007		93
EFFFF003	9/14/2007		73
EFFFF003	9/20/2007		579
EFFFF003	9/26/2007		77
EFFFF003	10/2/2007	O	23
EFFFF003	10/8/2007	O	38
EFFFF003	10/12/2007	O	29
EFFFF003	10/18/2007		224
EFFFF003	10/24/2007	>B	>8900
EFFFF003	12/11/2007		79
EFFFF003	3/25/2008	A	<7
EFFFF003	5/2/2008	A	<33
EFFFF003	5/8/2008		252
EFFFF003	5/14/2008	O	567
EFFFF003	5/20/2008		83
EFFFF003	5/27/2008	A	<71
EFFFF003	6/3/2008		515
EFFFF003	6/9/2008	A	<74

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	6/13/2008	A	<62
EFFFF003	6/19/2008	A	<57
EFFFF003	6/25/2008	A	<88
EFFFF003	7/1/2008	A	<69
EFFFF003	7/7/2008		370
EFFFF003	7/11/2008	A	<67
EFFFF003	7/17/2008	A	<112
EFFFF003	7/23/2008		80
EFFFF003	7/30/2008	A	<38
EFFFF003	8/5/2008	A	<60
EFFFF003	8/11/2008	A	<31
EFFFF003	8/15/2008		480
EFFFF003	8/21/2008	A	<48
EFFFF003	8/27/2008		70
EFFFF003	9/3/2008		450
EFFFF003	9/8/2008		1900
EFFFF003	9/12/2008		270
EFFFF003	9/18/2008	<A	<3
EFFFF003	9/24/2008	A	<7
EFFFF003	9/30/2008		130
EFFFF003	10/2/2008	A	<57
EFFFF003	10/8/2008		2800
EFFFF003	10/14/2008		127
EFFFF003	10/20/2008	A	<19
EFFFF003	10/24/2008	B&P	>2358
EFFFF003	10/30/2008		290
EFFFF003	12/9/2008	<A	<13
EFFFF003	3/24/2009	<	<23
EFFFF003	5/5/2009		189
EFFFF003	5/11/2009		252
EFFFF003	5/15/2009		97
EFFFF003	5/21/2009	<	<38
EFFFF003	5/28/2009		73
EFFFF003	6/2/2009	<	<71
EFFFF003	6/8/2009	<	<40
EFFFF003	6/12/2009	>P	>14900
EFFFF003	6/18/2009		580
EFFFF003	6/24/2009	>B	>4450

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	7/2/2009		67
EFFFF003	7/9/2009	<	<43
EFFFF003	7/15/2009	<	<52
EFFFF003	7/21/2009	<	<60
EFFFF003	7/27/2009		1650
EFFFF003	7/31/2009	>B	>5800
EFFFF003	8/10/2009		83
EFFFF003	8/14/2009		410
EFFFF003	8/20/2009		93
EFFFF003	8/26/2009		67
EFFFF003	8/31/2009		590
EFFFF003	9/2/2009	<	<48
EFFFF003	9/8/2009		97
EFFFF003	9/17/2009	<	<26
EFFFF003	9/23/2009		760
EFFFF003	9/29/2009		1550
EFFFF003	10/6/2009		192
EFFFF003	10/12/2009		344
EFFFF003	10/16/2009		1465
EFFFF003	10/22/2009	<	<43
EFFFF003	10/28/2009		9450
EFFFF003	12/15/2009		100
EFFFF003	3/22/2010	<A	<36
EFFFF003	5/4/2010		790
EFFFF003	5/10/2010		900
EFFFF003	5/14/2010		174
EFFFF003	5/20/2010		133
EFFFF003	5/26/2010		435
EFFFF003	6/2/2010		262
EFFFF003	6/7/2010		175
EFFFF003	6/11/2010		445
EFFFF003	6/17/2010		535
EFFFF003	6/23/2010		490
EFFFF003	6/29/2010		188
EFFFF003	7/2/2010	O	895
EFFFF003	7/9/2010		1415
EFFFF003	7/14/2010		1500
EFFFF003	7/20/2010	>B	>9000

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF003	7/29/2010		2450
EFFFF003	8/3/2010		127
EFFFF003	8/9/2010		300
EFFFF003	8/13/2010	O	1040
EFFFF003	8/19/2010		555
EFFFF003	8/25/2010		67
EFFFF003	8/31/2010	A	<10
EFFFF003	9/8/2010		200
EFFFF003	9/13/2010	A	<36
EFFFF003	9/17/2010	A	<17
EFFFF003	9/23/2010	A	<26
EFFFF003	9/29/2010	A	<43
EFFFF003	10/5/2010	A	<31
EFFFF003	10/11/2010	A	<31
EFFFF003	10/15/2010		190
EFFFF003	10/21/2010	A	<36
EFFFF003	10/27/2010		1000
EFFFF003	12/7/2010		110

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-8	6/25/2007		791
FF-8	6/29/2007		5600
FF-8	7/17/2007		156
FF-8	8/1/2007	14.40	100
FF-8	8/14/2007		140
FF-8	8/17/2007	156.00	2300
FF-8	8/21/2007	35.50	>8000
FF-8	9/6/2007		200
FF-8	9/20/2007		100
FF-8	10/16/2007	5.14	550
FF-8	10/23/2007		21000
FF-8	6/10/2008		260
FF-8	6/23/2008		120
FF-8	7/16/2008		200
FF-8	7/22/2008		270
FF-8	8/19/2008		100
FF-8	9/23/2008		220

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-8	10/2/2008		110
FF-8	10/9/2008	37.80	300
FF-8	10/16/2008		84
FF-8	10/23/2008		100

DOW Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
SRW012	5/18/2004		200
SRW012	6/22/2004		120
SRW012	7/22/2004		1500
SRW012	8/10/2004		370
SRW012	9/13/2004		330
SRW012	10/28/2004		3400

Floyds Fork 34.1 to 61.9			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-1	5/23/2007		36
FF-1	6/11/2007		104
FF-1	6/25/2007		108
FF-1	7/17/2007		92
FF-1	8/1/2007		700
FF-1	8/14/2007		150
FF-1	9/6/2007		3200
FF-1	9/20/2007		220
FF-1	10/16/2007		550
FF-1	10/24/2007		8300
FF-1	6/10/2008		460
FF-1	6/23/2008		460
FF-1	7/16/2008		1000
FF-1	8/19/2008		190
FF-1	9/23/2008		16
FF-1	10/2/2008		24
FF-1	10/23/2008		110

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-2	5/23/2007		450
FF-2	6/11/2007		9900
FF-2	6/25/2007		2000
FF-2	7/17/2007		720
FF-2	8/1/2007		180
FF-2	8/14/2007		940
FF-2	9/6/2007		570
FF-2	10/23/2007		52000
FF-2	6/10/2008		800
FF-2	6/23/2008		3200
FF-2	7/16/2008	3.43	750
FF-2	7/31/2008		17000
FF-2	8/18/2008		200
FF-2	9/23/2008		120
FF-2	10/2/2008		690
FF-2	10/9/2008		1300
FF-2	10/16/2008		210
FF-2	10/23/2008		20

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-3	5/23/2007	4.60	25
FF-3	6/11/2007	4.60	700
FF-3	6/25/2007	4.80	500
FF-3	7/17/2007	3.40	530
FF-3	8/1/2007	4.20	220
FF-3	8/14/2007	2.10	120
FF-3	8/17/2007	52.00	7800
FF-3	9/6/2007	3.00	160
FF-3	9/20/2007	4.10	120
FF-3	10/16/2007	3.20	730
FF-3	10/23/2007		48000
FF-3	6/10/2008		280
FF-3	6/23/2008		420
FF-3	8/19/2008		110
FF-3	9/23/2008		60
FF-3	10/2/2008		250
FF-3	10/9/2008		300

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-3	10/16/2008		4
FF-3	10/23/2008		60

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	5/3/2000		103
EFFFF001	5/9/2000		90
EFFFF001	5/18/2000		60
EFFFF001	5/24/2000		113
EFFFF001	5/31/2000		93
EFFFF001	6/2/2000		120
EFFFF001	6/5/2000	<A	<68
EFFFF001	6/5/2000	<A	<68
EFFFF001	6/6/2000	<A	<68
EFFFF001	6/13/2000	<A	<17
EFFFF001	6/21/2000		105
EFFFF001	6/29/2000		6600
EFFFF001	7/7/2000		9550
EFFFF001	7/13/2000		160
EFFFF001	7/20/2000		190
EFFFF001	7/27/2000		90
EFFFF001	8/2/2000	<A	<70
EFFFF001	8/16/2000		123
EFFFF001	8/24/2000		340
EFFFF001	8/30/2000	<A	<10
EFFFF001	9/8/2000	<A	<3
EFFFF001	9/13/2000	<A	<13
EFFFF001	9/21/2000		200
EFFFF001	9/28/2000	>B	>4000
EFFFF001	10/5/2000	<A	<3
EFFFF001	10/11/2000		103
EFFFF001	10/19/2000	<A	<3
EFFFF001	10/26/2000	<A	<3
EFFFF001	10/31/2000	<A	<3
EFFFF001	5/1/2001	<A	<33
EFFFF001	5/8/2001	>B	>4600
EFFFF001	5/15/2001		360
EFFFF001	5/22/2001		1450

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	5/29/2001		495
EFFFF001	6/5/2001	>B	>12000
EFFFF001	6/11/2001		350
EFFFF001	6/19/2001	<A	<3
EFFFF001	6/25/2001		97
EFFFF001	6/26/2001	<A	<3
EFFFF001	7/3/2001	<A	<3
EFFFF001	7/10/2001	<A	<3
EFFFF001	7/17/2001	<A	<3
EFFFF001	7/24/2001		107
EFFFF001	7/31/2001		160
EFFFF001	8/7/2001		110
EFFFF001	8/10/2001		240
EFFFF001	8/14/2001		2350
EFFFF001	8/23/2001	<A	<43
EFFFF001	8/27/2001		2800
EFFFF001	9/6/2001		73
EFFFF001	9/11/2001		230
EFFFF001	9/18/2001		80
EFFFF001	9/21/2001	<A	<40
EFFFF001	9/26/2001		200
EFFFF001	10/2/2001		80
EFFFF001	10/9/2001	<A	<60
EFFFF001	10/18/2001		130
EFFFF001	10/24/2001		1250
EFFFF001	10/30/2001		214
EFFFF001	5/1/2002	<A	<93
EFFFF001	5/7/2002		1100
EFFFF001	5/21/2002		123
EFFFF001	5/29/2002		470
EFFFF001	6/7/2002		3150
EFFFF001	6/11/2002		470
EFFFF001	6/19/2002		470
EFFFF001	6/25/2002		230
EFFFF001	7/2/2002		590
EFFFF001	7/11/2002		450
EFFFF001	7/18/2002		1050
EFFFF001	7/24/2002		380

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	7/30/2002		520
EFFFF001	8/6/2002		157
EFFFF001	8/9/2002	<A	<27
EFFFF001	8/14/2002		27
EFFFF001	8/20/2002	<A	<40
EFFFF001	8/29/2002		420
EFFFF001	9/5/2002	<A	<3
EFFFF001	9/9/2002	<A	<9
EFFFF001	9/12/2002	<A	<9
EFFFF001	9/19/2002	<A	<43
EFFFF001	9/27/2002	>B	>3150
EFFFF001	10/1/2002		230
EFFFF001	10/8/2002	<A	<23
EFFFF001	10/15/2002		380
EFFFF001	10/22/2002		420
EFFFF001	10/28/2002		215
EFFFF001	5/7/2003		3400
EFFFF001	5/13/2003		245
EFFFF001	5/20/2003		298
EFFFF001	5/23/2003		470
EFFFF001	5/28/2003		157
EFFFF001	6/3/2003		230
EFFFF001	6/10/2003		103
EFFFF001	6/17/2003		6600
EFFFF001	6/25/2003		173
EFFFF001	6/30/2003		390
EFFFF001	7/1/2003		1700
EFFFF001	7/9/2003		50
EFFFF001	7/15/2003		140
EFFFF001	7/22/2003		113
EFFFF001	7/29/2003	<A	<3
EFFFF001	8/5/2003	<A	<23
EFFFF001	8/12/2003	<A	<190
EFFFF001	8/19/2003		143
EFFFF001	8/22/2003		203
EFFFF001	8/27/2003	<A	<3
EFFFF001	9/3/2003	<A	<190
EFFFF001	9/10/2003	<	<57

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	9/16/2003		330
EFFFF001	9/26/2003	<A	<60
EFFFF001	9/30/2003		230
EFFFF001	10/7/2003		93
EFFFF001	10/14/2003	<A	<3
EFFFF001	10/17/2003		230
EFFFF001	10/20/2003	<A	<63
EFFFF001	10/30/2003		70
EFFFF001	5/3/2004		1950
EFFFF001	5/10/2004		190
EFFFF001	5/14/2004		187
EFFFF001	5/20/2004		1600
EFFFF001	5/26/2004	>B	>4000
EFFFF001	6/1/2004		250
EFFFF001	6/10/2004		370
EFFFF001	6/16/2004		100
EFFFF001	6/22/2004		70
EFFFF001	6/28/2004		103
EFFFF001	7/2/2004		123
EFFFF001	7/9/2004		80
EFFFF001	7/14/2004		7500
EFFFF001	7/20/2004		320
EFFFF001	7/26/2004		350
EFFFF001	7/30/2004		200
EFFFF001	8/5/2004		2950
EFFFF001	8/11/2004		380
EFFFF001	8/17/2004		180
EFFFF001	8/23/2004	<A	<50
EFFFF001	8/27/2004		885
EFFFF001	9/2/2004	<A	<90
EFFFF001	9/9/2004	>B	>11250
EFFFF001	9/14/2004		93
EFFFF001	9/20/2004		550
EFFFF001	9/24/2004		97
EFFFF001	10/6/2004	<A	<40
EFFFF001	10/12/2004		227
EFFFF001	10/18/2004		180
EFFFF001	10/22/2004		410

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	10/28/2004		546
EFFFF001	5/13/2005		160
EFFFF001	5/19/2005		179
EFFFF001	5/24/2005		294
EFFFF001	5/25/2005		184
EFFFF001	5/31/2005	<A	<50
EFFFF001	6/9/2005	<A	<60
EFFFF001	6/15/2005		430
EFFFF001	6/20/2005		550
EFFFF001	6/27/2005		143
EFFFF001	7/1/2005	>P	>23100
EFFFF001	7/5/2005		90
EFFFF001	7/14/2005	>P	>4475
EFFFF001	7/20/2005		388
EFFFF001	7/26/2005		232
EFFFF001	8/1/2005	<A	<75
EFFFF001	8/5/2005	A	<80
EFFFF001	8/11/2005	<A	<23
EFFFF001	8/17/2005		1115
EFFFF001	8/23/2005	<A	<95
EFFFF001	8/29/2005		558
EFFFF001	9/9/2005		1150
EFFFF001	9/15/2005		243
EFFFF001	9/20/2005		305
EFFFF001	9/26/2005	<A	<120
EFFFF001	9/30/2005		210
EFFFF001	10/6/2005		223
EFFFF001	10/12/2005	<A	<100
EFFFF001	10/18/2005	<A	<70
EFFFF001	10/24/2005		210
EFFFF001	10/28/2005	<A	<65
EFFFF001	5/1/2006		510
EFFFF001	5/5/2006		230
EFFFF001	5/11/2006		541
EFFFF001	5/19/2006		1500
EFFFF001	5/23/2006	<A	<53
EFFFF001	6/1/2006		87
EFFFF001	6/7/2006		212

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	6/13/2006		840
EFFFF001	6/19/2006		330
EFFFF001	6/23/2006		360
EFFFF001	6/29/2006	>B	>3400
EFFFF001	7/3/2006		177
EFFFF001	7/13/2006		430
EFFFF001	7/19/2006	<A	<70
EFFFF001	7/25/2006		100
EFFFF001	7/31/2006		97
EFFFF001	8/1/2006		549
EFFFF001	8/10/2006		83
EFFFF001	8/16/2006		220
EFFFF001	8/22/2006		375
EFFFF001	8/28/2006	>P	>11150
EFFFF001	9/8/2006		260
EFFFF001	9/14/2006	>B	>9850
EFFFF001	9/20/2006		103
EFFFF001	9/26/2006		640
EFFFF001	10/2/2006	>P	>11150
EFFFF001	10/6/2006		110
EFFFF001	10/12/2006		73
EFFFF001	10/18/2006		212
EFFFF001	10/24/2006		67
EFFFF001	12/11/2006		93
EFFFF001	3/26/2007		197
EFFFF001	5/1/2007	<A	<7
EFFFF001	5/8/2007	<A	<43
EFFFF001	5/17/2007		262
EFFFF001	5/23/2007		110
EFFFF001	5/30/2007	<A	<37
EFFFF001	6/1/2007	<A	<17
EFFFF001	6/7/2007		2650
EFFFF001	6/13/2007		590
EFFFF001	6/19/2007	<A	<33
EFFFF001	6/25/2007		330
EFFFF001	6/29/2007	O	33429
EFFFF001	7/2/2007		907
EFFFF001	7/12/2007		2150

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	7/18/2007		724
EFFFF001	7/24/2007	O	33
EFFFF001	7/30/2007		1140
EFFFF001	8/3/2007		1150
EFFFF001	8/9/2007		93
EFFFF001	8/15/2007	O	73
EFFFF001	8/21/2007		475
EFFFF001	8/27/2007		135
EFFFF001	8/31/2007		133
EFFFF001	9/4/2007	O	29
EFFFF001	9/13/2007		820
EFFFF001	9/19/2007	O	20
EFFFF001	9/24/2007		557
EFFFF001	9/25/2007		77
EFFFF001	10/1/2007	O	30
EFFFF001	10/5/2007		12
EFFFF001	10/11/2007	O	35
EFFFF001	10/17/2007		1850
EFFFF001	10/23/2007	>P	>16100
EFFFF001	12/10/2007		2750
EFFFF001	3/24/2008	O	19
EFFFF001	5/1/2008	A	<13
EFFFF001	5/7/2008		120
EFFFF001	5/13/2008		1850
EFFFF001	5/19/2008		207
EFFFF001	5/23/2008		110
EFFFF001	5/30/2008	A	<88
EFFFF001	6/2/2008		67
EFFFF001	6/6/2008	A	<28
EFFFF001	6/12/2008		70
EFFFF001	6/18/2008		120
EFFFF001	6/24/2008		194
EFFFF001	6/30/2008		525
EFFFF001	7/10/2008		515
EFFFF001	7/16/2008		395
EFFFF001	7/22/2008		840
EFFFF001	7/28/2008		272
EFFFF001	7/29/2008		365

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	8/4/2008		450
EFFFF001	8/8/2008		171
EFFFF001	8/14/2008		230
EFFFF001	8/20/2008	A	<36
EFFFF001	8/26/2008	A	<30
EFFFF001	9/2/2008	A	<36
EFFFF001	9/11/2008	A	<43
EFFFF001	9/23/2008	A	<33
EFFFF001	9/29/2008	A	<15
EFFFF001	10/1/2008		77
EFFFF001	10/7/2008	A	<79
EFFFF001	10/13/2008		67
EFFFF001	10/17/2008		80
EFFFF001	10/23/2008		194
EFFFF001	10/29/2008	A	<15
EFFFF001	12/8/2008	<A	<10
EFFFF001	3/23/2009	<	<10
EFFFF001	5/4/2009		1200
EFFFF001	5/8/2009		585
EFFFF001	5/14/2009		520
EFFFF001	5/20/2009	<	<36
EFFFF001	5/27/2009		169
EFFFF001	6/1/2009		83
EFFFF001	6/11/2009		600
EFFFF001	6/17/2009	>B	>3450
EFFFF001	6/23/2009		1650
EFFFF001	7/1/2009		470
EFFFF001	7/8/2009	<	<33
EFFFF001	7/14/2009		1380
EFFFF001	7/20/2009		290
EFFFF001	7/24/2009	<	<48
EFFFF001	7/30/2009		1650
EFFFF001	8/3/2009		298
EFFFF001	8/7/2009		760
EFFFF001	8/13/2009		2450
EFFFF001	8/19/2009		215
EFFFF001	8/25/2009	<	<159
EFFFF001	9/1/2009		197

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	9/11/2009		73
EFFFF001	9/16/2009	<	<64
EFFFF001	9/22/2009		1650
EFFFF001	9/28/2009		1330
EFFFF001	10/5/2009		146
EFFFF001	10/9/2009		1450
EFFFF001	10/15/2009	>B	>4850
EFFFF001	10/21/2009		67
EFFFF001	10/27/2009	<	<21
EFFFF001	12/14/2009		800
EFFFF001	3/22/2010		110
EFFFF001	5/3/2010		1325
EFFFF001	5/7/2010		230
EFFFF001	5/13/2010		250
EFFFF001	5/19/2010		2350
EFFFF001	5/25/2010		1550
EFFFF001	6/1/2010		745
EFFFF001	6/10/2010		1165
EFFFF001	6/16/2010		1950
EFFFF001	6/22/2010		1325
EFFFF001	6/28/2010		845
EFFFF001	7/1/2010		1020
EFFFF001	7/8/2010		93
EFFFF001	7/13/2010	>P	>11600
EFFFF001	7/19/2010		1040
EFFFF001	7/23/2010		2550
EFFFF001	7/28/2010		1750
EFFFF001	8/2/2010		212
EFFFF001	8/6/2010		103
EFFFF001	8/12/2010		500
EFFFF001	8/18/2010		123
EFFFF001	8/24/2010		140
EFFFF001	8/30/2010		120
EFFFF001	9/3/2010	A	<36
EFFFF001	9/7/2010		67
EFFFF001	9/16/2010		67
EFFFF001	9/22/2010		1010
EFFFF001	9/28/2010		70

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EFFFF001	10/4/2010		110
EFFFF001	10/8/2010	A	<45
EFFFF001	10/14/2010		2050
EFFFF001	10/20/2010	A	<36
EFFFF001	10/26/2010		163
EFFFF001	12/6/2010		150

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
FF-7	5/23/2007		43
FF-7	6/11/2007		96
FF-7	6/29/2007	83.00	2000
FF-7	7/17/2007		221
FF-7	7/31/2007	13.30	150
FF-7	8/14/2007		68
FF-7	8/17/2007	128.00	1800
FF-7	8/21/2007	60.90	2200
FF-7	9/6/2007	1.50	10
FF-7	9/20/2007		230
FF-7	10/16/2007	0.15	350
FF-7	10/23/2007	5720.00	31000
FF-7	6/10/2008		110
FF-7	6/23/2008		230
FF-7	7/16/2008		150
FF-7	7/22/2008	14.00	160
FF-7	8/19/2008		420
FF-7	9/23/2008		68
FF-7	10/2/2008		150
FF-7	10/9/2008	8.20	310
FF-7	10/16/2008		110
FF-7	10/23/2008		72

Long Run 0.0 to 10.0			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
LR-1	5/23/2007		180
LR-1	6/11/2007		74

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
LR-1	6/25/2007		500
LR-1	7/17/2007		520
LR-1	7/31/2007	0.25	530
LR-1	8/14/2007		16
LR-1	9/20/2007		8
LR-1	10/16/2007		16
LR-1	10/23/2007		1100
LR-1	6/10/2008		650
LR-1	6/23/2008		1000
LR-1	7/16/2008		300
LR-1	8/19/2008		350

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
LR-2	5/23/2007		60
LR-2	6/11/2007		132
LR-2	6/29/2007	6.20	3000
LR-2	7/17/2007		248
LR-2	7/31/2007	0.57	400
LR-2	8/14/2007		110
LR-2	8/17/2007	1.98	3400
LR-2	8/21/2007	8.09	3700
LR-2	10/23/2007		1700
LR-2	6/10/2008		120
LR-2	6/23/2008		3100
LR-2	7/16/2008	0.62	190
LR-2	7/22/2008	0.81	730
LR-2	7/31/2008	7.77	8900
LR-2	8/19/2008		180
LR-2	10/9/2008		430

North Fork Currys Fork 0.0 to 6.0			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
NFCF-1	5/23/2007		92
NFCF-1	6/11/2007		580

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
NFCF-1	6/25/2007		918
NFCF-1	7/17/2007		550
NFCF-1	7/31/2007	1.49	580
NFCF-1	8/14/2007		2100
NFCF-1	9/6/2007		300
NFCF-1	9/20/2007		1900
NFCF-1	10/16/2007		2800
NFCF-1	10/24/2007		8500
NFCF-1	6/10/2008		600
NFCF-1	6/23/2008		610
NFCF-1	7/16/2008	3.19	640
NFCF-1	7/31/2008	30.30	14000
NFCF-1	8/19/2008		280
NFCF-1	9/23/2008		350
NFCF-1	10/2/2008		120
NFCF-1	10/9/2008		1500
NFCF-1	10/16/2008		540
NFCF-1	10/23/2008		370

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC1	5/7/2007		700
NC1	5/23/2007		140
NC1	6/11/2007		540
NC1	6/25/2007		1200
NC1	7/11/2007		1000
NC1	7/25/2007		440
NC1	8/9/2007		2300
NC1	8/22/2007		5700
NC1	9/11/2007		180
NC1	9/26/2007		120
NC1	10/10/2007		140
NC1	10/25/2007		22000
NC1	5/21/2009		250
NC1	6/5/2009		2500
NC1	6/18/2009		660
NC1	7/2/2009		210
NC1	7/15/2009		1900

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC1	7/30/2009		4300
NC1	8/13/2009		510
NC1	8/27/2009		510
NC1	9/10/2009		2000
NC1	9/20/2009		3,400
NC1	9/20/2009		9,400
NC1	9/20/2009		19,000
NC1	9/24/2009		8800
NC1	10/8/2009		8200
NC1	10/22/2009		2,000
NC1	10/30/2009		100
NC1	10/31/2009		4,800
NC1	10/31/2009		4,000

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC1a	5/21/2009	11.11	60
NC1a	6/5/2009	4.07	680
NC1a	6/18/2009	69.97	11000
NC1a	7/2/2009	0.37	250
NC1a	7/15/2009	0.00	670
NC1a	7/30/2009	55.43	520
NC1a	8/13/2009	1.49	170
NC1a	8/27/2009	0.00	70
NC1a	9/10/2009	0.15	140
NC1a	9/20/2009	0.28	490
NC1a	9/20/2009	212.94	21,000
NC1a	9/20/2009	26.58	11,000
NC1a	9/24/2009	37.70	600
NC1a	10/8/2009	112.62	3500
NC1a	10/22/2009	55.43	4,000
NC1a	10/30/2009	18.61	770
NC1a	10/31/2009	369.61	2,500
NC1a	10/31/2009	247.89	2,500

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC1b	5/21/2009	11.01	170

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC1b	6/5/2009	2.39	660
NC1b	6/18/2009	22.52	6800
NC1b	7/2/2009	0.99	100
NC1b	7/15/2009	2.39	3100
NC1b	7/30/2009	70.30	2300
NC1b	8/13/2009	8.77	220
NC1b	8/27/2009	0.38	50
NC1b	9/10/2009	1.69	780
NC1b	10/22/2009	5.98	4,100

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
NC2	5/7/2007		100
NC2	5/23/2007		110
NC2	6/11/2007		110
NC2	6/25/2007		500
NC2	7/11/2007		4000
NC2	7/25/2007		18
NC2	8/9/2007		5000
NC2	10/25/2007		2000
NC2	5/21/2009		70
NC2	6/5/2009		130
NC2	6/18/2009		450
NC2	7/2/2009		1300
NC2	7/30/2009		640
NC2	8/13/2009		20
NC2	9/10/2009		90
NC2	9/24/2009		150
NC2	10/8/2009		450

Pennsylvania Run 0.0 to 3.3			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PR-1	5/23/2007	0.58	120
PR-1	6/11/2007	0.24	160
PR-1	6/25/2007	0.47	210
PR-1	7/17/2007	0.39	400

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PR-1	8/1/2007	0.37	100
PR-1	8/14/2007	2.30	270
PR-1	8/17/2007	3.00	190
PR-1	8/21/2007	5.40	11000
PR-1	9/6/2007	4.30	160
PR-1	10/16/2007	1.10	5800
PR-1	10/23/2007		7500
PR-1	6/10/2008		420
PR-1	6/23/2008		220
PR-1	7/16/2008		180
PR-1	7/31/2008		14000
PR-1	8/19/2008		4300
PR-1	9/23/2008		450
PR-1	10/2/2008		220
PR-1	10/9/2008		1600
PR-1	10/16/2008		670
PR-1	10/23/2008		5000

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	5/9/2000		540
EPRPR001	5/25/2000		350
EPRPR001	5/31/2000		1200
EPRPR001	6/2/2000		600
EPRPR001	6/5/2000		410
EPRPR001	6/13/2000		800
EPRPR001	6/21/2000	>B	>9150
EPRPR001	6/29/2000		205
EPRPR001	7/7/2000		250
EPRPR001	7/13/2000		10600
EPRPR001	7/20/2000		330
EPRPR001	7/27/2000		3000
EPRPR001	8/2/2000		360
EPRPR001	8/24/2000	>B	>15000
EPRPR001	9/8/2000		83
EPRPR001	9/13/2000	<A	<53
EPRPR001	9/28/2000		67
EPRPR001	10/5/2000	<A	<3

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	10/11/2000	<A	<7
EPRPR001	10/19/2000	<A	<3
EPRPR001	10/26/2000	<A	<3
EPRPR001	10/30/2000	<A	<3
EPRPR001	5/1/2001		163
EPRPR001	5/8/2001	<A	<17
EPRPR001	5/15/2001		200
EPRPR001	5/22/2001		1950
EPRPR001	5/30/2001		580
EPRPR001	6/5/2001		470
EPRPR001	6/12/2001		60
EPRPR001	6/19/2001		175
EPRPR001	6/26/2001		83
EPRPR001	7/3/2001	<A	<3
EPRPR001	7/12/2001		110
EPRPR001	7/17/2001	<A	<3
EPRPR001	7/24/2001		133
EPRPR001	7/31/2001		200
EPRPR001	8/7/2001		67
EPRPR001	8/10/2001		2400
EPRPR001	8/14/2001		360
EPRPR001	8/23/2001	<A	<47
EPRPR001	8/27/2001	>B	>4650
EPRPR001	9/6/2001		500
EPRPR001	9/11/2001		470
EPRPR001	9/18/2001		210
EPRPR001	9/21/2001		1600
EPRPR001	9/26/2001		320
EPRPR001	10/2/2001	<A	<3
EPRPR001	10/9/2001		77
EPRPR001	10/18/2001		90
EPRPR001	10/24/2001		4900
EPRPR001	10/30/2001		1400
EPRPR001	5/1/2002	<A	<40
EPRPR001	5/7/2002		1550
EPRPR001	5/21/2002		87
EPRPR001	5/30/2002		1550
EPRPR001	6/7/2002		1200

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	6/11/2002		460
EPRPR001	6/19/2002		480
EPRPR001	6/25/2002		815
EPRPR001	7/2/2002		130
EPRPR001	7/11/2002		590
EPRPR001	7/18/2002		1800
EPRPR001	7/24/2002	<A	<60
EPRPR001	8/6/2002		470
EPRPR001	8/9/2002		430
EPRPR001	8/14/2002		380
EPRPR001	8/29/2002	<A	<37
EPRPR001	9/5/2002	<A	<37
EPRPR001	9/9/2002		143
EPRPR001	9/27/2002		1100
EPRPR001	10/1/2002		330
EPRPR001	10/10/2002		110
EPRPR001	10/17/2002		280
EPRPR001	10/24/2002	<A	<40
EPRPR001	10/29/2002		300
EPRPR001	5/7/2003		285
EPRPR001	5/13/2003		522
EPRPR001	5/20/2003		87
EPRPR001	5/23/2003		27
EPRPR001	5/28/2003		77
EPRPR001	6/3/2003		700
EPRPR001	6/10/2003		100
EPRPR001	6/17/2003		12000
EPRPR001	6/25/2003		117
EPRPR001	6/30/2003		117
EPRPR001	7/1/2003		40000
EPRPR001	7/9/2003		177
EPRPR001	7/15/2003		200
EPRPR001	7/22/2003		210
EPRPR001	7/29/2003	<A	<13
EPRPR001	8/5/2003	<A	<3
EPRPR001	8/12/2003	<A	<37
EPRPR001	8/19/2003	<A	<40
EPRPR001	8/22/2003	<A	<27

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	8/27/2003		120
EPRPR001	9/3/2003		1500
EPRPR001	9/10/2003		147
EPRPR001	9/16/2003		127
EPRPR001	9/23/2003		200
EPRPR001	9/26/2003		510
EPRPR001	9/30/2003	<A	<33
EPRPR001	10/7/2003	<A	<37
EPRPR001	10/14/2003	<A	<57
EPRPR001	10/17/2003	<A	<13
EPRPR001	10/20/2003	<A	<3
EPRPR001	10/30/2003	<A	<27
EPRPR001	5/4/2004		107
EPRPR001	5/11/2004		83
EPRPR001	5/17/2004		190
EPRPR001	5/21/2004		130
EPRPR001	5/27/2004	<	<3
EPRPR001	6/7/2004	<A	<27
EPRPR001	6/11/2004		230
EPRPR001	6/17/2004		350
EPRPR001	6/23/2004		177
EPRPR001	6/29/2004		185
EPRPR001	7/6/2004		775
EPRPR001	7/15/2004		215
EPRPR001	7/21/2004		80
EPRPR001	7/27/2004		1750
EPRPR001	8/2/2004		227
EPRPR001	8/6/2004		2200
EPRPR001	8/12/2004		865
EPRPR001	8/18/2004		175
EPRPR001	8/24/2004		259
EPRPR001	8/30/2004		245
EPRPR001	9/3/2004		320
EPRPR001	9/10/2004		310
EPRPR001	9/15/2004		187
EPRPR001	9/21/2004	<A	<43
EPRPR001	9/27/2004		264
EPRPR001	10/1/2004	<A	<105

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	10/7/2004		185
EPRPR001	10/13/2004		2950
EPRPR001	10/19/2004		2750
EPRPR001	10/25/2004		103
EPRPR001	10/29/2004		550
EPRPR001	5/10/2005		123
EPRPR001	5/16/2005		137
EPRPR001	5/20/2005	P	7150
EPRPR001	5/25/2005		137
EPRPR001	5/26/2005		117
EPRPR001	6/1/2005		90
EPRPR001	6/6/2005		165
EPRPR001	6/10/2005		350
EPRPR001	6/16/2005		257
EPRPR001	6/22/2005		292
EPRPR001	6/28/2005		1675
EPRPR001	7/8/2005		1180
EPRPR001	7/11/2005		843
EPRPR001	7/15/2005		1180
EPRPR001	7/21/2005		208
EPRPR001	7/27/2005		900
EPRPR001	8/2/2005		590
EPRPR001	8/8/2005		314
EPRPR001	8/12/2005		1400
EPRPR001	8/18/2005		255
EPRPR001	8/24/2005		185
EPRPR001	8/30/2005		963
EPRPR001	9/6/2005		229
EPRPR001	9/15/2005		643
EPRPR001	9/21/2005		16250
EPRPR001	9/27/2005		290
EPRPR001	10/3/2005		2950
EPRPR001	10/7/2005	>P	>33550
EPRPR001	10/13/2005		270
EPRPR001	10/19/2005		135
EPRPR001	10/25/2005		130
EPRPR001	5/2/2006		925
EPRPR001	5/8/2006		222

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	5/12/2006		90
EPRPR001	5/18/2006		282
EPRPR001	5/24/2006		257
EPRPR001	6/2/2006		45600
EPRPR001	6/8/2006		180
EPRPR001	6/14/2006		127
EPRPR001	6/20/2006		847
EPRPR001	6/26/2006		232
EPRPR001	6/30/2006		480
EPRPR001	7/5/2006	>B	>5500
EPRPR001	7/10/2006		270
EPRPR001	7/14/2006		1850
EPRPR001	7/20/2006		280
EPRPR001	7/26/2006		310
EPRPR001	7/31/2006		310
EPRPR001	8/2/2006		277
EPRPR001	8/7/2006		90
EPRPR001	8/11/2006		1900
EPRPR001	8/17/2006		470
EPRPR001	8/23/2006		857
EPRPR001	8/29/2006		580
EPRPR001	9/5/2006		540
EPRPR001	9/11/2006	>B	>4300
EPRPR001	9/15/2006	P	11660
EPRPR001	9/21/2006		175
EPRPR001	9/27/2006		70
EPRPR001	10/3/2006		795
EPRPR001	10/9/2006		67
EPRPR001	10/13/2006		470
EPRPR001	10/19/2006		274
EPRPR001	10/25/2006		77
EPRPR001	12/12/2006	<A	<10
EPRPR001	3/27/2007		155
EPRPR001	5/2/2007		103
EPRPR001	5/9/2007	<A	<40
EPRPR001	5/14/2007	<A	<40
EPRPR001	5/18/2007		80
EPRPR001	5/24/2007		107

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	5/31/2007		77
EPRPR001	6/4/2007		274
EPRPR001	6/8/2007		153
EPRPR001	6/14/2007		175
EPRPR001	6/20/2007		440
EPRPR001	6/26/2007		1555
EPRPR001	7/3/2007		760
EPRPR001	7/9/2007		314
EPRPR001	7/13/2007		23
EPRPR001	7/19/2007		610
EPRPR001	7/25/2007		190
EPRPR001	7/31/2007		70
EPRPR001	8/6/2007	O	21
EPRPR001	8/10/2007		140
EPRPR001	8/16/2007		1140
EPRPR001	8/22/2007		870
EPRPR001	8/28/2007		235
EPRPR001	9/5/2007		538
EPRPR001	9/10/2007		2250
EPRPR001	9/14/2007		110
EPRPR001	9/20/2007		83
EPRPR001	9/26/2007		103
EPRPR001	10/2/2007		90
EPRPR001	10/8/2007	O	40
EPRPR001	10/12/2007		67
EPRPR001	10/18/2007	P	10500
EPRPR001	10/24/2007		2650
EPRPR001	12/11/2007		239
EPRPR001	3/28/2008		1900
EPRPR001	5/2/2008		815
EPRPR001	5/8/2008		110
EPRPR001	5/14/2008		3000
EPRPR001	5/20/2008		249
EPRPR001	5/27/2008		385
EPRPR001	6/3/2008	B&P	>2608
EPRPR001	6/9/2008		170
EPRPR001	6/13/2008		140
EPRPR001	6/19/2008		277

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	7/1/2008		360
EPRPR001	7/7/2008		107
EPRPR001	7/11/2008		2200
EPRPR001	7/17/2008		540
EPRPR001	7/23/2008		162
EPRPR001	7/30/2008		600
EPRPR001	8/5/2008		1350
EPRPR001	8/11/2008		235
EPRPR001	8/15/2008	A	<82
EPRPR001	8/21/2008		225
EPRPR001	8/27/2008		2950
EPRPR001	9/3/2008	P	22250
EPRPR001	9/8/2008		2200
EPRPR001	9/12/2008	B	>2350
EPRPR001	9/18/2008		199
EPRPR001	9/24/2008		93
EPRPR001	9/30/2008	P	16250
EPRPR001	10/2/2008		192
EPRPR001	10/14/2008		70
EPRPR001	10/20/2008	A	<60
EPRPR001	10/24/2008	B&P	>2217
EPRPR001	10/30/2008		360
EPRPR001	12/9/2008	<A	<3
EPRPR001	3/24/2009		280
EPRPR001	5/5/2009		147
EPRPR001	5/11/2009		73
EPRPR001	5/15/2009		445
EPRPR001	5/21/2009		133
EPRPR001	5/28/2009		130
EPRPR001	6/2/2009		93
EPRPR001	6/8/2009		103
EPRPR001	6/12/2009		1365
EPRPR001	6/18/2009		635
EPRPR001	6/24/2009		645
EPRPR001	7/2/2009		390
EPRPR001	7/9/2009		184
EPRPR001	7/15/2009		775
EPRPR001	7/21/2009		175

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	7/27/2009		67
EPRPR001	7/31/2009		1100
EPRPR001	8/10/2009		176
EPRPR001	8/14/2009		163
EPRPR001	8/20/2009		845
EPRPR001	8/26/2009		217
EPRPR001	8/31/2009	>B	>16400
EPRPR001	9/2/2009		200
EPRPR001	9/8/2009		130
EPRPR001	9/17/2009		188
EPRPR001	9/23/2009		330
EPRPR001	9/29/2009		198
EPRPR001	10/6/2009		87
EPRPR001	10/12/2009		745
EPRPR001	10/16/2009		2650
EPRPR001	10/22/2009	<	<48
EPRPR001	10/28/2009		2500
EPRPR001	12/15/2009		67
EPRPR001	3/22/2010	<A	<59
EPRPR001	5/4/2010		825
EPRPR001	5/10/2010		1450
EPRPR001	5/14/2010		410
EPRPR001	5/20/2010		276
EPRPR001	5/26/2010		290
EPRPR001	6/2/2010		690
EPRPR001	6/7/2010		800
EPRPR001	6/11/2010		310
EPRPR001	6/17/2010		216
EPRPR001	6/23/2010		1100
EPRPR001	6/29/2010		420
EPRPR001	7/2/2010	O	157
EPRPR001	7/9/2010		2950
EPRPR001	7/14/2010		440
EPRPR001	7/20/2010	>B	>4350
EPRPR001	7/29/2010		2250
EPRPR001	8/3/2010		262
EPRPR001	8/9/2010		207
EPRPR001	8/13/2010	O	702

MSD Site ID	Date	Data Flag	Fecal Coliform (colonies/100 ml)
EPRPR001	8/19/2010		262
EPRPR001	8/25/2010		202
EPRPR001	8/31/2010		140
EPRPR001	9/8/2010		510
EPRPR001	9/13/2010		183
EPRPR001	9/17/2010		300
EPRPR001	9/23/2010		117
EPRPR001	9/29/2010		169
EPRPR001	10/5/2010		153
EPRPR001	10/11/2010		580
EPRPR001	10/15/2010		147
EPRPR001	10/21/2010	A	<76
EPRPR001	10/27/2010		2950
EPRPR001	12/7/2010		67

Pope Lick 0.0 to 2.1			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PL-2	5/23/2007		140
PL-2	6/11/2007		257
PL-2	7/17/2007		306
PL-2	7/31/2007	1.12	270
PL-2	8/14/2007		80
PL-2	8/17/2007	2.86	4100
PL-2	8/21/2007	48.80	20000
PL-2	9/6/2007		260
PL-2	9/20/2007		110
PL-2	10/16/2007	0.29	2700
PL-2	10/23/2007		3300
PL-2	6/10/2008		290
PL-2	6/23/2008		1500
PL-2	7/16/2008		200
PL-2	7/22/2008	0.72	550
PL-2	7/31/2008	20.18	8600
PL-2	8/19/2008		120
PL-2	10/2/2008		860
PL-2	10/9/2008	2.03	1700

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PL-2	10/16/2008		200

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PL-3	5/23/2007		68
PL-3	6/11/2007		520
PL-3	7/17/2007		300
PL-3	7/31/2007	0.02	120
PL-3	8/14/2007		36
PL-3	9/6/2007		48
PL-3	9/20/2007		88
PL-3	10/16/2007	0.45	120
PL-3	10/23/2007		9000
PL-3	6/10/2008		1200
PL-3	6/23/2008		1300
PL-3	7/16/2008	0.83	400
PL-3	8/19/2008		120
PL-3	10/2/2008		200
PL-3	10/9/2008	1.75	650
PL-3	10/16/2008		280
PL-3	10/23/2008		64

Pope Lick Creek 2.1 to 5.5			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PL-1	5/23/2007		440
PL-1	6/11/2007		92
PL-1	7/17/2007		186
PL-1	7/31/2007	0.09	270
PL-1	8/14/2007		24
PL-1	8/21/2007	11.20	11000
PL-1	9/20/2007		60
PL-1	10/16/2007	1.15	410
PL-1	10/23/2007		17000
PL-1	6/10/2008		280
PL-1	6/23/2008		1600
PL-1	7/16/2008		390

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
PL-1	8/19/2008		380
PL-1	10/2/2008		420
PL-1	10/9/2008	0.31	620
PL-1	10/16/2008		680
PL-1	10/23/2008		100

South Fork Currys Fork 0.0 to 6.1			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
SFCF-2	5/23/2007		190
SFCF-2	6/11/2007		461
SFCF-2	6/25/2007		550
SFCF-2	7/17/2007		580
SFCF-2	7/31/2007	0.32	450
SFCF-2	8/14/2007		140
SFCF-2	9/6/2007		28
SFCF-2	10/16/2007		56
SFCF-2	10/24/2007		4300
SFCF-2	6/10/2008		640
SFCF-2	6/23/2008		720
SFCF-2	7/16/2008		<4
SFCF-2	7/31/2008		22000
SFCF-2	8/19/2008		110
SFCF-2	9/23/2008		>1000
SFCF-2	10/2/2008		1800
SFCF-2	10/9/2008		3400
SFCF-2	10/16/2008		16000
SFCF-2	10/23/2008		20

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
SC1	5/7/2007		500
SC1	5/23/2007		490
SC1	6/11/2007		600
SC1	6/25/2007		800
SC1	7/11/2007		87000

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
SC1	7/25/2007		110
SC1	8/9/2007		5000
SC1	8/22/2007		650
SC1	10/25/2007		3500
SC1	5/21/2009		400
SC1	6/5/2009		1000
SC1	6/18/2009		1700
SC1	7/2/2009		12000
SC1	7/15/2009		1800
SC1	7/30/2009		1000
SC1	8/13/2009		940
SC1	8/27/2009		560
SC1	9/10/2009		290
SC1	9/20/2009		4,600
SC1	9/20/2009		8,500
SC1	9/20/2009		6,600
SC1	9/24/2009		850
SC1	10/8/2009		13000
SC1	10/22/2009		1,700
SC1	10/30/2009		200
SC1	10/31/2009		10,000
SC1	10/31/2009		8,500

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
SC2	5/7/2007		200
SC2	5/23/2007		230
SC2	6/11/2007		764
SC2	6/25/2007		600
SC2	7/11/2007		4900
SC2	7/25/2007		380
SC2	8/9/2007		5100
SC2	8/22/2007		1600
SC2	9/11/2007		150
SC2	9/26/2007		260
SC2	10/10/2007		150
SC2	10/25/2007		3800
SC2	6/5/2009	0.2	310

Curry Fork WBP Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
SC2	6/18/2009	0.6	3800
SC2	7/2/2009	0.3	670
SC2	7/15/2009	5.6	330
SC2	7/30/2009	10.7	4200
SC2	8/13/2009	3.6	1500
SC2	9/10/2009	0.4	260
SC2	9/20/2009	0.1	140
SC2	9/20/2009	0.1	50
SC2	9/20/2009	0.1	4,600
SC2	9/24/2009	4.3	1100
SC2	10/8/2009	64.2	4800
SC2	10/22/2009	21.4	5,800
SC2	10/30/2009	1.4	190
SC2	10/31/2009	64.2	6,300
SC2	10/31/2009	7.1	5,200

South Long Run 0.0 to 3.35			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
SLR-1	5/23/2007		120
SLR-1	6/11/2007		40
SLR-1	7/17/2007		9900
SLR-1	7/31/2007	0.16	350
SLR-1	8/14/2007		92
SLR-1	8/21/2007	4.48	6300
SLR-1	9/6/2007		36
SLR-1	10/16/2007	0.01	620
SLR-1	10/23/2007		4100
SLR-1	6/10/2008		1000
SLR-1	6/23/2008		1300
SLR-1	7/16/2008	0.15	250
SLR-1	7/31/2008	3.55	3400
SLR-1	8/19/2008		48
SLR-1	10/2/2008		10
SLR-1	10/9/2008	0.01	2800
SLR-1	10/16/2008		60
SLR-1	10/23/2008		40

UT to South Fork Currys Fork 0.0 to 1.8			

USGS Site ID	Date	Discharge (cfs)	*E. coli* (colonies/100 ml)
SFCF-1	5/23/2007		1700
SFCF-1	6/11/2007		314
SFCF-1	6/25/2007		56
SFCF-1	7/17/2007		28
SFCF-1	7/31/2007	0.09	16
SFCF-1	8/14/2007		4
SFCF-1	9/6/2007		12
SFCF-1	9/20/2007		100
SFCF-1	10/16/2007		170
SFCF-1	10/24/2007		3300
SFCF-1	6/10/2008		72
SFCF-1	6/23/2008		10
SFCF-1	7/16/2008	0.79	550
SFCF-1	10/16/2008		80
SFCF-1	10/23/2008		320

Data not on TMDL Segments			

KDOW Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
1	8/3/1999	0.20	<10
2	8/3/1999		1500
3	8/3/1999	0.17	500
4	8/3/1999		520
5	8/3/1999	0.14	3000
6	8/3/1999		3000
7	8/3/1999	0.36	200
8	8/3/1999	0.69	300
9	8/3/1999	0.75	310
9	5/25/1999		90
9	6/21/1999		280
9	7/8/1999		170
9	8/13/1999		200
9	9/30/1999		140

KDOW Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
9	10/28/1999		40

Bullitt Co Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
BB-1	6/9/2005		320
BB-1	8/19/2005		60000
BB-1	10/10/2005		480
BB-2	6/9/2005		5300
BB-2	8/19/2005		60000
BB-2	10/10/2005		20
BL-1	6/9/2005		600
BL-1	8/19/2005		3000
BL-1	10/10/2005		900
BL-2	6/9/2005		2100
BL-2	8/19/2005		390
BL-2	10/10/2005		210
CR-1	6/9/2005		60000
CR-1	8/19/2005		2500
CR-1	10/10/2005		1400
WR-1	6/9/2005		4000
WR-1	8/19/2005		23000
WR-1	10/10/2005		600
WR-2	6/9/2005		1400
WR-2	8/19/2005		60000
WR-2	10/10/2005		600
BR-1	6/9/2005		2100
BR-1	8/19/2005		60000
BR-1	10/10/2005		9000
BR-2	6/9/2005		1400
BR-2	8/19/2005		1700
BR-2	10/10/2005		600
CC-2	6/9/2005		230
CC-2	8/19/2005		500
CC-2	10/10/2005		500
TB-1	6/9/2005		23000
TB-1	8/19/2005		60000
TB-1	10/10/2005		46000
TB-2	6/9/2005		900

Bullitt Co Site ID	Date	Discharge (cfs)	Fecal Coliform (colonies/100 ml)
TB-2	8/19/2005		60000
TB-2	10/10/2005		800

Table B.2 Data Quality Flag Descriptions

Qualifier	Description
A	Fecal result reported below counting range
B	Fecal result reported above counting range
O	Coliform colonies not within acceptable counting range
P	Coliform colonies above 200, results are estimated based upon quadrant count

Table B.3 Data Rejected During the Validation Process

Project Site ID	Date	Discharge (cfs)	(colonies/100 ml)	comments/flags	Reason for not validating
CANE-1	8/1/2007	0.00	150		No flow
CANE-1	10/16/2007		5700	No observable flow	No flow
ECCCC001	5/15/2001		300	>A	Can't determine if this is above or below 400 for fecal coliform
ECCCC001	5/7/2002		<950	<A	Can't determine if this is above or below 400 for fecal coliform
ECCCC001	7/21/2004		179	R	Analyzed beyond holding time
ECCCC001	8/14/2002		<220	<A	Can't determine if this is below 200 fecal geomean
ECCCC001	9/23/2003		<300	<A	Can't determine if this is below 200 fecal geomean
EFFCR001	5/8/2001		>290	>B	Can't determine if this is above 400 for fecal coliform
EFFCR001	10/28/2002		>203	>B	Can't determine if this is above 400 for fecal coliform
EFFCR001	9/23/2003		<250	<A	Can't determine if this is below 200 fecal geomean
EFFCR001	10/16/2009		>202	>B	Can't determine if this is above 400 for fecal coliform
CR-1	6/25/2007	2.40	4300	Channel Dry	No flow
EFFCR002	5/7/2002		<850	<A	Can't determine if this is less than 400 for fecal coliform
EFFCR002	9/19/2002		>257	<B	has both < and > qualifier. Couldn't determine which was correct

Project Site ID	Date	Discharge (cfs)	(colonies/100 ml)	comments/flags	Reason for not validating
EFFCR002	10/28/2002		>264	>B	Can't determine if this is less than 400 for fecal coliform
PRI100	6/12/2006		*Present >QL		Don't know QL for E. coli
EFFFF002	5/14/2002		<1000	<	Can't determine if this is less than 400 for fecal coliform
EFFFF002	8/12/2003		<1250	<A	Can't determine if this is less than 400 for fecal coliform
EFFFF002	5/20/2005		>200	P>	Can't determine if this is greater than 400 for fecal coliform
FF-4	6/25/2007	9.80	180	Channel Dry	No Flow
EFFFF003	5/31/2000		>207	>B	Can't determine if this is greater than 400 for fecal coliform
EFFFF003	7/7/2000		<400	<A	Can't determine if this is less than 200 for fecal geomean.
EFFFF003	8/12/2003		<330	<A	Can't determine if this is less than 200 for fecal geomean.
FF-1	10/9/2008		290	stream is stagnant several 100 yards US and DS	No flow
FF-1	10/16/2008		16	little/no flow	No flow
FF-3	7/16/2008		350	little to no flow	No flow
EFFFF001	5/14/2002		<700	<A	Can't determine if this is greater than 400 for fecal coliform
EFFFF001	9/23/2003		<700	<A	Can't determine if this is greater than 400 for fecal coliform
EFFFF001	9/2/2005		>790	B	Can't determine if this is greater than 1000/2000 for fecal coliform SCR
EFFFF001	9/1/2006		>1834	P	Can't determine if this is greater than 2000 for fecal coliform SCR
EFFFF001	6/5/2009		>745	>B&P	Can't determine if this is greater than 1000/2000 for fecal coliform SCR
FF-7	6/25/2007		170	Channel Dry	No flow
LR-1	9/6/2007		130	No Flow	No flow
LR-1	10/9/2008		570	no flow, sampled pool of water US side of bridge	No flow
LR-2	6/25/2007		300	Channel Dry	No flow
LR-2	9/6/2007		12	No Flow	No flow

Project Site ID	Date	Discharge (cfs)	(colonies/100 ml)	comments/flags	Reason for not validating
LR-2	9/20/2007		16	No flow, stagnant pools	No flow
LR-2	10/16/2007		420	No observable flow	No flow
PR-1	9/20/2007	5.10	1200	No Flow	No flow
EPRPR001	5/2/2000		>223	B	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	5/18/2000		<700	<	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	8/16/2000		<600	<A	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	8/30/2000		>850	>B	Can't determine if this is greater than 1000/2000 for fecal coliform SCR
EPRPR001	9/21/2000		>680	>B	Can't determine if this is greater than 1000/2000 for fecal coliform SCR
EPRPR001	7/10/2001		>333	>B	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	5/14/2002		<800	<A	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	7/30/2002		13400	>A	Has both < and > qualifier. Couldn't determine which was correct
EPRPR001	9/13/2002		>210	>B	Can't determine if this is greater than 400 for fecal coliform
EPRPR001	9/19/2002		224	<B	Has both < and > qualifier. Couldn't determine which was correct
EPRPR001	10/8/2008		>1967	B	Can't determine if this is greater than 2000 for fecal coliform SCR
PL-2	6/25/2007		430	Channel Dry	No flow
PL-2	10/23/2008		52	no flow, deep stagnant pools	No flow
PL-3	6/25/2007		540	Channel Dry	No flow
PL-1	6/25/2007		2100	Channel Dry, E. coli Estimated	No flow
PL-1	9/6/2007		56	Little/No Flow	No flow
SFCF-2	9/20/2007		250	No Flow	No flow
SC2	5/21/2009	0.0	240	0 flow	No flow
SC2	8/27/2009	0.0	180	0 flow	No flow
SLR-1	6/25/2007		340	Channel Dry	No flow
SLR-1	9/20/2007		96	No Flow	No flow

Project Site ID	Date	Discharge (cfs)	(colonies/100 ml)	comments/flags	Reason for not validating
SFCF-1	8/19/2008		12	all flow in creek from pipe	No flow
SFCF-1	9/23/2008		8	Water from Pipe is only water flowing	No flow
SFCF-1	10/2/2008		<4	all flow from pipe. Took sample from pipe	No flow
SFCF-1	10/9/2008		440	flow mostly coming out of outfall-a pool upstream that barely connects to flow-tree down blocking flow 30'-40' DS	No flow