Office of Water Quality
Total Maximum Daily Load Program

Total Maximum Daily Load for *Escherichia coli* (*E. coli*) For the Upper Wildcat Creek Watershed, Howard, Tipton, Grant, and Madison Counties

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August 26, 2010

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Introduction

Section 303(d) of the Federal Clean Water Act and the United States Environmental Protection Agency's (USEPA's) Water Quality Planning and Management Regulations (Title 40 of the Code of Federal Regulations (CFR), Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting Water Quality Standards (WQS). TMDLs provide states a basis for determining the pollutant reductions necessary from both point and nonpoint sources to restore and maintain the quality of their water resources. The purpose of this TMDL is to identify the sources and determine the allowable levels of *E. coli* bacteria that will result in the attainment of the applicable WQS in the Upper Wildcat Creek Watershed in Howard, Tipton, Grant, and Madison Counties in Indiana.

Background

In 1998 Indiana's Section 303(d) List cited the Upper Wildcat Creek as being impaired for *E. coli* in Howard, Tipton, Grant, and Madison Counties and has remained on the 303(d) List in subsequent years. In addition to the Upper Wildcat Creek, Indiana's 2008 Section 303(d) List cites 31 tributaries as being impaired for *E. coli.* Based on the data collected in 2002 by IDEM, a reassessment of water quality condition was warranted. This reassessment was completed in January 2006, for the Upper Wildcat Creek Watershed. The reassessment for the *E. coli* impairment resulted in the addition of the following segments in the Upper Wildcat Creek Watershed to the 2006 303(d) List: (Table 1). All other impaired segments were unaffected by this reassessment. (Figure 1, Table 1).

Recently IDEM began using the high resolution National Hydrography Dataset (NHD) created by USGS. Previously IDEM could only view streams at medium resolution (1:100,000 scale). The high resolution streams are at the 1:24,000 scale, which allows for a more detailed view of the watershed. These high resolution waters have always been present; however, they have not been visible in electronic maps until now. A reassessment of the Lower Wildcat Creek watershed was completed with regard to both medium and high resolution streams in this watershed.

This TMDL will address approximately 241.20 square miles and 92.47 stream miles of the Upper Wildcat Creek Watershed in Howard, Tipton, Grant, and Madison Counties, Indiana, where designated uses are impaired by elevated levels of *E. coli* during the recreational season. All nineteen segments of the listed streams for this TMDL are located in the Wildcat Basin, Hydrologic Unit Code 05120107. This TMDL addresses only the Upper Wildcat Creek from its headwaters to Kokomo, IN (Figure 1). Segments of the remaining portion of the Upper Wildcat Creek below Kokomo are impaired and are being addressed in the Lower Wildcat Creek TMDL, which is being written in conjunction with this TMDL. The description of the study area, its topography, and other particulars are as follows:

Table 1: 303d List of Impaired Segments in the Upper Wildcat Creek Watershed

Segment ID	Segment Name	Miles	County
INB0715_02	GRASSY FORK	13.31	GRANT CO
INB0716_04	MUD CREEK	7.08	HOWARD CO
INB0717_01	WILDCAT CREEK	14.22	
INB0717_T1009	WILDCAT CREEK - UNNAMED TRIBUTARY	5.59	
INB0717_T1010	WILDCAT CREEK - UNNAMED TRIBUTARY	4.00	
INB0717_T1011	WILDCAT CREEK - UNNAMED TRIBUTARY	2.93	
INB0718_01	KOKOMO CREEK	14.47	
INB0718_02	KOKOMO CREEK	7.04	
INB0718_T1005	KOKOMO CREEK - UNNAMED TRIBUTARY	4.86	
INB0718_T1006	KOKOMO CREEK - UNNAMED TRIBUTARY	4.10	
INB0718_T1007	KOKOMO CREEK - UNNAMED TRIBUTARY	2.65	
INB0719_01	WILDCAT CREEK	8.60	
INB0719_T1001	WILDCAT CREEK - UNNAMED TRIBUTARY	3.95	
INB0719_T1002	WILDCAT CREEK - UNNAMED TRIBUTARY	1.28	
INB0719_T1003	WILDCAT CREEK - UNNAMED TRIBUTARY	3.32	
INB0712_02	BROAD CREEK	21.29	TIPTON CO
INB0712_T1001	NORTH CREEK	6.90	
INB0712_T1002	BROAD CREEK - UNNAMED TRIBUTARY	2.88	
INB0713_01	TURKEY CREEK	4.96	
INB0713_T1001	TURKEY CREEK - UNNAMED TRIBUTARY	7.09	
INB0713_T1002	TURKEY CREEK - UNNAMED TRIBUTARY	1.38	
INB0713_T1003	TURKEY CREEK - UNNAMED TRIBUTARY	8.32	
INB0716_T1001	IRWIN CREEK	10.71	
INB0716_T1002	WILDCAT CREEK - UNNAMED TRIBUTARY	4.56	
INB0716_T1003	WILDCAT CREEK - UNNAMED TRIBUTARY	2.45	
INB0716_T1004	WILDCAT CREEK - UNNAMED TRIBUTARY	2.84	

IDEM conducted an intensive survey of the Wildcat Creek watershed in 2003. Sites were sampled September 8, 2003, through October 15, 2003 (Figure 3; Attachment A). All sites were sampled for the Wildcat Creek TMDL Watershed Project. All sites were sampled five (5) times, evenly spaced over a thirty (30) day period. Of the sixty-five (65) sites, five (5) sites, 22, 23, 37, 38, and 57, did not violate the geometric mean for *E. coli*. All other sites sampled violated the *E. coli* geometric mean of 125 MPN (Most Probable Number)/100 mL. The single sample maximum of 235 MPN/ 100 mL was violated 71.4% of the time.

Historic data collected by IDEM's Assessment Branch in 1998-2002 indicate high levels of *E. coli* in the Wildcat Creek River watershed. Violations ranged from 236 MPN/100 mL to greater than 2420 MPN/100 mL (Figure 2; Attachment B). Two hundred thirty-five of the 329 samples taken in 2003 exceeded the single sample maximum.

The TMDL development schedule corresponds with IDEM's basin-rotation water quality monitoring schedule. To take advantage of all available resources for TMDL development, impaired waters are scheduled according to the basin-rotation schedule unless there is a significant reason to deviate from this schedule. Waterbodies could be scheduled based on the following:

1) Waterbodies may be given a high or low priority for TMDL development depending on the specific designated uses that are not being met, or in relation to the magnitude of the impairment.

2) TMDL development of waterbodies where other interested parties, such as local watershed groups, are working on alleviating the water quality problem may be delayed to give these other actions time to have a positive impact on the waterbody. If water quality standards still are not met, then the TMDL process will be initiated.

3) TMDLs that are required due to water quality violations relating to pollutant parameters where no EPA guidance is available may be delayed to give EPA time to develop guidance.

This TMDL was scheduled based on the data available from the basin-rotation schedule, which represents the most accurate and current information available on water quality within waterbodies covered by this TMDL.

Numeric Targets

The impaired designated use for the waterbodies in the Upper Wildcat Creek Watershed is for total body contact recreational use during the recreational season, April 1st through October 31st.

327 IAC 2-1-6(d) (3), establishes the full body contact recreational use *E. coli* WQS for all waters in the Great Lakes system as follows:

(3) For full body contact recreational uses, E. coli bacteria shall not exceed the following:
(A) One hundred twenty-five (125) per one hundred (100) milliliters as a geometric mean based on not less than five (5) samples equally spaced over a thirty (30) day period.
(B) Two hundred thirty-five (235) per one hundred (100) milliliters in any one (1) sample in a thirty (30) day period, except that in cases where there are at least ten (10) samples at a given site, up to ten percent (10%) of the samples may exceed two hundred thirty-five (235) cfu or MPN per one hundred (100) milliliters where the:
(i) E. coli exceedances are incidental and attributable solely to E. coli resulting from the discharge of treated wastewater from a wastewater treatment plant as defined at IC 13-11-2-258; and
(ii) criterion in clause (A) is met.
However, a single sample shall be used for making beach notification and closure decisions.
If a geometric mean cannot be calculated because five (5) equally spaced samples are not available, then the criterion stated in clause (B) must be met.

The sanitary wastewater *E. coli* effluent limits from point sources in the non-Great Lakes system during the recreational season, April 1st through October 31st, are also covered under 327 IAC 2-1-6(d)(3).

For the Upper Wildcat Creek Watershed during the recreational season (April 1st through October 31st) the target level is set at the *E. coli* WQS of 125 MPN/100 mL as a 30-day geometric mean based on not less than five samples equally spaced over a thirty day period.

Source Assessment

<u>Watershed Characterization</u>

The Upper Wildcat Creek in Howard, Tipton, Grant, and Madison Counties is located in a predominantly agricultural watershed. Three of the primary headwater creeks (Mud, Turkey, and Kokomo Creeks) in the

Upper Wildcat Creek watershed flow in an easterly direction before curving counter-clockwise to flow in a westerly direction where they merge with Wildcat Creek. Wildcat Creek proper flows west by northwest direction until it flows into the city of Kokomo which is the end of the watershed addressed in this TMDL Several primary tributaries that feed the Upper Wildcat Creek are impaired for *E. coli*. These tributaries include Turkey Creek, Mud Creek, and Kokomo Creek. The watershed is located in Tipton County represents 100.37 sq. mi. (41.61%), Howard county has 97.20 sq. mi. (40.30%), Grant county with 34.80 sq. mi. (14.43%), and Madison county with 8.94 sq. mi. (3.70%) of the watershed area (Figure 1).

Landuse information was assembled using data collected from the 1992 Gap Analysis Program (GAP). In 1992, approximately 92.62% of the landuse in the Upper Wildcat Creek Watershed was agriculture/pasture. The remaining landuse along the Upper Wildcat Creek Watershed consisted of approximately 0.99% Forested, 1.96% Wetlands, 4.07% Urban, and 0.36% Water (Figure 3). A comparison of landuse information from 1992 with aerial photos taken in 1998 and 2005 show there is minimal change to the landuse in the Upper Wildcat Creek Watershed.

Wildlife is a known source of *E. coli* impairments in waterbodies. Many animals spend time in or around waterbodies. Deer, geese, ducks, raccoons, turkeys, and other animals all create potential sources of *E. coli*. Wildlife contributes to the potential impact of contaminated runoff from animal habitats, such as urban park areas, forest, and cropland.

Many homes within the Upper Wildcat Creek Watershed treat wastewater with on-site septic systems. Failing septic systems are known sources of *E. coli* impairment in waterbodies. A personal conversation with Nolan Pike of the Tipton County Health Department indicated that septic system failure does occur, but no tangible septic failure rate has been established by the Tipton County Health Department at this time (Tipton County Health Department, 2007). No additional data were in existence from the Howard, Madison, or Grant County Health Departments regarding failing septic system rates but it is believed that many older systems do fail occasionally and can lead to contributions to the *E. coli* impairment in the Upper Wildcat Creek Watershed.

National Pollutant Discharge Elimination System (NPDES) Permitted Dischargers

There are nine NPDES permitted facilities in the Upper Wildcat Creek Watershed (Figure 4, Table 2) with a sanitary component in their permit

All the facilities have recorded some violations of their *E. coli* limits in the previous five years. However, according to the IDEM's inspectors for each site, these upsets were primarily due to heavy rain events and subsequent flooding in and around the Upper Wildcat Creek. Since, these sites are not consistently violating their limits, except during extreme weather conditions, these facilities are not considered significant sources of *E. coli* to the Upper Wildcat Creek. One facility (Greentown STP (IN0021091) has an Agreed Order on file for *E. coli*.

Any other permitted dischargers have no sanitary component are not contributing to the sources of *E. coli* in the Upper Wildcat Creek Watershed.

Storm Water General Permit Rule 13

The City of Kokomo (INR040104) and Howard County (INR040048) have a Municipal Separate Storm Sewer System (MS4) Permits. Guidelines for MS4 permits and timelines are outlined in Indiana's Municipal Separate Storm Sewer System (MS4) Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11). It can be determined that the MS4 communities have the potential to be a source of *E. coli* to the Upper

Wildcat Creek. However, prior to the completion of the permit requirements, it is difficult to determine the magnitude of *E. coli* impact these MS4 communities have on the Upper Wildcat Creek.

Combined Sewer Overflows (CSO)

There are 24 Combined Sewer Overflows in Upper Wildcat Creek Watershed (Figure 5, Appendix 1), all located in the city of Kokomo. The City of Kokomo has an approved the Long Term Control Plan (LTCP). The LTCP allows for approximately two CSOs discharges to occur during a typical year. The City's Use Attainability Analysis (UAA) is currently under review by IDEM. As of September 28, 2007, Kokomo has a SJA (State Judicial Agreement). CSO outfalls are considered a source of *E.coli* to the Upper Wildcat Creek.

Confined Feeding Operations and Concentrated Animal Feeding Operations

The removal and disposal of the manure, litter, or processed wastewater that is generated as the result of confined feeding operations falls under the regulations for confined feeding operations (CFOs) and concentrated animal feeding operations (CAFOs). CAFOs are defined as point sources under the Federal NPDES regulations, while CFOs defined under Indiana statute are not considered point sources under the Federal NPDES regulations. There are thirteen (13) CFOs in the Upper Wildcat Creek Watershed and two (2) CAFOs (Table 3, Figure 6 and 7, Appendix 2). The CFO and CAFO regulations (327 IAC 16, 327 IAC 15) require operations "not cause or contribute to an impairment of surface waters of the state." The active animal operations near the Upper Wildcat Creek have no open enforcement actions at this time. However, these operations are still considered a potential source of *E. coli* for the Upper Wildcat Creek. All fifteen (15) operations are current on their permits and have an updated manure management plan with only one noted violation from Peters (1660) which had two administrative points of not having a spill response plan displayed and a Self-Monitoring log book. Both concerns were addressed and corrected.

There are many smaller livestock operations in the watershed. These operations, due to their small size, are not regulated under the CFO or CAFO regulations. These operations may still have an impact on the water quality and the *E. coli* impairment. No specific information on these small livestock operations is currently available for the Upper Wildcat Creek Watershed however; it is believed that these small livestock operations may be a source of the *E. coli* impairment.

Conclusions

The *E. coli* data have an average single sample maximum violation 71.4% of the time and an average geometric mean violation 92.3% of the time. There are nine (9) permitted NPDES facilities with a sanitary component in the watershed. There are no CFO violations and the CFOs are considered to be in compliance. Two CAFO and thirteen (13) CFO facilities are in operation within the watershed. The City of Kokomo, an MS4 community, is considered a source of *E. coli*. Based on the water quality duration curves, it can be concluded that the majority of sources of *E. coli* in this watershed are nonpoint sources which include small animal operations, wildlife, leaking and failing septic systems.

Linkage Analysis and *E. coli* Load Duration Curves

The linkage between the *E. coli* concentrations in the Upper Wildcat Creek Watershed and the potential sources of *E. coli* provides the basis for the development of this TMDL. Analysis of this relationship allows for estimating the total assimilative capacity of the stream and any needed load reductions. Water quality duration curves were created for the sampling sites in the Upper Wildcat Creek Watershed that were sampled by IDEM in 2002. A flow duration interval is described as a percentage. Zero (0) percent corresponds to the highest stream discharge (flood condition) and 100 percent corresponds to the lowest

discharge (drought condition. These sampling sites are representative of the hydrodynamics of the Upper Wildcat Creek Watershed (Attachment B).

To investigate further the potential sources mentioned above, an *E. coli* load duration curve analysis, as outlined in an unpublished paper by Cleland (2002), was developed for each sampling site in the Upper Wildcat Creek Watershed. The method considers how stream flow conditions relate to a variety of pollutant loadings and their sources (point and non-point).

In order to develop a load duration curve, continuous flow data is required. There is one (1) USGS flow gage station that represents the flows in the Upper Wildcat Creek Watershed. The station is USGS gage (0333700) located in the City of Kokomo, Indiana near the most downstream portion of the watershed addressed in this TMDL

The flow data is used to create flow duration curves, which display the cumulative frequency of distribution of the daily flow for the period of record. The flow duration curve relates flow values measured at the monitoring station to the percent of time that those values are met or exceeded. Flows are ranked from extremely low flows, which are exceeded nearly 100 percent of the time, to extremely high flows, which are rarely exceeded. Flow duration curves are then transformed into load duration curves by multiplying the flow values along the curve by applicable water quality criteria values for *E. coli* and appropriate conversion factors. The load duration curves are conceptually similar to the flow duration curves in that the x-axis represents the flow recurrence interval and the y-axis represents the allowable load of the water quality parameter. The curve representing the allowable load of *E. coli* was calculated using the daily and geometric mean standards of 235 MPN/100 mL and 125 MPN/100 mL, respectively. The final step in the development of a load duration curve is to add the water quality pollutant data to the curves. Pollutant loads are estimated from the data as the product of the pollutant concentrations, instantaneous flows measured at the time of sample collection, and appropriate conversion factors. In order to identify the plotting position of each calculated load, the recurrence interval of each instantaneous flow measurement was defined. Water quality pollutant monitoring data are plotted on the same graph as the load duration curve that provides a graphical display of the water quality conditions in the waterbody. The pollutant monitoring data points that are above the target line exceed the water quality standards (WQS); those that fall below the target line meet the WQS (Mississippi DEQ, 2002).

Load duration curves were created for all the sampling sites in the Upper Wildcat Creek watershed. However, sampling sites 26, 34, 18, 14, 62, and 53 provide the best description of the sources of *E. coli* to the Upper Wildcat Creek watershed and will be discussed in this TMDL (Figure 3, Attachment C & E). Site 25 (WAW010-0051) is located on the Wildcat Creek at Markland Ave. Site 34 (WAW010-0062) is located on Kokomo Creek at Park Ave. Site 18 (WAW010-0031) is located on Wildcat Creek at County Road 300 South. Site 14 (WAW010-0019) is located on Mud Creek at County Road 1100 East. Site 62 (WAW010-0119) is located on Turkey Creek at County Road 650 North. Site 53 (WAW010-0110) is located on Mud Creek at County Road 450 North. These sampling sites were intensively sampled for *E. coli* September through October 2003. The data indicate that the largest exceedances of the *E. coli* WQS are prevalent during wet weather events (noted by diamonds above the curve on the far left side of the figure in Attachment C). Dry weather contributions are also a source of *E. coli* to the Upper Wildcat Creek watershed (noted by the diamonds above the curve on right side of the figure in Attachment C). However, the dry weather contributions are less influential in this watershed as indicated by the diamonds on the right side of the graph being near or under the WQS target line.

To further investigate sources of pollution, *E. coli* counts in Most Probable Number (MPN)/100 mL have been plotted on precipitation graphs (Attachment B). Elevated levels of *E. coli* during or soon after rain events indicates *E. coli* contribution due to run-off. The precipitation data was taken from a weather station in Kokomo, IN and managed by the Indiana State Climate Office at Purdue University.

Load duration curves and precipitation graphs were created for all the sampling sites in the Upper Wildcat Creek watershed. However, sample sites 26, 34, 18, 14, 62, and 53 provide the best description of the sources of *E. coli* to the Upper Wildcat Creek watershed (Attachment B).

Site 26 is located on Wildcat Creek at Markland Ave and represents sources coming from all of the Wildcat and its tributaries but not including influence from Kokomo Creek. The geometric mean is 540 MPN/100 mL. This site is located downstream of a majority of SSO/CSO's in the City of Kokomo which may have an influence on the high values seen at this site during rain events. The load duration curve shows a mix of values above the daily Water Quality Standard. Two of the highest values were recorded when there was significant rainfall within a day or two of sampling. The precipitation graph shows the stream is susceptible to high loads of *E. coli* from run-off. An *E. coli* concentration of 2420 MPN/100 mL was recorded on September 24, 2003, after 1.50 inches of rainfall and 0.36 inches fell the day of sampling for a total of 1.86 inches effecting flow. There were several rain events during sampling which kept flows above "normal". Impacts to the stream at these higher flows during rain events could possibly be from surface runoff and saturated septic systems.

Site 34 is located on Kokomo Creek at Park Ave and represents sources coming from all of Kokomo Creek headwaters. The geometric mean value is 1839 MPN/100 mL. The precipitation graph shows the stream is susceptible to high loads of *E. coli* from run-off and consistently high loads during times with no rainfall. An *E. coli* concentration of 4106.0 MPN/100 mL was recorded on October 15, 2003, after 1.17 inches of rainfall. This stream has high levels of *E. coli* load and the run-off impacts the stream much more. Non-point sources are the most likely source of impairment.

Site 18 is located on Wildcat Creek at County Road 300 South and represents sources coming from just the headwaters of Wildcat Creek before Mud Creek flows into Wildcat Creek. The geometric mean is 979 MPN/100 mL. The precipitation graph shows the stream is susceptible to high loads of *E. coli* from run-off and has high levels of *E. coli* during non-rain events. Two *E. coli* concentrations of 2420 MPN/per 100 mL were recorded on September 23, 2003 and October 14, 2003. Both events happened on a day with an inch of rainfall. During periods of no rain the *E. coli* load is still significantly above water quality standard, indicating a spectrum of non-point and point sources contributing to the impairment.

Site 14 is on located Mud Creek at County Road 1100 East and represents sources coming from Turkey Creek and it's headwaters as well as the headwaters of Mud Creek. The geometric mean 622 per 100 mL. An *E. coli* concentration of 2419.2 MPN/100 mL was recorded on September 23, 2004, one day after 1.50 inches of rainfall. Other values at this site remained high but coincided with rainfall events. One site recorded an *E. coli* value of 218.7 MPN/100 mL on September 8, 2003. The previous rainfall was six days prior indicating that this portion of the watershed is more affected by precipitation events.

Site 62 is located on Turkey Creek at County Road 650 N and represents sources coming entirely from Turkey Creek and it's headwaters before flowing into Mud Creek. The geometric mean is 820 MPN/100 mL. The precipitation graph shows the stream is susceptible to high loads of *E. coli* from run-off. The highest *E. coli* concentration of 1732.9 MPN/100 mL was recorded on October 14, 2003 during 0.88 inches of rainfall. The stream is consistently in violation of water quality standards in the higher and very high flow conditions. Again, samples were taken during a very rainy time of year. The violations during these types of flow and rain events indicates more non-point sources may be contributing

Site 53 is located on Mud Creek at County Road 450 North and represents the headwaters of Mud Creek itself. The geometric mean value for Site 31 is 879 MPN/100 mL. The precipitation graph shows the stream is susceptible to high loads of *E. coli* from run-off. An *E. coli* concentration of 3654.0 MPN/100

mL was recorded on October 14, 2003, during 0.88 inches of rainfall. During times between rainfall events the *E. coli* values drop to near water quality standards indicating the stream is impacted by both non-point and point sources.

While there are point source contributions, compliance with the numeric *E. coli* WQS in the Upper Wildcat Creek Watershed most critically depends on controlling of nonpoint sources using best management plans (BMPs). If the *E. coli* inputs can be controlled, then total body contact recreation use in Upper Wildcat Creek Watershed will be protected.

TMDL Development

The TMDL represents the maximum loading that can be assimilated by the waterbody while still achieving the Waters Quality Standard (WQS). As indicated in the Numeric Targets section of this document, the target for this *E. coli* TMDL is 125 MPN/100 mL as a geometric mean based on not less than five samples equally spaced over a thirty-day period from April 1 through October 31. Concurrent with the selection of a numeric concentration endpoint, TMDL development also defines the critical conditions that will be used when defining allowable levels. Many TMDLs are designed as the set of environmental conditions that, when addressed by appropriate controls, will ensure attainment of WQS for the pollutant. For example, the critical conditions for the control of point sources in Indiana are given in 327 IAC 5-2-11.1(b). In general, the 7-day average low flow in 10 years (Q7, 10) for a stream is used as the design condition for point source dischargers. However, *E. coli* sources to Upper Wildcat Creek Watershed arise from a mixture of dry and wet weather-driven conditions, and there is no single critical condition that would achieve the *E. coli* WQS. For the Upper Wildcat Creek Watershed and the contributing sources, there are a number of different allowable loads that will ensure compliance, as long as they are distributed properly throughout the watershed.

For most pollutants, TMDLs are expressed on a mass loading basis (e.g. pounds per day). For *E. coli* indicators, however, mass is not an appropriate measure because *E. coli* is expressed in terms of organism counts (or resulting concentration) (USEPA, 2001). Meeting the Water Quality Standards (WQS) of 125 MPN/100 mL as a geometric mean and 235 MPN/100 mL is the overall goal of the TMDL. The geometric mean *E. coli* WQS allows for the best characterization of the watershed. The geometric mean provides a more reliable measure of *E. coli* concentration because it is less subject to random variation (USEPA, 2004). However, by setting the target to meet the 125 MPN/100 mL geometric mean standard, this TMDL also will meet the 235 MPN/100 mL single day standard. Therefore, this *E. coli* TMDL is concentration-based consistent with 327 IAC 5-2-11.1(b) and 40 CFR, Section 130.2 (i) and the TMDL is equal to the geometric mean *E. coli* WQS for each month of the recreational season (April 1 through October 31).

The Wasteload Allocation and Load Allocations in the TMDL are set at 125 MPN/100 mL, which as stated above, also will meet the 235 MPN/100 mL single day standard.

Allocations

TMDLs are comprised of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include a Margin of Safety (MOS), either implicitly or explicitly, that accounts for uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody. Conceptually, this definition is denoted by the equation:

$$TMDL = \sum WLAs + \sum LAs + MOS$$

The term TMDL represents the maximum loading that can be assimilated by the receiving water while still achieving WQS. The overall loading capacity is subsequently allocated into the TMDL components of WLAs for point sources, LAs for nonpoint sources, and the MOS. This *E. coli* TMDL is concentration-based consistent with USEPA regulations at 40 CFR, Section 130.2(i).

Wasteload Allocations

As previously mentioned, There are nine permitted dischargers in the Upper Wildcat Creek Watershed. All the facilities have *E. coli* limits in their permits. Kokomo STP (IN0032875) has both Total Residual Chlorine and *E. coli* limits. Taylor Township RSD (IN0062375) is a new facility and was not in existence at the time data were collected. Greentown STP (IN0021091) has a Notice of Violation and an Agreed Order. The STP failed to prevent unpermitted bypassing on at least 25 reported occasions between January 1, 2004 and February 2006, in addition to other discharges that failed to comply with their permit limits. The October 2006 agreed order required Greentown to cease all bypasses, take a series of corrective actions at the STP to prevent permit violations, revise local ordinances, and report to IDEM on all aspects of the order.

There are two MS4 communities, City of Kokomo and Howard County, in the Upper Wildcat Creek Watershed. To date, these permits have not been issued for any of these MS4 communities. Guidelines for MS4 permits and timelines are outlined in Indiana's Municipal Separate Storm Sewer System (MS4) Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11).

There is one CSO community in the Upper Wildcat Creek Watershed the City of Kokomo. The City of Kokomo has an approved the Long Term Control Plan (LTCP). A community with CSO that believes it is not possible to meet existing water quality based requirements may develop information that supports a use attainability analysis (UAA). The use attainability analysis may result in the revision of designated uses and associated criteria if the applicable requirements of state and federal law, including 40 CFR 131.10 are met. However, states may remove a designated use that is not an existing use. Additionally, any existing use, even if not a designated use, must be protected. Furthermore, downstream water quality standards must be maintained and protected. As of September 28, 2007, Kokomo has a SJA (State Judicial Agreement).

In the event that designated uses and associated water quality criteria applicable to the Upper Wildcat Creek watershed are revised in accordance with applicable requirements of state and federal law, this TMDL may be revised to be consistent with such revisions.

The WLA is set at the WQS of 125 MPN/100 mL as a geometric mean based on not less than five samples equally spaced over a thirty-day period from April 1st through October 31st.

Load Allocations

The LA for nonpoint sources is equal to the WQS of 125 MPN/100 mL as a geometric mean based on not less than five samples equally spaced over a thirty-day period from April 1st through October 31st. The LA will use the geometric mean of each sampling location to determine the reduction necessary to comply with WQS at each site (Appendix 4 & Attachment E). The reductions have additionally been broken down into a flow regime that will help identify critical flows and areas for the implementation of this TMDL (Appendix 4).

Load allocations may be affected by subsequent work in the watershed. There are currently no watershed projects or plans in the Upper Wildcat Creek Watershed. However, there have been several Watershed projects completed in the surrounding areas. IDEM plans to work with the watershed coordinators in the

surrounding areas along with local government agencies to encourage interest in watershed projects. It is anticipated that watershed projects will be useful in continuing to define and address the nonpoint sources of the *E. coli* in the Upper Wildcat Creek Watershed.

Margin of Safety

A Margin of Safety (MOS) was incorporated into this TMDL analysis. The MOS accounts for any uncertainty or lack of knowledge concerning the relationship between pollutant loading and water quality. The MOS can be either implicit (i.e., incorporated into TMDL analysis thorough conservative assumptions) or explicit (i.e., expressed in the TMDL as a portion of the loadings). This TMDL uses an implicit MOS by applying a couple of conservative assumptions. First, no rate of decay for *E. coli* was applied. *E. coli* bacteria have a limited capability of surviving outside of their hosts and therefore, a rate of decay normally would be applied. However, applying a rate of decay could result in a discharge limit that would be greater than the *E. coli* WQS, thus no rate of decay was applied. Second, the *E. coli* WQS was applied to all flow conditions. This adds to the MOS for this TMDL. IDEM determined that applying the *E. coli* WQS of 125 MPN/ 100 mL to all flow conditions and with no rate of decay for *E. coli* is a more conservative approach that provides for greater protection of the water quality.

Seasonality

Seasonality in the TMDL is addressed by expressing the TMDL in terms of the *E. coli* WQS for total body contact during the recreational season (April 1st through October 31st) as defined by 327 IAC 2-1-6(d). There is no applicable total body contact *E. coli* WQS during the remainder of the year in Indiana. Because this is a concentration-based TMDL, *E. coli* WQS will be met regardless of flow conditions in the applicable season.

Monitoring

Future *E. coli* monitoring of the Upper Wildcat Creek Watershed will take place during IDEM's five-year rotating basin schedule and/or once TMDL implementation methods are in place. Monitoring will be adjusted as needed to assist in continued source identification and elimination. IDEM will monitor at an appropriate frequency to determine if Indiana's 30-day geometric mean value of 125 *E. coli* MPN/100 mL is being met. When these results indicate that the waterbody is meeting the *E. coli* WQS, the waterbody will then be removed from the 303(d) list.

Reasonable Assurance Activities

Reasonable assurance activities are programs that are in place or will be in place to assist in meeting the Upper Wildcat Creek Watershed TMDL allocations and the *E. coli* Water Quality Standard (WQS).

National Pollutant Discharge Elimination System (NPDES) Permitted Dischargers

For the permitted dischargers that have only total residual chlorine limits in their current permits, IDEM's TMDL program proposes the *E. coli* limits and monitoring be added when the next permit renewals are issued. The City of Kokomo is a Combined Sewer Overflow (CSO) community discharger to the Upper Wildcat Creek watershed. The City of Kokomo is currently in the Long Term Control Plan (LTCP) permitting process. This process will address any concern about CSO discharges causing or contributing to the violation of the *E. coli* WQS.

Storm Water General Permit Rule 13

Municipal Separate Storm Sewer System (MS4) permits are being issued in the state of Indiana. The one MS4 community in the Upper Wildcat Creek Watershed is the City of Kokomo. Once this permit has been issued and implemented, they will improve the water quality in the Upper Wildcat Creek watershed. Guidelines for MS4 permits and timelines are outlined in Indiana's Municipal Separate Storm Sewer System (MS4) Rule 13 (327 IAC 15-13-10 and 327 IAC 15-13-11). This permit will be used to address storm water impacts in the Upper Wildcat Creek watershed.

Confined Feeding Operations and Concentrated Animal Feeding Operations

CFOs and CAFOs are required to manage manure, litter, and process wastewater pollutants in a manner that does not cause or contribute to the impairment of *E. coli* WQS. IDEM inspects these facilities on a regular basis for compliance.

Watershed Projects

There are currently no active 319 grant projects within the Upper Wildcat Creek Watershed boundaries as discussed within this document.

IDEM hired a Watershed Specialist who will be available to assist stakeholders with starting a watershed group, facilitating planning activities, and serving as a liaison between watershed planning and TMDL activities in the Upper Wildcat Creek Watershed.

Potential Future Activities

Non-point source pollution, which is the primary cause of *E. coli* impairment in this watershed, can be reduced by the implementation of "best management practices" (BMPs). BMPs are practices used in agriculture, forestry, urban land development, and industry to reduce the potential for damage to natural resources from human activities. A BMP may be structural, that is, something that is built or involves changes in landforms or equipment, or it may be managerial, that is, a specific way of using or handling infrastructure or resources. BMPs should be selected based on the goals of a watershed management plan. Livestock owners, farmers, and urban planners, can implement BMPs outside of a watershed management plan, but the success of BMPs would be enhanced if coordinated as part of a watershed management plan. Following are examples of BMPs that may be used to reduce *E. coli* runoff:

Tipton and Howard County Soil and Water Conservation Districts have shown an interest in forming a watershed group to address the impairments in the Upper Wildcat Creek Watershed.

Riparian Area Management - Management of riparian areas protects streambanks and river banks with a buffer zone of vegetation, either grasses, legumes, or trees.

Manure Collection and Storage - Collecting, storing, and handling manure in such a way that nutrients or bacteria do not run off into surface waters or leach down into ground water.

Contour Row Crops - Farming with row patterns and field operations aligned at or nearly perpendicular to the slope of the land.

No-Till Farming - No-till is a year-round conservation farming system. In its pure form, no-till does not include any tillage operations either before or after planting. The practice reduces wind and water erosion, catches snow, conserves soil and water, protects water quality, and provides wildlife habitat. No-till helps control soil erosion and improve water quality by maintaining maximum residue plant levels on the soil

surface. These plant residues: 1) protect soil particles and applied nutrients and pesticides from detachment by wind and water; 2) increase infiltration; and 3) reduce the speed at which wind and water move over the soil surface.

Manure Nutrient-Testing - If manure application is desired, sampling and chemical analysis of manure should be performed to determine nutrient content for establishing the proper manure application rate in order to avoid over application and run-off.

Drift Fences - Drift fences (short fences or barriers) can be installed to direct livestock movement. A drift fence parallel to a stream keep animals out and prevents direct input of *E. coli* to the stream.

Pet Clean-up / Education - Education programs for pet owners can improve water quality of runoff from urban areas.

Septic Management/Public Education - Programs for management of septic systems can provide a systematic approach to reducing septic system pollution. Education on proper maintenance of septic systems as well as the need to remove illicit discharges could alleviate some anthropogenic sources of *E. coli*.

Conclusion

The sources of *E. coli* to the Upper Wildcat Creek Watershed include both point and nonpoint sources. In order for the Upper Wildcat Creek Watershed to achieve Indiana's *E. coli* WQS, the wasteload and load allocations for the Upper Wildcat Creek Watershed in Indiana have been set to the *E. coli* WQS of 125 MPN/ 100 mL as a geometric mean based on not less than five samples equally spaced over a thirty day from April 1st through October 31st. Achieving the wasteload and load allocations for the Upper Wildcat Creek Watershed depends on:

1) *E. coli* limits being added to dischargers who monitor for total residual chlorine
2) CFOs not violating their permits
3) nonpoint sources of *E. coli* being controlled by implementing best management practices in the watershed.
4) Implementation of the *E. coli* TMDL completed on the impaired tributaries in the Middle West Fork White River watershed.

The next phase of this TMDL is to identify and support the implementation of activities that will bring the Upper Wildcat Creek Watershed in compliance with the *E. coli* WQS. IDEM will continue to work with its existing programs on implementation. In the event that designated uses and associated water quality criteria applicable to the Upper Wildcat Creek Watershed are revised in accordance with applicable requirements of state and federal law, the TMDL implementation activities may be revised to be consistent with such revisions. Additionally, IDEM will work with local stakeholder groups to pursue best management practices that will result in improvement of the water quality in the Upper Wildcat Creek Watershed.

REFERENCES

Cleland, B. 2002 TMDL Development from the "Bottom Up"-Part II. Using Duration Curves to Connect the Pieces. America's Clean Water Foundation.

Mississippi Department of Environmental Quality. 2002. Fecal Coliform TMDL for the Big Sunflower River, Yazoo River Basin.

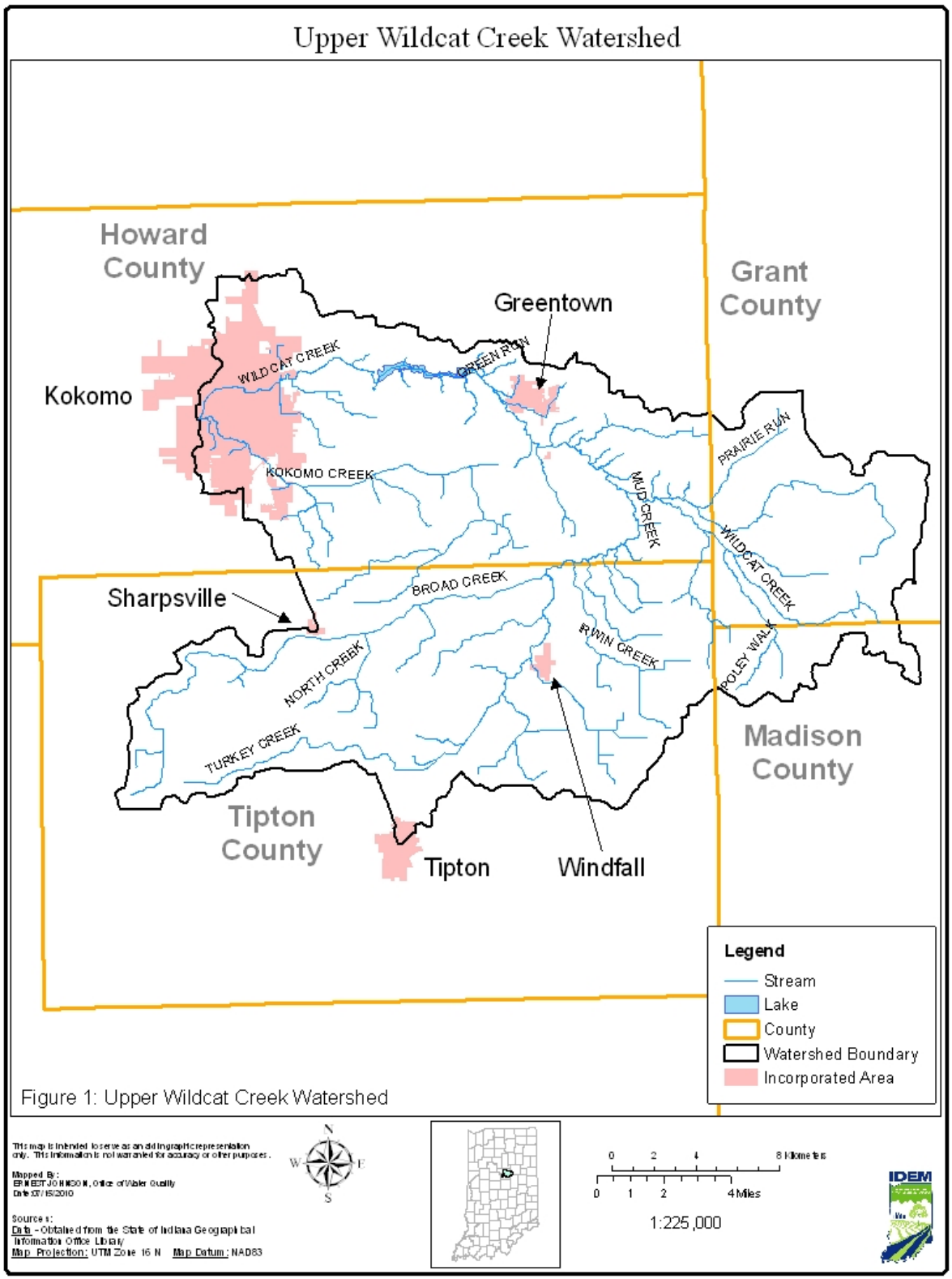
USEPA. 2001. Protocol for Developing Pathogen TMDLs. United States Environmental Protection Agency, 841-R-00-002.

Table 2: NPDES Sanitary Facilities in the Upper Wildcat Creek Watershed.

Permit Number	Name	Receiving Water
IN0021091	Greentown STP	Wildcat Cr S. Fork(Kokomo Reservoir)
IN0031844	Kokomo Regency MHP	Wildcat Creek via Kokomo Creek
IN0032875	Kokomo STP	Wildcat Creek
IN0036935	Forest Lodge MHP	Harrison-Harlan Ditch
IN0038784	Woodland Estates MHP	Or/Wabash/Wildcat/Prairie Creek Diversion
IN0040762	Windfall WWTP	Or/Wabash/Wildcat/Prairie Creek Diversion
IN0041131	Taylor Elem. and High School	Kokomo Creek
IN0041912	Timbernest Apts	Or/Wabash/Kokomo Creek/2 lakes/Wetland
IN0062375	Taylor Township RSD	Or/Wabash/Wildcat/Kokomo Creek

Table 3: List of Concentrated Animal Feeding Operations and Confined Feeding Operations

Permit Number	Permit Type	Operation Name	Status	Animal Type
709	CAFO	Salsbery Pork Prod Inc	ACTIVE	Hog, Chicken
4252	CAFO	Barber	ACTIVE	Hog, Chicken, Cattle
2549	CFO	Harlow	ACTIVE	Hog, Chicken
1660	CFO	Peters	ACTIVE	Hog, Chicken
4159	CFO	Mundell	ACTIVE	Hog, Chicken
2151	CFO	Schafer	ACTIVE	Hog, Chicken
2277	CFO	Harlow	ACTIVE	Hog, Chicken
712	CFO	Kirkendall	ACTIVE	Hog, Chicken
2159	CFO	Maple	ACTIVE	Chicken
3909	CFO	Maple	ACTIVE	Hog, Chicken
2624	CFO	Salsbery Pork Prod Inc	ACTIVE	Hog, Chicken
4212	CFO	Tolle	ACTIVE	Hog, Chicken
713	CFO	Hussey	ACTIVE	Chicken
2301	CFO	Hussey	ACTIVE	Hog
4259	CFO	Myers	ACTIVE	Chicken


Upper Wildcat Creek Watershed
Howard County
Grant County
Kokomo
Greentown
WILDCAT CREEK
GREEN RUN
KOKOMO CREEK
MUD CREEK
PRAIRIE RUN
WILDCAT CREEK
Sharpsville
BROAD CREEK
IRWIN CREEK
POLEY WALK
NORTH CREEK
TURKEY CREEK
Madison County
Tipton County
Tipton
Windfall
Legend
Stream
Lake
County
Watershed Boundary
Incorporated Area
Figure 1: Upper Wildcat Creek Watershed
This map is intended to serve as an aid in graphic representation only. This information is not warranted for accuracy or other purposes.
Mapped By:
ERNEST JOHNSON, Office of Water Quality
Date: 3/15/2010
Sources:
Data - Obtained from the State of Indiana Geographical Information Office Library
Map Projection: UTM Zone 16 N Map Datum: NAD83
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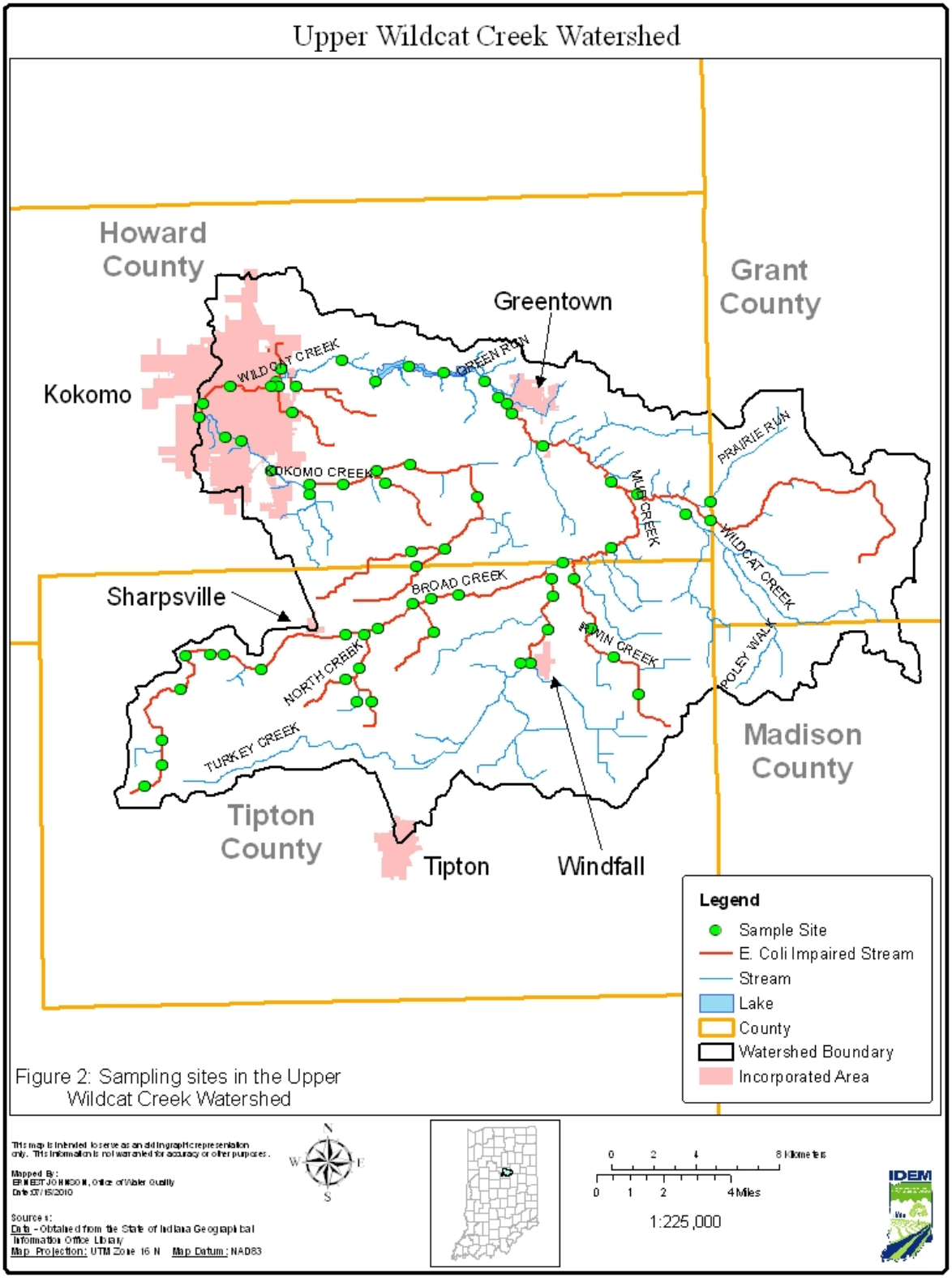

Figure 2: Sampling sites in the Upper Wildcat Creek Watershed

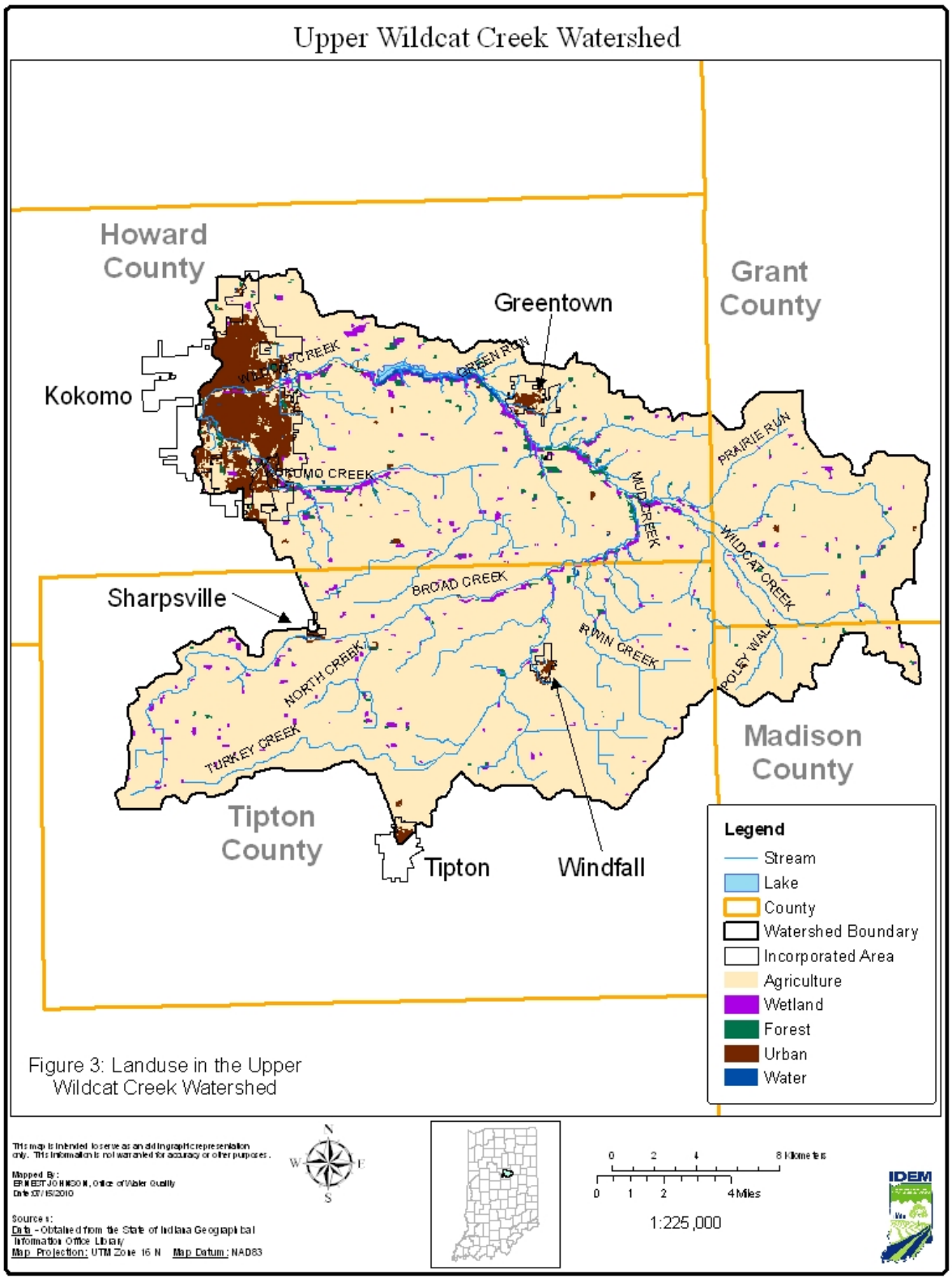

Figure 3: Landuse in the Upper Wildcat Creek Watershed

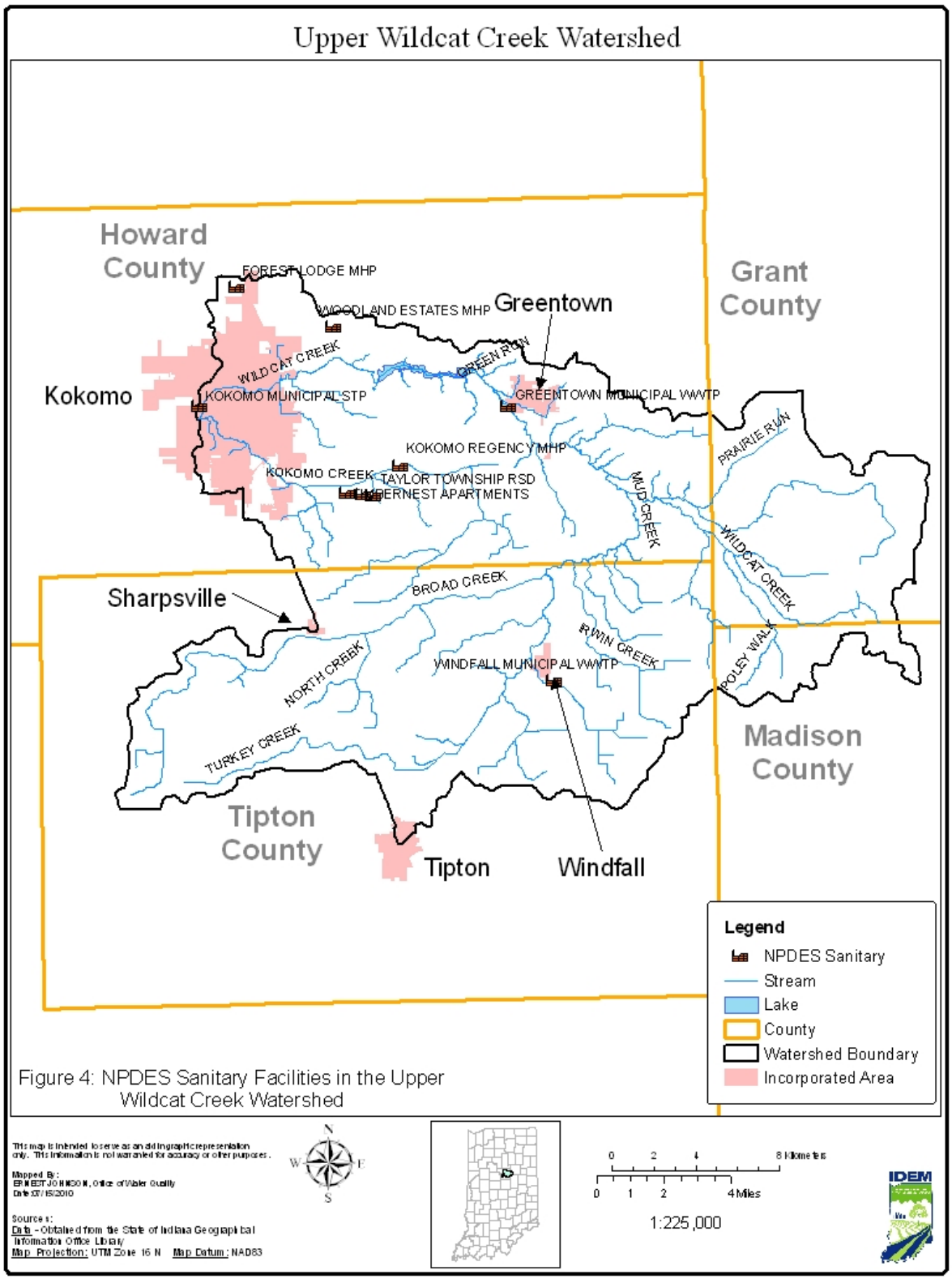

Figure 4: NPDES Sanitary Facilities in the Upper Wildcat Creek Watershed

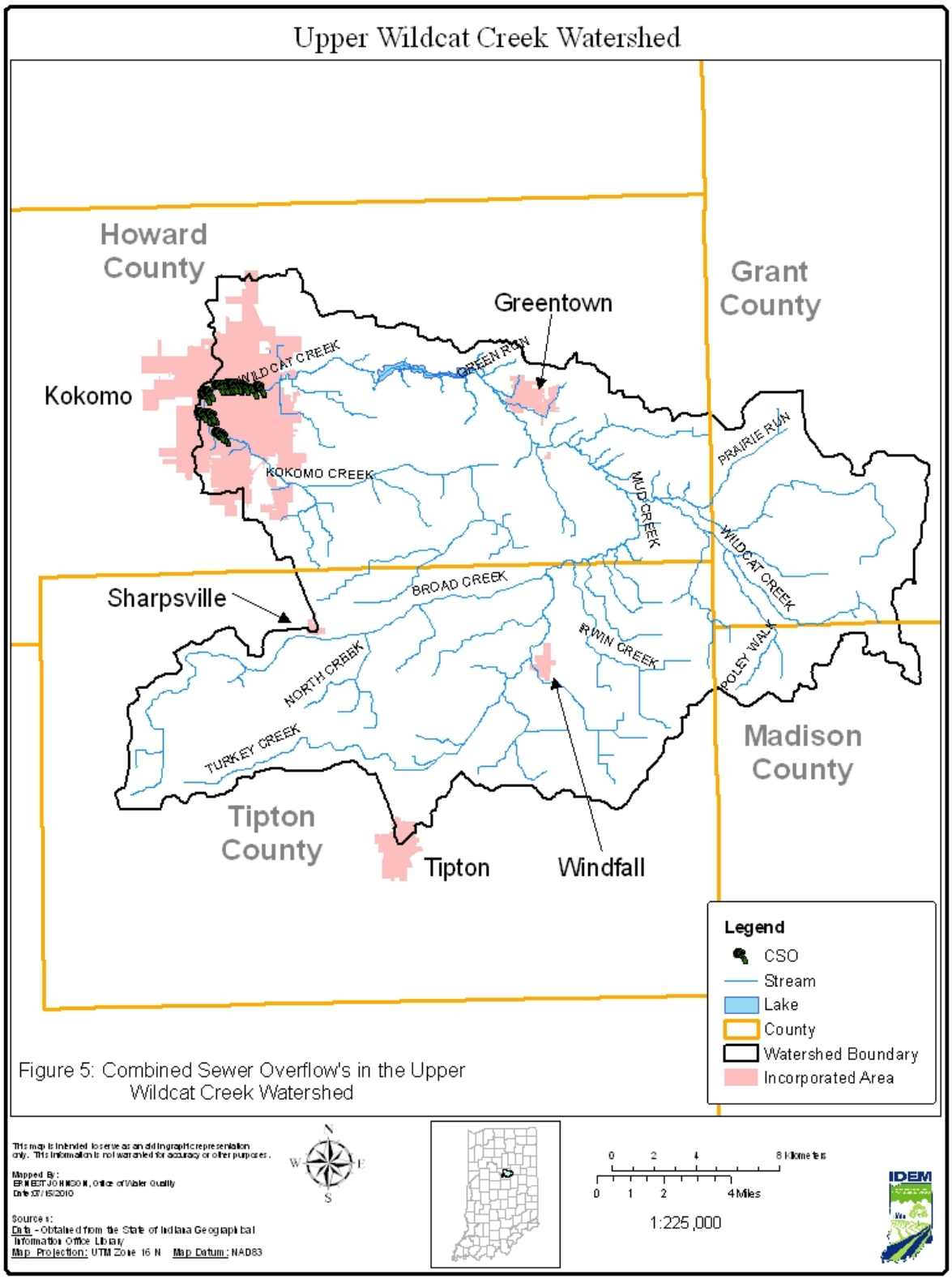

Figure 5: Combined Sewer Overflow's in the Upper Wildcat Creek Watershed

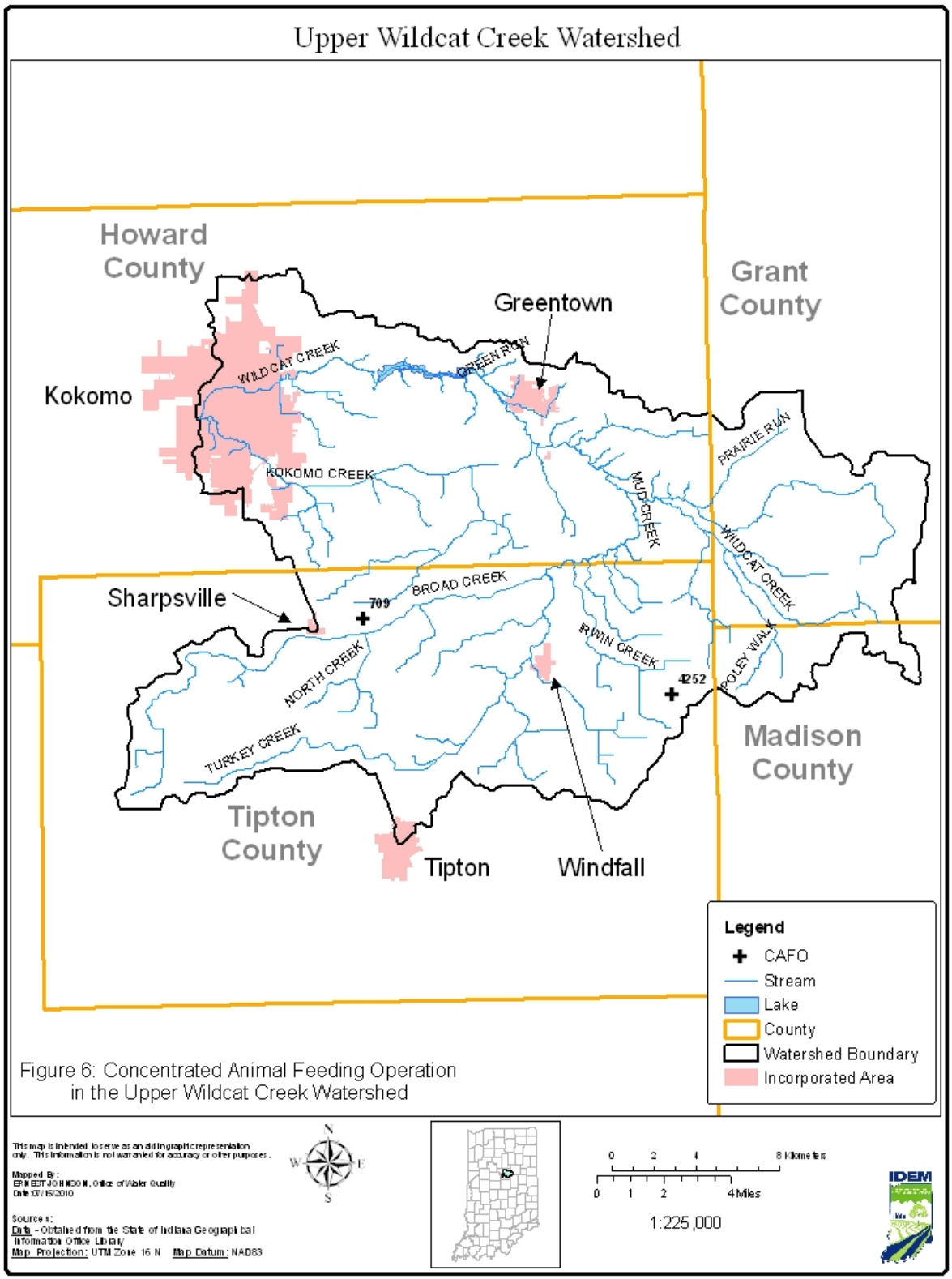

Figure 6: Concentrated Animal Feeding Operation in the Upper Wildcat Creek Watershed

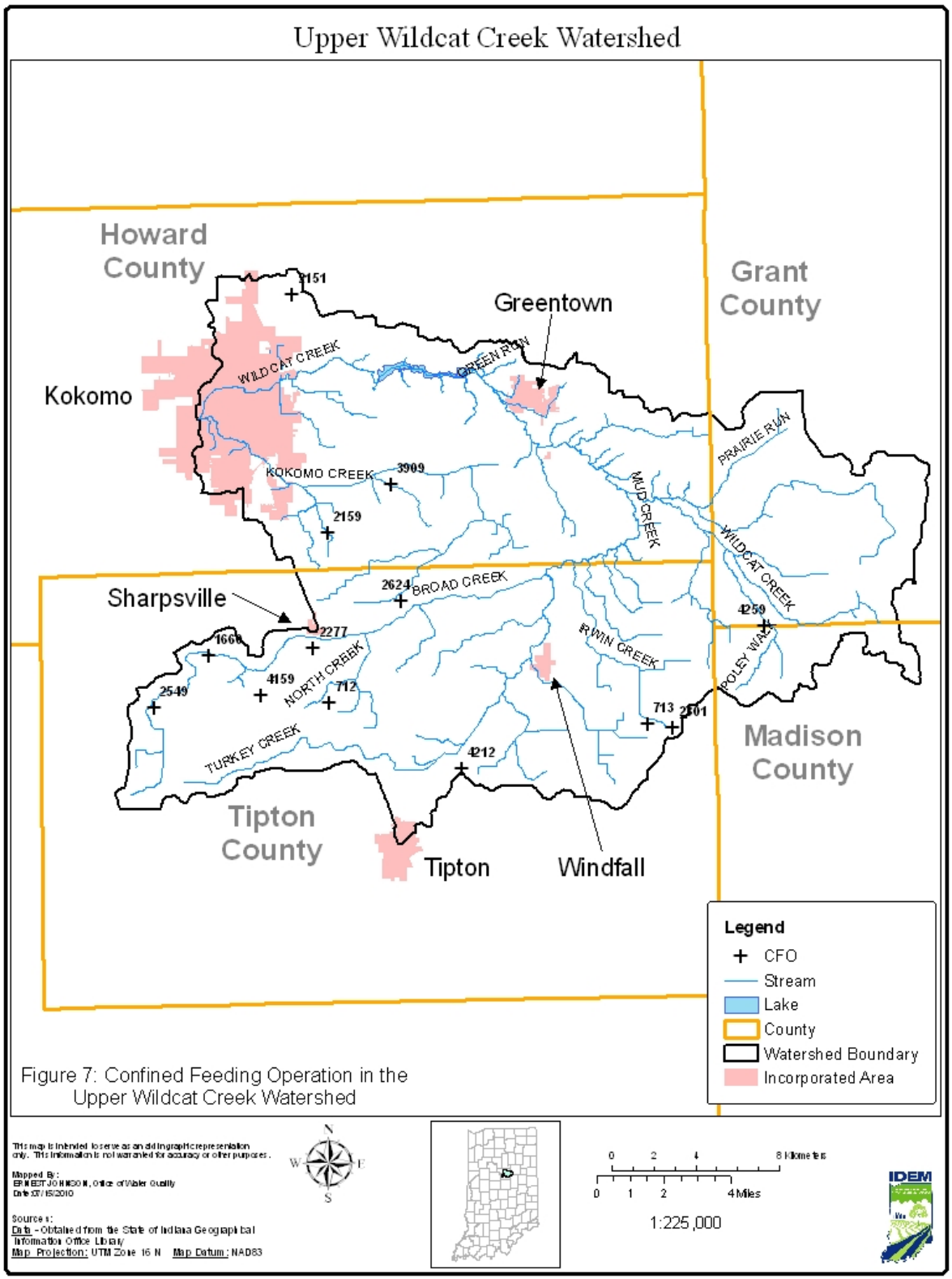

Figure 7: Confined Feeding Operation in the Upper Wildcat Creek Watershed

Appendix 1: Combined Sewer Overflows and Sanitary Sewer Overflows in Upper Wildcat Creek Watershed

City of Kokomo (All CSO empty into the Wildcat Creek at noted locations)

CSO Outfall #	Location (Latitude/Longitude)	Lat (DD)	Long (DD)
IN0032875010C	UNION ST., WEST BANK	40.484472	-86.130556
IN0032875013C	BUCKEYE ST., NORTH BANK	40.484611	-86.132500
IN0032875018C	FOSTER PARK, NORTH BANK	40.484083	-86.140583
IN0032875037C	NORTH OF DEFFENBAUGH (OLD PARK ROAD)	40.470556	-86.147222
IN0032875001C	OHIO ST., SOUTH BANK	40.483000	-86.117222
IN0032875014C	WASHINGTON ST., NORTH BANK	40.484389	-86.133889
IN0032875016C	FOSTER PARK, NORTH BANK	40.483861	-86.137500
IN0032875022C	PHILLIPS ST., NORTH BANK	40.481639	-86.145889
IN0032875030C	PETES RUN (HIGHLAND PARK)	40.471750	-86.145694
IN0032875009C	UNION ST., NORTH BANK	40.484444	-86.129694
IN0032875020C	COURTLAND AVE., SOUTH BANK	40.483861	-86.138028
IN0032875029C	PARK AVENUE - EAST BANK	40.472250	-86.150222
IN0032875041C	NE BANK @ CONRAIL TRESTLE	40.482222	-86.121694
IN0032875050C	NW DEFFENBAUGH/OLD PK RD	40.471111	-86.148611
IN0032875019C	COURTLAND AVE., SOUTH BANK	40.483806	-86.137417
IN0032875032C	HIGHLAND PARK, N OF BRIDGE	40.463917	-86.141139
IN0032875002C	OHIO ST., NORTH BANK	40.483222	-86.117222
IN0032875017C	FOSTER PARK, SOUTH BANK	40.483833	-86.136139
IN0032875033C	HIGHLAND PARK, WEST BANK	40.463139	-86.139528
IN0032875046C	OHIO STREET, SOUTH BANK	40.483056	-86.117222
IN0032875048C	UCT PARK, NORTH BANK	40.480000	-86.148611
IN0032875006C	APPERSONWAY-NORTH BANK	40.484167	-86.126750
IN0032875015C	FOSTER PARK, SOUTH BANK	40.484111	-86.134667
IN0032875031C	HIGHLAND PARK LIFT STATION	40.471333	-86.144500
IN0032875034C	HIGHLAND PARK, EAST BANK	40.462333	-86.137722
IN0032875008C	UNION ST., SOUTH BANK	40.484167	-86.129722
IN0032875027C	INTERCEPTOR JUNCTION BOX	40.472556	-86.150306

Appendix 2: CFOs in the Upper Wildcat Creek Watershed

Permit Number	Permit Type	Operation Name	Status	Nursery Pigs	Finishers	Sows	Beef Cattle
709	CAFO	Salsbery Pork Prod Inc	ACTIVE	2200	3300		
4252	CAFO	Barber	ACTIVE	180	4240	93	30
2549	CFO	Harlow	ACTIVE	560	1062	326	
1660	CFO	Peters	ACTIVE	350	930	174	
4159	CFO	Mundell	ACTIVE	180	761	44	
2151	CFO	Schafer	ACTIVE	1080	800	115	
2277	CFO	Harlow	ACTIVE	1010	1652	332	
712	CFO	Kirkendall	ACTIVE	702	1200	248	
2159	CFO	Maple	ACTIVE		1730		
3909	CFO	Maple	ACTIVE	360	700	451	
2624	CFO	Salsbery Pork Prod Inc	ACTIVE	500	500	168	
4212	CFO	Tolle	ACTIVE	750	900	170	
713	CFO	Hussey	ACTIVE		1500		
2301	CFO	Hussey	ACTIVE	1440		554	
4259	CFO	Myers	ACTIVE	0	327		

Attachment A

E. coli Data for the Upper Wildcat Creek Watershed TMDL

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Attachment A

E. coli Data for the Upper Wildcat Creek Watershed TMDL

Stream Name	Description	EcoRegion	LSITE	County Name	Sample Date	Sample Number	E coli (MPN/100mL)
Mud Cr	CR 350 N	Eastern Corn Belt Plains	WAW010-0001	Tipton	9/8/2003 9:42	AA16226	166.9
Mud Cr	CR 350 N	Eastern Corn Belt Plains	WAW010-0001	Tipton	9/23/2003 9:28	AA19156	2420.0
Mud Cr	CR 350 N	Eastern Corn Belt Plains	WAW010-0001	Tipton	9/29/2003 9:45	AA19330	387.3
Mud Cr	CR 350 N	Eastern Corn Belt Plains	WAW010-0001	Tipton	10/6/2003 9:47	AA19686	435.2
Mud Cr	CR 350 N	Eastern Corn Belt Plains	WAW010-0001	Tipton	10/14/2003 9:46	AA19899	2419.2
						GeoMean	697
Mud Cr	CR 700 W	Eastern Corn Belt Plains	WAW010-0002	Tipton	9/8/2003 10:00	AA16224	770.1
Mud Cr	CR 700 W	Eastern Corn Belt Plains	WAW010-0002	Tipton	9/23/2003 9:40	AA19158	2420.0
Mud Cr	CR 700 W	Eastern Corn Belt Plains	WAW010-0002	Tipton	9/29/2003 10:00	AA19332	547.5
Mud Cr	CR 700 W	Eastern Corn Belt Plains	WAW010-0002	Tipton	10/6/2003 10:02	AA19688	1203.3
Mud Cr	CR 700 W	Eastern Corn Belt Plains	WAW010-0002	Tipton	10/14/2003 9:58	AA19901	5794.0
						GeoMean	1481

Mud Cr	CR 550 W	Eastern Corn Belt Plains	WAW010-0003	Tipton	9/8/2003 10:17	AA16222	488.4
Mud Cr	CR 550 W	Eastern Corn Belt Plains	WAW010-0003	Tipton	9/23/2003 9:54	AA19160	2420.0
Mud Cr	CR 550 W	Eastern Corn Belt Plains	WAW010-0003	Tipton	9/29/2003 10:20	AA19335	517.2
Mud Cr	CR 550 W	Eastern Corn Belt Plains	WAW010-0003	Tipton	10/6/2003 10:13	AA19690	648.8
Mud Cr	CR 550 W	Eastern Corn Belt Plains	WAW010-0003	Tipton	10/14/2003 10:10	AA19903	1986.3
						GeoMean	953
Mud Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0004	Tipton	9/8/2003 11:00	AA16221	186.0
Mud Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0004	Tipton	9/23/2003 10:27	AA19165	2419.2
Mud Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0004	Tipton	9/29/2003 10:55	AA19340	816.4
Mud Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0004	Tipton	10/6/2003 10:50	AA19696	166.4
Mud Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0004	Tipton	10/14/2003 10:44	AA19909	1203.3
						GeoMean	593
North Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0005	Tipton	9/8/2003 11:10	AA16220	35.9

North Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0005	Tipton	9/23/2003 10:34	AA19167	517.2
North Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0005	Tipton	9/29/2003 11:05	AA19341	114.5
North Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0005	Tipton	10/6/2003 10:57	AA19697	161.6
North Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0005	Tipton	10/14/2003 10:51	AA19910	1046.2
						GeoMean	205
Mud Cr	SR 19	Eastern Corn Belt Plains	WAW010-0006	Tipton	9/8/2003 11:35	AA16214	147.0
Mud Cr	SR 19	Eastern Corn Belt Plains	WAW010-0006	Tipton	9/23/2003 10:50	AA19170	1732.9
Mud Cr	SR 19	Eastern Corn Belt Plains	WAW010-0006	Tipton	9/29/2003 11:25	AA19344	240.0
Mud Cr	SR 19	Eastern Corn Belt Plains	WAW010-0006	Tipton	10/6/2003 11:15	AA19700	80.1
Mud Cr	SR 19	Eastern Corn Belt Plains	WAW010-0006	Tipton	10/14/2003 11:08	AA19913	248.1
						GeoMean	261
Mud Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0007	Tipton	9/8/2003 11:45	AA16212	209.8
Mud Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0007	Tipton	9/23/2003 11:00	AA19171	1732.9
Mud Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0007	Tipton	9/29/2003 11:30	AA19345	478.6

Mud Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0007	Tipton	10/6/2003 11:25	AA19701	178.5
Mud Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0007	Tipton	10/14/2003 11:15	AA19914	816.4
						GeoMean	480
Turkey Cr	CR 400 N	Eastern Corn Belt Plains	WAW010-0011	Tipton	9/8/2003 9:55	AA16206	104.6
Turkey Cr	CR 400 N	Eastern Corn Belt Plains	WAW010-0011	Tipton	9/23/2003 9:10	AA19136	1046.2
Turkey Cr	CR 400 N	Eastern Corn Belt Plains	WAW010-0011	Tipton	9/29/2003 9:20	AA19352	206.3
Turkey Cr	CR 400 N	Eastern Corn Belt Plains	WAW010-0011	Tipton	10/6/2003 9:35	AA19709	307.6
Turkey Cr	CR 400 N	Eastern Corn Belt Plains	WAW010-0011	Tipton	10/14/2003 9:30	AA19921	517.2
						GeoMean	324
Round Prairie Ditch	CR 400 N	Eastern Corn Belt Plains	WAW010-0014	Tipton	9/8/2003 9:45	AA16205	866.4
Round Prairie Ditch	CR 400 N	Eastern Corn Belt Plains	WAW010-0014	Tipton	9/23/2003 9:05	AA19135	1046.2
Round Prairie Ditch	CR 400 N	Eastern Corn Belt Plains	WAW010-0014	Tipton	9/29/2003 9:15	AA19351	184.2
Round Prairie Ditch	CR 400 N	Eastern Corn Belt Plains	WAW010-0014	Tipton	10/6/2003 9:30	AA19708	325.5
Round Prairie Ditch	CR 400 N	Eastern Corn Belt Plains	WAW010-0014	Tipton	10/14/2003 9:25	AA19920	1553.1

						GeoMean	610
Turkey Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0015	Tipton	9/8/2003 10:00	AA16208	248.1
Turkey Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0015	Tipton	9/23/2003 9:20	AA19137	1046.2
Turkey Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0015	Tipton	9/29/2003 9:30	AA19353	214.2
Turkey Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0015	Tipton	10/6/2003 9:45	AA19710	727.0
Turkey Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0015	Tipton	10/14/2003 9:40	AA19922	1203.3
						GeoMean	546
Turkey Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0016	Tipton	9/8/2003 10:10	AA16209	517.2
Turkey Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0016	Tipton	9/23/2003 9:30	AA19138	1553.1
Turkey Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0016	Tipton	9/29/2003 9:35	AA19354	238.2
Turkey Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0016	Tipton	10/6/2003 10:00	AA19711	770.1
Turkey Cr	CR 600 N	Eastern Corn Belt Plains	WAW010-0016	Tipton	10/14/2003 9:55	AA19923	1553.1
						GeoMean	745
Mud Cr	CR 500 S	Eastern Corn Belt Plains	WAW010-0017	Tipton	9/8/2003 10:30	AA16204	260.2

Mud Cr	CR 500 S	Eastern Corn Belt Plains	WAW010-0017	Tipton	9/23/2003 9:55	AA19141	1732.9
Mud Cr	CR 500 S	Eastern Corn Belt Plains	WAW010-0017	Tipton	9/29/2003 10:00	AA19357	579.4
Mud Cr	CR 500 S	Eastern Corn Belt Plains	WAW010-0017	Tipton	10/6/2003 10:25	AA19714	307.6
Mud Cr	CR 500 S	Eastern Corn Belt Plains	WAW010-0017	Tipton	10/14/2003 10:10	AA19926	920.8
						GeoMean	594
Irwin Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0018	Tipton	9/8/2003 10:25	AA16203	133.4
Irwin Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0018	Tipton	9/23/2003 9:50	AA19140	2420.0
Irwin Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0018	Tipton	9/29/2003 9:45	AA19356	228.2
Irwin Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0018	Tipton	10/6/2003 10:10	AA19713	75.4
Irwin Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0018	Tipton	10/14/2003 10:05	AA19925	579.4
						GeoMean	317
Mud Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0019	Howard	9/8/2003 10:40	AA16259	218.7
Mud Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0019	Howard	9/23/2003 10:10	AA19142	2419.2
Mud Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0019	Howard	9/29/2003 10:10	AA19359	770.1

Mud Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0019	Howard	10/6/2003 10:30	AA19715	416.0
Mud Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0019	Howard	10/14/2003 10:20	AA19927	547.5
						GeoMean	622
Middle Fk	CR 1330 E	Eastern Corn Belt Plains	WAW010-0024	Howard	9/8/2003 11:05	AA16260	613.1
Middle Fk	CR 1330 E	Eastern Corn Belt Plains	WAW010-0024	Howard	9/23/2003 10:30	AA19145	1986.3
Middle Fk	CR 1330 E	Eastern Corn Belt Plains	WAW010-0024	Howard	9/29/2003 10:30	AA19362	461.1
Middle Fk	CR 1330 E	Eastern Corn Belt Plains	WAW010-0024	Howard	10/6/2003 10:55	AA19718	1986.3
Middle Fk	CR 1330 E	Eastern Corn Belt Plains	WAW010-0024	Howard	10/14/2003 10:45	AA19930	365.4
						GeoMean	836
Grassy Fk	CR 1400 E	Eastern Corn Belt Plains	WAW010-0027	Grant	9/8/2003 10:50	AA16269	410.6
Grassy Fk	CR 1400 E	Eastern Corn Belt Plains	WAW010-0027	Grant	9/23/2003 10:15	AA19143	2420.0
Grassy Fk	CR 1400 E	Eastern Corn Belt Plains	WAW010-0027	Grant	9/29/2003 10:20	AA19360	770.1
Grassy Fk	CR 1400 E	Eastern Corn Belt Plains	WAW010-0027	Grant	10/6/2003 10:45	AA19716	435.2
Grassy Fk	CR 1400 E	Eastern Corn Belt Plains	WAW010-0027	Grant	10/14/2003 10:30	AA19928	648.8

						GeoMean	736
Prairie Run	CR 1400 E	Eastern Corn Belt Plains	WAW010-0028	Grant	9/8/2003 10:55	AA16261	228.2
Prairie Run	CR 1400 E	Eastern Corn Belt Plains	WAW010-0028	Grant	9/23/2003 10:20	AA19144	727.0
Prairie Run	CR 1400 E	Eastern Corn Belt Plains	WAW010-0028	Grant	9/29/2003 10:25	AA19361	307.6
Prairie Run	CR 1400 E	Eastern Corn Belt Plains	WAW010-0028	Grant	10/6/2003 10:50	AA19717	461.1
Prairie Run	CR 1400 E	Eastern Corn Belt Plains	WAW010-0028	Grant	10/14/2003 10:35	AA19929	1732.9
						GeoMean	527
Wildcat Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0031	Howard	9/8/2003 11:10	AA16263	574.8
Wildcat Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0031	Howard	9/23/2003 10:40	AA19146	2420.0
Wildcat Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0031	Howard	9/29/2003 10:40	AA19363	488.4
Wildcat Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0031	Howard	10/6/2003 11:05	AA19719	547.5
Wildcat Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0031	Howard	10/14/2003 10:50	AA19931	2419.2
						GeoMean	979
Wildcat Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0032	Howard	9/8/2003 11:20	AA16265	365.4

Wildcat Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0032	Howard	9/23/2003 10:50	AA19147	2420.0
Wildcat Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0032	Howard	9/29/2003 10:45	AA19364	613.1
Wildcat Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0032	Howard	10/6/2003 11:10	AA19720	190.4
Wildcat Cr	CR 1100 E	Eastern Corn Belt Plains	WAW010-0032	Howard	10/14/2003 10:55	AA19932	1413.6
						GeoMean	680
Kokomo Res No 2	CR 50 S	Eastern Corn Belt Plains	WAW010-0034	Howard	9/8/2003 11:55	AA16272	107.1
Kokomo Res No 2	CR 50 S	Eastern Corn Belt Plains	WAW010-0034	Howard	9/23/2003 12:00	AA19150	1986.3
Kokomo Res No 2	CR 50 S	Eastern Corn Belt Plains	WAW010-0034	Howard	9/29/2003 11:20	AA19367	547.5
Kokomo Res No 2	CR 50 S	Eastern Corn Belt Plains	WAW010-0034	Howard	10/6/2003 11:50	AA19723	151.5
Kokomo Res No 2	CR 50 S	Eastern Corn Belt Plains	WAW010-0034	Howard	10/14/2003 11:25	AA19935	104.3
						GeoMean	284
Kokomo Res No 2	SR 22	Eastern Corn Belt Plains	WAW010-0035	Howard	9/9/2003 9:18	AA16276	79.8
Kokomo Res No 2	SR 22	Eastern Corn Belt Plains	WAW010-0035	Howard	9/24/2003 9:34	AA19194	1299.7
Kokomo Res No 2	SR 22	Eastern Corn Belt Plains	WAW010-0035	Howard	9/30/2003 9:14	AA19389	547.5

Kokomo Res No 2	SR 22	Eastern Corn Belt Plains	WAW010-0035	Howard	10/7/2003 9:17	AA19745	116.0
Kokomo Res No 2	SR 22	Eastern Corn Belt Plains	WAW010-0035	Howard	10/15/2003 9:30	AA19958	727.0
						GeoMean	344
Wildcat Cr	CR 400 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0036	Howard	9/9/2003 9:54	AA16289	13.5
Wildcat Cr	CR 400 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0036	Howard	9/24/2003 10:05	AA19199	15.5
Wildcat Cr	CR 400 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0036	Howard	9/30/2003 9:47	AA19394	107.6
Wildcat Cr	CR 400 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0036	Howard	10/7/2003 9:48	AA19750	11.0
Wildcat Cr	CR 400 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0036	Howard	10/15/2003 9:58	AA19963	5.2
						GeoMean	17
Wildcat Cr	CR 300 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0037	Howard	9/9/2003 10:00	AA16288	38.2
Wildcat Cr	CR 300 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0037	Howard	9/24/2003 10:12	AA19200	816.4
Wildcat Cr	CR 300 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0037	Howard	9/30/2003 9:55	AA19396	98.7
Wildcat Cr	CR 300 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0037	Howard	10/5/2003 10:04	AA19965	88.2
Wildcat Cr	CR 300 E (below reservoir)	Eastern Corn Belt Plains	WAW010-0037	Howard	10/7/2003 9:55	AA19751	58.1

						GeoMean	110
Wildcat Cr	Carter St	Eastern Corn Belt Plains	WAW010-0044	Howard	9/9/2003 10:55	AA16280	325.5
Wildcat Cr	Carter St	Eastern Corn Belt Plains	WAW010-0044	Howard	9/24/2003 10:58	AA19206	2420.0
Wildcat Cr	Carter St	Eastern Corn Belt Plains	WAW010-0044	Howard	9/30/2003 10:43	AA19402	125.0
Wildcat Cr	Carter St	Eastern Corn Belt Plains	WAW010-0044	Howard	10/7/2003 10:47	AA19758	191.8
Wildcat Cr	Carter St	Eastern Corn Belt Plains	WAW010-0044	Howard	10/15/2003 10:50	AA19971	920.8
						GeoMean	445
Wildcat Cr	Washington St	Eastern Corn Belt Plains	WAW010-0048	Howard	9/9/2003 10:45	AA16258	112.4
Wildcat Cr	Washington St	Eastern Corn Belt Plains	WAW010-0048	Howard	9/24/2003 10:50	AA19205	686.7
Wildcat Cr	Washington St	Eastern Corn Belt Plains	WAW010-0048	Howard	9/30/2003 10:34	AA19401	151.5
Wildcat Cr	Washington St	Eastern Corn Belt Plains	WAW010-0048	Howard	10/7/2003 10:40	AA19757	178.5
Wildcat Cr	Washington St	Eastern Corn Belt Plains	WAW010-0048	Howard	10/15/2003 10:41	AA19970	325.5
						GeoMean	233
Wildcat Cr	Markland Ave	Eastern Corn Belt Plains	WAW010-0051	Howard	9/9/2003 11:08	AA16257	162.4

Wildcat Cr	Markland Ave	Eastern Corn Belt Plains	WAW010-0051	Howard	9/24/2003 11:20	AA19207	2420.0
Wildcat Cr	Markland Ave	Eastern Corn Belt Plains	WAW010-0051	Howard	9/30/2003 11:03	AA19403	365.4
Wildcat Cr	Markland Ave	Eastern Corn Belt Plains	WAW010-0051	Howard	10/7/2003 11:11	AA19759	160.7
Wildcat Cr	Markland Ave	Eastern Corn Belt Plains	WAW010-0051	Howard	10/15/2003 11:08	AA19972	1986.3
						GeoMean	540
Kokomo Cr	CR 600 E	Eastern Corn Belt Plains	WAW010-0052	Howard	9/9/2003 9:50	AA16294	1553.1
Kokomo Cr	CR 600 E	Eastern Corn Belt Plains	WAW010-0052	Howard	9/24/2003 9:35	AA19176	2420.0
Kokomo Cr	CR 600 E	Eastern Corn Belt Plains	WAW010-0052	Howard	9/30/2003 9:40	AA19371	2419.2
Kokomo Cr	CR 600 E	Eastern Corn Belt Plains	WAW010-0052	Howard	10/7/2003 9:55	AA19727	1203.3
Kokomo Cr	CR 600 E	Eastern Corn Belt Plains	WAW010-0052	Howard	10/15/2003 9:40	AA19940	770.1
						GeoMean	1532
Kokomo Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0053	Howard	9/9/2003 10:05	AA16293	920.8
Kokomo Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0053	Howard	9/24/2003 9:40	AA19177	1413.6
Kokomo Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0053	Howard	9/30/2003 9:45	AA19372	727.0

Kokomo Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0053	Howard	10/7/2003 10:05	AA19728	1553.1
Kokomo Cr	CR 300 S	Eastern Corn Belt Plains	WAW010-0053	Howard	10/15/2003 9:45	AA19941	980.4
						GeoMean	1076
Kokomo Cr	CR 400 E	Eastern Corn Belt Plains	WAW010-0055	Howard	9/9/2003 10:35	AA16299	2419.2
Kokomo Cr	CR 400 E	Eastern Corn Belt Plains	WAW010-0055	Howard	9/24/2003 10:10	AA19180	1119.9
Kokomo Cr	CR 400 E	Eastern Corn Belt Plains	WAW010-0055	Howard	9/30/2003 10:10	AA19375	410.6
Kokomo Cr	CR 400 E	Eastern Corn Belt Plains	WAW010-0055	Howard	10/7/2003 10:35	AA19731	488.4
Kokomo Cr	CR 400 E	Eastern Corn Belt Plains	WAW010-0055	Howard	10/15/2003 10:15	AA19944	2755.0
						GeoMean	1084
Kokomo Cr	CR 300 E	Eastern Corn Belt Plains	WAW010-0056	Howard	9/9/2003 10:40	AA16300	770.1
Kokomo Cr	CR 300 E	Eastern Corn Belt Plains	WAW010-0056	Howard	9/24/2003 10:20	AA19182	2419.2
Kokomo Cr	CR 300 E	Eastern Corn Belt Plains	WAW010-0056	Howard	9/30/2003 10:20	AA19376	613.1
Kokomo Cr	CR 300 E	Eastern Corn Belt Plains	WAW010-0056	Howard	10/7/2003 10:45	AA19732	313.0
Kokomo Cr	CR 300 E	Eastern Corn Belt Plains	WAW010-0056	Howard	10/15/2003 10:30	AA19945	1732.9

						GeoMean	909
Kokomo Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0057	Howard	9/9/2003 11:00	AA16303	488.4
Kokomo Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0057	Howard	9/24/2003 10:45	AA19183	2420.0
Kokomo Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0057	Howard	9/30/2003 10:50	AA19377	866.4
Kokomo Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0057	Howard	10/7/2003 11:00	AA19733	325.5
Kokomo Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0057	Howard	10/15/2003 10:45	AA19946	1046.2
						GeoMean	810
Kokomo Cr	Southway Blvd	Eastern Corn Belt Plains	WAW010-0058	Howard	9/9/2003 11:10	AA16305	488.4
Kokomo Cr	Southway Blvd	Eastern Corn Belt Plains	WAW010-0058	Howard	9/24/2003 10:55	AA19185	2420.0
Kokomo Cr	Southway Blvd	Eastern Corn Belt Plains	WAW010-0058	Howard	9/30/2003 10:55	AA19379	410.6
Kokomo Cr	Southway Blvd	Eastern Corn Belt Plains	WAW010-0058	Howard	10/7/2003 11:10	AA19735	410.6
Kokomo Cr	Southway Blvd	Eastern Corn Belt Plains	WAW010-0058	Howard	10/15/2003 10:50	AA19949	1203.3
						GeoMean	752
Kokomo Cr	LaFountain St	Eastern Corn Belt Plains	WAW010-0060	Howard	9/9/2003 11:20	AA16307	517.2

Kokomo Cr	LaFountain St	Eastern Corn Belt Plains	WAW010-0060	Howard	9/24/2003 11:05	AA19186	1986.3
Kokomo Cr	LaFountain St	Eastern Corn Belt Plains	WAW010-0060	Howard	9/30/2003 11:15	AA19381	613.1
Kokomo Cr	LaFountain St	Eastern Corn Belt Plains	WAW010-0060	Howard	10/7/2003 11:20	AA19736	228.2
Kokomo Cr	LaFountain St	Eastern Corn Belt Plains	WAW010-0060	Howard	10/15/2003 11:00	AA19950	2419.2
						GeoMean	810
Kokomo Cr	Park Ave	Eastern Corn Belt Plains	WAW010-0062	Howard	9/9/2003 11:17	AA16234	727.0
Kokomo Cr	Park Ave	Eastern Corn Belt Plains	WAW010-0062	Howard	9/24/2003 11:30	AA19208	2420.0
Kokomo Cr	Park Ave	Eastern Corn Belt Plains	WAW010-0062	Howard	9/30/2003 11:07	AA19404	2420.0
Kokomo Cr	Park Ave	Eastern Corn Belt Plains	WAW010-0062	Howard	10/7/2003 11:21	AA19760	1203.3
Kokomo Cr	Park Ave	Eastern Corn Belt Plains	WAW010-0062	Howard	10/15/2003 11:15	AA19973	4106.0
						GeoMean	1839
Wildcat Cr	SR 213	Eastern Corn Belt Plains	WAW010-0066	Howard	9/8/2003 11:30	AA16267	248.1
Wildcat Cr	SR 213	Eastern Corn Belt Plains	WAW010-0066	Howard	9/23/2003 11:00	AA19148	2420.0
Wildcat Cr	SR 213	Eastern Corn Belt Plains	WAW010-0066	Howard	9/29/2003 11:00	AA19365	488.4

Wildcat Cr	SR 213	Eastern Corn Belt Plains	WAW010-0066	Howard	10/6/2003 11:30	AA19721	222.4
Wildcat Cr	SR 213	Eastern Corn Belt Plains	WAW010-0066	Howard	10/14/2003 11:10	AA19933	1413.6
						GeoMean	621
Kokomo Res No 2	CR 600 E	Eastern Corn Belt Plains	WAW010-0067	Howard	9/9/2003 9:40	AA16291	32.7
Kokomo Res No 2	CR 600 E	Eastern Corn Belt Plains	WAW010-0067	Howard	9/24/2003 9:53	AA19197	461.1
Kokomo Res No 2	CR 600 E	Eastern Corn Belt Plains	WAW010-0067	Howard	9/30/2003 9:35	AA19392	275.5
Kokomo Res No 2	CR 600 E	Eastern Corn Belt Plains	WAW010-0067	Howard	10/7/2003 9:34	AA19748	59.1
Kokomo Res No 2	CR 600 E	Eastern Corn Belt Plains	WAW010-0067	Howard	10/15/2003 9:45	AA19961	365.4
						GeoMean	155
Kokomo Res No 2	CR 500 E	Eastern Corn Belt Plains	WAW010-0068	Howard	9/9/2003 9:46	AA16290	18.3
Kokomo Res No 2	CR 500 E	Eastern Corn Belt Plains	WAW010-0068	Howard	9/24/2003 10:00	AA19198	65.7
Kokomo Res No 2	CR 500 E	Eastern Corn Belt Plains	WAW010-0068	Howard	9/30/2003 9:43	AA19393	198.9
Kokomo Res No 2	CR 500 E	Eastern Corn Belt Plains	WAW010-0068	Howard	10/7/2003 9:43	AA19749	14.3
Kokomo Res No 2	CR 500 E	Eastern Corn Belt Plains	WAW010-0068	Howard	10/15/2003 9:51	AA19962	59.1

						GeoMean	46
Greentown POTW	001 Final Effluent	Eastern Corn Belt Plains	WAW010-0071	Howard	9/8/2003 12:10	AA16274	2420.0
Greentown POTW	001 Final Effluent	Eastern Corn Belt Plains	WAW010-0071	Howard	9/23/2003 11:48	AA19149	7.4
Greentown POTW	001 Final Effluent	Eastern Corn Belt Plains	WAW010-0071	Howard	9/29/2003 11:15	AA19366	95.9
Greentown POTW	001 Final Effluent	Eastern Corn Belt Plains	WAW010-0071	Howard	10/6/2003 11:45	AA19722	5.1
Greentown POTW	001 Final Effluent	Eastern Corn Belt Plains	WAW010-0071	Howard	10/14/2003 11:20	AA19934	4.1
						GeoMean	32
Prairie Cr Ditch	Jefferson Rd near US 31	Eastern Corn Belt Plains	WAW010-0096	Howard	9/9/2003 10:39	AA16278	866.4
Prairie Cr Ditch	Jefferson Rd near US 31	Eastern Corn Belt Plains	WAW010-0096	Howard	9/24/2003 10:42	AA19203	2420.0
Prairie Cr Ditch	Jefferson Rd near US 31	Eastern Corn Belt Plains	WAW010-0096	Howard	9/30/2003 10:25	AA19399	1119.9
Prairie Cr Ditch	Jefferson Rd near US 31	Eastern Corn Belt Plains	WAW010-0096	Howard	10/7/2003 10:30	AA19754	2420.0
Prairie Cr Ditch	Jefferson Rd near US 31	Eastern Corn Belt Plains	WAW010-0096	Howard	10/15/2003 10:34	AA19968	1986.3
						GeoMean	1624
Cannon-Goyer D	Carter St near US 31	Eastern Corn Belt Plains	WAW010-0097	Howard	9/9/2003 10:30	AA16282	2420.0

Cannon-Goyer D	Carter St near US 31	Eastern Corn Belt Plains	WAW010-0097	Howard	9/24/2003 10:35	AA19204	2420.0
Cannon-Goyer D	Carter St near US 31	Eastern Corn Belt Plains	WAW010-0097	Howard	9/30/2003 10:20	AA19400	686.7
Cannon-Goyer D	Carter St near US 31	Eastern Corn Belt Plains	WAW010-0097	Howard	10/7/2003 10:23	AA19756	137.1
Cannon-Goyer D	Carter St near US 31	Eastern Corn Belt Plains	WAW010-0097	Howard	10/15/2003 10:28	AA19969	866.4
						GeoMean	863
Cannon-Goyer D	150 East Near Kokomo	Eastern Corn Belt Plains	WAW010-0098	Howard	9/9/2003 10:10	AA16284	517.2
Cannon-Goyer D	150 East Near Kokomo	Eastern Corn Belt Plains	WAW010-0098	Howard	9/24/2003 10:20	AA19201	2420.0
Cannon-Goyer D	150 East Near Kokomo	Eastern Corn Belt Plains	WAW010-0098	Howard	9/30/2003 10:06	AA19397	686.7
Cannon-Goyer D	150 East Near Kokomo	Eastern Corn Belt Plains	WAW010-0098	Howard	10/7/2003 10:10	AA19752	727.0
Cannon-Goyer D	150 East Near Kokomo	Eastern Corn Belt Plains	WAW010-0098	Howard	10/15/2003 10:13	AA19966	727.0
						GeoMean	854
Stahl Ditch	Carter Street (50N)	Eastern Corn Belt Plains	WAW010-0099	Howard	9/9/2003 10:20	AA16286	1299.7
Stahl Ditch	Carter Street (50N)	Eastern Corn Belt Plains	WAW010-0099	Howard	9/24/2003 10:28	AA19202	2420.0
Stahl Ditch	Carter Street (50N)	Eastern Corn Belt Plains	WAW010-0099	Howard	9/30/2003 10:14	AA19398	2419.2

Stahl Ditch	Carter Street (50N)	Eastern Corn Belt Plains	WAW010-0099	Howard	10/7/2003 10:16	AA19753	1986.3
Stahl Ditch	Carter Street (50N)	Eastern Corn Belt Plains	WAW010-0099	Howard	10/15/2003 10:21	AA19967	1203.3
						GeoMean	1786
Kokomo Res No 2	50N Bridge over Reservoir	Eastern Corn Belt Plains	WAW010-0100	Howard	9/9/2003 9:34	AA16292	41.6
Kokomo Res No 2	50N Bridge over Reservoir	Eastern Corn Belt Plains	WAW010-0100	Howard	9/24/2003 9:45	AA19196	1203.3
Kokomo Res No 2	50N Bridge over Reservoir	Eastern Corn Belt Plains	WAW010-0100	Howard	9/30/2003 9:28	AA19391	235.9
Kokomo Res No 2	50N Bridge over Reservoir	Eastern Corn Belt Plains	WAW010-0100	Howard	10/7/2003 9:28	AA19747	125.9
Kokomo Res No 2	50N Bridge over Reservoir	Eastern Corn Belt Plains	WAW010-0100	Howard	10/15/2003 9:40	AA19960	156.5
						GeoMean	188
Tolle Ditch	700N Near Hemlock	Eastern Corn Belt Plains	WAW010-0101	Tipton	9/9/2003 9:45	AA16295	123.6
Tolle Ditch	700N Near Hemlock	Eastern Corn Belt Plains	WAW010-0101	Tipton	9/24/2003 9:25	AA19173	1986.3
Tolle Ditch	700N Near Hemlock	Eastern Corn Belt Plains	WAW010-0101	Tipton	9/30/2003 9:30	AA19368	228.2
Tolle Ditch	700N Near Hemlock	Eastern Corn Belt Plains	WAW010-0101	Tipton	10/7/2003 9:50	AA19724	410.6
Tolle Ditch	700N Near Hemlock	Eastern Corn Belt Plains	WAW010-0101	Tipton	10/15/2003 9:35	AA19937	488.4

						GeoMean	407
Finn Ditch	500E near Hemlock	Eastern Corn Belt Plains	WAW010-0102	Howard	9/9/2003 9:35	AA16296	290.9
Finn Ditch	500E near Hemlock	Eastern Corn Belt Plains	WAW010-0102	Howard	9/24/2003 9:20	AA19175	2420.0
Finn Ditch	500E near Hemlock	Eastern Corn Belt Plains	WAW010-0102	Howard	9/30/2003 9:20	AA19370	461.1
Finn Ditch	500E near Hemlock	Eastern Corn Belt Plains	WAW010-0102	Howard	10/7/2003 9:40	AA19726	222.4
Finn Ditch	500E near Hemlock	Eastern Corn Belt Plains	WAW010-0102	Howard	10/15/2003 9:25	AA19939	816.4
						GeoMean	568
Kokomo Cr	200S near Center	Eastern Corn Belt Plains	WAW010-0103	Howard	9/9/2003 10:15	AA16297	686.7
Kokomo Cr	200S near Center	Eastern Corn Belt Plains	WAW010-0103	Howard	9/24/2003 9:55	AA19178	866.4
Kokomo Cr	200S near Center	Eastern Corn Belt Plains	WAW010-0103	Howard	9/30/2003 9:55	AA19373	378.4
Kokomo Cr	200S near Center	Eastern Corn Belt Plains	WAW010-0103	Howard	10/7/2003 10:20	AA19729	816.4
Kokomo Cr	200S near Center	Eastern Corn Belt Plains	WAW010-0103	Howard	10/15/2003 10:05	AA19942	920.8
						GeoMean	701
Mugg-Ingels D	250S near Center	Eastern Corn Belt Plains	WAW010-0104	Howard	9/9/2003 10:25	AA16298	2420.0

Mugg-Ingels D	250S near Center	Eastern Corn Belt Plains	WAW010-0104	Howard	9/24/2003 10:00	AA19179	2420.0
Mugg-Ingels D	250S near Center	Eastern Corn Belt Plains	WAW010-0104	Howard	9/30/2003 10:05	AA19374	816.4
Mugg-Ingels D	250S near Center	Eastern Corn Belt Plains	WAW010-0104	Howard	10/7/2003 10:30	AA19730	2420.0
Mugg-Ingels D	250S near Center	Eastern Corn Belt Plains	WAW010-0104	Howard	10/15/2003 10:20	AA19943	1299.7
						GeoMean	1720
Martin-Youngman D	200E near Center	Eastern Corn Belt Plains	WAW010-0105	Howard	9/9/2003 10:50	AA16301	866.4
Martin-Youngman D	200E near Center	Eastern Corn Belt Plains	WAW010-0105	Howard	9/24/2003 10:30	AA19184	2419.2
Martin-Youngman D	200E near Center	Eastern Corn Belt Plains	WAW010-0105	Howard	9/30/2003 10:35	AA19378	1986.3
Martin-Youngman D	200E near Center	Eastern Corn Belt Plains	WAW010-0105	Howard	10/7/2003 10:55	AA19734	1046.2
Martin-Youngman D	200E near Center	Eastern Corn Belt Plains	WAW010-0105	Howard	10/15/2003 10:35	AA19947	1119.9
						GeoMean	1373
Kokomo Cr	Webster St in Kokomo	Eastern Corn Belt Plains	WAW010-0106	Howard	9/9/2003 11:30	AA16310	517.2
Kokomo Cr	Webster St in Kokomo	Eastern Corn Belt Plains	WAW010-0106	Howard	9/24/2003 11:10	AA19187	2420.0
Kokomo Cr	Webster St in Kokomo	Eastern Corn Belt Plains	WAW010-0106	Howard	9/30/2003 11:20	AA19382	770.1

Kokomo Cr	Webster St in Kokomo	Eastern Corn Belt Plains	WAW010-0106	Howard	10/7/2003 11:30	AA19737	866.4
Kokomo Cr	Webster St in Kokomo	Eastern Corn Belt Plains	WAW010-0106	Howard	10/15/2003 11:10	AA19951	1553.1
						GeoMean	1053
Mud Cr	CR 900 W	Eastern Corn Belt Plains	WAW010-0107	Tipton	9/8/2003 9:04	AA16232	125.9
Mud Cr	CR 900 W	Eastern Corn Belt Plains	WAW010-0107	Tipton	9/23/2003 8:57	AA19152	579.4
Mud Cr	CR 900 W	Eastern Corn Belt Plains	WAW010-0107	Tipton	9/29/2003 9:15	AA19326	165.8
Mud Cr	CR 900 W	Eastern Corn Belt Plains	WAW010-0107	Tipton	10/6/2003 9:17	AA19682	2419.2
Mud Cr	CR 900 W	Eastern Corn Belt Plains	WAW010-0107	Tipton	10/14/2003 9:16	AA19895	2420.0
						GeoMean	589
Mud Cr	CR 125N	Eastern Corn Belt Plains	WAW010-0108	Tipton	9/8/2003 9:20	AA16230	488.4
Mud Cr	CR 125N	Eastern Corn Belt Plains	WAW010-0108	Tipton	9/23/2003 9:10	AA19154	2420.0
Mud Cr	CR 125N	Eastern Corn Belt Plains	WAW010-0108	Tipton	9/29/2003 9:26	AA19328	1413.6
Mud Cr	CR 125N	Eastern Corn Belt Plains	WAW010-0108	Tipton	10/6/2003 9:30	AA19684	1046.2
Mud Cr	CR 125N	Eastern Corn Belt Plains	WAW010-0108	Tipton	10/14/2003 9:31	AA19897	6131.0

						GeoMean	1607
Mud Cr	CR 200 N	Eastern Corn Belt Plains	WAW010-0109	Tipton	9/8/2003 9:30	AA16228	275.5
Mud Cr	CR 200 N	Eastern Corn Belt Plains	WAW010-0109	Tipton	9/23/2003 9:16	AA19155	1553.1
Mud Cr	CR 200 N	Eastern Corn Belt Plains	WAW010-0109	Tipton	9/29/2003 9:34	AA19329	1986.3
Mud Cr	CR 200 N	Eastern Corn Belt Plains	WAW010-0109	Tipton	10/6/2003 9:36	AA19685	920.8
Mud Cr	CR 200 N	Eastern Corn Belt Plains	WAW010-0109	Tipton	10/14/2003 9:37	AA19898	3873.0
						GeoMean	1248
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0110	Tipton	9/8/2003 9:50	AA16225	249.5
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0110	Tipton	9/23/2003 9:35	AA19157	2419.2
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0110	Tipton	9/29/2003 9:50	AA19331	290.9
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0110	Tipton	10/6/2003 9:55	AA19687	816.4
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0110	Tipton	10/14/2003 9:52	AA19900	3654.0
						GeoMean	879
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0111	Tipton	9/8/2003 10:07	AA16223	980.4

Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0111	Tipton	9/23/2003 9:45	AA19159	2420.0
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0111	Tipton	9/29/2003 10:05	AA19334	770.1
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0111	Tipton	10/6/2003 10:07	AA19689	387.3
Mud Cr	CR 450 N	Eastern Corn Belt Plains	WAW010-0111	Tipton	10/14/2003 10:03	AA19902	8664.0
						GeoMean	1437
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	9/8/2003 10:44	AA16219	35.4
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	9/23/2003 10:15	AA19163	1203.3
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	9/29/2003 10:42	AA19338	116.0
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	10/6/2003 10:36	AA19694	104.3
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	10/6/2003 10:36	AA19693	131.3
North Cr	CR 400N	Eastern Corn Belt Plains	WAW010-0112	Tipton	10/14/2003 10:30	AA19906	1043.0
						GeoMean	203
North Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0113	Tipton	9/8/2003 10:50	AA16218	45.0
North Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0113	Tipton	9/23/2003 10:20	AA19164	1553.1

North Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0113	Tipton	9/29/2003 10:45	AA19339	158.5
North Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0113	Tipton	10/6/2003 10:43	AA19695	185.0
North Cr	CR 300 W	Eastern Corn Belt Plains	WAW010-0113	Tipton	10/14/2003 10:36	AA19907	2420.0
						GeoMean	346
Pole Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0114	Tipton	9/8/2003 10:28	AA16217	22.8
Pole Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0114	Tipton	9/23/2003 10:03	AA19161	82.0
Pole Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0114	Tipton	9/29/2003 10:28	AA19336	47.2
Pole Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0114	Tipton	10/6/2003 10:25	AA19691	54.6
Pole Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0114	Tipton	10/14/2003 10:20	AA19904	225.4
						GeoMean	64
Off Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0115	Tipton	9/8/2003 10:35	AA16216	96.0
Off Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0115	Tipton	9/23/2003 10:08	AA19162	325.5
Off Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0115	Tipton	9/29/2003 10:34	AA19337	93.3
Off Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0115	Tipton	10/6/2003 10:30	AA19692	160.7

Off Ditch	CR 300 N	Eastern Corn Belt Plains	WAW010-0115	Tipton	10/14/2003 10:24	AA19905	131.7
						GeoMean	144
Mud Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0116	Tipton	9/8/2003 11:15	AA16215	152.9
Mud Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0116	Tipton	9/23/2003 10:37	AA19168	613.1
Mud Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0116	Tipton	9/29/2003 11:10	AA19342	387.3
Mud Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0116	Tipton	10/6/2003 11:02	AA19698	248.9
Mud Cr	CR 200 E	Eastern Corn Belt Plains	WAW010-0116	Tipton	10/14/2003 10:55	AA19911	816.4
						GeoMean	375
Ross Ditch	CR 500 N	Eastern Corn Belt Plains	WAW010-0117	Tipton	9/8/2003 11:28	AA16213	111.8
Ross Ditch	CR 500 N	Eastern Corn Belt Plains	WAW010-0117	Tipton	9/23/2003 10:45	AA19169	1413.6
Ross Ditch	CR 500 N	Eastern Corn Belt Plains	WAW010-0117	Tipton	9/29/2003 11:16	AA19343	206.3
Ross Ditch	CR 500 N	Eastern Corn Belt Plains	WAW010-0117	Tipton	10/6/2003 11:08	AA19699	218.7
Ross Ditch	CR 500 N	Eastern Corn Belt Plains	WAW010-0117	Tipton	10/14/2003 11:03	AA19912	2419.2
						GeoMean	444

Mud Cr	CR 50 E	Eastern Corn Belt Plains	WAW010-0118	Tipton	9/8/2003 11:55	AA16211	228.2
Mud Cr	CR 50 E	Eastern Corn Belt Plains	WAW010-0118	Tipton	9/23/2003 11:05	AA19172	1553.1
Mud Cr	CR 50 E	Eastern Corn Belt Plains	WAW010-0118	Tipton	9/29/2003 11:40	AA19346	488.4
Mud Cr	CR 50 E	Eastern Corn Belt Plains	WAW010-0118	Tipton	10/6/2003 11:32	AA19702	142.1
Mud Cr	CR 50 E	Eastern Corn Belt Plains	WAW010-0118	Tipton	10/14/2003 11:23	AA19915	770.1
						GeoMean	452
Turkey Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0119	Tipton	9/8/2003 10:15	AA16210	980.4
Turkey Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0119	Tipton	9/23/2003 9:40	AA19139	1299.7
Turkey Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0119	Tipton	9/29/2003 9:40	AA19355	307.6
Turkey Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0119	Tipton	10/6/2003 10:05	AA19712	547.5
Turkey Cr	CR 650 N	Eastern Corn Belt Plains	WAW010-0119	Tipton	10/14/2003 10:00	AA19924	1732.9
						GeoMean	820
Irwin Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0120	Tipton	9/8/2003 9:30	AA16202	142.1
Irwin Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0120	Tipton	9/23/2003 8:55	AA19134	2420.0

Irwin Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0120	Tipton	9/29/2003 9:05	AA19350	110.6
Irwin Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0120	Tipton	10/6/2003 9:20	AA19706	387.3
Irwin Cr	CR 500 N	Eastern Corn Belt Plains	WAW010-0120	Tipton	10/14/2003 9:15	AA19919	298.7
						GeoMean	338
Irwin Cr	CR 500 E	Eastern Corn Belt Plains	WAW010-0121	Tipton	9/8/2003 9:20	AA16201	81.6
Irwin Cr	CR 500 E	Eastern Corn Belt Plains	WAW010-0121	Tipton	9/23/2003 8:45	AA19133	2420.0
Irwin Cr	CR 500 E	Eastern Corn Belt Plains	WAW010-0121	Tipton	9/29/2003 8:55	AA19349	166.4
Irwin Cr	CR 500 E	Eastern Corn Belt Plains	WAW010-0121	Tipton	10/6/2003 9:10	AA19705	65.7
Irwin Cr	CR 500 E	Eastern Corn Belt Plains	WAW010-0121	Tipton	10/14/2003 9:10	AA19918	1119.9
						GeoMean	300
Irwin Cr	CR 300 N	Eastern Corn Belt Plains	WAW010-0122	Tipton	9/8/2003 9:05	AA16199	128.1
Irwin Cr	CR 300 N	Eastern Corn Belt Plains	WAW010-0122	Tipton	9/23/2003 8:30	AA19131	2420.0
Irwin Cr	CR 300 N	Eastern Corn Belt Plains	WAW010-0122	Tipton	9/29/2003 8:45	AA19347	461.1
Irwin Cr	CR 300 N	Eastern Corn Belt Plains	WAW010-0122	Tipton	10/6/2003 9:00	AA19703	816.4

Irwin Cr	CR 300 N	Eastern Corn Belt Plains	WAW010-0122	Tipton	10/14/2003 9:00	AA19916	613.1
						GeoMean	590

Attachment B

Load Duration and Precipitation Curves for Upper Wildcat Creek Watershed TMDL

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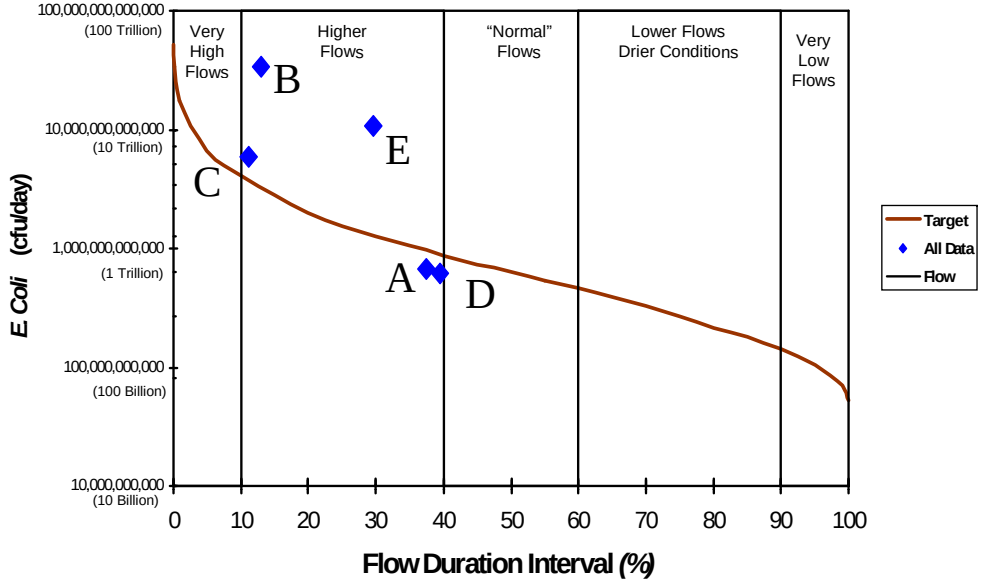
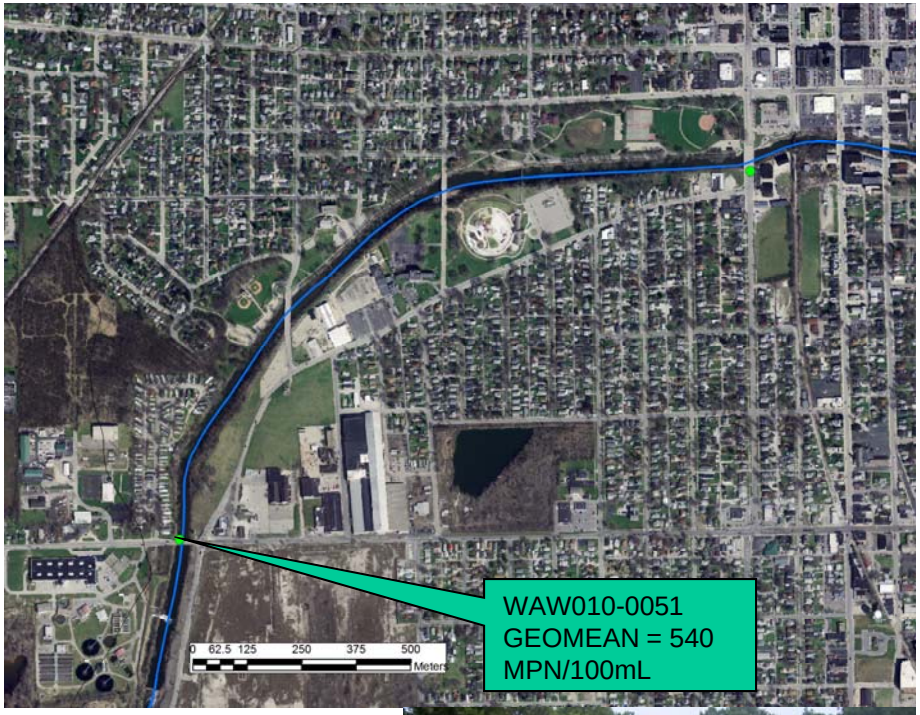
Wildcat Creek
At Markland Ave

E. coli Load Duration Curve - Site: WAW010-0051

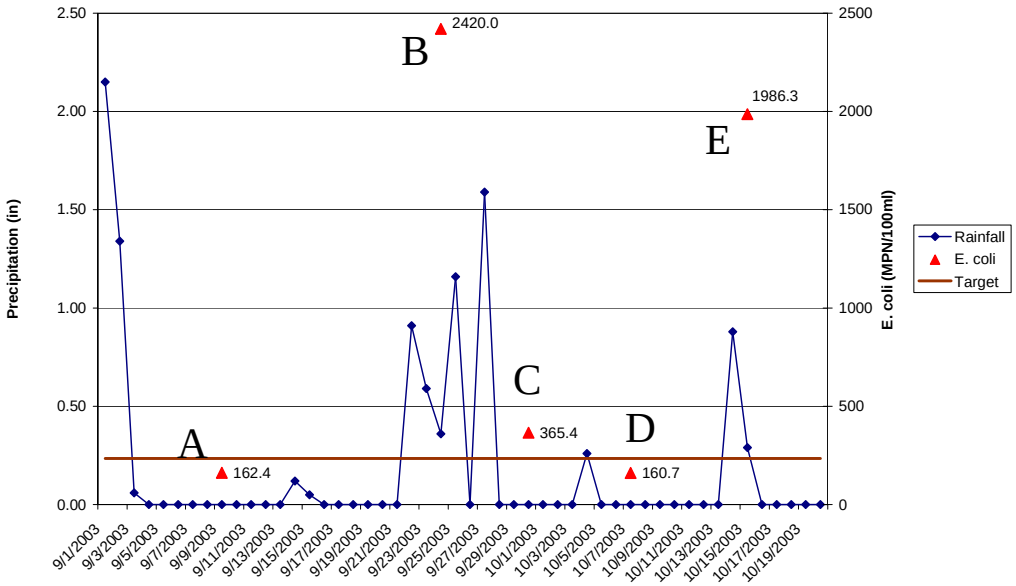




IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 204.04 square miles

Attachment C : 2 of 7

Wildcat Creek at Markland Ave
WAW010-0051

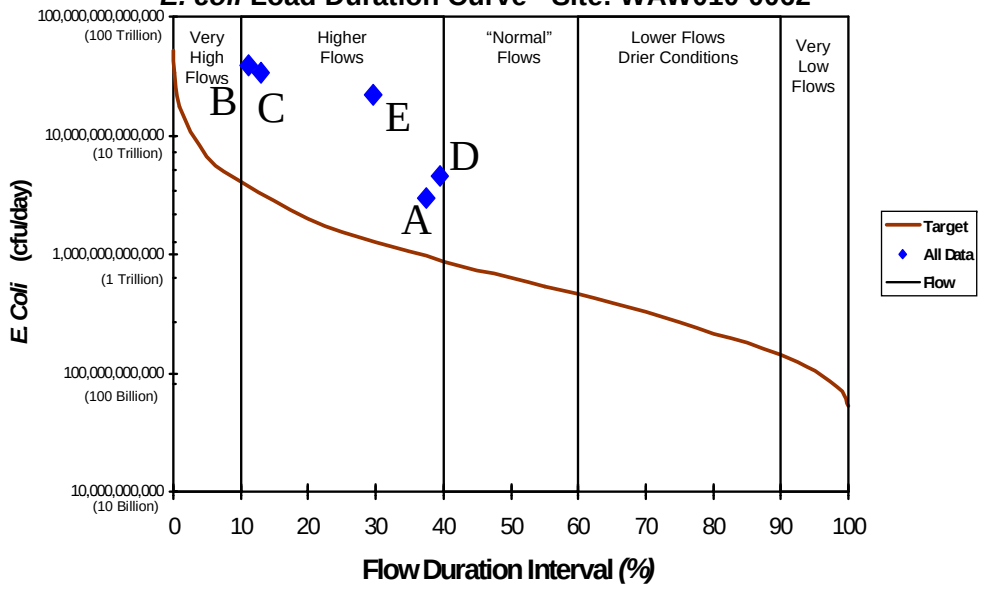


UPSTREAM

DOWNSTREAM

Kokomo Creek
At Park Ave

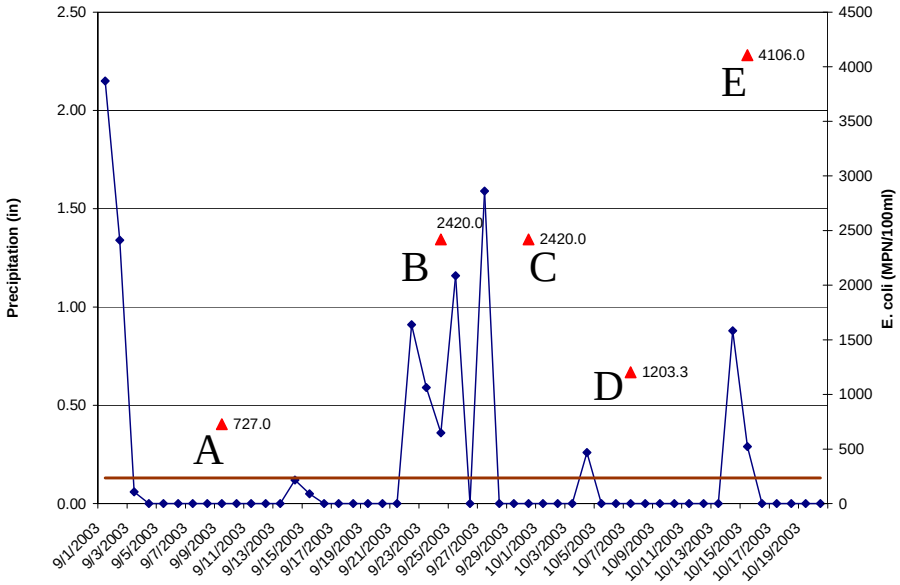
E. coli Load Duration Curve - Site: WAW010-0062



IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 34.77 square miles

Attachment C : 3 of 7

Kokomo Creek at Park Ave
WAW010-0062

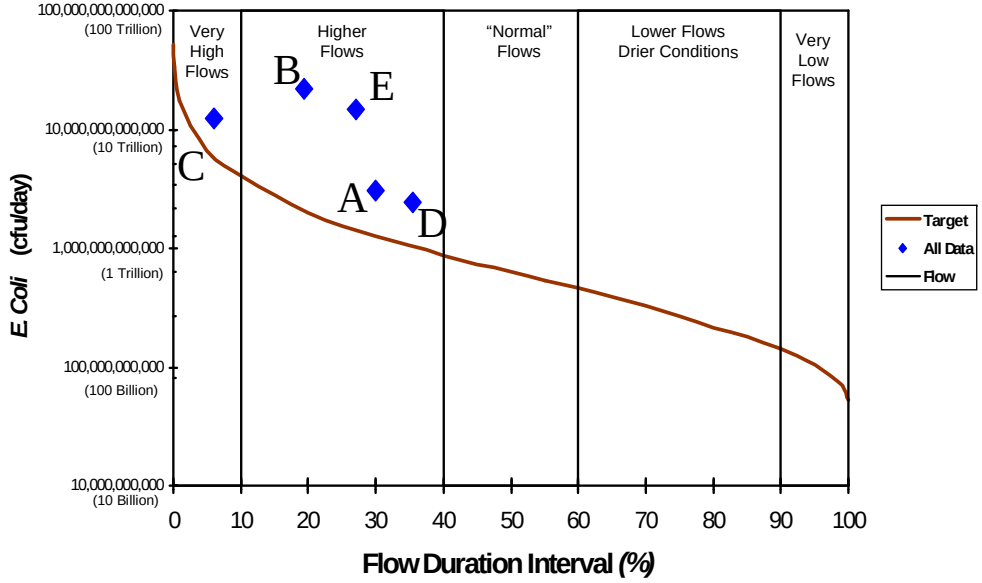


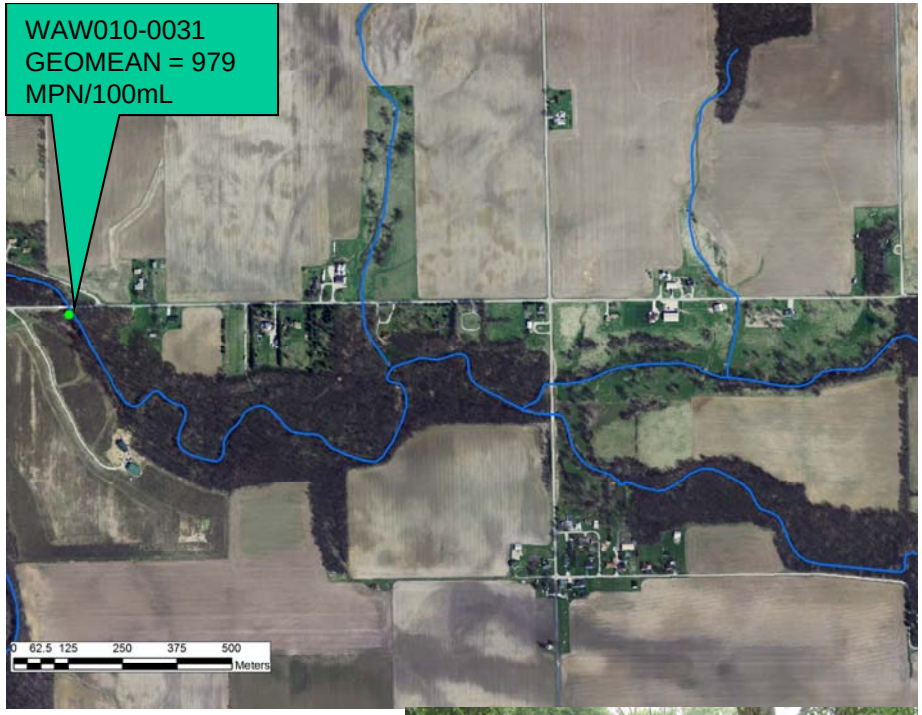
UPSTREAM

DOWNSTREAM

Wildcat Creek
At CR 300 S

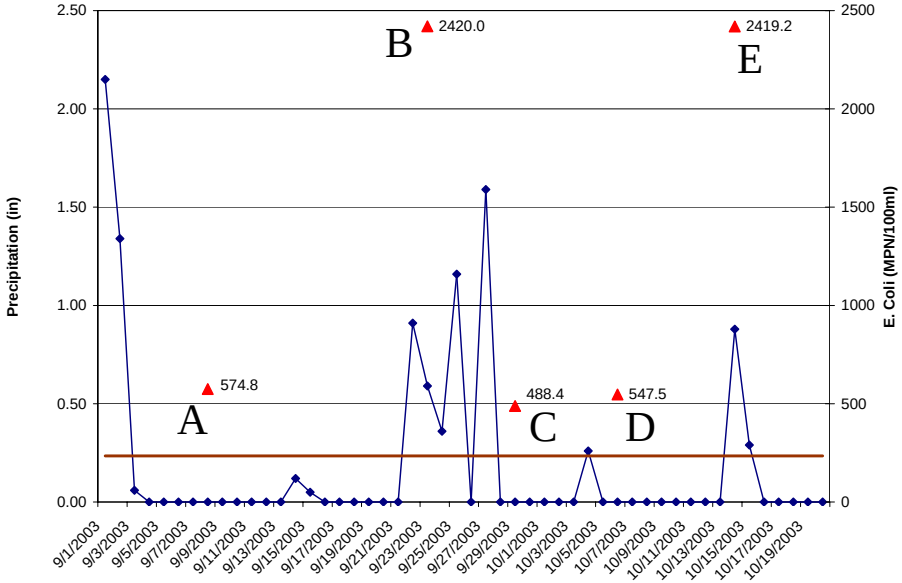
E. coli Load Duration Curve - Site: WAW010-0031



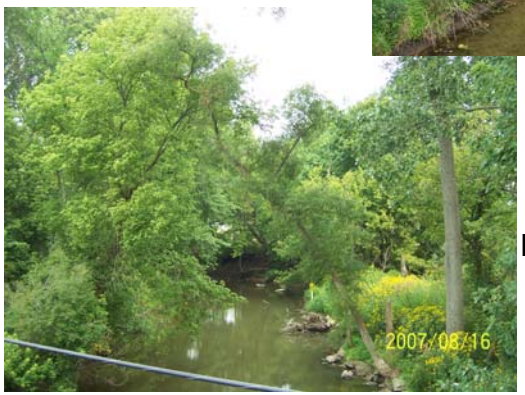


IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 50.29 square miles

Wildcat Creek at CR 300 S
WAW010-0031



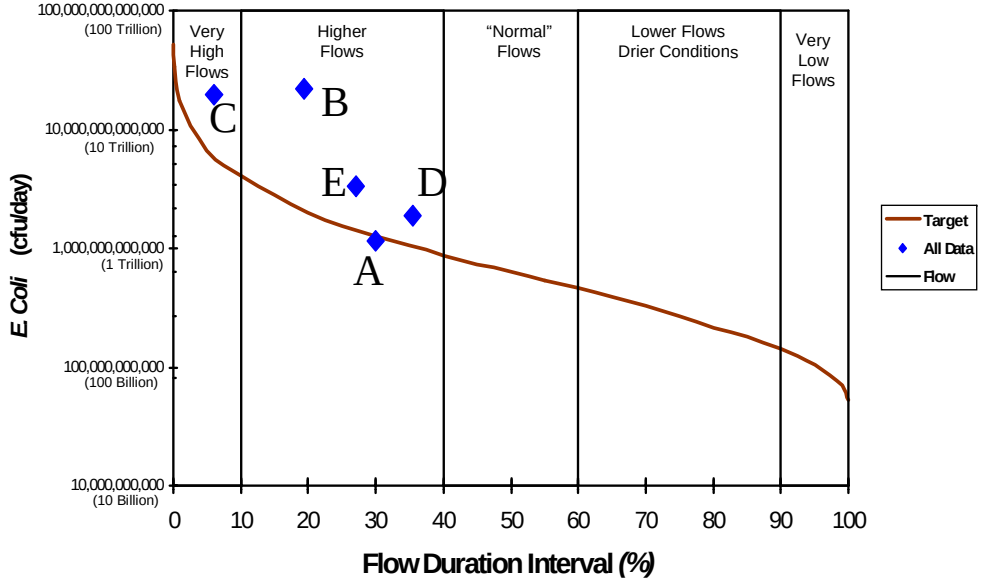
UPSTREAM

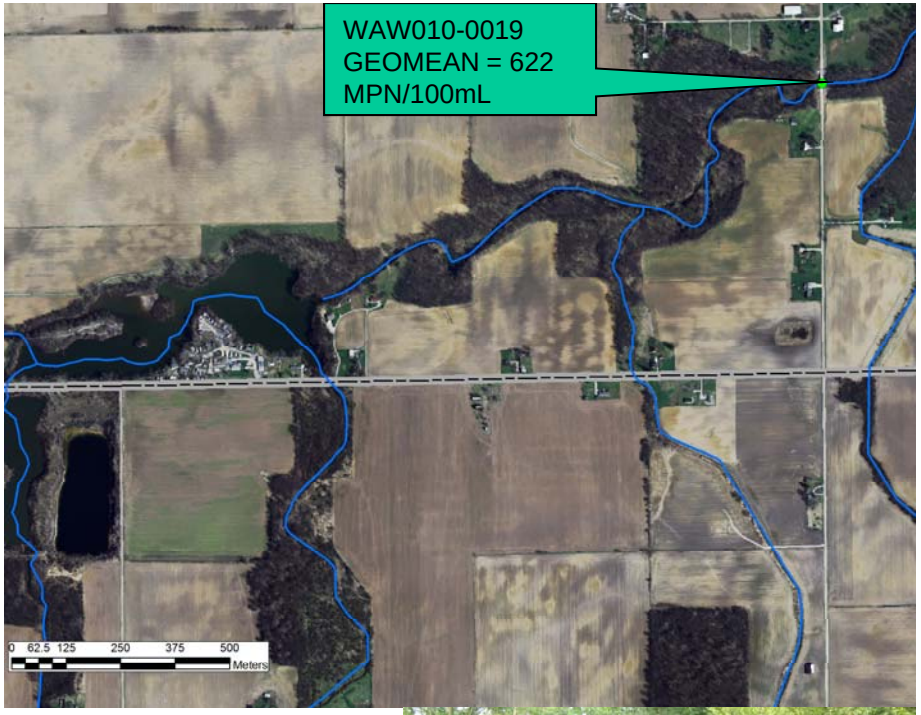


DOWNSTREAM

Mud Creek
At CR 1100 E

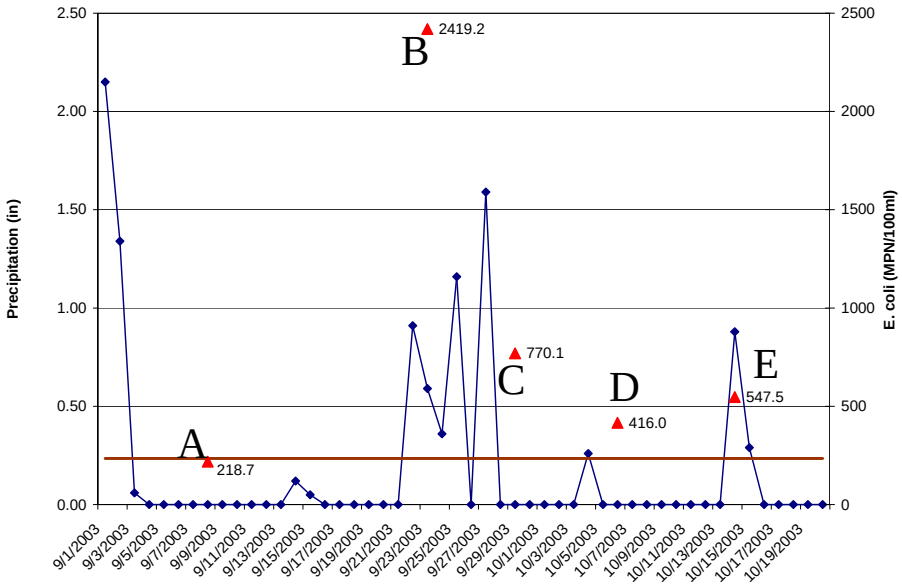
E. coli Load Duration Curve - Site: WAW010-0019





IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 91.38 square miles

Mud Creek at CR 1100 E
WAW010-0019

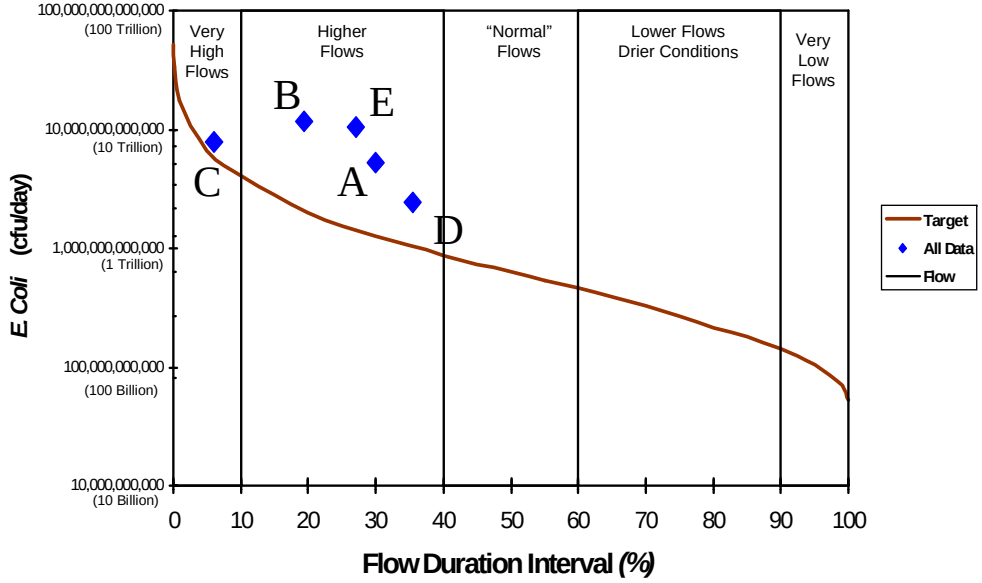


UPSTREAM

DOWNSTREAM

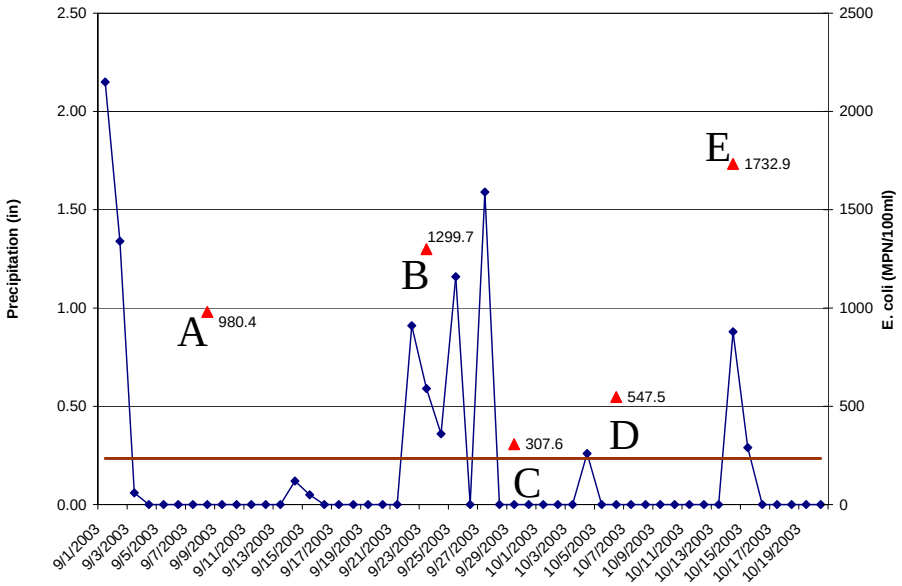
Turkey Creek
At CR 650 N

E. coli Load Duration Curve - Site: WAW010-0119



IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 42.99 square miles

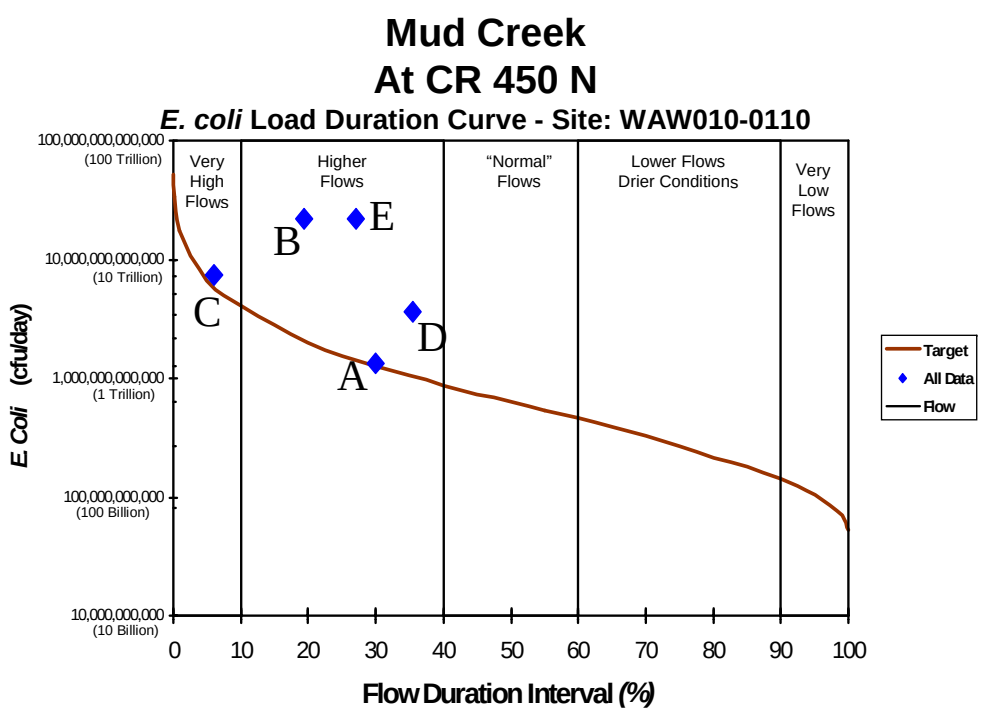
Turkey Creek at CR 650 N
WAW010-0119

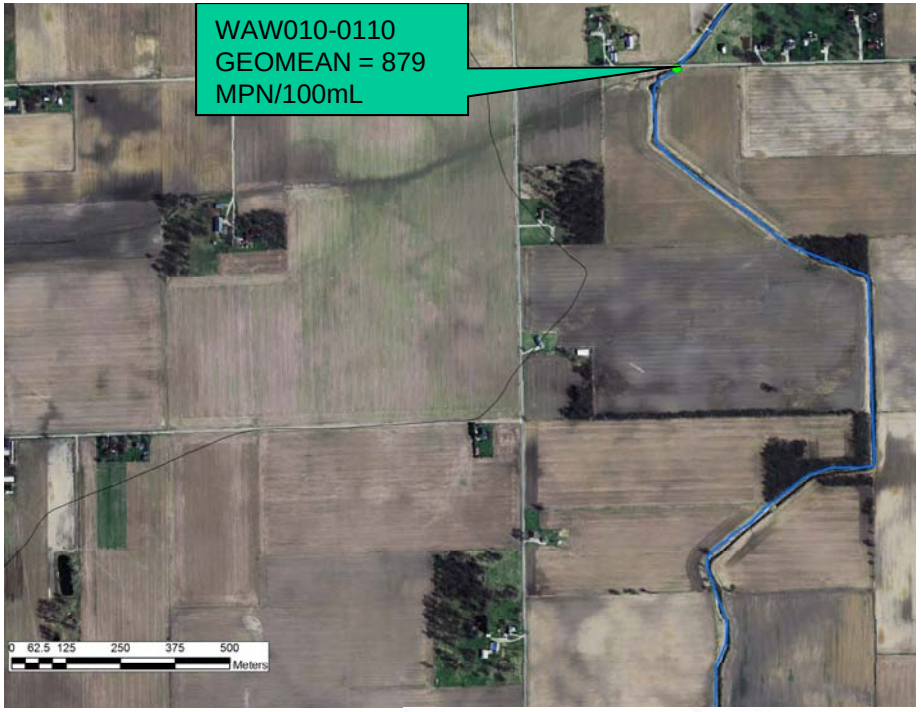


UPSTREAM

DOWNSTREAM

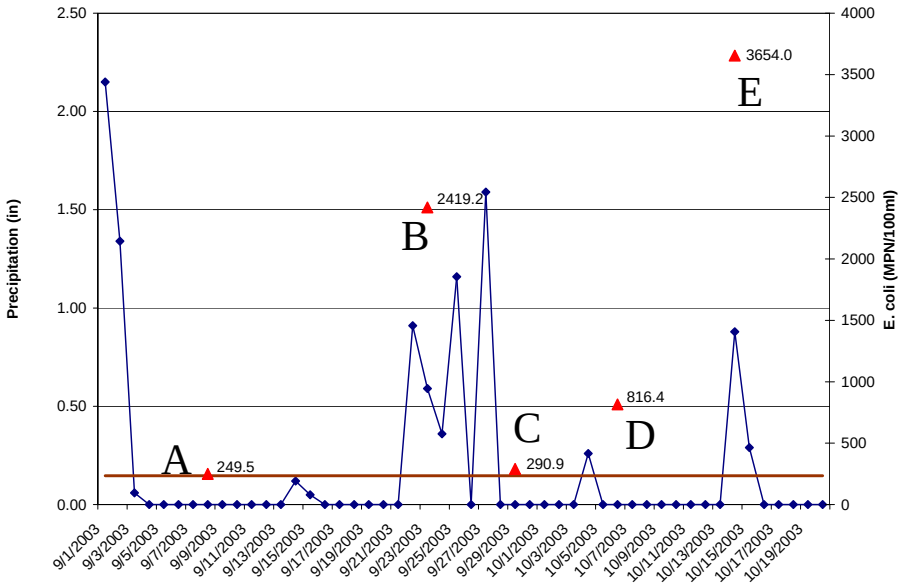
Mud Creek
At CR 450 N





IDEM Water Quality Data & USGS Gage 03333700 Stream Flow Data
Upstream Drainage Area is 9.00 square miles

Mud Creek at Cr 450 N
WAW010-0110



UPSTREAM

DOWNSTREAM

Attachment C

Upper Wildcat Creek Watershed TMDL Reductions

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Attachment C: Upper Wildcat Creek Watershed Reductions

***E. Coli* (MPN/100mL) Duration Curve Zone Geometric Means and Reductions**

Site ID	Upper Wildcat Creek Watershed						
	Site Geometric Mean	Overall Site Reductions	Area	Northing	Easting	Segment ID	Site Name/Location
WAW010-0001	697	82%	6.53	4467310.864840	571048.566272	INB0713_00	Mud Cr at CR350N
WAW010-0002	1481	92%	9.52	4468989.824002	572495.000443	INB0713_00	Mud Cr at CR700W
WAW010-0003	953	87%	12.33	4468273.670368	574931.491476	INB0713_00	Mud Cr at CR550W
WAW010-0004	593	79%	16.96	4469918.563997	578971.410831	INB0713_00	Mud Cr at CR300W
WAW010-0005	205	39%	6.94	4469928.043226	579867.486467	INB0714_T1002	North Cr at CR 500N
WAW010-0006	261	52%	25.68	4471402.410217	582186.131883	INB0714_00	Mud Cr at SR 19
WAW010-0007	480	74%	28.92	4471628.109881	583079.646416	INB0714_00	Mud Cr at CR600N
WAW010-0011	324	61%	29.40	4468531.285216	587359.877668	INB0716_00	Turkey Cr at CR400N
WAW010-0014	610	80%	7.37	4468537.338291	587878.763023	INB0716_00	Round Prairie Ditch at CR400N
WAW010-0015	546	77%	37.81	4470180.935318	588661.379706	INB0716_T1030	Turkey Cr at CR500N
WAW010-0016	745	83%	42.71	4471787.625136	588925.347242	INB0716_T1030	Turkey Cr at CR600N
WAW010-0017	594	79%	76.33	4473396.575003	589377.752297	INB0717_T1031	Mud Cr at CR500S
WAW010-0018	317	61%	9.85	4472601.381445	589929.485801	INB0717_T1031	Irwin Cr at CR650N
WAW010-0019	622	80%	91.38	4474103.666525	591750.075371	INB0717_00	Mud Cr at CR1100E
WAW010-0024	836	85%	25.55	4475720.885279	595312.480853	INB0712_00	Middle Fk at CR1330E
WAW010-0027	736	83%	15.71	4475427.927528	596518.191992	INB0711_00	Grassy Fk at CR1400 E
WAW010-0028	527	76%	5.99	4476291.276207	596507.072597	INB0711_00	Prairie Run at CR1400E
WAW010-0031	979	87%	50.29	4476678.260972	592967.450652	INB0717_T1001	Wildcat Cr at CR300S
WAW010-0032	680	82%	147.91	4477248.712189	591711.578016	INB0718_T1002	Wildcat Cr at CR1100E
WAW010-0034	284	56%	0.00	4480553.666270	586984.379369	INB0718_T1002	Kokomo Reservoir No 2 at CR50S
WAW010-0035	344	64%	0.00	4481286.044540	586316.500604	INB0718_T1002	Kokomo Reservoir No 2 at SR 22
WAW010-0036	17	N/A	180.63	4482083.78743	580420.84225	N/A	Wildcat Cr at CR400 E
WAW010-0037	110	N/A	183.22	4483115.095500	578808.886337	N/A	Wildcat Cr at CR300E

WAW010-0044	445	72%	200.67	4481846.304427	575384.566605	INB071A_T1006	Wildcat Cr at Carter St
WAW010-0048	233	46%	202.12	4481826.863775	573430.476676	INB071A_T1006	Wildcat Cr at Washington St
WAW010-0051	540	77%	204.04	4480981.525137	572120.081862	INB071A_T1006	Wildcat Cr at Markland Ave
WAW010-0052	1532	92%	16.11	4474040.987621	583760.057975	INB071B_T1007	Kokomo Cr at CR600E
WAW010-0053	1076	88%	13.15	4476524.949602	585263.925232	INB071B_T1007	Kokomo Cr at CR300S
WAW010-0055	1084	88%	19.30	4477767.057842	580467.243647	INB071B_T1007	Kokomo Cr at CR400E
WAW010-0056	909	86%	23.95	4477133.344835	578871.907695	INB071B_T1007	Kokomo Cr at CR 300E
WAW010-0057	810	85%	24.46	4477116.404866	577246.389160	INB071B_T1007	Kokomo Cr at CR200E
WAW010-0058	752	83%	31.50	4477776.256301	575425.574681	INB071C_T1026	Kokomo Cr at Southway Blvd
WAW010-0060	810	85%	39.20	4479242.168096	573997.581764	INB071C_T1026	Kokomo Cr at LaFountain St
WAW010-0062	1839	93%	34.77	4480332.204196	571937.940564	INB071A_T1006	Kokomo Cr at Park Ave
WAW010-0066	621	80%	158.79	4478998.251831	588462.933902	INB0718_T1002	Wildcat Cr at SR213
WAW010-0067	155	19%	0.00	4482489.437629	583665.603996	N/A	Kokomo Reservoir No 2 at CR600E
WAW010-0068	46	N/A	0.00	4482779.778779	582037.849864	N/A	Kokomo Reservoir No 2 at CR 500E
WAW010-0071	32	N/A	0.00	4480982.061570	586696.802579	N/A	Greentown POTW at 001 Final Effluent
WAW010-0096	1624	92%	7.41	4482658.751083	575861.836271	INB071A_T1032	Prairie Cr Ditch at Jefferson Rd/US31
WAW010-0097	863	86%	4.30	4481857.668258	575776.722442	INB071AT1033	Cannon - Goyer Ditch at Carter St/US31
WAW010-0098	854	85%	3.10	4480613.177991	576422.108055	INB071AT1033	Cannon - Goyer Ditch at CR 150E
WAW010-0099	1786	93%	3.30	4481871.041643	576605.158884	INB071A_00	Stahl Ditch at CR50N
WAW010-0100	188	34%	0.00	4482078.948123	585650.884436	N/A	Kokomo Reservoir No 2 at CR50N
WAW010-0101	407	69%	2.11	4473210.844322	582395.928842	INB071B_T1007	Tolle Ditch at CR700N
WAW010-0102	568	78%	3.86	4473898.717359	582133.328320	INB071B_00	Finn Ditch at CR500E
WAW010-0103	701	82%	18.72	4478076.365222	582087.549167	INB071B_T1007	Kokomo Cr at CR 200S
WAW010-0104	1720	93%	1.86	4477202.204690	580875.967555	INB071B_00	Mugg - Ingels Ditch at CR250S
WAW010-0105	1373	91%	5.80	4476688.803721	577256.689248	INB071C_00	Martin - Youngman Ditch at CR200E
WAW010-0106	1053	88%	32.47	4479420.297820	573202.787942	INB071C_T1026	Kokomo Cr at Webster St
WAW010-0107	589	79%	0.90	4462637.310093	569352.308682	INB0713_00	Mud Cr at CR900W
WAW010-0108	1607	92%	1.80	4463655.079471	570138.794649	INB0713_00	Mud Cr at CR 125N
WAW010-0109	1248	90%	3.66	4464861.094425	570142.651632	INB0713_00	Mud Cr at CR200N
WAW010-0110	879	86%	9.00	4468929.407356	571273.127033	INB0713_00	Mud Cr at CR450N
WAW010-0111	1437	91%	9.78	4468977.203479	573133.354955	INB0713_00	Mud Cr at CR450N
WAW010-0112	203	38%	5.98	4468317.755358	579606.740286	INB0714_T1002	North Cr at CR400N

WAW010-0113	346	64%	2.86	4467800.723940	578973.396284	INB0714_T1002	North Cr at CR300W
WAW010-0114	64	N/A	0.96	4466710.248721	579490.941918	N/A	Pole Ditch at CR300N
WAW010-0115	144	13%	1.01	4466727.932812	580197.620753	INB0714_T1003	Off Ditch at CR300N
WAW010-0116	375	67%	24.47	4470229.193428	580548.416932	INB0714_00	Mud Cr at CR200E
WAW010-0117	444	72%	2.11	4470038.062303	583211.393824	INB0714_T1001	Ross Ditch at CR500N
WAW010-0118	452	72%	29.98	4471822.528046	584418.616846	INB0714_00	Mud Cr at CR50E
WAW010-0119	820	85%	42.99	4472589.630654	588865.859621	INB0716_T1030	Turkey Cr at CR650N
WAW010-0120	338	63%	8.62	4470215.672790	590793.661033	INB0717_T1031	Irwin Cr at CR500N
WAW010-0121	300	58%	5.52	4468837.385269	591822.272143	INB0717_T1031	Irwin Cr at CR500E
WAW010-0122	590	79%	2.04	4467080.680652	593036.899349	INB0717_T1031	Irwin Cr at CR300N

Attachment D

Segment Load Reductions for the Upper Wildcat Creek Watershed TMDL

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Segment ID	Miles	Sample Maximum	Target	Total Needed Reduction	Segment Percentage of Watershed	Segment Load Reduction
INB0715_02	13.31	4106	235	3871	8%	301.65
INB0716_04	7.08	4106	235	3871	4%	160.44
INB0717_01	14.22	4106	235	3871	8%	322.35
INB0717_T1009	5.59	4106	235	3871	3%	126.64
INB0717_T1010	4.00	4106	235	3871	2%	90.67
INB0717_T1011	2.93	4106	235	3871	2%	66.47
INB0718_01	14.47	4106	235	3871	8%	327.99
INB0718_02	7.04	4106	235	3871	4%	159.67
INB0718_T1005	4.86	4106	235	3871	3%	110.04
INB0718_T1006	4.10	4106	235	3871	2%	92.93
INB0718_T1007	2.65	4106	235	3871	2%	60.14
INB0719_01	8.60	4106	235	3871	5%	195.02
INB0719_T1001	3.95	4106	235	3871	2%	89.59
INB0719_T1002	1.28	4106	235	3871	1%	28.97
INB0719_T1003	3.32	4106	235	3871	2%	75.16
INB0712_02	21.29	4106	235	3871	12%	482.51
INB0712_T1001	6.90	4106	235	3871	4%	156.49
INB0712_T1002	2.88	4106	235	3871	2%	65.29
INB0713_01	4.96	4106	235	3871	3%	112.42
INB0713_T1001	7.09	4106	235	3871	4%	160.61
INB0713_T1002	1.38	4106	235	3871	1%	31.32
INB0713_T1003	8.32	4106	235	3871	5%	188.50
INB0716_T1001	10.71	4106	235	3871	6%	242.70
INB0716_T1002	4.56	4106	235	3871	3%	103.44
INB0716_T1003	2.45	4106	235	3871	1%	55.62
INB0716_T1004	2.84	4106	235	3871	2%	64.36
	170.79				100%	3871