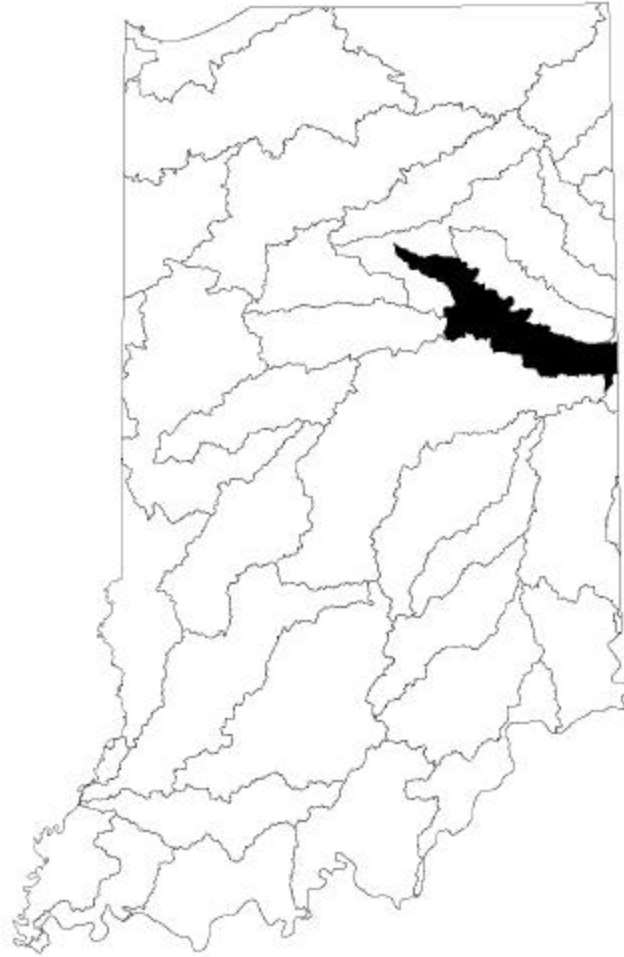


# Mississinewa River Watershed Restoration Action Strategy

Part I: Characterization and Responsibilities



*Prepared by*  
Indiana Department of  
Environmental Management  
Office of Water Management  
*May 2001*

## **FOREWORD**

The Mississinewa River Watershed Restoration Action Strategy (WRAS) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The first draft of the Mississinewa River WRAS was released for public review during April 2001. This version of the WRAS incorporates public comments received during that time period.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

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# TABLE OF CONTENTS

FOREWORD.....	1
TABLE OF CONTENTS.....	2
LIST OF TABLES .....	3
LIST OF FIGURES .....	3
APPENICES .....	3
EXECUTIVE SUMMARY .....	4
OVERVIEW OF THE MISSISSINEWA RIVER WATERSHED .....	4
CURRENT STATUS OF WATER QUALITY IN THE MISSISSINEWA RIVER WATERSHED.....	4
WATER QUALITY GOAL.....	5
1. INTRODUCTION.....	6
1.1 PURPOSE OF THIS DOCUMENT .....	6
1.2 GUIDE TO THE USE OF THIS DOCUMENT .....	6
1.3 STAKEHOLDER GROUPS IN THE WATERSHED .....	7
2 GENERAL WATERSHED DESCRIPTION.....	8
2.1 MISSISSINEWA RIVER WATERSHED OVERVIEW.....	8
2.2 LAND COVER, POPULATION, AND GROWTH TRENDS.....	10
2.3 AGRICULTURAL ACTIVITIES IN THE MISSISSINEWA RIVER WATERSHED.....	13
2.4 SIGNIFICANT NATURAL AREAS IN THE MISSISSINEWA RIVER WATERSHED.....	15
2.5 SURFACE WATER USE DESIGNATIONS AND CLASSIFICATIONS .....	17
2.6 US GEOLOGICAL SURVEY WATER USE INFORMATION FOR THE MISSISSINEWA RIVER WATERSHED.....	18
3 CAUSES AND SOURCES OF WATER POLLUTION.....	20
3.1 CAUSES OF POLLUTION.....	20
3.2 POINT SOURCES OF POLLUTION.....	23
3.3 NONPOINT SOURCES OF POLLUTION.....	28
4. WATER QUALITY AND USE SUPPORT RATINGS - MISSISSINEWA RIVER WATERSHED...31	
4.1 WATER QUALITY MONITORING PROGRAMS .....	31
4.2 SUMMARY OF AMBIENT MONITORING DATA FOR THE MISSISSINEWA RIVER WATERSHED .....	32
4.3 FISH CONSUMPTION ADVISORIES.....	34
4.4 CLEAN WATER ACT SECTION 305(B) REPORT .....	35
4.5 CLEAN WATER ACT SECTION 305(B) ASSESSMENT AND USE-SUPPORT: METHODOLOGY.....	35
5 STATE AND FEDERAL WATER PROGRAMS.....	38
5.1 INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT WATER QUALITY PROGRAMS.....	38
5.2 INDIANA DEPARTMENT OF NATURAL RESOURCES WATER PROGRAMS .....	45
5.3 USDA/NATURAL RESOURCES CONSERVATION SERVICE WATER QUALITY PROGRAMS .....	46
REFERENCES.....	50

## List of Tables

Table 2-1 Mississinewa River County Population Projections 1990-2020.....	11
Table 2-2 Mississinewa River City And Town Population Estimates .....	12
Table 2-3 Livestock In The Mississinewa River Watershed .....	14
Table 2-4 Crops Produced In The Mississinewa River Watershed.....	15
Table 2-5 Mississinewa River Watershed On The Outstanding Rivers List For Indiana.....	16
Table 2-6 Special Areas In The Mississinewa River Watershed .....	16
Table 2-7 1995 Water Use Information For The Mississinewa River Watershed .....	19
Table 3-1 Causes Of Water Pollution And Contributing Activities .....	20
Table 3-2 Npdes Permitted Facilities Mississinewa River Watershed.....	25
Table 4-1 Seasonal Kendall Analysis For In The Mississinewa River Watershed .....	33
Table 4-2 Criteria For Use Support Assessment.....	37
Table 5-1 Types Of Permits Issued Under The Npdes Program.....	41

## List of Figures

Figure 2-1 Mississinewa River Watershed
Figure 2-2 14 digit Hydrologic Unit Code areas
Figure 2-3 General Land Cover
Figure 3-1 NPDES Facilities

## Appenices

Appendix A Benchmark Characteristic Analysis Of Data From Fixed Stations In The Mississinewa River Watershed 1991 To 1997
Appendix B Mississinewa River Waters Assessed In The 2000 Clean Water Act Section 305(B) Report
Appendix C Potential Stakeholders In The Mississinewa River Watershed
Appendix D Funding Sources

## EXECUTIVE SUMMARY

The overall goal and purpose of Part I of the Watershed Restoration Action Strategy (WRAS) is to provide a reference point and map to assist local citizens with improving water quality. The major water quality concerns and recommended management strategies will be addressed in Part II: Concerns and Recommendations of the WRAS.

This Strategy broadly covers the entire watershed; therefore, it is intended to be an overall strategy and does not dictate management and activities at the stream site or segment level. Water quality management decisions and activities for individual portions of the watershed are most effective and efficient when managed through sub-watershed plans. However, these sub-watershed plans must also consider the impact on the watershed as a whole.

This Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, this Strategy will require revision when updated information becomes available.

### Overview of the Mississinewa River Watershed

The Mississinewa River originates in Ohio and flows to the northwest for approximately 100 miles before discharging into the Wabash River near Peru, Indiana. The lower portion of the Mississinewa River is impounded for flood protection and forms the Mississinewa Reservoir. Overall, the Mississinewa River flows through a low, flat, wide valley; however, falling 3.3 feet to the mile, it is one of the swiftest streams in Indiana (IDNR 1999). The Miami Indians are the originators of the name "Mississinewa," which means 'falling water' (IDNR 1999).

### Current Status of Water Quality in the Mississinewa River Watershed

Section 303(d) of the Clean Water Act requires states to identify waters that do not meet, or are not expected to meet, applicable water quality standards. The Clean Water Act Section 303(d) list for Indiana provides a basis for understanding the current status of water quality in the Mississinewa River Watershed. The following waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted to and approved by EPA:

Water Body	Location/Reach	County	Parameter(s) of Concern	HUC	Subwatershed(s)
Little Mississinewa River	Union City	Randolph	FCA for PCB	5120103	10
Mississinewa River	All	Randolph / Delaware / Grant	FCA for PCB & Hg	5120103	010 020 030 050 060

FCA - Fish Consumption Advisory

PCB - Polychlorinated Biphenyls

Hg - Mercury

\*\*\*Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above.

The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish

Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

## **Water Quality Goal**

The overall water quality goal for the Mississinewa River Watershed is that all waterbodies meet the applicable water quality standards for their designated uses as determined by the State of Indiana, under the provisions of the Clean Water Act.

# Mississinewa River Watershed Restoration Action Strategy

## Part I: Characterization and Responsibilities

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### 1. Introduction

The Clean Water Action Plan states that “States and tribes should work with public agencies and private-sector organizations and citizens to develop, based on the initial schedule for the first two years, Watershed Restoration Action Strategies, for watersheds most in need of restoration.” A WRAS is essentially a large-scale coordination plan for an eight-digit hydrologic unit watershed. Each year, more assessments and data may become available. This will require amendments to the WRAS, which must be flexible and broad enough to accommodate change. The WRAS will also foster greater cooperation among State and Federal agencies, which should result in more effective use of personnel and resources.

The WRAS provides an opportunity to assemble, in one place, projects and monitoring that has been completed or is on going within a watershed. It also allows agencies and stakeholders to compare watershed goals and provides a guide for future work within a watershed.

The WRAS for the Mississinewa River watershed contains two parts. Part I provides a characterization of water quality in the watershed and agency responsibilities. Part II provides a discussion of resource concerns and recommended strategies.

#### 1.1 Purpose of This Document

The overall goal and purpose of the Watershed Restoration Action Strategy Part I is to provide a reference point and roadmap to assist with improving water quality. Part I is a compilation of information, facts, and local concerns in this watershed. It will serve as a reference document for watershed groups and others involved in the assessment and planning of watershed restoration activities.

Part I of the Strategy is intended to be a fluid document in order to respond to the changing and dynamic quality of our environment. Therefore, it will require revision when updated information becomes available.

#### 1.2 Guide to the Use of This Document

**Chapter 1: Introduction** - This Chapter provides a non-technical description of the purpose of Part 1 of the Strategy. This Chapter also provides an overview of stakeholder groups in the Mississinewa River watershed.

**Chapter 2: General Watershed Description**- Some of the specific topics covered in this chapter include:

- An overview of the watershed
- Hydrology of the watershed

- A summary of land use within the watershed
- Natural resources in the watershed
- Population statistics
- Major water uses in the watershed
- Water quality classifications and standards

**Chapter 3: Causes and Sources of Water Pollution** - This Chapter describes a number of important causes of water quality impacts including biochemical oxygen demand (BOD), toxic substances, nutrients, E. coli bacteria and others. This Chapter also describes both point and nonpoint sources of pollution.

**Chapter 4: Water Quality and Use Support Ratings** - This Chapter describes the various types of water quality monitoring conducted by IDEM. It summarizes water quality in the watershed based on Office of Water Management data, and presents a summary of use support ratings for those surface waters that have been monitored or evaluated.

**Chapter 5: State and Federal Water Quality Programs** - Chapter 5 summarizes the existing State and Federal point and nonpoint source pollution control programs available to address water quality problems. These programs are management tools available for addressing the priority water quality concerns and issues that are discussed in Part II of the Strategy. Chapter 5 also describes the concept of Total Maximum Daily Loads (TMDLs). TMDLs represent management strategies aimed at controlling point and nonpoint source pollutants. IDEM's TMDL Strategy will also be discussed.

### 1.3 Stakeholder Groups in the Watershed

The Mississinewa River watershed contains several stakeholder groups that have different missions (Appendix C). Many of these groups have a long history of conservation work in the Mississinewa River watershed. The following discussions briefly describe some of the watershed groups.

#### *Randolph County Soil and Water Conservation District*

The Randolph County Soil and Water Conservation District (SWCD) received a Lake and River Enhancement (LARE) Program grant through the Indiana Department of Natural Resources to conduct a diagnostic study of nonpoint source pollution in the upper Mississinewa River watershed (this study was completed February 2001). The diagnostic study can be obtained by contacting the Randolph County SWCD.

#### *Taylor University and Asherwood Environmental Center*

Taylor University and Asherwood Environmental Center are working cooperatively on the Mississinewa River Watershed Project. This project is designed to identify and assess nonpoint source pollution to the Mississinewa river.



## 2 General Watershed Description

This Chapter provides a general description of Mississinewa River and its watershed and includes the following:

- Section 2.1 Mississinewa River Watershed Overview
- Section 2.2 Land Cover, Population, and Growth Trends
- Section 2.3 Agricultural Activities in the Mississinewa River Watershed
- Section 2.4 Significant Natural Areas in the Mississinewa River Watershed
- Section 2.5 Surface Water Use Designations and Classifications
- Section 2.6 US Geological Survey Water Use Information for the Mississinewa River Watershed

### 2.1 Mississinewa River Watershed Overview

The Mississinewa River watershed is an 8 digit (05120103) hydrologic unit code (HUC) watershed located in east-central Indiana (Figure 2-1). The watershed encompasses approximately 1,947 square miles in nine different counties and approximately 2,500 miles of perennial streams. It is subdivided into 116 subbasins represented on the map by 14 digit HUCs (figure 2-2).

The Mississinewa River originates in Ohio and flows to the northwest for approximately 100 miles before discharging into the Wabash River near Peru, Indiana. The lower portion of the Mississinewa River is impounded for flood protection and forms the Mississinewa Reservoir. Overall, the Mississinewa River flows through a low, flat, wide valley; however, falling 3.3 feet to the mile, it is one of the swiftest streams in Indiana (IDNR 1999). The Miami Indians are the originators of the name "Mississinewa," which means 'falling water' (IDNR 1999).

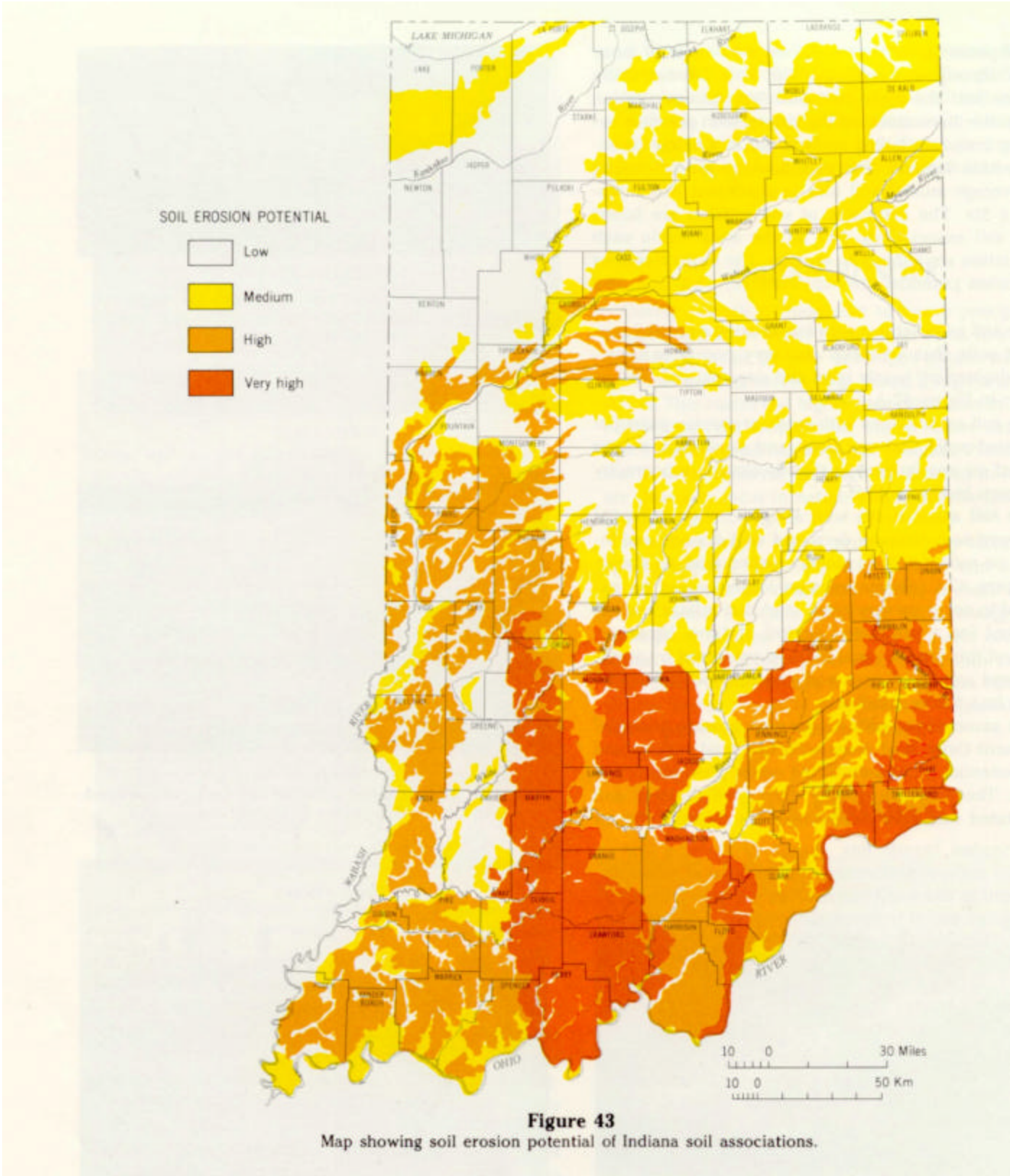


Figure 2-3 Erosion Potential \*  
\* from *The Indiana Water Resource*, IDNR, 1980

## 2.2 Land Cover, Population, and Growth Trends

### 2.2.1 General Land Cover

The U.S. Geological Survey - Biological Resources Division and the U.S. Fish and Wildlife Service are overseeing the National Gap Analysis Program (GAP). In Indiana, Indiana State University and Indiana University are carrying out the Indiana GAP Project which involves an analysis of current vegetative land cover through remote sensing (ISU 1999). This analysis provides vegetative land cover data in 30 by 30-meter grids (Figure 2-4). The following is a summary of vegetative cover in the watershed determined from the GAP image:

1.9%	Urban (impervious, low and high density)
88%	Agricultural vegetation (row crop and pasture)
7%	Forest vegetation (shrubland, woodland, forest)
2.3%	Wetland vegetation (Palustrine: forest, shrubland, herbaceous)
0.8%	Open Water

### 2.2.2 Population

The 1990 total population in the nine counties that have land portions in the watershed was 494,617 (IRBC 1998). Table 2-1 shows a break down of population by county and estimated population projections. It should be noted that these numbers do not reflect the actual population living in the Mississinewa River watershed. For example, only a portion of Madison and Huntington counties are within the land area of the Mississinewa River watershed (Figure 2-1). A better estimate of the population within the Mississinewa River watershed may be the 1995 U.S. Geological Survey Water Use Reports, which show a total population in the watershed of 103,470 in 1995 (Table 2-7).

The U.S. Census and the Indiana Business Research Center also provide information about the population in cities and towns. Table 2-2 contains population estimates for various cities and towns located wholly within the watershed.

**TABLE 2-1  
MISSISSINEWA RIVER COUNTY POPULATION PROJECTIONS 1990-2020\***

<b>County</b>	<b>1990</b>	<b>2000</b>	<b>2010</b>	<b>2020</b>	<b>Percent Change (1990 to 2020)</b>
Blackford County	14,067	14,003	13,977	13,961	-0.76
Delaware County	119,659	117,543	117,418	117,344	-1.97
Grant County	74,169	72,654	72,405	72,257	-2.65
Huntington County	35,427	38,208	39,822	40,783	13.13
Jay County	21,512	21,947	22,335	22,565	4.67
Madison County	130,669	132,533	133,584	134,210	2.64
Miami County	36,897	34,661	36,881	38,203	3.42
Randolph County	27,148	27,830	28,360	28,676	5.33
Wabash County	35,069	34,720	35,017	35,193	0.35

\* Source: Indiana Business Research Center, Indiana University Kelley School of Business  
1998 Preliminary Series - Indiana County Population Projections.  
Last Updated on 3/10/99 By IBRC Email: [ibrc@iupui.edu](mailto:ibrc@iupui.edu)

**TABLE 2-2  
MISSISSINEWA RIVER CITY AND TOWN POPULATION ESTIMATES\***

<b>City/Town</b>	<b>Census 1990</b>	<b>Estimate 1996</b>	<b>Percent Change (1990 to 1996)</b>
Albany	2,357	2,264	-6.3
Converse	1,144	1,114	-4
Dunkirk	2,739	2,746	-0.8
Eaton	1,614	1,603	-4
Fairmount	3,130	3,285	2.8
Fowlerton	306	345	12.7
Gas City	6,296	5,782	-8.9
Gaston	979	952	-3.2
Hartford City	6,960	6,809	-2.1
Jonesboro	2,073	2,078	2.8
La Fontaine	909	902	-3.2
Marion	32,618	30,046	-9.1
Matthews	571	535	-7
Redkey	1,383	1,393	0.7
Ridgeville	808	792	-0.6
Saratoga	266	263	-1.1
Shadeland	1,674	1,857	22.3
Union City	3,612	3,666	-0.2
Upland	3,295	3,522	3.3

\* IBRC 1997

## 2.3 Agricultural Activities in the Mississinewa River Watershed

Agriculture is the dominant land use in the Mississinewa River Watershed. Section 2.2.1 shows that 88 percent of land cover in the watershed is agricultural vegetation. This section provides an overview of the agricultural activities in the watershed.

### 2.3.1 Livestock Operations

Livestock production within the watershed encompasses several species, and the overall composition changes from county to county. Hogs and cattle are produced in almost every county, and Kosciusko County produces significant numbers of ducks, geese, and other poultry. See Table 2-3 for livestock inventory numbers. Some animals are raised in open lots or pastures and some are raised in confined feeding lots or buildings.

Confined feeding is the raising of animals for food, fur or recreation in lots, pens, ponds, sheds or buildings, where they are confined, fed and maintained for at least 45 days during any year, and where there is no ground cover or vegetation present over at least half of the animals' confinement area. Livestock markets and sale barns are generally excluded (IDEM 1999).

Indiana law defines a confined feeding operation as any livestock operation engaged in the confined feeding of at least 300 cattle, or 600 swine or sheep, or 30,000 fowl, such as chickens, ducks and other poultry. The IDEM regulates these confined feeding operations, as well as smaller livestock operations which have violated water pollution rules or laws, under IC 13-18-10.

As of October 1999, there were 525 livestock producers operating under the Confined Feeding Rules in the nine counties of the watershed (IDEM 1999). Tables 2-3 show livestock numbers from the USDA Agricultural Census (USDA-NASS 1997) "inventory" animals in each county.

**TABLE 2-3  
LIVESTOCK IN THE MISSISSINEWA RIVER WATERSHED**

1997 Livestock Inventory*								
County	Hogs and pigs		Cattle and calves		Sheep and lamb		Layers 20 weeks and older	
	Number	State Rank**	Number	State Rank**	Number	State Rank**	Number	State Rank**
Blackford County	33,458	41	1,769	90	217	68	(D)	30
Delaware County	24,502	54	4,857	69	506	47	686	43
Grant County	27,858	45	4,728	70	390	53	(D)	27
Huntington County	36,854	37	7,070	56	652	35	65,334	25
Jay County	53,052	28	@	@	@	@	1,779,966	5
Madison County	26,111	48	6,485	60	785	28	479	50
Miami County	99,543	11	14,578	21	808	26	529	48
Randolph County	50,936	29	7,862	51	1,039	14	(D)	20
Wabash County	127,954	5	22,465	9	@	@	(D)	16

\* USDA-NASS 1997

@ indicates specie is not in the top 4 for this county

\*\* State Rank is out of a total of 92 counties in Indiana

D Numbers not disclosed by USDA-NASS

### 2.3.2 Crop Production

The soils of the Mississinewa River watershed are good for crop production. Table 2-4 lists the 1997 acres of the major crops produced in 1997 throughout the nine counties in the watershed. For 1997, total acres of soybeans for beans edged out total acres of corn for grain as the number one crop produced in the nine counties. Corn and soybeans are clearly the primary crops produced in the watershed on basis of total acres.

**TABLE 2-4  
CROPS PRODUCED IN THE MISSISSINEWA RIVER WATERSHED**

County	1997 Crops*							
	Corn for grain		Soybeans for beans		Wheat		Hay crops	
	Acres	State Rank**	Acres	State Rank**	Acres	State Rank**	Acres	State Rank**
Blackford County	28,065	75	38,889	64	3,207	66	1,402	89
Delaware County	63,858	46	77,999	21	4,404	45	3,602	70
Grant County	71,940	29	91,265	12	4,218	48	3,459	73
Huntington County	64,040	45	80,190	19	8,692	14	4,397	63
Jay County	55,697	57	69,516	33	7,218	21	6,780	35
Madison County	95,169	15	97,000	9	5,232	34	3,884	66
Miami County	73,862	28	76,551	23	5,706	32	7,456	31
Randolph County	78,429	25	96,447	10	9,422	11	4,631	59
Wabash County	69,202	37	65,519	35	8,460	16	5,553	47

\* USDA-NASS 1997

\*\* State Rank is out of a total of 92 counties in Indiana

@ indicates specie is not in the top 4 for this county

## 2.4 Significant Natural Areas in the Mississinewa River Watershed

In 1993, the Indiana Natural Resources Commission (NRC) adopted its "Outstanding Rivers" List for Indiana. This listing is referenced in the standards for utility line crossings within floodways, formerly governed by IC 14-28-2 and now controlled by 310 IAC 6-1-16 through 310 IAC 6-1-18. Except where incorporated into a statute or rule, the "Outstanding Rivers List" is intended to provide guidance rather than to have regulatory application (NRC 1997). To help identify the rivers and streams which have particular environmental or aesthetic interest, a special listing has been prepared by IDNR's Division of Outdoor Recreation. This listing is a corrected and



condensed version of a list compiled by American Rivers and dated October 1990. The NRC has adopted the IDNR listing as an official recognition of the resource values of these waters. A river included in the "Outstanding Rivers List" qualifies under one or more of 22 categories. Table 2-5 presents the rivers in the Mississinewa River watershed which are on the "Outstanding Rivers List" and their significance.

*State Parks, Forests, Nature Preserves, and Recreation Areas*

Table 2-6 lists a number of parks, forests, nature preserves and other recreational areas within the Mississinewa River Watershed.

**TABLE 2-5  
WATERS OF THE MISSISSINEWA RIVER WATERSHED ON THE  
OUTSTANDING RIVERS LIST FOR INDIANA \***

<b>River Segment</b>	<b>County</b>	<b>Significance</b>
Mississinewa River: Mississinewa Reservoir to confluence with Wabash River	Miami	17

**Significance of numbering system:**

- 17. Other Rivers. Miscellaneous rivers identified as having outstanding ecological, recreational, or scenic importance.

\*NRC 1997

**Table 2-6  
Special Areas in the Mississinewa River Watershed**

<b>County</b>	<b>Special Area</b>	<b>Manager</b>	<b>Access</b>
Delaware	Ginn Woods	Univ- Ball State University	Open
Grant	South Marion Park	Local- Marion Park Board	Open
Grant	Mississinewa Community Park	Local- Gas City Park Board	Open
Grant	Playacres Park	Local- Fairmount Park Board	Open
Miami	Frances Slocum State Forest	DNR Forestry	Open
Miami	Peoria (Omer Cole) Public Access Site	DNR Fish & Wildlife	Open
Miami	Mississinewa Spillway	U.S. Army Corps Of Engineers (COE)	Restricted
Miami	Seven Pillars Of Mississinewa	Priv- Acres Inc.	Open
Miami/Wabash/Grant	Mississinewa Reservoir	COE, Leased To DNR Reservoirs	Open
Randolph	Phipps Woods	Univ- Ball State University	Open
Randolph	Davis-Purdue Forest	Univ- Purdue University	Open
Randolph	Harter Park	Local- Union City Park Board	Open
Wabash	Mississinewa Dam	U.S. Army Corps Of Engineers	Restricted

## 2.5 Surface Water Use Designations and Classifications

The following uses are designated by the Indiana Water Pollution Control Board (327 IAC 2-1-3):

- ◆ Surface waters of the state are designated for full-body contact recreation during the recreational season (April through October).
- ◆ All waters, except limited use waters, will be capable of supporting a well-balanced, warm water aquatic community.
- ◆ All waters, which are used for public or industrial water supply, must meet the standards for those uses at the point where water is withdrawn.
- ◆ All waters, which are used for agricultural purposes, must meet minimum surface water quality standards.
- ◆ All waters in which naturally poor physical characteristics (including lack of sufficient flow), naturally poor or reversible man-induced conditions, which came into existence prior to January 1, 1983, and having been established by use attainability analysis, public comment period, and hearing may qualify to be classified for limited use and must be evaluated for restoration and upgrading at each triennial review of this rule.
- ◆ All waters, which provide unusual aquatic habitat, which are an integral feature of an area of exceptional natural beauty or character, or which support unique assemblages of aquatic organisms may be classified for exceptional use.

All waters of the state, at all times and at all places, including the mixing zone, shall meet the minimum conditions of being free from substances, materials, floating debris, oil, or scum attributable to municipal, industrial, agricultural, and other land use practices, or other discharges:

- ◆ that will settle to form putrescent or otherwise objectionable deposits,
- ◆ that are in amounts sufficient to be unsightly or deleterious,
- ◆ that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance,
- ◆ which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans, or
- ◆ which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such degree as to create a nuisance, be unsightly, or otherwise impair designated uses.

### 2.5.1 Surface Water Classifications in the Mississinewa River Watershed

The statewide classifications discussed in Section 2.5 apply to all stream segments in the Mississinewa River watershed with the exceptions of:

- Redkey Run and Halfway Creek in Jay County from the Redkey STP to two miles downstream, and
- Jefferson Ditch in Grant County from the Upland STP to its confluence with Lake Branch;

which are all designated for limited use.

## **2.6 US Geological Survey Water Use Information for the Mississinewa River Watershed**

The U.S. Geological Survey's (USGS) National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The USGS works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. USGS also compiles the data from hundreds of thousands of sites to produce water-use information aggregated up to the county, state, and national levels. Every five years, data at the state and hydrologic region level are compiled into a national water-use data system. Table 2-7 shows the USGS Water-Use information for the Mississinewa River Watershed for 1995.

**TABLE 2-7**  
**1995 Water Use Information for the Mississinewa River Watershed**

<b>Population and Water Use totals</b>	<b>1995</b>
Total population in the watershed (thousands)	103.47
<b>Public Water Supply</b>	
<b>1995</b>	
Population served by public groundwater supply (thousands)	64.82
Population served by surface water supply (thousands)	5.88
Total population served by public water supply (thousands)	70.7
Total groundwater withdrawals (mgd)	10.21
Total surface water withdrawals (mgd)	0
Total water withdrawals (mgd)	10.21
Total per capita withdrawal (gal/day)	144.41
Population self-supplied with water (thousands)	32.77
<b>Commercial Water Use</b>	
<b>1995</b>	
Groundwater withdrawal for commercial use (mgd)	0.14
Surface water withdrawal for commercial use (mgd)	0.06
Deliveries from public water supplies for commercial use (mgd)	0.49
Total commercial water use (mgd)	0.69
<b>Industrial Water Use</b>	
<b>1995</b>	
Groundwater withdrawal for industrial use (mgd)	1.1
Surface water withdrawals for industrial use (mgd)	2.32
Deliveries from public water suppliers for industrial use (mgd)	1.71
Total industrial water use (mgd)	5.13
<b>Agricultural Water Use</b>	
<b>1995</b>	
Groundwater withdrawals for livestock use (mgd)	0.58
Surface water withdrawals for livestock use (mgd)	0.24
Total livestock water use (mgd)	0.82
Groundwater withdrawals for irrigation (mgd)	0.01
Surface water withdrawals for irrigation (mgd)	0.01
Total irrigation water use (mgd)	0.02

**Notes:**

mgd     million gallon per day  
gal/day     gallon per day

- The water-use information presented in this table was compiled from information provided in the U.S. Geological Survey's National Water-Use Information Program data system for 1990 and 1995. The National Water-Use Information Program is responsible for compiling and disseminating the nation's water-use data. The U.S. Geological Survey works in cooperation with local, State, and Federal environmental agencies to collect water-use information at a site-specific level. Every five years, the U.S. Geological Survey compiles data at the state and hydrologic region level into a national water-use data system and are published in a national circular.

### 3 Causes and Sources of Water Pollution

A number of substances including nutrients, bacteria, oxygen-demanding wastes, metals, and toxic substances, cause water pollution. Sources of these pollution-causing substances are divided into two broad categories: point sources and nonpoint sources. Point sources are typically piped discharges from wastewater treatment plants, large urban and industrial stormwater systems, and other facilities. Nonpoint sources can include atmospheric deposition, groundwater inputs, and runoff from urban areas, agricultural lands and others. Chapter 3 includes the following:

- Section 3.1 Causes of Pollution
- Section 3.2 Point Sources of Pollution
- Section 3.3 Nonpoint Sources of Pollution

#### 3.1 Causes of Pollution

'Causes of pollution' refer to the substances which enter surface waters from point and nonpoint sources and result in water quality degradation and impairment. Major causes of water quality impairment include biochemical oxygen demand (BOD), nutrients, toxicants (such as heavy metals, polychlorinated biphenyls [PCBs], chlorine, pH and ammonia) and E. coli bacteria. Table 3-1 provides a general overview of causes of impairment and the activities that may lead to their introduction into surface waters. Each of these causes is discussed in the following sections.

**TABLE 3-1  
CAUSES OF WATER POLLUTION AND CONTRIBUTING ACTIVITIES**

Cause	Activity associated with cause
<b>Nutrients</b>	Fertilizer on agricultural crops and residential/ commercial lawns, animal wastes, leaky sewers and septic tanks, direct septic discharge, atmospheric deposition, wastewater treatment plants
<b>Toxic Chemicals</b>	Pesticide applications, disinfectants, automobile fluids, accidental spills, illegal dumping, urban stormwater runoff, direct septic discharge, industrial effluent
<b>Oxygen-Consuming Substances</b>	Wastewater effluent, leaking sewers and septic tanks, direct septic discharge, animal waste
<b>E. coli</b>	Failing septic systems, direct septic discharge, animal waste (including runoff from livestock operations and impacts from wildlife), improperly disinfected wastewater treatment plant effluent

### 3.1.1 *E. coli* Bacteria

*E. coli* bacteria are associated with the intestinal tract of warm-blooded animals. They are widely used as an indicator of the potential presence of waterborne disease-causing (pathogenic) bacteria, protozoa, and viruses because they are easier and less costly to detect than the actual pathogenic organisms. The presence of waterborne disease-causing organisms can lead to outbreaks of such diseases as typhoid fever, dysentery, cholera, and cryptosporidiosis. The detection and identification of specific bacteria, viruses, and protozoa, (such as *Giardia*, *Cryptosporidium*, and *Shigella*) require special sampling protocols and very sophisticated laboratory techniques which are not commonly available.

*E. coli* water quality standards have been established in order to ensure safe use of waters for water supplies and recreation. 327 IAC 2-1-6 Section 6(d) states that *E. coli* bacteria, using membrane filter count (MF), shall not exceed 125 per 100 milliliters as a geometric mean based on not less than five samples equally spaced over a 30 day period nor exceed 235 per 100 milliliters in any one sample in a 30 day period.

*E. coli* bacteria may enter surface waters from nonpoint source runoff, but they also come from improperly treated discharges of domestic wastewater. Common potential sources of *E. coli* bacteria include leaking or failing septic systems, direct septic discharge, leaking sewer lines or pump station overflows, runoff from livestock operations, urban stormwater and wildlife. *E. coli* bacteria in treatment plant effluent are controlled through disinfection methods including chlorination (often followed by dechlorination), ozonation or ultraviolet light radiation.

### 3.1.2 Toxic Substances

327 IAC 2-1-9(45) defines toxic substances as substances, which are or may become harmful to plant or animal life, or to food chains when present in sufficient concentrations or combinations. Toxic substances include, but are not limited to, those pollutants identified as toxic under Section 307 (a)(1) of the Clean Water Act. Standards for individual toxic substances are listed 327 IAC 2-1-6. Toxic substances frequently encountered include chlorine, ammonia, organics (hydrocarbons and pesticides) heavy metals and pH. These materials are toxic to different organisms in varying amounts, and the effects may be evident immediately or may only be manifested after long-term exposure or accumulation in living tissue.

Whole effluent toxicity testing is required for major NPDES dischargers (discharge over 1 million gallons per day or population greater than 10,000). This test shows whether the effluent from a treatment plant is toxic, but it does not identify the specific cause of toxicity. If the effluent is found to be toxic, further testing is done to determine the specific cause. This follow-up testing is called a toxicity reduction evaluation. Other testing, or monitoring, done to detect aquatic toxicity problems include fish tissue analyses, chemical water quality sampling and assessment of fish community and bottom-dwelling organisms such as aquatic insect larvae. These monitoring programs are discussed in Chapter 4.

Each of the substances below can be toxic in sufficient quantity or concentration.

#### Metals

Municipal and industrial dischargers and urban runoff are the main sources of metal contamination in surface water. Indiana has stream standards for many heavy metals, but the

most common ones in municipal permits are cadmium, chromium, copper, nickel, lead, mercury, and zinc. Standards are listed in 327 IAC 2-1-6. Point source discharges of metals are controlled through the National Pollution Discharge Elimination System (NPDES) permit process. Mass balance models are employed to determine allowable concentrations for a permit limit. Municipalities with significant industrial users discharging wastes to their treatment facilities limit the heavy metals from these industries through a pretreatment program. Source reduction and wastewater recycling at waste water treatment plants (WWTP) also reduces the amount of metals being discharged to a stream. Nonpoint sources of pollution are controlled through best management practices.

In Indiana, as well as many other areas of the country, mercury contamination in fish has caused the need to post widespread fish consumption advisories. The source of the mercury is unclear; however, atmospheric sources are suspected and are currently being studied.

#### Polychlorinated biphenyls (PCBs)

Polychlorinated biphenyls (PCBs) were first created in 1881 and subsequently began to be commercially manufactured around 1929 (Bunce 1994). Because of their fire-resistant and insulating properties, PCBs were widely used in transformers, capacitors, and in hydraulic and heat transfer systems. In addition, PCBs were used in products such as plasticizers, rubber, ink, and wax. In 1966, PCBs were first detected in wildlife, and were soon found to be ubiquitous in the environment (Bunce 1994). PCBs entered the environment through unregulated disposal of products such as waste oils, transformers, capacitors, sealants, paints, and carbonless copy paper. In 1977, production of PCBs in North America was halted. Subsequently, the PCB contamination present in our surface waters and environment today is the result of historical waste disposal practices.

#### Ammonia (NH<sub>3</sub>)

Point source dischargers are one of the major sources of ammonia. In addition, discharge of untreated septic effluent, decaying organisms which may come from nonpoint source runoff and bacterial decomposition of animal waste also contribute to the level of ammonia in a waterbody. Standards for ammonia are listed in 327 IAC 2-1-6.

### *3.1.3 Oxygen-Consuming Wastes*

Oxygen-consuming wastes include decomposing organic matter or chemicals, which reduce dissolved oxygen in water through chemical reactions. Raw domestic wastewater contains high concentrations of oxygen-consuming wastes that need to be removed from the wastewater before it can be discharged into a waterway. Maintaining a sufficient level of dissolved oxygen in the water is critical to most forms of aquatic life.

The concentration of dissolved oxygen in a water body is one indicator of the general health of an aquatic ecosystem. 327 IAC Section 6 (b)(3) states that concentrations of dissolved oxygen shall average at least five milligrams per liter per calendar day and shall not be less than four milligrams per liter at any time. Dissolved oxygen concentrations are affected by a number of factors. Higher dissolved oxygen is produced by turbulent actions, such as waves, which mix air and water. Lower water temperatures also generally allows for retention of higher dissolved oxygen concentrations. Low dissolved oxygen levels tend to occur more often in warmer,

slow-moving waters. In general, the lowest dissolved oxygen concentrations occur during the warmest summer months and particularly during low flow periods.

Sources of dissolved oxygen depletion include wastewater treatment plant effluent, the decomposition of organic matter (such as leaves, dead plants and animals) and organic waste matter that is washed or discharged into the water. Sewage from human and household wastes is high in organic waste matter. Bacterial decomposition can rapidly deplete dissolved oxygen levels unless these wastes are adequately treated at a wastewater treatment plant. In addition, excess nutrients in a water body may lead to an over-abundance of algae and reduce dissolved oxygen in the water through algal respiration and decomposition of dead algae. Also, some chemicals may react with and bind up dissolved oxygen. Industrial discharges with oxygen consuming wasteflow may be resilient instream and continue to use oxygen for a long distance downstream.

#### *3.1.4 Nutrients*

The term “nutrients” in this Strategy refers to two major plant nutrients, phosphorus and nitrogen. These are common components of fertilizers, animal and human wastes, vegetation, and some industrial processes. Nutrients in surface waters come from both point and nonpoint sources. Nutrients are beneficial to aquatic life in small amounts. However, in over-abundance and under favorable conditions, they can stimulate the occurrence of algal blooms and excessive plant growth in quiet waters or low flow conditions. The algal blooms and excessive plant growth often reduce the dissolved oxygen content of surface waters through plant respiration and decomposition of dead algae and other plants. This is accentuated in hot weather and low flow conditions because of the reduced capacity of the water to retain dissolved oxygen.

### **3.2 Point Sources of Pollution**

As discussed previously, sources of water pollution are divided into two broad categories: point sources and nonpoint sources. This section focuses on point sources. Section 3.3.1 defines point sources and Section 3.3.2 discusses point sources in the Mississinewa River Watershed.

#### *3.2.1 Defining Point Sources*

Point sources refer to discharges that enter surface waters through a pipe, ditch or other well-defined point of discharge. The term applies to wastewater and stormwater discharges from a variety of sources. Wastewater point source discharges include municipal (city and county) and industrial wastewater treatment plants and small domestic wastewater treatment systems that may serve schools, commercial offices, residential subdivisions and individual homes. Stormwater point source discharges include stormwater collection systems for medium and large municipalities which serve populations greater than 100,000 and stormwater discharges associated with industrial activity as defined in the Code of Federal Regulations (40 CFR 122.26(a)(14)). The primary pollutants associated with point source discharges are Oxygen demanding wastes, nutrients, sediment, color and toxic substances including chlorine, ammonia and metals.



Point source dischargers in Indiana must apply for and obtain a National Pollutant Discharge Elimination System (NPDES) permit from the state. Discharge permits are issued under the NPDES program, which is delegated to Indiana by the US Environmental Protection Agency (EPA). See Chapter 5 for a description of the NPDES program and permitting strategies.

### 3.2.2 Point Source Discharges in the Mississinewa River Watershed

As of June 1999, there were 63 active NPDES permits within the Mississinewa River watershed (Table 3-2, Figure 3-1). Five of the 63 active NPDES permits are for major discharges (see Table 5-1 for a definition of a major discharge).

Another point source covered by NPDES permits is combined sewer overflows (CSO). A combined sewer system is a wastewater collection system that conveys sanitary wastewater (domestic, commercial and industrial wastewater) and stormwater through a single-pipe system to a Publicly Owned Treatment Works. A CSO is the discharge from a combined sewer system at a point prior to the Publicly Owned Treatment Works. CSOs are point sources subject to NPDES permit requirements including both technology-based and water quality-based requirements of the Clean Water Act.

<u>Community</u>	<u>CSO Outfalls</u>
Eaton	2
Fairmount	16
Hartford City	17
Marion	9
Redkey	6
Ridgeville	3

In addition to the NPDES permitted dischargers in the watershed, there may be many unpermitted, illegal discharges to the Mississinewa River system. Illegal discharges of residential wastewater (septic tank effluent) to streams and ditches from straight pipe discharges and old inadequate systems are a problem within the watershed.

**Table 3-2  
NPDES PERMITTED FACILITIES  
MISSISSINEWA RIVER WATERSHED**

<b>NPDES</b>	<b>Facility Name</b>	<b>Maj/Mi</b>	<b>City</b>	<b>County</b>	<b>Status</b>
ING080021	MARSH VILLAGE PANTRY #505	MINOR	ALBANY,	DELAWARE	INACTIVE
ING080024	AMOCO OIL COMPANY, ST.	MINOR	MARION	GRANT	INACTIVE
ING080037	AMOCO OIL COMPANY, ST.	MINOR	MARION	GRANT	INACTIVE
ING250017	SAINT-GOBAIN CONTAINERS,	MINOR	DUNKIRK	JAY	ACTIVE
ING250047	CAMBRIDGE INDUSTRIES, INC.	MINOR	GRABILL	ALLEN	ACTIVE
ING490015	IMI/GAS CITY SAND & GRAVEL	MINOR	MARION	GRANT	ACTIVE
ING490050	MESHBERGER BROS. STONE,	MINOR	RIDGEVILLE	RANDOLPH	ACTIVE
ING490051	MESHBERGER BROS. STONE,	MINOR	RIDGEVILLE	RANDOLPH	ACTIVE
ING490054	NAVILLUS AGGREGATES LLC	MINOR	GAS CITY	GRANT	INACTIVE
ING670003	INDIANA GAS CO., PROJECT #1	MINOR	MARION.	GRANT	INACTIVE
ING670004	INDIANA GAS CO., PROJECT #2	MINOR	VAN BUREN	GRANT	INACTIVE
INL020001	RIDGEVILLE MUNICIPAL STP	MINOR		RANDOLPH	ACTIVE
INL020982	UNION CITY MUNICIPAL STP	MINOR		RANDOLPH	ACTIVE
INL021105	FAIRMOUNT MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL021491	DUNKIRK MUNICIPAL STP	MINOR		JAY	ACTIVE
INL021628	HARTFORD CITY MUNICIPAL	MINOR		BLACKFORD	ACTIVE
INL021652	EATON MUNICIPAL STP	MINOR		DELAWARE	ACTIVE
INL022136	ALBANY MUNICIPAL STP	MINOR		DELAWARE	ACTIVE
INL022985	GAS CITY MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL024406	REDKEY MUNICIPAL STP	MINOR		JAY	ACTIVE
INL025585	MARION MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL030643	MADISON-GRANT HIGH	MINOR		GRANT	ACTIVE
INL031372	EASTBROOK HIGH SCHOOL	MINOR		GRANT	ACTIVE
INL036978	UPLAND MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL036994	JONESBORO MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL040321	MATTHEWS MUNICIPAL STP	MINOR		GRANT	ACTIVE
INL049832	SHAMROCK LAKES MUNICIPAL	MINOR		BLACKFORD	ACTIVE
INP000020	UNION CITY BODY COMPANY,	MINOR	UNION CITY	RANDOLPH	INACTIVE
INP000021	UNION CITY BODY COMPANY,	MINOR	UNION CITY	RANDOLPH	ACTIVE
INP000036	LEAR CORP. AUTOMOTIVE	MINOR	UNION CITY	RANDOLPH	ACTIVE
INP000051	CBS CORPORATION	MINOR	UNION CITY	RANDOLPH	ACTIVE
INP000082	HARTFORD CITY PAPER LLC.	MINOR	HARTFORD	BLACKFORD	ACTIVE
INP000085	NEKOOSA PACKAGING	MINOR		GRANT	INACTIVE
INP000100	AMCAST AUTOMOTIVE	MINOR	GAS CITY	GRANT	ACTIVE
INP000144	KEY PLASTICS, INC.	MINOR	HARTFORD	BLACKFORD	ACTIVE
INP000201	SAINT-GOBAIN CONTAINERS,	MINOR	DUNKIRK	JAY	ACTIVE
INU000415	BLACKFORD COUNTY JAIL	MINOR		BLACKFORD	ACTIVE
IN0001961	SAINT-GOBAIN CONTAINERS,	MINOR	MARION	GRANT	ACTIVE
IN0002038	UNION CITY BODY COMPANY,	MINOR	UNION CITY	RANDOLPH	INACTIVE
IN0002321	THREE M (3M) CORPORATION	MINOR	HARTFORD	BLACKFORD	ACTIVE
IN0002372	BICC GENERAL CABLE	MINOR	MARION	GRANT	ACTIVE
IN0002496	HARTFORD PACKING	MINOR	HARTFORD	BLACKFORD	ACTIVE
IN0002569	IRVING BROTHERS GRAVEL	MINOR		DELAWARE	INACTIVE
IN0002674	IRVING BROTHERS GRAVEL	MINOR	MARION,	GRANT	INACTIVE
IN0003051	OWENS-ILLINOIS GLASS,	MINOR		GRANT	INACTIVE
IN0003107	UNITED TECH. AUTOMOTIVE,	MINOR	UNION CITY	RANDOLPH	INACTIVE
IN0003212	IND CITIES WATER-SOMERSET	MINOR		WABASH	INACTIVE

Table 3-2 (Continued)

NPDES	Facility Name	Maj/Min	City	County	Status
IN0003450	THOMSON CONSUMER ELECTRONICS,	MINOR	MARION	GRANT	ACTIVE
IN0003735	ACTIVE PRODUCTS CORP.	MINOR		GRANT	INACTIVE
IN0004162	MCCORMICK BROTHER CORP	MINOR		DELAWARE	INACTIVE
IN0004928	BLACKFORD COUNTY CANNING CO.	MINOR	HARTFORD CIT	BLACKFORD	INACTIVE
IN0004944	EATON FOODS	MINOR	EATON	DELAWARE	INACTIVE
IN0005002	ROCK-TENN COMPANY, MILL DIV.	MINOR	EATON	DELAWARE	ACTIVE
IN0020001	RIDGEVILLE MUNICIPAL STP	MINOR	RIDGEVILLE	RANDOLPH	ACTIVE
IN0020371	LAFONTAINE MUNICIPAL STP	MINOR	LAFONTAINE	WABASH	ACTIVE
IN0020982	UNION CITY MUNICIPAL STP	MAJOR	UNION CITY	RANDOLPH	ACTIVE
IN0021105	FAIRMOUNT MUNICIPAL STP	MINOR	FAIRMOUNT	GRANT	ACTIVE
IN0021491	DUNKIRK MUNICIPAL STP	MINOR	DUNKIRK	JAY	ACTIVE
IN0021610	HARTFORD CITY - EAST	MINOR		BLACKFORD	INACTIVE
IN0021628	HARTFORD CITY MUNICIPAL STP	MAJOR	HARTFORD CIT	BLACKFORD	ACTIVE
IN0021652	EATON MUNICIPAL STP	MINOR	EATON	DELAWARE	ACTIVE
IN0022136	ALBANY MUNICIPAL STP	MINOR	ALBANY	DELAWARE	ACTIVE
IN0022985	GAS CITY MUNICIPAL STP	MAJOR	GAS CITY	GRANT	ACTIVE
IN0024228	IDNR	MINOR		MIAMI	INACTIVE
IN0024236	IDNR	MINOR		MIAMI	INACTIVE
IN0024279	MIAMI STATE RECREATIONAL AREA	MINOR	PERU	MIAMI	ACTIVE
IN0024309	PEORIA FISHING SITE,MISSISSINE	MINOR	PERU	MIAMI	ACTIVE
IN0024406	REDKEY MUNICIPAL STP	MINOR	REDKEY	JAY	ACTIVE
IN0024651	UPLAND WWTP	MINOR		GRANT	INACTIVE
IN0024929	EATON FOODS INC	MINOR		DELAWARE	INACTIVE
IN0025062	SHELLER-GLOBE CORP-HARDY DIV	MINOR		RANDOLPH	INACTIVE
IN0025585	MARION MUNICIPAL STP	MAJOR	MARION	GRANT	ACTIVE
IN0029769	RIDGEVILLE WATER WORKS	MINOR		RANDOLPH	INACTIVE
IN0029785	MESHBERGER BROS. STONE, PLT #4	MINOR	RIDGEVILLE	RANDOLPH	INACTIVE
IN0029815	SOMERSET SUBDIVISION	MINOR	SOMERSET	WABASH	ACTIVE
IN0030015	LAKE PLACID CONFERENCE CENTER	MINOR	HARTFORD CIT	BLACKFORD	ACTIVE
IN0030112	MISSISSINEWA RESERVOIR	MINOR		MIAMI	INACTIVE
IN0030121	MISSISSINEWA RESERVOIR	MINOR		MIAMI	INACTIVE
IN0030198	MISSISSINEWA RESERVOIR-MIAMI S	MINOR		MIAMI	INACTIVE
IN0030210	MISSISSINEWA RESERVOIR-RED BRI	MINOR		MIAMI	INACTIVE
IN0030414	MISSISSINEWA RESERVOIR-SLOCUM	MINOR		MIAMI	INACTIVE
IN0030422	MISSISSINEWA RESERVOIR-PERSON	MINOR		MIAMI	INACTIVE
IN0030643	MADISON-GRANT HIGH SCHOOL	MINOR	FAIRMOUNT	GRANT	ACTIVE
IN0031372	EASTBROOK HIGH SCHOOL	MINOR	MARION	GRANT	ACTIVE
IN0032948	INDIANA MICHIGAN POWER, DEER C	MINOR	MARION,	GRANT	ACTIVE
IN0035602	MESHBERGER BROS. STONE, PLT #5	MINOR	FAIRVIEW,	RANDOLPH	INACTIVE
IN0035858	SHADY BROOM MOBILE HOME PARK	MINOR		GRANT	INACTIVE
IN0036242	OWENS-ILLINOIS INC	MINOR		JAY	INACTIVE
IN0036641	JONESBORO WTR WORKS	MINOR		GRANT	INACTIVE
IN0036978	UPLAND MUNICIPAL STP	MINOR	UPLAND	GRANT	ACTIVE
IN0036994	JONESBORO MUNICIPAL STP	MINOR	JONESBORO	GRANT	INACTIVE
IN0037982	MID-WEST FOOD PACKERS INC	MINOR		GRANT	INACTIVE
IN0038016	NEW MERIDIAN, INC.	MINOR	EATON,	DELAWARE	ACTIVE

Table 3-2 (Continued)

NPDES	Facility Name	Maj/Min	City	County	Status
IN0038148	CULLIGAN WATER CONDITIONING	MINOR		GRANT	INACTIVE
IN0038610	DEERWOOD COURT MHP	MINOR		GRANT	INACTIVE
IN0038962	COUNTY LINE MOBILE HOME PARK	MINOR	FAIRMOUNT	GRANT	ACTIVE
IN0039501	WHITE OAKS MOBILE HOME PARK	MINOR	MARION	GRANT	INACTIVE
IN0040321	MATTHEWS MUNICIPAL STP	MINOR	MATTHEWS	GRANT	ACTIVE
IN0041173	FAIRVIEW ACRES MHP	MINOR	ALBANY	RANDOLPH	ACTIVE
IN0041319	MARION WATER TREATMENT PLANT	MINOR	MARION	GRANT	ACTIVE
IN0041521	FAIRMOUNT TOWN OF	MINOR		GRANT	INACTIVE
IN0042048	SHADY BROOK MOBILE HOME PARK	MINOR		GRANT	INACTIVE
IN0042323	IDNR FRANCIS SLOCUM REC. AREA	MINOR		WABASH	INACTIVE
IN0042340	MORGAN PACKING CO INC	MINOR		JAY	INACTIVE
IN0042544	UNION CITY WATER TREATMENT PLA	MINOR	UNION CITY	RANDOLPH	INACTIVE
IN0042552	UNION CITY SOUTH SIDE WTR TRMT	MINOR	UNION CITY	RANDOLPH	INACTIVE
IN0042803	ALBANY PUBLIC WATER SUPPLY	MINOR		DELAWARE	INACTIVE
IN0042994	JONESBORO CITY OF	MINOR		GRANT	INACTIVE
IN0043494	RIDGEVILLE WTR UTL	MINOR	RIDGEVILLE	RANDOLPH	INACTIVE
IN0043567	COLONIAL CREST APTS	MINOR		GRANT	INACTIVE
IN0044423	FOREST RIDGE ESTATES WWTP	MINOR	MARION	GRANT	ACTIVE
IN0044598	A. O. SMITH CORP.	MINOR		RANDOLPH	INACTIVE
IN0047554	N.E.I. NAZARENE CAMPGROUND	MINOR	MARION	GRANT	INACTIVE
IN0048020	FOX PRAIRIE ENTERPRISES	MINOR		DELAWARE	INACTIVE
IN0048089	INDIANA GLASS COMPANY	MINOR	DUNKIRK	JAY	INACTIVE
IN0048267	DEERFIELD ELEMENTARY SCHOOL	MINOR	RIDGEVILLE	RANDOLPH	ACTIVE
IN0048348	UNIVERSAL HEAT EXCHANGER CO.	MINOR		BLACKFORD	INACTIVE
IN0048640	D & H MANUFACTURERS INC.	MAJOR	ALBANY	DELAWARE	INACTIVE
IN0049832	SHAMROCK LAKES MUNICIPAL STP	MINOR	HARTFORD CIT	BLACKFORD	ACTIVE
IN0051357	UNION CITY BODY CO., INC.	MINOR	UNION CITY	RANDOLPH	INACTIVE
IN0059889	LIBERTY ELEMENTARY SCHOOL	MINOR	FAIRMOUNT	GRANT	ACTIVE

### 3.3 Nonpoint Sources of Pollution

Nonpoint source pollution refers to runoff that enters surface waters through stormwater runoff, contaminated ground water, snowmelt or atmospheric deposition. There are many types of land use activities that can serve as sources of nonpoint source pollution including land development, construction, mining operations, crop production, animal feeding lots, timber harvesting, failing septic systems, landfills, roads and paved areas. Stormwater from large urban areas (greater than 100,000 people) and from certain industrial and construction sites is technically considered a point source since NPDES permits are required for discharges of stormwater from these areas.

Sediment and nutrients are major pollution causing substances associated with nonpoint source pollution. Others include *E. coli* bacteria, heavy metals, pesticides, oil and grease, and any other substance that may be washed off the ground or removed from the atmosphere and carried into surface waters. Unlike point source pollution, nonpoint pollution sources are diffuse in nature and occur at random time intervals depending on rainfall events. Below is a brief description of major areas of nonpoint sources of pollution in the Mississinewa River watershed.

#### 3.3.1 Agriculture

There are a number of activities associated with agriculture that can serve as potential sources of water pollution. Land clearing and tilling make soils susceptible to erosion, which can then cause stream sedimentation. Pesticides and fertilizers (including synthetic fertilizers and animal wastes) can be washed from fields or improperly designed storage or disposal sites. Construction of drainage ditches on poorly drained soils enhances the movement of oxygen consuming wastes, sediment and soluble nutrients into groundwater and surface waters.

Concentrated animal operations can be a significant source of nutrients, biochemical oxygen demand and *E. coli* bacteria if wastes are not properly managed. Impacts can result from over application of wastes to fields, from leaking lagoons and from flows of lagoon liquids to surface waters due to improper waste lagoon management. Also there are potential concerns associated with nitrate-nitrogen movement through the soil from poorly constructed lagoons and from wastes applied to the soil surface.

Grassed waterways, conservation tillage, and no-till practices are several common practices used by many farmers to minimize soil loss. Maintaining a vegetated buffer between fields and streams is another excellent way to minimize sediment and nutrient loads to streams.

#### 3.3.2 Urban/Residential

Runoff from urbanized areas, as a rule, is more localized and can often be more severe in magnitude than agricultural runoff. Any type of land-disturbing activity such as land clearing or excavation can result in soil loss and sedimentation. The rate and volume of runoff in urban areas is much greater due both to the high concentration of impervious surface areas and to storm drainage systems that rapidly transport stormwater to nearby surface waters. This increase in volume and rate of runoff can result in streambank erosion and sedimentation in surface waters.

Urban drainage systems, including curb and guttered roadways, also allow urban pollutants to reach surface waters quickly and with little or no filtering. Pollutants include lawn care pesticides and fertilizers; automobile fluids; lawn and household wastes; road salts, and E. coli bacteria (from animals and failing septic systems). The diversity of these pollutants makes it very challenging to attribute water quality degradation to any one pollutant.

Replacement of natural vegetation with pavement and removal of buffers reduces the ability of the watershed to filter pollutants before they enter surface waters. The chronic introduction of these pollutants and increased flow and velocity into a stream results in degraded waters. Many waters adjacent to urban areas are rated as biologically poor. This degradation also exists in lakes, which have been heavily influenced by adjacent urban development.

The population figures discussed in Section 2.3.2 are good indicators of where urban development and potential urban water quality impacts are likely to occur. Concentrated areas where urban development is high may lead to further water quality problems associated with the addition of impervious surfaces next to surface waters.

### 3.3.3 Onsite Wastewater Disposal

Septic systems contain all of the wastewater from a household or business. A complete septic system consists of a septic tank and an absorption field to receive effluent from the septic tank. The septic tank removes some wastes, but the soil absorption field provides further absorption and treatment. Septic systems can be a safe and effective method for treating wastewater if they are sized, sited, and maintained properly. However, if the tank or absorption field malfunction or are improperly placed, constructed or maintained, nearby wells and surface waters may become contaminated.

Some of the potential problems from malfunctioning septic systems include:

- Polluted groundwater: Pollutants in septic effluent include bacteria, nutrients, toxic substances, and oxygen-consuming wastes. Nearby wells can become contaminated by failing septic systems.
- Polluted surface water: Groundwater often carries the pollutants mentioned above into surface waters, where they can cause serious harm to aquatic ecosystems. Leaking septic tanks can also leak into surface waters through or over the soil. In addition, some septic tanks may directly discharge to surface waters.
- Risks to human health: Septic system malfunctions can endanger human health when they contaminate nearby wells, drinking water supplies, and fishing and swimming areas.

Pollutants associated with onsite wastewater disposal may also be discharged directly to surface waters through direct pipe connections between the septic system and surface waters (straight pipe discharge). However, 327 IAC 5-1-1.5 specifically states that "point source discharge of sewage treated or untreated, from a dwelling or its associated residential sewage disposal system, to the waters of the state is prohibited".

### *3.3.4 Construction*

Construction activities that involve excavation, grading or filling can produce significant sedimentation if not properly controlled. Sedimentation from developing urban areas can be a major source of pollution due to the cumulative number of acres disturbed in a watershed. Construction of single family homes in rural areas can also be a source of sedimentation when homes are placed in or near stream corridors.

As a pollution source, construction activities are typically temporary, but the impacts on water quality can be severe and long lasting. Construction activities tend to be concentrated in the more rapidly developing areas of the watershed.

## 4. Water Quality and Use Support Ratings in the Mississinewa River Watershed

This section provides a detailed overview of water quality monitoring, water quality, and use support ratings in the Mississinewa River watershed and includes the following:

- Section 4.1 Water Quality Monitoring Programs
- Section 4.2 Summary of Ambient Monitoring Data for the Mississinewa River Watershed
- Section 4.3 Fish Consumption Advisories
- Section 4.4 Clean Water Act Section 305(b) Report
- Section 4.5 Clean Water Act Section 305(b) Assessment and Use-Support: Methodology
- Section 4.6 Summary of Other Monitoring Efforts

### 4.1 Water Quality Monitoring Programs

This section discusses water quality monitoring programs. Specifically, Section 4.1.1 describes IDEM's Office of Water Management monitoring programs and Section 4.1.2 discusses other monitoring efforts in the watershed.

#### 4.1.1 Office of Water Management Programs

The Water Quality Assessment Branch of the Office of Water Management is responsible for assessing the quality of water in Indiana's lakes, rivers and streams. This assessment is performed by field staff from the Survey Section and the Biological Studies Section. Virtually every element of IDEM's surface water quality management program of IDEM is directly or indirectly related to activities currently carried out by this Branch. The biological and surface water monitoring activities identify stream reaches, watersheds or segments where physical, chemical and/or biological quality has been or would be impaired by either point or nonpoint sources. This information is used to help allocate waste loads equitably among various sources in a way that would ensure that water quality standards are met along stream reaches in each of the nearly 100 stream segments in Indiana.

The purpose of the Surveys Section is to provide the water quality and hydrological data required for the assessment of Indiana's waters by conducting Watershed/Basin Surveys and Stream Reach Surveys. In 1996, the Section began a five-year synoptic study (Basin Monitoring Strategy) of the State's ten major watersheds. Information from these studies will be integrated with data from biological and nonpoint source studies as well as the Fixed Station Monitoring Program to make a major assessment of the State's waters. Such surveys determine the extent to which water quality standards are being met and whether the fishable, swimmable and water supply uses are being maintained.

Information derived from this strategy will contribute significantly to improved planning processes throughout the Office of Water Management. This plan should initiate the development of interrelated action plans, which encompass the wide range of responsibilities,



such as rule making, permitting, compliance, nonpoint source issues, and wastewater treatment facility oversight.

The Biological Studies Section conducts studies of fish and macroinvertebrate communities as well as stream habitats to establish biological conditions to which other streams may be compared in order to identify impaired streams or watersheds. The Biological Studies Section also conducts fish tissue and sediment sampling to pinpoint sources of toxic and bioconcentrating substances. Fish tissue data serve as the basis for fish consumption advisories, which are issued, through the Indiana State Department of Health, to protect the health of Indiana citizens. This Section also participates in the development of site-specific water quality standards.

The Biological Studies Section relies on the Volunteer Water Quality Monitoring Programs to provide additional data on lakes and wetlands that may not be sampling sites in the Monitoring Strategy. Volunteer collected data provides IDEM scientists with an overall view of water quality trends and early warning of problems that may be occurring in a lake or wetland. If volunteers detect that a lake or wetland is severely degraded, professional IDEM scientists will conduct follow up investigation.

#### **4.2 Summary of Ambient Monitoring Data for the Mississinewa River Watershed**

The fixed station-monitoring program managed by IDEM's Office of Water Management has been monitoring surface water chemistry throughout the state since 1957. The data set from 1986 to 1995 was analyzed using the Seasonal Kendall test. This test deduces if a statistical change in the surface water chemistry occurred over a time period. The results of the Seasonal Kendall analysis for stations located in the Mississinewa River watershed are provided in Table 4-1. The data collected from 1991 to 1997 from this monitoring program was also analyzed to determine benchmark characteristics. The results of the benchmark characteristic analysis for stations located in the Mississinewa River watershed are provided in Appendix B. For a more in depth discussion of this analysis, please refer to the Indiana Fixed Station Statistical Analysis 1997 (IDEM 32/02/005/1998), published in May 1998 by the Assessment Branch of the Office of Water Management - IDEM.

**TABLE 4-1  
RESULTS OF SEASONAL KENDALL ANALYSIS FOR STATIONS LOCATED  
IN THE MISSISSINEWA RIVER WATERSHED 1986 TO 1995**

<b>Parameter</b>	<b>MS-1 Mississinewa River State Highway 124 East of Peru</b>	<b>MS-28 Mississinewa River C.R. 500N Bridge, East of Jalapa</b>	<b>MS-36 Mississinewa River Highland Avenue Marion</b>	<b>MS-99 Mississinewa River C.R. 134E Deerfield</b>
Biological Oxygen Demand	↓	«	«	«
Chemical Oxygen Demand	?	«	«	↓
Dissolved Oxygen	«	«	«	↗
E. coli	«	«	«	«
Ammonia	«	«	«	«
Nitrite + Nitrate	«	«	«	«
Total phosphorus	«	↘	«	↓
Total Residue	«	↗	↓	↘
Total Residue, Filterable	?	?	?	?
Total Residue, Nonfilterable	«	↘	↘	↘

## Notes

- « No Statistical Change; significance < 80% or reported slope = 0.00000
- ↓ Statistically Decreasing; significance >95% with a negative slope
- ↘ Potentially Decreasing; significance >80% with a negative slope
- ↗ Potentially Increasing; significance >80% with a positive slope
- ↑ Statistically Increasing; significance >95 % with a positive slope
- ? Insufficient Data for analysis

### 4.3 Fish Consumption Advisories

Since 1972, the Indiana Department of Natural Resources, the IDEM, and the Indiana State Department of Health (ISDH) have worked together to create the Indiana Fish Consumption Advisory. Each year members from these three agencies meet to discuss the findings of recent fish monitoring data and to develop the new statewide fish consumption advisory.

The 2000 advisory is based on levels of PCBs and mercury found in fish tissue. Fish are tested regularly only in areas where there is suspected contamination. In each area, samples were taken of bottom-feeding fish, top-feeding fish, and fish feeding in between. Over 1,600 fish tissue samples collected throughout the state were analyzed for PCBs, pesticides, and heavy metals. Of those samples, 99 percent contained mercury. Criteria for placing fish Indiana Fish Consumption Advisory have changed from using the Food and Drug Administration guidelines to using the Great Lakes Task Force risk-based approach.

The ISDH defines the Advisory Groups as follows:

<b>Group 1</b>	Unrestricted consumption
<b>Group 2</b>	One meal per week (52 meals per year) for adult males and females. One meal per month for women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15.
<b>Group 3</b>	One meal per month (12 meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat.
<b>Group 4</b>	One meal every two months (six meals per year) for adult males and females. Women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15 do not eat.
<b>Group 5</b>	No consumption (DO NOT EAT)

Carp generally are contaminated with both PCBs and mercury. Except as otherwise noted, carp in all Indiana rivers and streams fall under the following risk groups:

- Carp, 15-20 inches - Group 3
- Carp, 20-25 inches - Group 4
- Carp over 25 inches - Group 5

In the Mississinewa River Watershed, the following waterbodies are under the 2000 fish consumption advisory:

Waterbody/County	Species	Size	Contaminant	Group	
<b>Little Mississinewa River Randolph</b>	<b>ALL SPECIES</b>	<b>ALL</b>	<b>PCB/Mercury</b>	<b>5</b>	
<b>Mississinewa River Randolph</b>	Carp	>17"	PCB	5	
	Channel catfish	>15"	PCB	5	
	Green sunfish	>3"	PCB	5	
	Longear sunfish	3-5"	PCB	3	
		>5"	PCB	4	
	White crappie	8-10"	PCB	3	
		>10"	PCB	4	
	<b>Delaware</b>	Bluegill	>6"	PCB	2
		Green sunfish	4-6"	PCB	2
			>6"	PCB	3
		Rock bass	6-7"	PCB/Mercury	2
	<b>Grant</b>		>7"	PCB/Mercury	3
		Channel catfish	11-13"	PCB/Mercury	2
			>13"	PCB/Mercury	3
		Largemouth bass	8-11"	PCB	2
			>11"	PCB	3
		White crappie	8-11"	Mercury	2
	<b>Miami</b>		>11"	Mercury	3
		Carp	14-19"	PCB	3
Carp		19-20"	PCB	2	
<b>Mississinewa Reservoir Miami</b>	Largemouth bass	11-16"	PCB	2	
		>16"	PCB	3	
	Channel catfish	17-18"	PCB	3	
		>18"	PCB	4	

#### 4.4 Clean Water Act Section 305(b) Report

Section 305(b) of the Clean Water Act requires states to prepare and submit to the EPA a water quality assessment report of state water resources. A new surface water monitoring strategy for the Office of Water Management was implemented in 1996 with the goal of monitoring all waters of the state by 2001 and reporting the assessments by 2003. Each year approximately 20 percent of the waterbodies in the state will be assessed and reported the following year. Appendix C contains the listing of the Mississinewa River watershed waterbodies assessed, status of designated use support, probable causes of impairment, and stream miles affected. The methodologies of the Clean Water Act Section 305(b) assessment and use support ratings are discussed in Section 4.5.

#### 4.5 Clean Water Act Section 305(b) Assessment and Use-Support: Methodology

The Office of Water Management determines use support status for each stream and waterbody in accordance with the assessment guidelines provided by EPA (1997). Results from four monitoring programs are integrated to provide an assessment for each stream and waterbody:

- Physical/chemical water column results,
- Benthic aquatic macroinvertebrate community assessments,
- Fish tissue and surficial aquatic sediment contaminant results, and
- *E. coli* monitoring results.

The assessment process was applied to each data sampling program. The individual assessments were integrated into an overall assessment for each waterbody by use designation: aquatic life support, fish consumption, and recreational use. River miles in a watershed appear as one waterbody while each lake in a watershed is reported as a separate waterbody.

Physical/chemical data for toxicants (total recoverable metals), conventional water chemistry parameters (dissolved oxygen, pH, and temperature), and bacteria (*E. coli*) were evaluated for exceedance of the Indiana Water Quality Standards (327 IAC 2-1-6). U.S. EPA 305(b) Guidelines were applied to sample results as indicated in Table 4-3 (U.S. EPA 1997b).

**TABLE 4-2  
CRITERIA FOR USE SUPPORT ASSESSMENT\***

Parameter	Fully Supporting	Partially Supporting	Not Supporting
<b>Aquatic Life Use Support</b>			
<b>Toxicants</b>	Metals were evaluated on a site by site basis and judged according to magnitude of exceedance and the number of times exceedances occurred.		
<b>Conventional inorganics</b>	There were very few water quality violations, almost all of which were due to natural conditions.		
<b>Benthic aquatic macroinvertebrate Index of Biotic Integrity (mIBI)</b>	mIBI $\geq$ 4.	mIBI < 4 and $\geq$ 2.	mIBI < 2.
<b>Qualitative habitat use evaluation (QHEI)</b>	QHEI $\geq$ 64.	QHEI < 64 and $\geq$ 51.	QHEI < 51.
<b>Fish community (fIBI) (Lower White River only)</b>	IBI $\geq$ 44.	IBI < 44 and $\geq$ 22	IBI < 22.
<b>Sediment (PAHs = polynuclear aromatic hydrocarbons. AVS/SEM = acid volatile sulfide/ simultaneously extracted metals.)</b>	All PAHs $\leq$ 75 <sup>th</sup> percentile. All AVS/SEMs $\leq$ 75 <sup>th</sup> percentile. All other parameters $\leq$ 95 <sup>th</sup> percentile.	PAHs or AVS/SEMs > 75 <sup>th</sup> percentile. (Includes Grand Calumet River and Indiana Harbor Canal sediment results, and so is a conservative number.)	Parameters > 95 <sup>th</sup> percentile as derived from IDEM Sediment Contaminants Database.
<b>Indiana Trophic State Index (lakes only)</b>	Nutrients, dissolved oxygen, turbidity, algal growth, and sometimes pH were evaluated on a lake-by-lake basis. Each parameter judged according to magnitude.		
<b>Fish Consumption</b>			
Fish tissue	No specific Advisory*	Limited Group 2 - 4 Advisory*	Group 5 Advisory*
* Indiana Fish Consumption Advisory, 1997, includes a state wide advisory for carp consumption. This was not included in individual waterbody reports because it obscures the magnitude of impairment caused by other parameters.			
<b>Recreational Use Support (Swimmable)</b>			
Bacteria (cfu = colony forming units.)	No more than one grab sample slightly > 235 cfu/100ml, and geometric mean not exceeded.	No samples in this classification.	One or more grab sample exceeded 235 cfu/100ml, and geometric mean exceeded.

\*From Indiana Water Quality Report for 1998

## 5 State and Federal Water Programs

This Chapter summarizes the existing point and nonpoint source pollution control programs available for addressing water quality problems in the Mississinewa River watershed. Chapter 5 includes:

- Section 5.1 Indiana Department of Environmental Management Water Quality Programs
- Section 5.2 Indiana Department of Natural Resources Water Programs
- Section 5.3 USDA/Natural Resources Conservation Service Water Programs

### 5.1 Indiana Department of Environmental Management Water Quality Programs

This Section describes the water quality programs managed by the Office of Water Management within IDEM and includes:

- Section 5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program
- Section 5.1.2 Indiana's Point Source Control Program
- Section 5.1.3 Indiana's Nonpoint Source Control Programs
- Section 5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies
- Section 5.1.5 Potential Sources of Funding for Water Quality Projects

#### *5.1.1 State and Federal Legislative Authorities for Indiana's Water Quality Program*

Authorities for some of the programs and responsibilities carried out by the Office of Water Management are derived from a number of federal and state legislative mandates outlined below. The major federal authorities for the state's water quality program are found in sections of the Clean Water Act. State authorities are from state statutes.

#### Federal Authorities for Indiana's Water Quality Program

- ◆ The Clean Water Act Section 301 - Prohibits the discharge of pollutants into surface waters unless permitted by EPA.
- ◆ The Clean Water Act Section 303(c) - States are responsible for reviewing, establishing and revising water quality standards for all surface waters.
- ◆ The Clean Water Act Section 303(d) - Each state shall identify waters within its boundaries for which the effluent limits required by 301(b)(1) A and B are not stringent enough to protect any water quality standards applicable to such waters.
- ◆ The Clean Water Act Section 305(b) - Each state is required to submit a biennial report to the EPA describing the status of surface waters in that state.
- ◆ The Clean Water Act Section 319 - Each state is required to develop and implement a nonpoint source pollution management program.

- ◆ The Clean Water Act Section 402 - Establishes the National Pollutant Discharge Elimination System (NPDES) permitting program. Allows for delegation of permitting authority to qualifying states (which Indiana has received).
- ◆ The Clean Water Act Section 404/401 - Section 404 regulates the discharge of dredge and fill materials into navigable waters and adjoining wetlands. Section 401 requires the U.S. Army Corps of Engineers to receive a state Water Quality Certification prior to issuance a 404 permit.

#### State Authorities for Indiana's Water Quality Program

IC 13-13-5 Designation of Department for Purposes of Federal Law: Designates the Indiana Department of Environmental Management as the water pollution agency for Indiana for all purposes of the Federal Water Pollution Control Act (33 U.S.C. 1251 et seq.) effective January 1, 1988, and the federal Safe Drinking Water Act (42 U.S.C. 300f through 300j) effective January 1, 1988.

### **5.1.2 Indiana's Point Source Control Program**

The State of Indiana's efforts to control the direct discharge of pollutants to waters of the State were inaugurated by the passage of the Stream Pollution Control Law of 1943. The vehicle currently used to control direct discharges to waters of the State is the NPDES (National Pollutant Discharge Elimination System) permit program. This was made possible by the passage of the Federal Water Pollution Control Act Amendments of 1972 (also referred to as the Clean Water Act). These permits place limits on the amount of pollutants that may be discharged to waters of the State by each discharger. These limits are set at levels protective of both the aquatic life in the waters which receive the discharge and human health.

The State of Indiana was granted primacy from U.S. EPA to issue NPDES permits on January 1, 1975 through a Memorandum of Agreement.

U.S. EPA, Region V, has oversight authority for the NPDES permits program. Under terms of the Memorandum of Agreement, Region V has the right to comment on all draft Major discharger permits. In addition to NPDES, the Office of Water Management Permits Section has a pretreatment group which regulates municipalities in their development of municipal pretreatment programs and indirect discharges, or those discharges of process wastewater to municipal sewage treatment plants through Industrial Waste Pretreatment permits and regulation of Stormwater, CSO's, and variance requests through a special projects group currently known as the Urban Wet Weather Group. Land Application of waste treatment plant sludge is no longer a part of the Office of Water Management but is now a part of the Office of Land Quality (formerly, Office of Solid and Hazardous Waste).

The purpose of the NPDES permit is to control the point source discharge of pollutants into the waters of the State such that the quality of the water of the State is maintained in accordance with the standards contained in 327 IAC 2. The NPDES permit requirements must ensure that the minimum amount of control is imposed upon any new or existing point source through the application of technology-based treatment requirement contained in 327 IAC 5-5-2. According to 327 IAC 5-2-2, "Any discharge of pollutants into waters of the State as a point source discharge, except for exclusions made in 327 IAC 5-2-4 is prohibited unless in conformity with a



valid NPDES permit obtained prior to discharge." This is the most basic principal of the NPDES permit program.

The majority of NPDES permits have existed since 1974. This means that most of the permit writing is for permit renewals. Approximately 10 percent of each year's workload is attributed to new permits, modifications and requests for estimated limits. NPDES permits are designed to be re-issued every five years but are administratively extended in full force and effect indefinitely if the permittee applied for a renewal before the current permit expires.

There are several different types of permits that are issued in the NPDES permitting program. Table 5-1 lists and describes the various permits.

**TABLE 5-1  
TYPES OF PERMITS ISSUED UNDER THE NPDES PROGRAM**

Type of Permit	Subtype	Comment
<b>Municipal, Semi-Public or State (sanitary discharger)</b>	Major	A facility owned by a municipality with a design flow Municipal of 1 MGD or greater (Cities, Towns, Regional Sewer Districts)
	Minor	Any municipally owned facility with a design flow of less than 1 MGD (Cities, Towns, Regional Sewer Districts)
	Semipublic	Any facility not municipally, State or Federally owned (i.e.- mobile home parks, schools, restaurants, etc.)
	State Owned	A facility owned or managed by a State agency (State parks, prisons, etc.)
	Federally Owned	A facility owned by a federal agency (military Owned installation, national park, federal penitentiary, etc.)
<b>Industrial (Wastewater generated in the process of producing a product)</b>	Major	Any point source discharger designated annually by agreement between the commissioner and EPA. Classification of discharger as a major involves consideration of factors relating to significance of impact on the environment, such as: Nature and quantity of pollutants discharged; Character and assimilative capacity of receiving waters; Presence of toxic pollutants in discharge; Compliance history of discharger.
	Minor	All dischargers which are not designated as major dischargers.
	General	General permit rule provides streamlined NPDES permitting process for certain categories of industrial point source discharges under requirements of the applicable general permit rule, rather than requirements of an individual permit specific to a single discharge. General permit rules: 327 IAC 15-7 Coal mining, coal processing, and reclamation activities; 327 IAC 15-8 Non-contact cooling water; 327 IAC 15-9 Petroleum product terminals; 327 IAC 15-10 Groundwater petroleum remediation systems; 327 IAC 15-11 Hydrostatic testing of commercial pipelines; 327 IAC 15-12 Sand, gravel, dimension stone or crushed stone operations.
	Cooling Water	Water which is used to remove heat from a product or process; the water may or may not come in contact with the product.
Public Water Supply	Wastewater generated from the process of removing pollutants from ground or surface water for the purpose of producing drinking water.	
<b>Pretreatment Urban Wet Weather Group</b> (Associated with NPDES but do not fall under same rule.)	Stormwater-related	Wastewater resulting from precipitation coming in contact with a substance which is dissolved or suspended in the water.
	Industrial Wastewater Pre-treatment	Processed wastewater generated by Industries that contribute to the overall wastewater received by the wastewater treatment plant.
	Combined Sewer Overflow (CSO)	Wastewater discharged from combined storm and sanitary sewers due to precipitation events. Municipal and Industrial Urban Wet Weather Programs

### 5.1.3 Nonpoint Source Control Programs

Nonpoint source (NPS) pollution is so named because the pollutants do not originate at single point sources, such as industrial and municipal waste discharge pipes. Instead, NPS pollutants are carried over fields, lawns, and streets by rainwater, wind, or snowmelt. This runoff may carry with it such things as fertilizer, road salt, sediment, motor oil, or pesticides. These pollutants either enter lakes and streams or seep into groundwater. While some NPS pollution is naturally occurring, most of it is a result of human activities.

Reducing NPS pollution requires careful attention to land use management and local geographic and economic conditions. The NPS Program was established to fully integrate methods for coping with the state's varied NPS water pollution problems. While a number of agencies and organizations currently have their own programs for addressing specific NPS issues, overall NPS coordination is being aided through the consolidated NPS Management Plan that was developed in the early stages of the Program's formation. Approximately, over 180 NPS-related projects have been funded and managed by the NPS Program since 1990. The NPS Management Plan was prepared in 1989, partially based on findings from the NPS Assessment Report, which was also completed that year. The NPS Management Plan was updated and received EPA approval in 1999. Some of the objectives of the Management Plan included the education of land users, the reduction and remediation of NPS pollution caused by erosion and sedimentation of forested and agricultural lands, and urban runoff. Other objectives addressed pesticide and fertilizer use, land application of sludge, animal waste practices, past and present mining practices, on-site sewage disposal, and atmospheric deposition.

The state's NPS Program, administered by the IDEM Office of Water Management's Watershed Management Section, focuses on the assessment and prevention of NPS water pollution. The program also provides for the exchange of education and information in order to improve the way land is managed. Through the use of federal funding for the installation of best management practices (BMPs), the NPS Program effectively reaches out to citizens and assists in the development of BMPs to manage land in such a way that less pollution is generated. The NPS program promotes a non-regulatory, voluntary approach to solving water quality problems.

The many nonpoint source projects funded through the Office of Water Management are a combination of local, regional, and statewide efforts sponsored by various public and not-for-profit organizations. The emphasis of these projects has been on the local, voluntary implementation of NPS water pollution controls. Since the inception of the program in the late 1980s, it has utilized over \$12 million of federal funds for the development of over 180 projects.

The federal Clean Water Act contains nonpoint source provisions in several sections of the Act including the Section 319 Nonpoint Source Program, the Section 314 Clean Lakes Program (no longer funded), the Section 104(b)(3) Watershed Management Program, and the Section 205(j) Water Quality Planning Program. The Section 319 program provides for various voluntary projects throughout the state to prevent water pollution and also provides for assessment and management plans related to water bodies in Indiana impacted by NPS pollution. Section 314 has assessment provisions that assist in determining the nonpoint and point source water quality impacts on lakes and provides recommendations for improvements, but no longer receives funding. Section 104(b)(3) provides assistance in the development of watershed management planning efforts and education/information and implementation projects. Section 604(b) provides for planning activities relating to the improvement of water quality from

nonpoint and point sources. The Watershed Management Section within the Planning Branch of the Office of Water Management provides for the administration of the Section 319 funding source for the NPS-related projects. The Financial Management Services Branch of the Office of Water Management administers the Section 104(b)(3) and Section 604(b) grants.

Clean Water Act Section 319(h) grant monies are made available to the states on an annual basis by EPA. Agencies and organizations in the state that deal with NPS problems submit proposals to the Office of Water Management each year for use of these funds in various projects.

One of the most important aspects of all NPS pollution prevention programs is the emphasis on the watershed approach to these programs. This calls for users in the watershed to become involved in the planning and implementation of practices, which are designed to prevent pollution. By looking at the watershed as a whole, all situations causing the degradation of water quality will be addressed, not just a few. Appendix C lists the conservation partners and local stakeholders located in the Mississinewa River watershed.

#### *5.1.4 Integrating Point and Nonpoint Source Pollution Control Strategies*

Integrating point and nonpoint source pollution controls and determining the amount and location of the remaining assimilative capacity in a watershed are key long-term objectives of watershed management. The information is used for a number of purposes including: determining if and where new or expanded municipal or industrial wastewater treatment facilities can be allowed; setting the recommended treatment level at these facilities; and identifying where point and nonpoint source pollution controls must be implemented to restore capacity and maintain water quality standards.

##### Total Maximum Daily Loads

The Clean Water Act mandates an integrated point and nonpoint source pollution control approach. This approach, called a total maximum daily load (TMDL), uses the concept of determining the total pollutant loading from point and nonpoint sources that a waterbody can assimilate while still maintaining its designated use (maintaining water quality standards). EPA is responsible for ensuring that TMDLs are completed by States and for approving the completed TMDLs.

Under the TMDL approach, waterbodies that do not meet water quality standards are identified. States establish priorities for action, and then determine reductions in pollutant loads or other actions needed to meet water quality goals. The approach is flexible and promotes a watershed approach driven by local needs and directed by the State's list of priority waterbodies. The overall goal in establishing the TMDL is to establish the management actions on point and nonpoint sources of pollution necessary for a waterbody to meet water quality standards.

The Office of Water Management at IDEM is in the process of reorganizing its work activities around a five year rotating basin schedule. The waters of the state have been grouped geographically into major river basins, and water quality data and other information will be collected and analyzed from each basin, or group of basins, once every five years. The schedule for implementing the TMDL Strategy is proposed to follow this rotating basin plan to the extent possible. The TMDL Strategy discusses activities to be accomplished in three phases. Phase One involves planning, sampling and data collection and would take place the first year. Phase Two involves TMDL development and would occur in the second year, and Phase Three is

the TMDL implementation and would occur the third year. It is expected that some phases, especially implementation of TMDLs (Phase Three) in the basin(s), may take more than one year to fully accomplish.

Initially, as part of the TMDL Strategy in a watershed, the IDEM TMDL Program Manager, in coordination with the IDEM Basin Coordinator of the target basin, will develop an activity reference guide for each TMDL. This activity reference guide will provide: (1) a list of the necessary activities and tasks, (2) a schedule for completing activities and tasks associated with an individual TMDL, and (3) a roster that indicates which Section, staff, and /or contractor are responsible for completion of each activity/task.

In Phase Three, the TMDL scenario chosen in conjunction with watershed stakeholders during Phase Two will be used to develop a plan to implement the TMDL. During this process, stakeholder participation will be essential. The Basin Coordinator, in conjunction with the stakeholder groups, will develop a plan to implement the TMDL. Once the draft plan has been finalized through comments from stakeholder groups and IDEM, the plan becomes 'draft-final' and open public review. Public meetings will be held in areas affected to solicit comments.

#### *5.1.5 Potential Sources of Funding for Water Quality Projects*

There are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofits, and private funding. Funds may be loans, cost-share projects, or grants. Section 319(h) grants and other funding sources are discussed below.

If a local government, environmental group, university researcher, or other individual or agency wants to find funding to address a local water quality problem, it is well worth the time to prepare a thorough but concise proposal and submit it to applicable funding agencies. Even if a project is not funded, follow-up should be done to determine what changes may be needed in order to make the application more competitive.

#### Section 319(h) Grants

EPA offers to the state Clean Water Act Section 319(h) grant moneys on an annual basis. These grants must be used to fund projects that address nonpoint source pollution issues. Some projects which the Office of Water Management has funded with this money in the past include best management practice (BMP) demonstrations, watershed water quality improvements, data management, educational programs, modeling, stream restoration, and riparian buffer establishment. Units of government, nonprofit groups, and universities in the state that have expertise in nonpoint source pollution problems are invited to submit Section 319(h) proposals to the Office of Water Management.

Office of Water Management staff review proposals for minimum 319 eligibility criteria such as:

- ◆ Does it support the state NPS Management Program milestones?
- ◆ Does the project address targeted, high priority watersheds?
- ◆ Is there sufficient non-federal cost-share match available (25% of project costs)?
- ◆ Are measurable outputs identified?
- ◆ Is monitoring required? Is there a Quality Assurance/Quality Control plan for monitoring?
- ◆ If a Geographical Information System is used, is it compatible with that of the state?

- ◆ Is there a commitment for educational activities and a final report?
- ◆ Are upstream sources of NPS pollution addressed?
- ◆ Are stakeholders involved in the project?

Office of Water Management staff separately review and rank each proposal which meets the minimum 319 eligibility criteria. In their review, members consider such factors as: technical soundness; likelihood of achieving water quality results; degree of balance lent to the statewide NPS Program in terms of project type; and competence/reliability of contracting agency. They then convene to discuss individual project merits, to pool all rankings and to arrive at final rankings for the projects. Comments are also sought from outside experts in other governmental agencies, nonprofit groups, and universities. The Office of Water Management seeks a balance between geographic regions of the state and types of projects. All proposals that rank above the funding target are included in the annual grant application to EPA, with EPA reserving the right to make final changes to the list. Actual funding depends on approval from EPA and yearly congressional appropriations.

To obtain more information about applying for a Section 319(h) grant, contact:

IDEM Office of Water Management  
100 N. Senate Avenue  
P.O. Box 6015  
Indianapolis, IN 46206-6015  
(317) 233-8803

#### Other Sources of Funding

Besides Section 319(h) funding, there are numerous sources of funding for all types of water quality projects. The sources of funding include federal and state agencies, nonprofit, and private funding. Funds may be loans, cost-shares, or grants. Appendix D provides a summary list of agencies and funding opportunities.

## **5.2 Indiana Department of Natural Resources Water Programs**

### *5.2.1 Division of Soil Conservation*

The Division of Soil Conservation's mission is to ensure the protection, wise use, and enhancement of Indiana's soil and water resources. The Division's employees are part of Indiana's Conservation Partnership, which includes the 92 soil and water conservation districts (SWCDs), the USDA Natural Resources Conservation Service, and the Purdue University Cooperative Extension Service. Working together, the partnership provides technical, educational, and financial assistance to citizens to solve erosion and sediment-related problems occurring on the land or impacting public waters.

The Division administers the Clean Water Indiana soil conservation and water quality program under guidelines established by the State Soil Conservation Board, primarily through the SWCDs in direct service to landusers. The Division staff includes field-based resource specialists who work closely with landusers, assisting in the selection, design, and installation of practices to reduce soil erosion on their land. Regional Urban Conservation Specialists work primarily with developers, contractors, and others to address erosion and sediment concerns in urban

settings, developments under construction, and in landfills. The Lake and River Enhancement staff (LARE) oversee all administrative, operational, and technical aspects of the LARE program, which provides financial assistance to local entities concerned with improving and maintaining water quality in public-access lakes, rivers, and streams.

### 5.2.2 *Division of Water*

The IDNR, Division of Water (DOW) is charged by the State of Indiana to maintain, regulate, collect data, and evaluate Indiana's surface and ground water resources.

The Engineering Branch of the DOW includes Dam and Levee Safety, Project Development, Surveying, Drafting, and Computer Services. The Dam and Levee Safety Section performs geotechnical and hydraulic evaluation on existing and proposed dams and levees throughout the State. The Project Development Section provides technical support to locally funded water resource projects along with engineering leadership and construction management to State funded water resource projects. The remaining sections provide support services to all Sections within the DOW such as reservoir depth mapping, topographic mapping, highwater marks, design of publications and brochures, and computer procurement and maintenance.

The Planning Branch of the DOW consists of Basin Studies, Coastal Coordination, Floodplain Management, Ground Water, Hydrology and Hydraulics, and Water Rights. Basin Studies are comprehensive reports on surface-and ground-water availability and use. Coastal Coordination is a communication vehicle to address Lake Michigan's diverse shoreline issues. Floodplain Management involves various floodplain management aspects including coordination with the National Flood Insurance Program and with State and Federal Emergency Management agencies during major flooding events. The Ground Water Section maintains the water-well record computer database and publishes reports and maps on the ground-water resource for the State. Hydrology and Hydraulics Section develops and reviews floodplain mapping and performs hydrologic studies and modeling. The Water Rights Section investigates and mediates groundwater/surface water rights issues, licenses water-well drillers, and develops well construction and abandonment procedures.

The Regulations Branch of DOW is made up of Stream Permits, Lake Permits, Permit Administration, Public Assistance, and Legal Counsel. The Stream Permits Section is responsible for reviewing permit applications for construction activity in the 100-year regulatory floodway along Indiana's waterways. The Lake Permits Section reviews construction projects at or below the legal lake level for all of Indiana's public freshwater lakes. Permit Administration Section provides administrative support to Branch staff, maintains the application database, and coordinates the application review process with other Divisions. The Public Assistance Section provides technical assistance on possible permit applications on proposed construction projects, investigates and mediates unpermitted construction activities and in some cases with the support of Legal Counsel pursues legal action for violation of State laws.

## 5.3 **USDA/Natural Resources Conservation Service Water Quality Programs**

While there are a variety of USDA programs available to assist people with their conservation needs. The following assistance programs are the principal programs available.

### Conservation Technical Assistance (CTA)

The purpose of the program is to assist landusers, communities, units of state and local government, and other Federal agencies in planning and implementing conservation systems. The purpose of the conservation systems are to reduce erosion, improve soil and water quality, improve and conserve wetlands, enhance fish and wildlife habitat, improve air quality, improve pasture and range condition, reduce upstream flooding, and improve woodlands.

The objective of the program is to: Assist individual landusers, communities, conservation districts, and other units of State and local government and Federal agencies to meet their goals for resource stewardship and assist individuals to comply with State and local requirements. NRCS assistance to individuals is provided through conservation districts in accordance with the Memorandum of Understanding signed by the Secretary of Agriculture, the Governor of the State, and the conservation district. Assistance is provided to landusers voluntarily applying conservation and to those who must comply with local or State laws and regulations. Assistance is also provided to agricultural producers to comply with the highly erodible land (HEL) and wetland (Swampbuster) provisions of the 1985 Food Security Act as amended by the Food, Agriculture, Conservation and Trade Act of 1990 (16 U.S.C. 3801 et. seq.); the Federal Agriculture Improvement and Reform Act of 1996, and wetlands requirements of Section 404 of the Clean Water Act. NRCS makes HEL and wetland determinations and helps land users develop and implement conservation plans to comply with the law. They also provide technical assistance to participants in USDA cost-share and conservation incentive programs. NRCS collects, analyzes, interprets, displays, and disseminates information about the condition and trends of the Nation's soil and other natural resources so that people can make good decisions about resource use and about public policies for resource conservation. They also develop effective science-based technologies for natural resource assessment, management, and conservation.

### Conservation of Private Grazing Land Initiative (CPGL)

The Conservation of Private Grazing Land initiative will ensure that technical, educational, and related assistance is provided to those who own private grazing lands. It is not a cost-share program. This technical assistance will offer opportunities for: better grazing land management; protecting soil from erosive wind and water; using more energy-efficient ways to produce food and fiber; conserving water; providing habitat for wildlife; sustaining forage and grazing plants; using plants to sequester greenhouse gases and increase soil organic matter; and using grazing lands as a source of biomass energy and raw materials for industrial products.

### Conservation Reserve Program (CRP)

NRCS provides technical assistance to landowners interested in participating in the Conservation Reserve Program administered by the USDA Farm Service Agency. The Conservation Reserve Program reduces soil erosion, protects the Nation's ability to produce food and fiber, reduces sedimentation in streams and lakes, improves water quality, establishes wildlife habitat, and enhances forest and wetland resources. It encourages farmers to convert highly erodible cropland or other environmentally sensitive acreage to vegetative cover, such as tame or native grasses, wildlife plantings, trees, filterstrips, or riparian buffers. Farmers receive an annual rental payment for the term of the multi-year contract. Cost-share funding is provided to establish the vegetative cover practices.



### Environmental Quality Incentives Program (EQIP)

The Environmental Quality Incentives Program provides technical, educational, and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost effective manner. The program provides assistance to farmers and ranchers in complying with Federal, State, and tribal environmental laws, and encourages environmental enhancement. The program is funded through the Commodity Credit Corporation. The purposes of the program are achieved through the implementation of a conservation plan, which includes structural, vegetative, and land management practices on eligible land. Five to ten year contracts are made with eligible producers. Cost-share payments may be made to implement one or more eligible structural or vegetative practices, such as animal waste management facilities, terraces, filter strips, tree planting, and permanent wildlife habitat. Incentive payments can be made to implement one or more land management practices, such as nutrient management, pest management, and grazing land management.

Fifty percent of the funding available for the program is targeted at natural resource concerns relating to livestock production. The program is carried out primarily in priority areas that may be watersheds, regions, or multi-state areas, and for significant statewide natural resource concerns that are outside of geographic priority areas.

### Watershed Surveys and Planning

The Watershed and Flood Prevention Act, P.L. 83-566, August 4, 1954, (16 U.S.C. 1001-1008) authorized this program. Prior to fiscal year 1996, small watershed planning activities and the cooperative river basin surveys and investigations authorized by Section 6 of the Act were operated as separate programs. The 1996 appropriations act combined the activities into a single program entitled the Watershed Surveys and Planning program. Activities under both programs are continuing under this authority.

The purpose of the program is to assist Federal, State, and local agencies and tribal governments to protect watersheds from damage caused by erosion, floodwater, and sediment and to conserve and develop water and land resources. Resource concerns addressed by the program include water quality, opportunities for water conservation, wetland and water storage capacity, agricultural drought problems, rural development, municipal and industrial water needs, upstream flood damages, and water needs for fish, wildlife, and forest-based industries.

Types of surveys and plans include watershed plans, river basin surveys and studies, flood hazard analyses, and flood plain management assistance. The focus of these plans is to identify solutions that use land treatment and non-structural measures to solve resource problems.

### Watershed Program and Flood Prevention Program (WF 08 or FP 03)

The Small Watershed Program works through local government sponsors and helps participants solve natural resource and related economic problems on a watershed basis. Projects include watershed protection, flood prevention, erosion and sediment control, water supply, water quality, fish and wildlife habitat enhancement, wetlands creation and restoration, and public recreation in watersheds of 250,000 or fewer acres. Both technical and financial assistance are available.

### Wetlands Reserve Program (WRP)

The Wetlands Reserve Program is a voluntary program to restore wetlands. Participating landowners can establish conservation easements of either permanent or 30 year duration, or can enter into restoration cost-share agreements where no easement is involved. In exchange for establishing a permanent easement, the landowner receives payment up to the agricultural value of the land and 100 percent of the restoration costs for restoring the wetlands. The 30 year easement payment is 75 percent of what would be provided for a permanent easement on the same site and 75 percent of the restoration cost. The voluntary agreements are for a minimum 10 year duration and provide for 75 percent of the cost of restoring the involved wetlands. Easements and restoration cost-share agreements establish wetland protection and restoration as the primary land use for the duration of the easement or agreement. In all instances, landowners continue to control access to their land.

### Wildlife Habitat Incentives Program (WHIP)

The Wildlife Habitat Incentives Program provides financial incentives to develop habitat for fish and wildlife on private lands. Participants agree to implement a wildlife habitat development plan and USDA agrees to provide cost-share assistance for the initial implementation of wildlife habitat development practices. USDA and program participants enter into a cost-share agreement for wildlife habitat development. This agreement generally lasts a minimum of 10 years from the date that the contract is signed.

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# Mississinewa River Watershed Restoration Action Strategy

## Part II: Concerns and Recommendations

*Prepared by*  
Indiana Department of  
Environmental Management  
Office of Water Quality

*May 2001*

## **Foreword**

The Mississinewa River Watershed Restoration Action Strategy (WRAS) is intended to be a living document to assist restoration and protection efforts of stakeholders in their sub-watersheds. As a "living document" information contained within the WRAS will need to be revised and updated periodically.

The first draft of the Mississinewa River WRAS was released for public review during April 2001. This version of the WRAS incorporates public comments received during that time period.

The WRAS is divided into two parts: Part I, Characterization and Responsibilities and Part II, Concerns and Recommendations.

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# Mississinewa River Watershed Restoration Action Strategy

## Part II: Concerns and Recommendations

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Part II of the Watershed Restoration Action Strategy discusses the water quality concerns identified for the Mississinewa River Watershed and lists recommended management strategies to address these concerns.

Part II includes:

- Section 1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups
- Section 2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies
- Section 3 Identification of Impaired Waters
- Section 4 Priority Issues and Recommended Management Strategies
- Section 5 Future Actions and Expectations

### **1 Water Quality Concerns and Priority Issues Identified by Stakeholder Groups**

The Mississinewa River watershed contains potential stakeholder groups that have different missions. Many of these groups have a long history of working in the Mississinewa River watershed. The following discussion briefly describes some of the watershed groups and lists their priorities and concerns.

#### ***Randolph County Soil and Water Conservation District***

The Randolph County Soil and Water Conservation District (SWCD) received a Lake and River Enhancement (LARE) Program grant through the Indiana Department of Natural Resources to conduct a diagnostic study of nonpoint source pollution in the upper Mississinewa River watershed (this study was completed February 2001). The diagnostic study can be obtained by contacting the Randolph County SWCD.

#### ***Taylor University and Asherwood Environmental Center***

Taylor University and Asherwood Environmental Center are working cooperatively on the Mississinewa River Watershed Project. This project is designed to identify and assess nonpoint source pollution to the Mississinewa River.

### **2 Water Quality Concerns and Priority Issues Identified by State and Federal Agencies**

This section presents the combined efforts of state and federal agencies, and universities (such as IDEM, IDNR, USDA-Natural Resources Conservation Service, Ohio River Valley Water Sanitation Commission, Purdue University, Indiana University, Indiana Geologic Survey, and US

Geological Survey) to assess water quality concerns and priority issues in the Mississinewa River Watershed. This multi-organization effort formed the basis of the Unified Watershed Assessment for Indiana. At this time, the Unified Watershed Assessment has been completed for 1998 and updated for 2000-2001.

### Indiana's Unified Watershed Assessment (UWA)

The UWA workgroup gathered a wide range of water quality data that could be used to characterize Indiana's water resources. These data were used in 'layers' in order to sort the 8-digit HUC watersheds according to the present condition of the water in lakes, rivers, and streams. The workgroup used only those data which concerned the water column, organisms living in the water, or the suitability of the water for supporting aquatic ecosystems. Each 'layer' of information/data was partitioned by percentiles into scores. The scores ranged between one and five, with a score of one indicative of good water quality or minimum impairment, and a score of five indicating heavily impacted or degraded water quality.

The data layers used in the 1998 and the 2000-2001 update include:

- ◆ Lake Fishery: Large mouth bass community information for lakes
- ◆ Stream Fishery: Small mouth bass community information for streams
- ◆ Aquatic Life Use Support: The "livability" of the water column for aquatic life, determined from evaluation of chemical and physical water data, and assessment of aquatic life
- ◆ Fish Consumption Advisories: Site specific advisories based on current data
- ◆ Fish Index of Biotic Integrity: Based on fish community diversity and fish health
- ◆ Qualitative Habitat Evaluation Index: Measure of whether the aquatic habitat is suitable for diverse communities, based on visual observations
- ◆ Lake Trophic Scores: Indicator for the rate at which a lake is 'aging' due to inputs of nutrients and other factors
- ◆ Sediment Potential: Indicator of potential sediment input to waterbodies in the watershed

The sources and additional information for these data layers include:

- ◆ Lake Fishery: From IDNR fisheries surveys of lakes and reservoirs from 1972 to 1994. Raw scores were averaged for all lakes in the watershed
- ◆ Stream Fishery: From IDNR fisheries surveys of streams from 1970 to 1994. Raw scores were averaged for all streams in the watershed
- ◆ Aquatic Life Use Support: IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Consumption Advisories: ISDH and IDEM, Office of Water Quality, Assessment Branch
- ◆ Fish Index of Biotic Integrity: IDEM, Office of Water Quality, Assessment Branch
- ◆ Qualitative Habitat Evaluation Index: IDEM, Office of Water Quality, Assessment Branch
- ◆ Lake Trophic Scores: Indiana Clean Lakes Program through IDEM, Office of Water Quality, Assessment Branch. This score was based on information gathered from sampling conducted in the 1970's and 1980's

During summer 1999 the UWA workgroup used additional layers of information to identify the **resource concerns and stressors** for each of the 361 11-digit watersheds in Indiana. Examination of the human activities that have the potential to impact the ecosystem will help

planners to focus on those areas where restoration may be most critical. Organizations can identify opportunities to use their programs and resources to address those areas.

This focusing process will illuminate areas where the interests of two or more partner agencies may converge. It is intended that this will lead to more effective allocation of resources for restoration and protection activities. At the local level, this information can assist groups to prioritize watershed activities and provide some discussion points for planning.

This amended assessment has the following benefits:

- ◆ Provides a logical process for targeting funds, which may be expanded or updated without changing the basic framework.
- ◆ Provides information at a finer resolution (11-digit hydrologic units) to agencies and local groups interested in watershed assessment.
- ◆ Identifies data gaps.
- ◆ Can be used as a compliment to other assessments, such as the 305(b) Report and 303(d) List.

Table 2-1 and Figure 2-1 show the results of the 2000-2001 UWA for the Mississinewa River watershed.

### 3 Identification of Impaired Waters

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with federal technology based standards alone. States are also required to develop a priority ranking for these waters taking into account the severity of the pollution and the designated uses of the waters. Indiana's 303(d) list was approved by EPA on February 16, 1999.

Once the Section 303(d) list and ranking of waters is completed, the states are required to develop Total Maximum Daily Loads (TMDLs) for these waters in order to achieve compliance with the water quality standards. The TMDL is an allocation that determines the point and nonpoint source (plus margin of safety) load reductions required in order for the waterbody to meet water quality standards. IDEM's Office of Water Quality has and continues to perform point source waste load allocations for receiving waters. Part I of the WRAS briefly outlines IDEM's strategy for developing TMDLs.

The following Mississinewa River Watershed waterbodies are on Indiana's 1998 Clean Water Act Section 303(d) list submitted and approved by EPA 303(d) list (Figure 3-1):

Water Body	Location/Reach	County	Parameter(s) of Concern	HUC	Subwatershed(s)
Little Mississinewa River	Union City	Randolph	FCA for PCB	5120103	10
Mississinewa River	All	Randolph / Delaware / Grant	FCA for PCB & Hg	5120103	010 020 030 050 060

FCA - Fish Consumption Advisory

PCB - Polychlorinated Biphenyls

Hg - Mercury

\*\*\*Only waters for which fish tissue data support issuance of fish consumption advisories are individually cited above.

The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state.



This advisory was based on extrapolation of the fish tissue data that were available and generally recommends that if no site-specific advisory is in place for a waterbody, the public should eat no more than one meal (8 oz.) per week of fish caught in these waters. Women of child bearing age, women who are breast feeding, and children up to 15 years of age should eat no more than one meal per month. The basis for this general advisory is widespread occurrence of mercury or PCBs (or both) in most fish sampled throughout the state. Please refer to the most recent Fish Consumption Advisory booklet available through the Indiana Department of Health (317/233-7808). Sources of the mercury and PCBs are unknown for the most part, but it is suspected that they result from air deposition.

## 4 Priority Issues and Recommended Management Strategies

Part I provided the existing water quality information for the Mississinewa River watershed and Part II lists priority issues and concerns from local, state, and federal stakeholders in the watershed. This section pulls together the priority issues and concerns held by all stakeholders and recommends management strategies. Underlying all discussions of priority issues and concerns is the fact that improving water quality in the Mississinewa River Watershed will also enhance the natural and recreational values of Mississinewa River. Each subsection below focuses on a single priority issue.

### 4.1 Data/ Information and Targeting

The success in restoring water quality in the Mississinewa River Watershed is fundamentally based on identifying the specific geographic problem areas; identifying all sources contributing to the impairment of the waterbody; and quantifying the contribution of a pollutant by each source.

**Recommended Management Strategy 1:** Numerous data collection efforts are ongoing in the Mississinewa River Watershed. This information should be used in prioritizing and targeting specific problems and geographic areas in the watershed. The scale at which targeting and prioritization should occur is the 14-digit HUC watershed area (Figure 2-2 of Part I). Targeting and prioritization will require input from stakeholders living in those geographic areas. The purpose of prioritization and targeting is to enhance allocation of resources in the effort of improving water quality.

**Recommended Management Strategy 2:** Through the development of Total Maximum Daily Loads (TMDLs) for impaired waterbodies in the Mississinewa River Watershed, all sources contributing to the impairment of a waterbody will be identified and quantified in terms of their contribution to the waterbody. This includes gathering more data and information on nonpoint sources of water pollution. Throughout the TMDL process, information and feedback from watershed stakeholders will be required in order to generate appropriate allocation scenarios. The result of developing TMDLs will be an understanding of the impact of nonpoint sources on water quality in the watershed.

### 4.2 Streambank Erosion and Stabilization

The cutting and erosion of streambanks within the Mississinewa River Watershed is a major concern. This cutting and erosion increases the sediment load in waterbodies and directly impacts the scenic and recreational values of waterbodies in the Mississinewa River Watershed. Streambank cutting and erosion is often a function of many factors that include: stream energy

and velocity, flooding, and land management. Increased drainage in headwater streams and ditches increases stream energies during rainfall events and often leads to increased streambank cutting and erosion downstream. Land clearing and urban development also impact volume and velocity of runoff. Hence, this problem is not easily solved.

**Recommended Management Strategy 1:** Structural stabilization of specific streambank areas in the Mississinewa River watershed may solve problems on a temporary basis. However, a comprehensive understanding of drainage, stream flows and energies, and land management practices is required to adequately approach this problem. Conservation partners (local, state, and federal) are actively working within their specific geographic areas (typically at the county level); however, this may not facilitate solving the streambank cutting and erosion problems because efforts may not be coordinated between headwater and downstream areas. For example, drainage should take into account the work and efforts of downstream partners to reduce flooding and streambank cutting. Conservation efforts should be in the context of watersheds and span county boundaries in order to account for downstream impacts. Local Drainage Boards, Planning and Zoning Boards, and County Commissioners could effectively address this issue by involving local stakeholders in the decision making process and approaching the issue on a watershed basis.

### **4.3 Failing Septic Systems and Straight Pipe Discharges**

Local county health departments and other stakeholders have identified failing septic systems and straight pipe discharge from septic tanks as significant sources of water pollution in the Mississinewa River watershed. Straight pipe discharges from septic tanks and septic tanks connected to drainage tiles are illegal (327 IAC 5-1-1.5); however, these practices still exist in the Mississinewa River watershed.

**Recommended Management Strategy 1:** The direct impact of communities discharging their septic tank effluent to waterbodies needs to be adequately characterized. This will involve coordination between the Office of Water Quality, local health departments, Indiana State Department of Health, and other stakeholders. The option of choice to eliminate the illegal discharges will be a cooperative effort between homeowners and local, state, and federal stakeholders.

**Recommended Management Strategy 2:** Local planning, zoning, and health ordinances could be adopted or strengthened to address this problem during new development. Existing local ordinances could be enforced more vigorously to correct problems with existing systems. Both of these strategies will require input from local stakeholders.

**Recommended Management Strategy 3:** An education/ outreach program on the health and environmental risks of septic system discharges, system maintenance, and system function would provide homeowners and others with basic information to better understand the impacts of inadequate systems. This kind of education effort would involve local health departments, Indiana State Department of Health, IDEM, and other stakeholders. The ArrowHead RC&D is working on a project to demonstrate proper septic system installation.

### **4.4 Water Quality - General**

The Clean Water Act Section 303(d) list presented in Section 3 lists impaired waterbodies for the Mississinewa River watershed.

**Recommended Management Strategy:** The Clean Water Act requires states to complete TMDLs for waterbodies listed on the Section 303(d) list. The Office of Water Quality is currently evaluating and exploring the modeling process and data needs required to complete TMDLs for the Section 303(d) listed waterbodies. Completion of a TMDL will involve loading allocations of a pollutant to both point and nonpoint sources. The development of TMDLs will involve meetings with stakeholder groups linked to the Section 303(d) waterbodies. As TMDLs are developed, this Watershed Restoration Action Strategy will be amended to incorporate the final TMDLs.

#### 4.5 Fish Consumption Advisories

As noted in Part I and Part II, fish consumption advisories are concerns within the Mississinewa River watershed.

**Recommended Management Strategy 1:** In many cases, the source of the contamination is unknown and may be from atmospheric deposition or some unknown discharge. To address this concern, the cause or source must be identified. Until that is accomplished, the fish consumption advisories should be followed.

#### 4.6 Nonpoint Source Pollution - General

Nonpoint source pollution contributions are often difficult to assess or quantify. They can include sediment deposition from soil erosion, nutrient runoff from animal wastes and commercial fertilizer, herbicide and insecticide runoff, and oil or fuel waste runoff. Nonpoint pollution can emanate from agricultural as well as urban lands. Currently, loadings of nonpoint source pollutants to water are often inferred by examination of land use practices, without actual measurements. In addition, the actual water quality impairments related to nonpoint source pollutants have not been well characterized in the Mississinewa River watershed. Finally, very few regulatory control mechanisms exist to control nonpoint source pollution.

**Recommended Management Strategy 1:** Through the TMDL development process, the Office of Water Quality will identify, assess, and quantify nonpoint source pollutant loadings to impaired waterbodies. In order to accomplish this task, the Office of Water Quality will work closely with local, state, and federal stakeholders at the watershed and subwatershed level. Loading scenarios for nonpoint source pollutants will be developed by the Office of Water Quality and reviewed by local, state, and federal stakeholders. Implementation of nonpoint source controls will involve a blend of funding assistance and regulatory action, where applicable.

**Recommended Management Strategy 2:** Numerous funding mechanisms, such as Conservation Reserve Program, Environmental Quality Incentive Program, Lake and River Enhancement program, and 319(h) grants, exist to promote practices to reduce nonpoint source pollution in the watershed. To more efficiently and effectively address nonpoint source pollution in the watershed, the prioritization and targeting discussed previously in Part II should be used to allocate further application of resources.

**Recommended Management Strategy 3:** The management of urban nonpoint sources can be addressed through effective land use planning and site design. Designs that incorporate less impervious area and more natural infiltration areas have proven effective in reducing urban

nonpoint pollution. Local stakeholders working with local planning and zoning authorities, and developers, should implement more stringent site design requirements to reduce nonpoint source contaminants. This effort would be supported by the state and federal stakeholders.

#### *4.6.1 Nonpoint Source Pollution- Education and Outreach*

This Watershed Restoration Action Strategy is a beginning point for education and outreach efforts. It compiles existing knowledge about the water resource in this watershed and presents it to the stakeholders who live in the Mississinewa River. It brings to a public forum the available information and local concerns. However, the education process does not stop with the publication of this document.

**Recommended Management Strategy:** Local stakeholders, in cooperation with state and federal agencies, need to seek additional information on water quality concerns and issues addressed in this document and make that information available to the public. Additionally, the problems associated with septic failures, soil erosion, land use issues, and riparian zones can be emphasized through meetings, training sessions, and stakeholder group discussions. Field days are excellent ways to present information and encourage discussion. Use of experts with strong background knowledge coupled with local sponsors is an effective method to convey solutions to these problems.

#### **4.7 Point Sources - General**

There are 63 active NPDES permitted dischargers, and 53 CSO discharge points in the Mississinewa River watershed. Additionally there are illegal point source discharges, such as tiles discharging septic tank effluent that exist in the watershed.

**Recommended Management Strategy:** The Permitting and Compliance Branch of the Office of Water Quality is responsible for issuing and monitoring compliance of NPDES permit holders. Clearly, more emphasis and resources are needed to identify and correct illegal point sources and noncomplying point sources. Improving compliance of NPDES dischargers and identifying illegal dischargers will involve fostering a working relationship with other local, state, and federal stakeholders to monitor compliance and report unusual discharges or stream appearance. In regards to illegal discharges, the Office of Water Quality will work with local, state, and federal stakeholders to identify and eliminate these sources of water pollution.

## 5 Future Expectations and Actions

As discussed in Part I, this Watershed Restoration Action Strategy is intended to be fluid document that will be revised or amended as new information becomes available. Section 5.1 discusses expectations derived from the Strategy and how progress will be measured. Specific revisions and amendments to the Watershed Restoration Action Strategy are discussed in Section 5.2. Finally, the Watershed Restoration Action Strategy will be reviewed by all stakeholders before it becomes final, as described in Section 5.3.

### 5.1 Expectations and Measuring Progress

The Mississinewa River Strategy provides a starting point to address water quality concerns held by local, state, and federal stakeholders. Part II provides recommended management strategies to address these concerns. Through cooperative efforts with stakeholders, all of the recommended management strategies listed will begin implementation by the summer of 2002.

Measurement of progress is critical to the success of any plan. Water quality improvements will not take place overnight. Measuring of progress in terms of water quality will be provided through the Office of Water Quality Assessment Branch's rotating basin monitoring strategy.

### 5.2 Expected Revisions and Amendments

This Watershed Restoration Action Strategy is intended to provide a starting point to improve water quality and measure the improvement. Hence, this document will require revisions and amendments as new information becomes available. The future revisions and amendments have been divided into those that are expected within the next year (Section 5.2.1) and those that will occur over a long-term basis (Section 5.2.2).

#### 5.2.1 Short Term Revisions and Amendments

The most significant revisions and amendments will likely occur during 2001 and after, as a result of stakeholder review.

#### 5.2.2 Long Term Revisions and Amendments

The Office of Water Quality is moving toward adopting a watershed management approach to solve water quality problems. Part of the watershed approach is the use of a rotating basin management cycle. The Assessment Branch of the Office of Water Quality has already adopted this rotating basin cycle in its intensive monitoring and assessment of Indiana waterbodies (this is in addition to the already established fixed monitoring station monitoring which occurs on a monthly basis). The Watershed Restoration Action Strategy may be revised or amended when sufficient information becomes available.

### **5.3 Review of the Watershed Restoration Action Strategy**

Before this Watershed Restoration Action Strategy becomes final, it will undergo rigorous review. The first stage of review will be performed internally by the Office of Water Quality. Once the Watershed Restoration Action Strategy has been revised to address internal Office of Water Quality comments, it will be circulated to local, state, and federal stakeholders in the watershed. Written comments from local, state, and federal stakeholders will be addressed and the Watershed Restoration Action Strategy will again be revised to incorporate applicable comments. Once internal and external comments have been addressed, the final version of the Watershed Restoration Action Strategy will be released.

Table 2-1

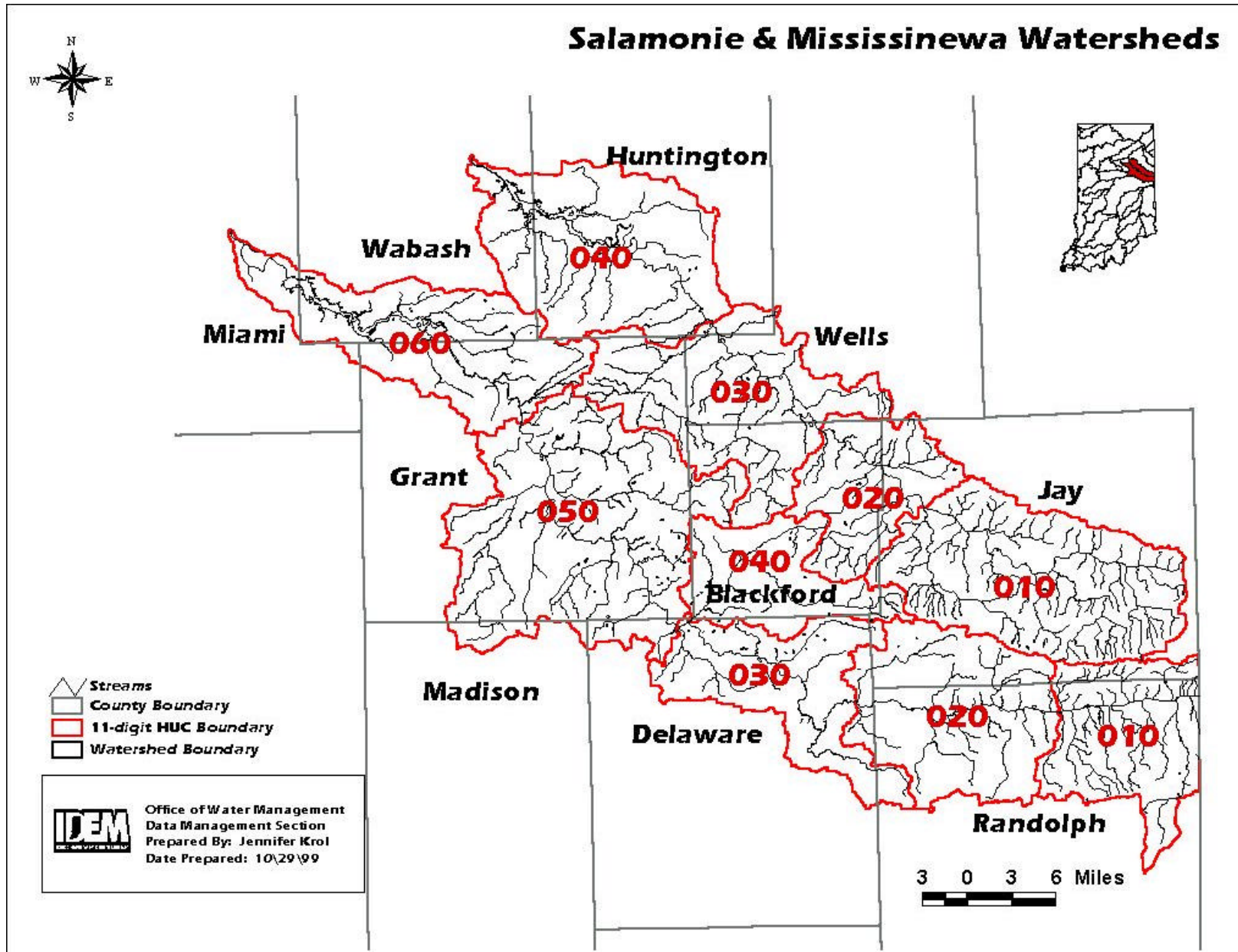
<b>HYDROLOGIC UNIT SCORES for Each Parameter Used in the Unified Watershed Assessment [2000-2001]</b>																
<b>11 Digit Hydrologic Unit</b>		<b>Mussel Diversity and Occurrence</b>	<b>Aquatic Life Use Support</b>	<b>Recreational Use Attainment</b>	<b>Stream Fishery</b>	<b>Lake Fishery</b>	<b>Eurasian Milfoil Infestation Status</b>	<b>Lake Trophic Status</b>	<b>Critical Biodiversity Resource</b>	<b>Aquifer Vulnerability</b>	<b>Population Using Surface Water for Drinking Water</b>	<b>Residential Septic System Density</b>	<b>Degree of Urbanization</b>	<b>Density of Livestock</b>	<b>% Cropland</b>	<b>Mineral Extraction Activities</b>
<b>Mississinewa</b>	05120103010	nd	nd	nd	nd	nd	nd	nd	2	4	2	2	2	4	4	2
	05120103020	nd	nd	nd	nd	nd	nd	nd	2	5	2	1	2	4	4	2
	05120103030	nd	nd	nd	nd	nd	nd	nd	2	5	2	4	2	3	4	2
	05120103040	nd	nd	nd	nd	nd	nd	nd	2	5	2	2	2	3	5	3
	05120103050	nd	nd	nd	nd	nd	nd	nd	2	5	2	4	2	2	4	3
	05120103060	nd	nd	nd	nd	nd	nd	2	2	4	2	3	2	4	4	3

Note:

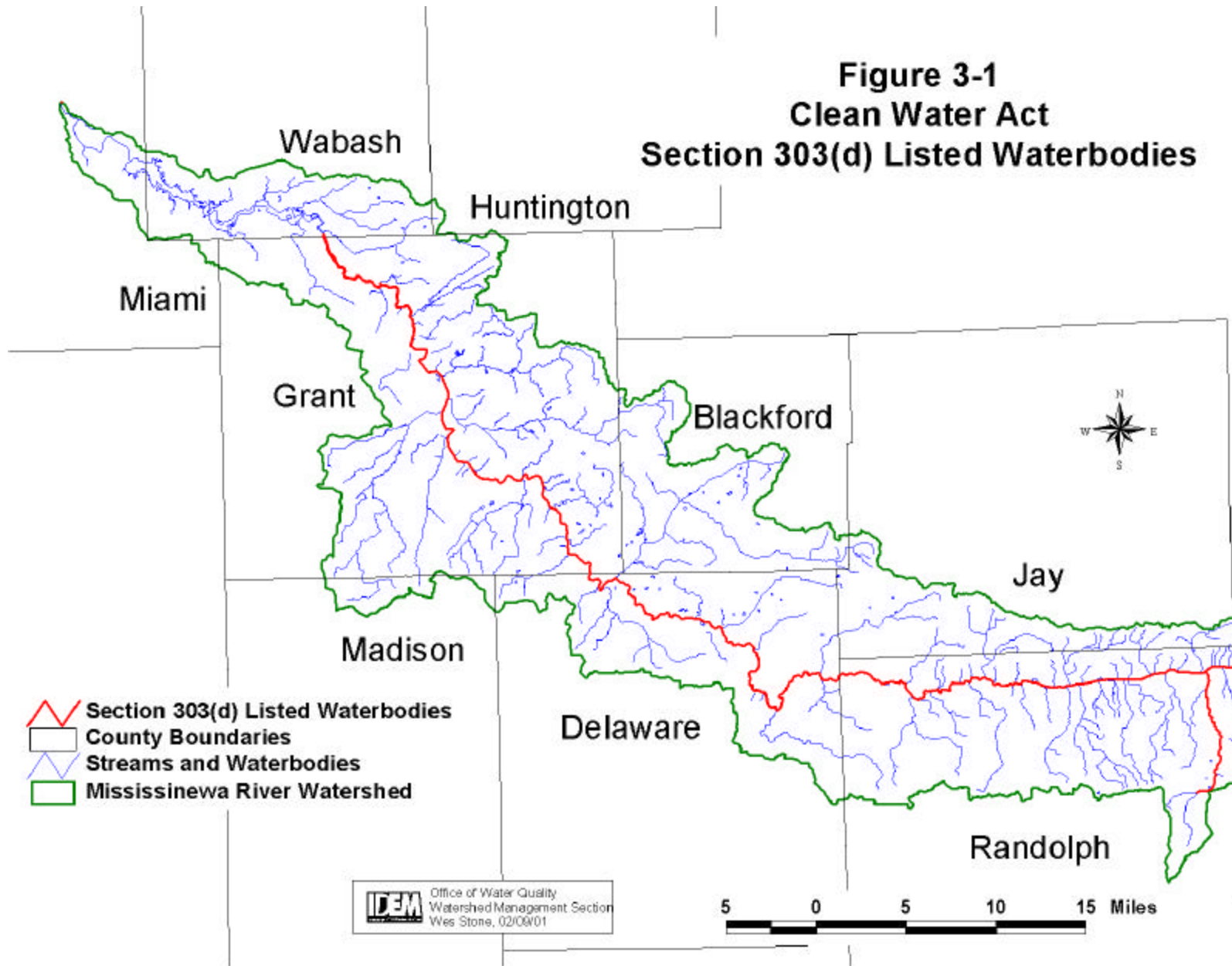
The UWA scores range from 1 to 5, with a score of 1 indicating good water quality and a score of 5 indicating severe impairment.

Nd = No data

Figure 2-1







# APPENDIX A

BENCHMARK CHARACTERISTIC ANALYSIS  
OF DATA FROM FIXED STATIONS IN THE  
MISSISSINEWA RIVER WATERSHED  
1991 TO 1997

Station: MS-

Parameter	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quantile Range	Variance	Std Dev.	Standard Error	Skewness	Std. Err.	Kurtosis	Std. Err.
Alkalinity (mg/l)	79	176.5063	167.6023	185.4103	171	13944	86	269	150	198	183	48	1580.228	39.75208	4.472458	0.333721	0.270545	0.06899	0.534952
Ammonia (mg/l as N)	79	0.099387	0.080431	0.118303	0.05	7.85	0.05	0.4	0.05	0.1	0.35	0.05	0.007147	0.08454	0.009512	1.73469	0.270545	2.090624	0.534952
BOD (mg/l)	36	1.763889	1.286541	2.241237	1.4	63.5	0.5	6.6	1	2	6.1	1	1.990373	1.410806	0.235134	1.994932	0.392544	4.221011	0.768076
COD (mg/l)	1	14				14		14											
Cyanide (mg/l)	0																		
Nitrate (mg/l)	79	3.431013	3.04824	3.813785	3	271.05	0.05	7.7	2.3	4.3	7.65	2	2.92034	1.7089	0.192266	0.5565	0.270545	-0.1355	0.534952
Nitrite (mg/l as N)	79	0.122722	0.083257	0.152186	0.08	9.695	0.015	0.96	0.05	0.14	0.945	0.09	0.017304	0.131544	0.0148	3.805033	0.270545	20.82634	0.534952
Total Phosphorus (mg/l as P)	79	382.2152	360.3866	404.0437	363	30195	276	1058	328	415	782	87	9497.325	97.45422	10.96446	4.461184	0.270545	29.28285	0.534952
Total Solids (mg/l)	79	28.87342	15.78764	41.9592	14	2281	2	496	7	33	494	26	3413.112	58.42185	6.572971	6.828025	0.270545	53.70989	0.534952
Suspended Solids (mg/l)	0																		
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	1	0.05				0.05	0.05	0.05		100	8495	95	1015480	1007.71	114.8393	7.635042	0.273908	61.85599	0.54146
E. coli (CFU/100ml)	77	231.5584	2.836215	460.2807	40	17830	5	8500	211	286	292	75	3129.353	55.94062	6.293812	0.146296	0.270545	0.183304	0.534952
TOC (mg/l)	79	247.0759	234.5459	259.606	240	19519	98	390	211	286	292	75	3129.353	55.94062	6.293812	0.146296	0.270545	0.183304	0.534952
Hardness (mg/l)	0																		
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	61	11.02525	10.36031	11.69019	10.26	672.54	7.52	20.11	9.5	12.48	12.59	2.98	6.740715	2.595289	0.332421	1.479792	0.30627	2.887251	0.603837
pH	62	8.015161	7.918344	8.11979	8.02	486.94	7	9.11	7.83	8.27	2.11	0.44	0.145347	0.381244	0.048418	-0.04222	0.303902	0.565863	0.599288
Copper (ug/l)	9	2.955556	1.816661	4.09445	2	26.6	2	5.3	2	4	3.3	2	2.195278	1.481647	0.493882	1.071045	0.717137	-0.869	1.399708
Iron (ug/l)	231.125	124.4026	337.8474	235	1849	39	390	390	130	345	351	215	16295.84	127.6552	45.13291	-0.17314	0.752101	-1.21822	1.48088
Zinc (ug/l)	3.34375	0.757442	5.930058	2.25	26.75	11	2.25	11	2.25	2.25	8.75	0	9.570313	3.093592	1.09375	2.828427	0.752101	8	1.48088

Station: MS-28

Parameter	Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quantile Range	Variance	Std Dev.	Standard Error	Skewness	Std. Err.	Kurtosis	Std. Err.
Alkalinity (mg/l)	80	210.925	201.7413	220.1087	217.5	16874	123	287	188	240.5	164	52.5	1703.032	41.28781	4.613882	-0.36872	0.268909	-0.44154	0.531786
BOD (mg/l)	80	0.0875	0.070199	0.104801	0.05	7	0.05	0.4	0.05	0.075	0.35	0.025	0.006044	0.077745	0.008692	2.170522	0.268909	4.080091	0.531786
Ammonia (mg/l as N)	40	2.35	1.837885	2.862115	2.05	94	0.5	6.3	1.15	3.55	5.8	2.4	2.564103	1.601282	0.253185	0.783221	0.373783	-0.14823	0.7326
COD (mg/l)	80	19.07625	17.51154	20.64096	18	1526.1	7.6	43.2	14	22.7	35.6	6.7	49.43702	7.031147	0.786106	0.851202	0.268909	0.89971	0.531786
Cyanide (mg/l)	13	0.005462	0.004737	0.006186	0.005	0.071	0.005	0.009	0.005	0.005	0.004	0	1.4E-06	0.001198	0.000332	2.882395	0.816336	6.964286	1.190874
Nitrate (mg/l as N)	80	3.3175	2.829584	3.805416	2.7	265.4	0.6	9.4	1.65	4.35	8.8	2.7	4.807032	2.192494	0.245128	1.083674	0.268909	0.245074	0.531786
Total Phosphorus (mg/l as P)	80	0.156313	0.132727	0.179898	0.14	12.505	0.015	0.56	0.08	0.19	0.545	0.11	0.011233	0.105985	0.011849	1.588154	0.268909	3.21827	0.531786
Total Solids (mg/l)	79	522.0633	488.9993	545.1273	491	41243	330	896	458	581	566	123	10602.83	102.97	11.58503	0.953205	0.270545	1.428129	0.534952
Suspended Solids (mg/l)	79	37.67089	26.88705	48.45472	24	2976	2	310	10	40	308	30	2317.916	48.14474	5.416708	3.160369	0.270545	13.33413	0.534952
Dissolved Solids (mg/l)	0																		
Sulfate (mg/l)	0																		
TKN (mg/l as N)	0																		
E. coli (CFU/100ml)	75	1095.133	354.8606	1835.406	200	82135	2	18000	278	349	17995	590	1E+07	3217.471	371.5215	4.284117	0.2774	18.03997	0.548211
TOC (mg/l)	80	312.275	297.4301	327.1199	317	24982	481	481	278	349	71	4449.822	66.70699	7.458068	-0.23167	0.268909	0.357368	0.531786	
Hardness (mg/l)	0																		
Chloride (mg/l)	0																		
Dissolved Oxygen (mg/l)	63	10.65222	10.15384	11.1506	10.59	671.09	7	15.1	8.83	11.8	8.1	2.97	3.916027	1.978895	0.249317	0.368603	0.301589	-0.40115	0.594841
pH	64	7.985469	7.896849	8.074088	8.03	511.07	7.04	8.64	7.8	8.235	1.6	0.435	0.125863	0.354772	0.044347	-0.51242	0.299327	0.098193	0.590491
Copper (ug/l)	16	4.84375	2.980004	6.707496	4.4	77.5	2	15	2	6	13	4	12.23329	3.497672	0.874403	1.870556	0.564308	4.110681	1.090774
Iron (ug/l)	8	575.5	-9.83185	1160.832	350	4604	74	2200	140	675	2126	535	490196.3	700.1402	247.5369	2.210018	0.270545	5.245233	1.48088
Zinc (ug/l)	16	11.93125	5.745532	18.11697	9.25	190.9	2.25	50	6.3	10	47.75	3.7	134.7566	11.60847	2.902118	2.664491	0.564308	8.081322	1.090774

Station: MS-36

Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quantile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err.	Kurtosis	Std.Err.
79	220.8734	211.1043	230.6426	228	17449	109	299	190	250	190	60	1902.24	43.61468	4.907035	-0.59036	0.270545	0.002587	0.534952
79	0.105063	0.084491	0.125636	0.05	8.3	0.05	0.5	0.05	0.1	0.45	0.05	0.008436	0.091845	0.010333	2.0372	0.270545	4.502303	0.534952
38	2.571053	1.845073	3.297032	1.9	97.7	0.5	11	1.1	3.4	10.5	2.3	4.878329	2.208694	0.358297	1.811088	0.382818	4.396938	0.7497
79	19.222278	17.1668	21.27877	17.8	1518.6	7	68	14	22	6.1	8	84.25383	9.178989	1.032717	2.610466	0.270545	10.96154	0.534952
0	2.876582	2.317634	3.435531	2.5	227.25	0.05	9.6	0.8	4	9.55	3.2	6.227233	2.495442	0.280759	0.903416	0.270545	-0.09176	0.534952
79	0.138797	0.113638	0.163957	0.11	10.965	0.015	0.61	0.07	0.17	0.595	0.1	0.012617	0.112325	0.012637	0.204787	0.270545	5.624128	0.534952
78	461.641	449.4678	473.8142	456.5	36008	338	579	428	507	241	79	2915.064	53.99134	6.113315	0.054641	0.272211	-0.45354	0.538176
78	34.74359	26.06426	43.42292	23.5	2710	2	272	13	46	270	33	1481.881	38.49521	4.358725	5.540122	0.272211	18.45638	0.538176
0	0.951899	0.863834	1.039963	0.8	75.2	0.3	1.9	0.6	1.2	1.6	0.6	0.15458	0.393166	0.044235	0.519577	0.270545	-0.52388	0.534952
76	4056.513	-204.578	8317.604	255	308295	5	120000	90	665	119995	575	3.5E+08	18647.3	2138.992	5.813294	0.275637	33.5452	0.544804
0	301.4937	288.9014	314.0859	314	23818	148	404	264	337	256	73	3160.51	56.21841	6.325065	-0.68186	0.270545	0.240475	0.534952
0	10.41246	9.875188	10.94973	10.56	635.16	5.67	16.04	8.87	11.98	10.37	3.11	4.400756	2.097798	0.268595	0.122945	0.30627	0.052717	0.603837
61	7.92619	7.84155	8.010831	8.02	499.35	6.9	8.52	7.75	8.18	1.62*	0.43	0.11295	0.33608	0.042342	-0.80061	0.301589	0.321589	0.594841
63	4.157895	3.565162	4.749628	4	316	2	13	2	5	11	3	6.70567	2.589531	0.29704	1.529371	0.275637	2.331888	0.544804
76	597	302.5322	891.4678	510	5970	170	1500	280	760	1330	480	169445.6	411.6377	130.1713	1.243761	0.687043	1.431766	1.334249
10	12.46234	10.44146	14.48322	10	959.6	2.25	51	10	12	48.75	2	79.27488	8.903644	1.014664	2.483821	0.273908	7.629884	0.54146

Station: MS-99

Valid N	Mean	Confid. -95.000%	Confid. +95.000%	Median	Sum	Minimum	Maximum	Lower Quartile	Upper Quartile	Range	Quantile Range	Variance	Std.Dev.	Standard Error	Skewness	Std.Err.	Kurtosis	Std.Err.
79	251.6709	241.1751	262.1667	254	19882	115	326	219	285	211	66	2195.736	46.85869	5.272014	-0.7131	0.270545	0.259734	0.534952
79	0.081013	0.060699	0.101326	0.05	6.4	0.05	0.7	0.05	0.05	0.65	0	0.008225	0.09069	0.01203	4.727578	0.270545	28.16995	0.534952
38	1.236842	0.95612	1.517564	1	47	0.5	4.6	0.5	1.7	4.1	1.2	0.729417	0.854059	0.138547	1.790079	0.382818	5.11246	0.7497
79	16.57848	14.32919	18.82777	14	1309.7	6	68	10.7	20.6	62	9.9	100.8425	10.04204	1.129817	2.708934	0.270545	10.01652	0.534952
79	0.005266	0.005084	0.005448	0.005	0.416	0.005	0.009	0.005	0.005	0.004	0	6.6E-07	0.000812	9.1E-05	3.158337	0.270545	9.312598	0.534952
79	3.88481	2.961941	4.807679	3.4	306.9	0.05	31	1.2	4.9	30.95	3.7	16.97586	4.120177	0.463556	3.878786	0.270545	23.42568	0.534952
79	0.172848	0.142489	0.203207	0.14	13.655	0.015	0.79	0.08	0.22	0.775	0.14	0.018371	0.135539	0.015249	1.99068	0.270545	5.421785	0.534952
79	480.0759	463.6359	496.516	465	37926	371	904	437	511	533	74	5387.148	73.39719	8.257829	2.865911	0.270545	13.7742	0.534952
79	25.81013	14.18885	37.4314	10	2039	2	396	5	22	394	17	2691.899	51.88352	5.837352	5.211824	0.270545	33.84049	0.534952
0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	380	1190885	1091.277	126.0098	4.249314	0.2774	22.54612	0.546211
1	561.1333	310.0534	812.2133	250	42085	5	7500	60	440	7495	60	2917.344	54.01245	6.076875	-0.57834	0.270545	1.211433	0.534952
79	335.1646	323.0664	347.2627	344	26478	166	488	309	369	322	60	4.355018	2.086868	0.267196	0.239941	0.30627	0.667647	0.603837
0	10.08426	9.549791	10.61873	9.83	615.14	4.21	16.03	8.55	11.32	11.82	2.77	0.110378	0.332232	0.042194	-0.35815	0.303902	-0.15481	0.599288
61	7.917097	7.832726	8.001468	8.005	490.86	7.07	8.6	7.76	8.14	1.53.*	0.38	6.679556	2.584484	0.817285	2.302979	0.687043	5.53221	1.334249
62	3.32	1.471172	5.168828	2	33.2	2	10	2	4.5	8	2.5	46005.3	4.678274	226.0908	2.696546	0.711737	7.467977	1.399708
10	446.2222	-75.1441	967.5885	190	4016	66	2200	160	230	2134	70	11.56822	3.401209	1.075557	1.203947	0.687043	0.63746	1.334249
9	5.14	2.706922	7.573078	5.05	51.4	2.25	12	2.25	5.2	9.75	2.95							

# APPENDIX B

MISSISSINEWA RIVER WATERS ASSESSED IN THE  
CLEAN WATER ACT SECTION 305(B) REPORT

MISSISSINEWA WATERSHED ASSESSMENTS  
SECTION 305(B) 2000

Waterbody ID	Hydrologic unit	Segment name	Size (mi.)	YEAR 303D	Aquatic Life	Fish Cons	Contact (Recr)	Bio comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticide	Priority organics	Salinity/TDS/ chlorides	ammonia	Assess date
INB0311_00	05120103010010	Mitchell Ditch and other tributaries	8.18		X	X	X													
INB0311_T1001	05120103010010	Mississinewa River - mainstem above LtI Mississinewa R	1.70	1998	X	P	X								M					19980301
INB0312_00	05120103010020	Gettinger Ditch and other tributaries	8.13		X	X	X													
INB0312_T1002	05120103010020	Little Mississinewa River mainstem	8.42	1998	F	N	X								H					19991108
INB0313_00	05120103010030	Jordan Creek and other tributaries	9.05		F	X	X													
INB0313_T1003	05120103010030	Mississinewa River - mainstem	2.36	1998	F	P	X								M					19991108
INB0314_00	05120103010040	HARSHMAN CREEK - LOWES BRANCH	17.06		X	X	X													
INB0315_00	05120103010050	Porter/ Miller Creeks and other tributaries	22.04		X	X	X													
INB0315_T1004	05120103010050	Mississinewa River - mainstem	2.30	1998	X	P	X								M					19980301
INB0316_00	05120103010060	Clear Creek and other tributaries	30.57		X	X	X													
INB0316_T1005	05120103010060	Mississinewa River - mainstem	2.58	1998	X	P	X								M					19980301
INB0317_00	05120103010070	Mud/ O'Brien Creeks and other tributaries	20.28		X	X	X													
INB0317_T1006	05120103010070	Mississinewa River - mainstem	0.85	1998	X	P	X								M					19980301
INB0321_00	05120103020010	Unnamed tributary of Mississinewa R	1.79		F	X	X													
INB0321_T1007	05120103020010	Mississinewa River - mainstem	4.89	1998	F	P	X								M					19991122
INB0322_00	05120103020020	Days Creek basin	10.29		X	X	X													
INB0322_T1008	05120103020020	Mississinewa River - mainstem	1.21	1998	X	P	X								M					19980301
INB0323_00	05120103020030	Bear Creek basin	7.80		X	X	X													
INB0324_T1009	05120103020040	Mississinewa River - mainstem	4.54	1998	X	P	X								M					19980301
INB0325_00	05120103020050	BUSH CREEK - ELKHORN CREEK	11.85		X	X	X													
INB0326_00	05120103020060	Platt Nibarger Ditch	4.92		X	X	X													
INB0326_T1010	05120103020060	Mississinewa River - mainstem	5.02	1998	F	P	X								M					19991108
INB0327_00	05120103020070	Mud Creek basin	5.30		X	X	X													
INB0327_T1011	05120103020070	Mississinewa River - mainstem	1.62	1998	X	P	X					S			M					19980301
INB0328_00	05120103020080	HALFWAY CREEK - REDKEY RUN	9.26		X	X	X													
INB0331_00	05120103030010	Campbell Creek	11.78		X	X	X													
INB0332_00	05120103030020	Bosman Ditch	4.25	1998	F	X	X													
INB0332_T1012	05120103030020	Mississinewa River - mainstem	11.71	1998	X	P	X					S			M					19980301
INB0333_00	05120103030030	REES DITCH	8.05		X	X	X													
INB0334_T1013	05120103030040	Mississinewa River - mainstem	8.40	1998	F	P	N					S		M	M					19991108
INB0335_00	05120103030050	Pike Creek basin	10.99		F	X	X													

Use support: F-fully supporting,P-partially supporting,N-not supporting,X-Not assessed,A-Not attainable. Cause magnitude: S-slight,M-moderate,H-high,T-more information needed. \*Biological community status-stressor not identified.

Waterbody ID	Hydrologic unit	Segment name	Size (mi.)	YEAR 303D	Aquatic Life	Fish Cons	Contact (Recr)	Bio comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticide	Priority organics	Salinity/TDS/ chlorides	ammonia	Assess date
INB0335_T1014	05120103030050	Mississinewa River - mainstem	0.93	1998	F	P	X								M					19991108
INB0341_00	05120103040010	BIG LICK CREEK - HEADWATERS	5.10		X	X	X													
INB0343_00	05120103040030	LITTLE LICK CREEK (BLACKFORD)	6.82		X	X	X													
INB0344_00	05120103040040	BIG LICK CREEK - MOORE PRONG/ LITTLE JOE CREEK	7.28		X	X	X													
INB0345_00	05120103040050	BIG LICK CREEK - TOWNSEND LUCAS DITCH	12.57		X	X	X													
INB0351_00	05120103050010	Hoppas Ditch	5.06		X	X	X													
INB0351_T1015	05120103050010	Mississinewa River - mainstem	3.78	1998	N	P	N	M			S		S	M						19991108
INB0352_00	05120103050020	Lake Branch and other tributaries	11.49		X	X	X													
INB0352_T1016	05120103050020	Mississinewa River - mainstem	2.89	1998	X	P	X				S			M						19980301
INB0353_00	05120103050030	BARREN CREEK - FOWLER DITCH	12.50		X	X	X													
INB0354_T1017	05120103050040	Mississinewa River - mainstem	9.42	1998	X	P	X				S			M						19980301
INB0355_00	05120103050050	BACK CREEK (GRANT)	9.09		X	X	X													
INB0356_00	05120103050060	DEER CREEK - LITTLE DEER CREEK	15.36		X	X	X													
INB0356_T1023	05120103050060	Little Creek	4.38		N	X	X	H												19991108
INB0357_00	05120103050070	DEER CREEK - BELL/ DRY FORK DITCH	7.53		X	X	X													
INB0357_T1024	05120103050070	Mississinewa River - mainstem	4.13		F	X	X													
INB0358_00	05120103050080	WALNUT CREEK - LITTLE WALNUT CREEK	9.46		F	X	X													
INB0359_00	05120103050090	WALNUT CREEK - MONROE PRAIRIE CREEK	6.21		F	X	X													
INB035A_00	05120103050100	Walnut Creek	4.95		X	X	X													
INB035A_T1018	05120103050100	Mississinewa River - mainstem	4.16	1998	X	P	X				S			M						19980301
INB035C_00	05120103050120	LUGAR CREEK - TIPPEY DITCH	10.86		X	X	X													
INB035D_00	05120103050130	Boots and Massey Creeks	9.56		P	X	X	H												19991108
INB035D_T1019	05120103050130	Mississinewa River - mainstem	4.11		F	P	N				T	S		S	M					19991122
INB0361_00	05120103060010	Hummel Creek	7.53		P	X	X	H												19991108
INB0361_T1020	05120103060010	Mississinewa River	1.34	1998	F	P	N				T	S		S	M					19991122
INB0362_T1021	05120103060020	Mississinewa River - mainstem	8.80	1998	F	P	N				T	S		H	M					19991108
INB0363_00	05120103060030	Metocinah Creek	8.35		X	X	X													
INB0364_00	05120103060040	MISSISSINEWA RIVER - CART CREEK	10.12		X	X	X													
INB0365_00	05120103060050	GRANT CREEK - BADGER CREEK	7.09		X	X	X													
INB0366_00	05120103060060	MISSISSINEWA LAKE - FORKED BRANCH	7.99		X	X	X													
INB0367_00	05120103060070	TENMILE CREEK	3.23		X	X	X													

Use support: F-fully supporting,P-partially supporting,N-not supporting,X-Not assessed,A-Not attainable. Cause magnitude: S-slight,M-moderate,H-high,T-more information needed. \*Biological community status-stressor not identified.

Waterbody ID	Hydrologic unit	Segment name	Size (mi.)	YEAR 303D	Aquatic Life	Fish Cons	Contact (Recr)	Bio comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticide	Priority organics	Salinity/TDS/ chlorides	ammonia	Assess date	
INB0369_P1022	05120103060090	MISSISSINEWA LAKE	9.79		X	X	X														
INB036A_00	05120103060100	MISSISSINEWA RIVER - BELOW DAM	6.99		F	X	X														

Use support: F-fully supporting,P-partially supporting,N-not supporting,X-Not assessed,A-Not attainable. Cause magnitude: S-slight,M-moderate,H-high,T-more information needed. \*Biological community status-stressor not identified.



# APPENDIX C

## Potential Stakeholders in the Mississinewa River Watershed

## Potential Stakeholders in the Mississinewa River Watershed

Madison Cnty Co-Op Extn  
16 E 9th St # 303  
Anderson, IN 46016  
765/ 641-9514

Dunkirk Mayor's Office  
131 S Main St  
Dunkirk, IN 47336  
765/ 768-6858

Madison County Board Of Health  
206 E 9th St  
Anderson, IN 46016  
765/ 641-9523

Dunkirk Sewage Disposal  
West I St  
Dunkirk, IN 47336  
765/ 768-6401

Madison County Commissioner  
16 E 9th St  
Anderson, IN 46016  
765/ 641-9474

Dunkirk Water Dept  
304 N Meridian St  
Dunkirk, IN 47336  
765/ 768-6050

Madison County Council-Govts  
16 E 9th St # 100  
Anderson, IN 46016  
765/ 641-9482

Eaton Sewage Disposal Plant  
W Indiana Ave  
Eaton, IN 47338  
765/ 396-3941

Madison County Drainage Board  
206 E 9th St  
Anderson, IN 46016  
765/ 641-9687

Eaton Water & Sewage Dept  
600 E Harris St  
Eaton, IN 47338  
765/ 396-3980

Madison Co. Coop Extension  
16 East 9th Street  
Anderson, IN 46016  
765) 641-9514

Sewage Disposal Plant  
200 W 8th St  
Fairmount, IN 46928  
765/ 948-4313

Madison Co. SWCD  
1917 East University Blvd  
Anderson, IN 46012  
765/ 644-4249

Water Works Office  
214 W Washington St  
Fairmount, IN 46928  
765/ 948-4632

USDA Natural Resource Cons. Service  
1917 East University Blvd  
Anderson, IN 46012  
765/ 644-4249

Gas City Mayor's Office  
211 E Main St  
Gas City, IN 46933  
765/ 677-3080

Converse Water Works  
210 N Jefferson St  
Converse, IN 46919  
765/ 395-3459

Gas City Sewage Treatment Plnt  
500 S Broadway  
Gas City, IN 46933  
765/ 677-3083

Sewage Dept  
107 N Sycamore St  
Gaston, IN 47342  
765/ 358-3104

Water & Sewage Office  
700 N Walnut St  
Hartford City, IN 47348  
765/ 348-0410

Blackford County Landfill  
1025 S Willman Rd  
Hartford City, IN 47348  
765/ 348-5011

Water Works  
721 S Jefferson St  
Hartford City, IN 47348  
765/ 348-2230

Blackford County Offices  
124 N Jefferson St  
Hartford City, IN 47348  
765/ 348-3101

Blackford County SWCD  
319 W. Ohio Avenue  
Hartford City, IN 47348-1303  
765-348-1404

County Health Dept  
100 N Jefferson St  
Hartford City, IN 47348  
765/ 348-4317

Cooperative Extension Agents  
201 N Jefferson St # 209  
Huntington, IN 46750  
219/ 358-4826

County Surveyor  
110 W Washington St # 2  
Hartford City, IN 47348  
765/ 348-1203

County Commissioner  
201 N Jefferson St # 103  
Huntington, IN 46750  
219/ 358-4822

Hartford City Mayor's Office  
700 N Walnut St  
Hartford City, IN 47348  
765/ 348-0412

Health Dept  
201 N Jefferson St # 205  
Huntington, IN 46750  
219/ 358-4831

Natural Resources Conservation  
319 W Ohio Ave  
Hartford City, IN 47348  
765/ 348-1404

Huntington County Surveyor  
201 N Jefferson St # 203  
Huntington, IN 46750  
219/ 358-4856

Natural Resources Dept  
120 N Jefferson St  
Hartford City, IN 47348  
765/ 348-5067

US Army Corps Of Engineers  
State Road 5 S  
Huntington, IN 46750  
219/ 356-8648

Purdue Extension Office  
110 W Washington St  
Hartford City, IN 47348  
765/ 348-3213

US Farm Svc Agency  
2040 Riverfork Dr  
Huntington, IN 46750  
219/ 356-6816

Sewage Disposal Plant  
Center Pike Rd  
Hartford City, IN 47348  
765/ 348-3855

Huntington County SWCD  
2040 Riverfork Drive, West  
Huntington, IN 46750-9004  
219-356-6816

Jonesboro Mayor's Office  
414 S Main St  
Jonesboro, IN 46938  
765/ 674-4393

Grant County Surveyors Office  
401 S Adams St  
Marion, IN 46953  
765/ 668-8871

La Fontaine Water & Sewage  
22 W Branson St  
La Fontaine, IN 46940  
765/ 981-4591

US Consolidated Farm Svc Agcy  
1111 E 4th St  
Marion, IN 46952  
765/ 668-8983

Marion City Engineer Office  
301 S Branson St Fl 3  
Marion, IN 46952  
765/ 668-4441

Delaware Co. SWCD  
2904 Granville Avenue  
Muncie, IN 47303  
765-747-5531

Marion Mayor's Office  
301 S Branson St Fl 2  
Marion, IN 46952  
765/ 662-9931

Delaware County Board-Health  
100 W Main St # 207  
Muncie, IN 47305  
765/ 747-7721

Marion Sewer Maintenance Dept  
1540 N Washington St  
Marion, IN 46952  
765/ 662-9668

Delaware County Commissioners  
100 W Main St # 309  
Muncie, IN 47305  
765/ 747-7730

Marion Waste Water Treatment  
1540 N Washington St  
Marion, IN 46952  
765/ 664-9056

Delaware County Extension  
100 W Main St # 202  
Muncie, IN 47305  
765/ 747-7732

Grant County Health Department  
Courthouse Complex, 401 S Adams St  
Marion, IN 46953-2031  
765/ 651-2404

Delaware County Surveyor  
100 W Main St # 203  
Muncie, IN 47305  
765/ 747-7806

Grant County SWCD  
1113 East 4th Street  
Marion, IN 46952-4211  
765/ 668-8985

USDA Natural Resources Conservation  
Service  
2904 Granville Avenue  
Muncie, IN 47303  
765-747-5531

Coop Extension - Grant County  
401 S. Adams Street  
Marion, IN 46953-2035  
765/ 651-2413

Miami County Co-Op Extension  
21 Court St  
Peru, IN 46970  
765/ 472-1921

Grant County Commissioners Ofc  
401 S Adams St  
Marion, IN 46953  
765/ 668-8871

Miami County Offices  
25 Court St # 211a  
Peru, IN 46970  
765/ 473-4649

Miami County SWCD  
1170 US Highway 24 W  
Peru, IN 46970  
765/ 473-6110

Union City Mayor's Office  
115 N Columbia St  
Union City, IN 47390  
765/ 964-3700

Natural Resources Dept  
1124 N Mexico Rd  
Peru, IN 46970  
765/ 473-9722

Union City Sewage Disposal  
825 N Jackson Pike  
Union City, IN 47390  
765/ 964-5544

Jay Co Coop Purdue University  
120 W Main St  
Portland, IN 47371  
219/ 726-4707

Union City South Side Plant  
216 W Maple St  
Union City, IN 47390  
765/ 964-5101

Jay County Commissioners  
120 N Court St  
Portland, IN 47371  
219/ 726-7595

Union City Water Works  
Deerfield Rd  
Union City, IN 47390  
765/ 964-5521

Jay County Engineer  
1035 E 200 N  
Portland, IN 47371  
219/ 726-8701

US Agricultural Dept  
599 Bryan Ave  
Wabash, IN 46992  
219/ 563-7486

Jay County Health Dept  
120 N Court St  
Portland, IN 47371  
219/ 726-8080

Wabash County Health Dept  
89 W Hill St  
Wabash, IN 46992  
219/ 563-0661

Jay County Surveyor  
120 N Court St  
Portland, IN 47371  
219/ 726-8784

Wabash County SWCD  
599 Bryan Avenue  
Wabash, IN 46992-1019  
219-563-7486

Jay County SWCD  
Route 2 Box 1E, Highway 67 W  
Portland, IN 47371-1146  
219/ 726-4888

Randolph Co. SWCD  
975 East Washington St. Suite 2  
Winchester, IN 47394  
765/ 584-4505

Redkey Sewage Disposal  
S Union  
Redkey, IN 47373  
765/ 369-2811

Health Dept  
211 S Main St  
Winchester, IN 47394  
765/ 584-1155

Redkey Water Plant  
Sherman St  
Redkey, IN 47373  
765/ 369-2807

Randolph County Area Planning  
100 S Main St # 207  
Winchester, IN 47394  
765/ 584-8610

Randolph County Building Comm Courtthouse # 207 Winchester, IN 47394 765/ 584-0275	(317) 232-8172 Criminal Investigations (317) 232-8128
Randolph County Extension Ofc 1885 S US Highway 27 Winchester, IN 47394 765/ 584-2271	Enforcement (317) 233-5529 Environmental Response (317) 308-3017
Randolph County Surveyor 100 S Main St # 206 Winchester, IN 47394 765/ 584-0609	Legal Counsel (317) 232-8493
US Consolidated Farm Svc State Rd 32 E Winchester, IN 47394 765/ 584-4505	Media and Communication Services (317) 232-8560
<b><u>STATE STAKEHOLDERS</u></b>	Pollution Prevention and Technical Assistance (317) 232-8172
Indiana Farm Bureau Inc. 225 S East St Indianapolis, IN 46202 (317) 692-7851	Solid and Hazardous Waste Management (317) 233-3656
Indiana Department of Environmental Management 100 N. Senate Ave P.O. Box 6015 Indianapolis, IN 46206-6015	Water Management (317) 232-8670
IDEM Switchboard (317) 232-8603 or (800) 451-6027	Indiana Department of Natural Resources 402 West Washington Street Indianapolis, IN 46204-2748
Agricultural Liaison (317) 232-8587	IDNR, Division of Soil Conservation, Field Representatives are generally located with the SWCD office in each county.
Air Management (317) 233-0178	Division of Engineering (317) 232-4150
Community Relations (317) 233-6648	Division of Entomology and Plant Pathology (317) 232-4120
Compliance and Technical Assistance	Division of Fish & Wildlife (317) 232-4080

Division of Forestry  
(317)-232-4105

Division of Outdoor Recreation  
(317)-232-4070

Division of Historic  
Preservation & Archaeology  
(317) 232-1646

Division of Nature Preserves  
(317)-232-4052

Division of Law Enforcement  
(317) 232-4010

Indiana State Department of Health  
2 North Meridian St.  
Indianapolis, IN 46204  
(317) 233-1325

Division of State  
Parks and Reservoirs  
(317)-232-4124

FEDERAL STAKEHOLDERS

Division of Water  
(317)-232-4160

Natural Resources  
Conservation Service  
6013 Lakeside Blvd  
Indianapolis, In 46278  
(317) 290-3200

Division of Public  
Information and Education  
(317) 232-4200

Division of Reclamation  
(317)-232-1547

*NRCS Field Representatives are generally  
located with the SWCD office in each  
county.*

Division of Safety and Training  
(317) 232-4145

U.S. EPA Region 5  
77 West Jackson Blvd  
Chicago, IL 60604  
(312) 353-2000  
(800) 632-8431

Division of Soil Conservation  
(317)-233-3870

Division of Oil and Gas  
(317) 232-4055

# APPENDIX D

## FUNDING SOURCES



# FUNDING SOURCES

This listing of funding sources was derived from the November 1998 *Watershed Action Guide for Indiana*, which is available from the Watershed Management Section of IDEM.

## FEDERAL CONSERVATION AND WATERSHED PROGRAMS

### *Environmental Protection Agency*

#### Section 319, 604(b), and 104(b)3 Grants

Grants for conservation practices, water body assessment, watershed planning, and watershed projects. Available to non-profit or governmental entities. These monies, enabled by the Clean Water Act, are funneled through the Indiana Department of Environmental Management. *For details see IDEM below.*

### *U.S. Department of Agriculture (See county listings for local federal agency contacts.)*

**EQIP:** Environmental Quality Incentive Program. Administered by the Natural Resources Conservation Service. Conservation cost-share program for implementing Best Management Practices, available to agricultural producers who agree to implement a whole-farm plan that addresses major resource concerns. Up to \$50,000 over a 5- to 10-year period. Some parts of the state are designated Conservation Priority Areas and receive a larger funding allotments.

**WRP:** Wetland Reserve Program. Administered by the Natural Resources Conservation Service. Easement and restoration program to restore agricultural production land to wetland. Easements may be for 10 years, 30 years, or permanent. Longer easements are preferred. Partnerships with other acquisition programs are encouraged. Restoration and legal costs are paid by NRCS. Landowner retains ownership of the property and may use the land in ways that do not interfere with wetland function and habitat, such as hunting, recreational development, and timber harvesting.

**CRP:** Conservation Reserve Program. Administered by the Farm Service Agency with technical assistance from NRCS. Conservation easements in certain critical areas on private property. Agricultural producers are eligible. Easements are for 10 or 15 years, depending on vegetative cover, and compensation payments are made yearly to replace income lost through not farming the land. Cost share is available for planting vegetative cover on restored areas.

**WHIP:** Wildlife Habitat Incentive Program. Administered by the Natural Resources Conservation Service. Cost share to restore habitat on previously farmed land. Private landowners who are agricultural producers are eligible. Cost share up to 75%, and contracts are for 10 years.

**FIP:** Forestry Incentive Program. Administered by the Natural Resources Conservation Service. Cost-share to assist forest management on private lands. Funds may be limited.

*U.S. Fish & Wildlife Service*

**Partners for Wildlife:** assistance for habitat restoration.

## STATE CONSERVATION AND WATERSHED PROGRAMS

*IDNR Division of Soil Conservation*

**LARE:** Lake & River Enhancement Program. Funds diagnostic and feasibility studies in selected watersheds and cost-share programs through local Soil & Water Conservation Districts. Project oversight provided through county-based Resource Specialists and Lake & River Enhancement Watershed Coordinators. Funding requests for Watershed Land Treatment projects must come from Soil & Water Conservation Districts. If a proposed project area includes more than one district, the affected SWCDs should work together to develop an implementation plan. The SWCDs should then apply for the funding necessary to administer the watershed project. Before applying for funding, the SWCDs should contact the Lake & River Enhancement Coordinators to determine (1) the appropriate watershed to include in the project, (2) if the proposed project meets the eligibility criteria, and (3) if funding is available.

*IDNR Division of Fish & Wildlife*

**Classified Wildlife Habitat Program:** Incentive program to foster private wildlife habitat management through tax reduction and technical assistance. Landowners need 15 or more acres of habitat to be eligible. IDNR provides management plans and assistance through District Wildlife Managers. See county listings.

**Wildlife Habitat Cost-share Program:** Similar to above.

*IDNR Division of Forestry*

**Classified Forest Program:** Incentive program to foster private forest management through tax reduction and technical assistance. Landowners need 10 or more acres of woods to be eligible. IDNR provides management plans and assistance through District Foresters. (See county listings.)

**Classified Windbreak Act:** Establishment of windbreaks at least 450 feet long adjacent to tillable land. Provides tax incentive, technical assistance through IDNR District Foresters.

**Forest Stewardship Program & Stewardship Incentives Program:** Cost share and technical assistance to encourage responsibly managed and productive private forests.

*IDNR Division of Reclamation*

**Appalachian Clean Streams Initiative:** Funds for acid mine drainage abatement.

*IDNR Division of Nature Preserves*

**State Nature Preserve Dedication:** Acquisition and management of threatened habitat.

*IDEM Office of Water Management*

**State Revolving Fund:** Available to municipalities and counties for facilities development. Will be available in 1999 for nonpoint source projects as well. Funding is through very low-interest loans.

**Section 319 Grants:** Available to nonprofit groups, municipalities, counties, and institutions for implementing water quality improvement projects that address nonpoint source pollution concerns. Twenty-five percent match is required, which may be cash or in-kind. Maximum grant amount is \$112,500. Projects are allowed two years for completion. Projects may be for land treatment through implementing Best Management Practices, for education, and for developing tools and applications for state-wide use.

**Section 205(j) Grants, formerly called 604(b) Grants:** Available to municipalities, counties, conservation districts, drainage districts. These are for water quality management projects such as studies of nonpoint pollution impacts, nonagricultural NPS mapping, and watershed management projects targeted to Northwest Indiana (including BMPs, wetland restoration, etc.)

**Section 104(b)(3) Grants:** These are watershed project grants for innovative demonstration projects to promote statewide watershed approaches for permitted discharges, development of storm water management plans by small municipalities, projects involving a watershed approach to municipal separate sewer systems, and projects that directly promote community based environmental protection. NOTE: the application time frame for IDEM grant programs is annually, by March 31<sup>st</sup>.

## **PRIVATE FUNDING SOURCES**

*National Fish and Wildlife Foundation*

1120 Connecticut Avenue, NW Suite 900, Washington DC 20036. Nonprofit, established by Congress 1984, awards challenge grants for natural resource conservation. Federally appropriated funds are used to match private sector funds. Six program areas include wetland conservation, conservation education, fisheries, migratory bird conservation, conservation policy, and wildlife habitat.

*Individual Utilities*

Check local utilities such as IPALCO, CINergy, REMC, NIPSCO. Many have grants for educational and environmental purposes.

*Indiana Hardwood Lumbermen's Association*

Indiana Tree Farm Program

*The Nature Conservancy*

*Land acquisition and restoration.*

Southern Lake Michigan Conservation Initiative

Blue River Focus Area

Fish Creek Focus Area

Natural Areas Registry

Hoosier Landscapes Capitol Campaign

*Conservation Technology Information Center (CTIC)*

'*Know Your Watershed*' educational materials are available

*Indiana Heritage Trust*

*Land acquisition programs*

*Ducks Unlimited*

*Land acquisition and habitat restoration assistance*

*Quail Unlimited*

*Pheasants Forever*

*Sycamore Land Trust*

*Acres Inc.*

*Land trust*

*Oxbow, Inc.*

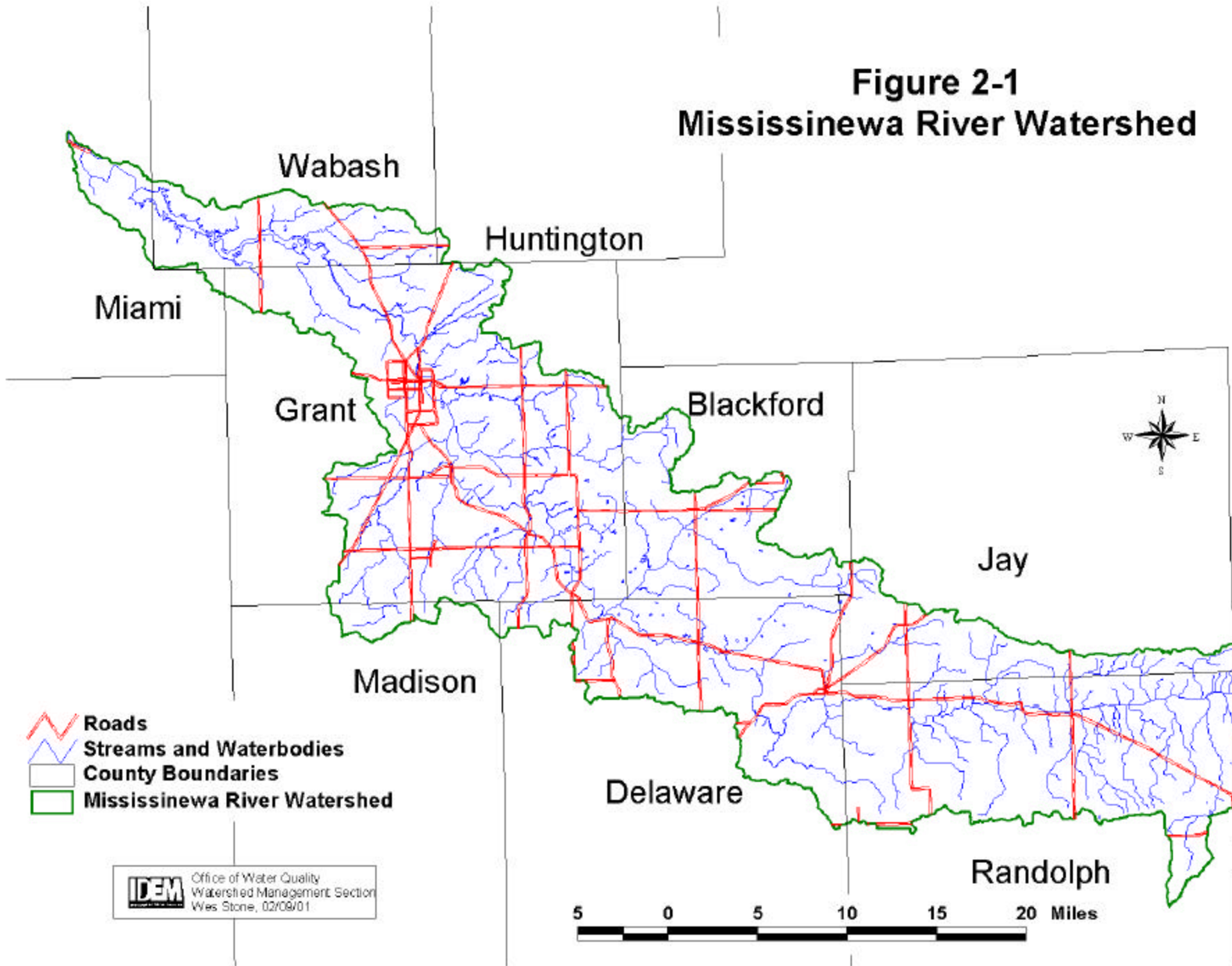
*Land trust*

**SOURCES OF ADDITIONAL FUNDING OPPORTUNITIES**

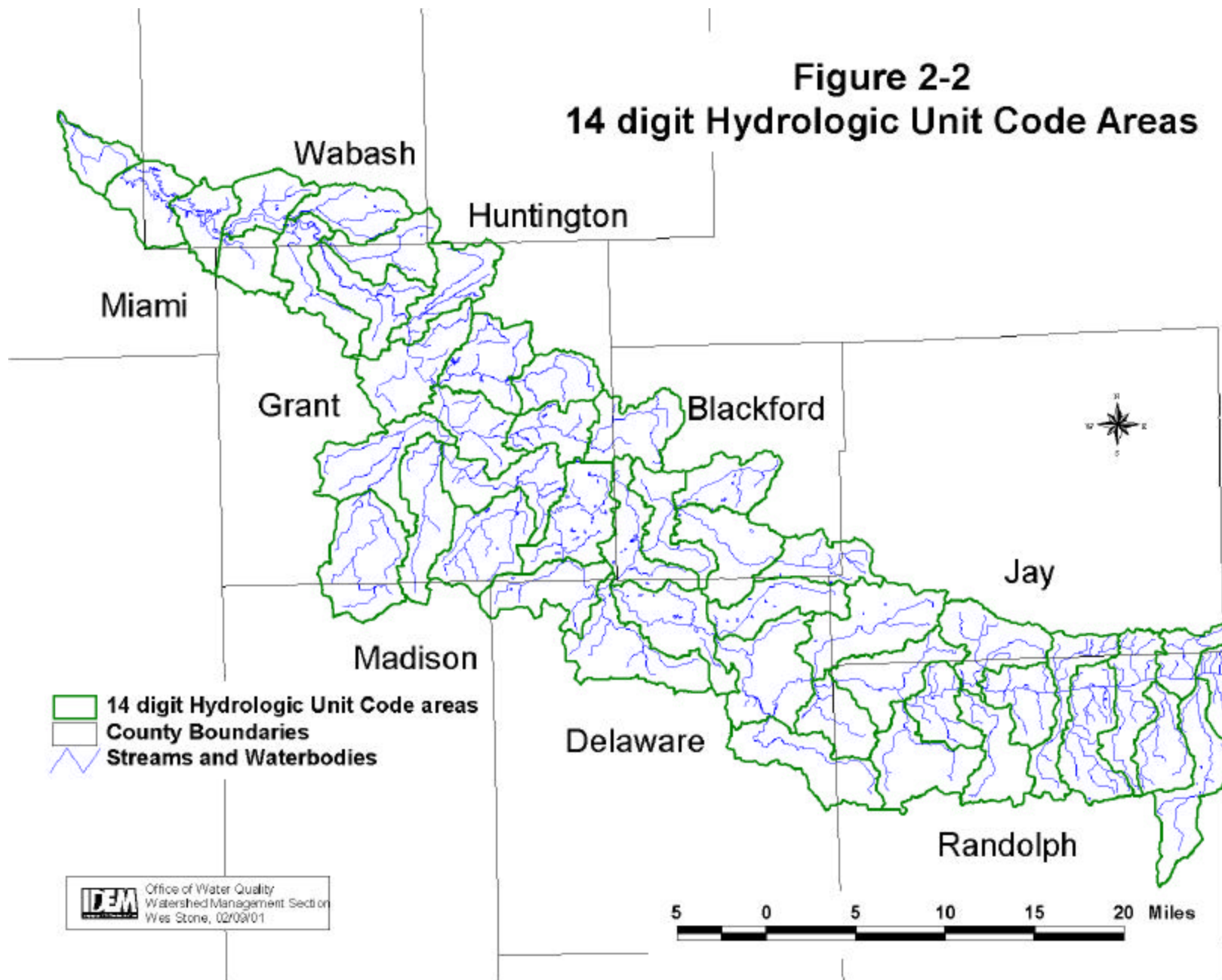
*Catalog of Federal Funding Sources for Watershed Protection*  
EPA Office of Water (EPA841-B-97-008) September 1997

**GrantsWeb:** <http://www.srainternational.org/cws/sra/resource.htm>

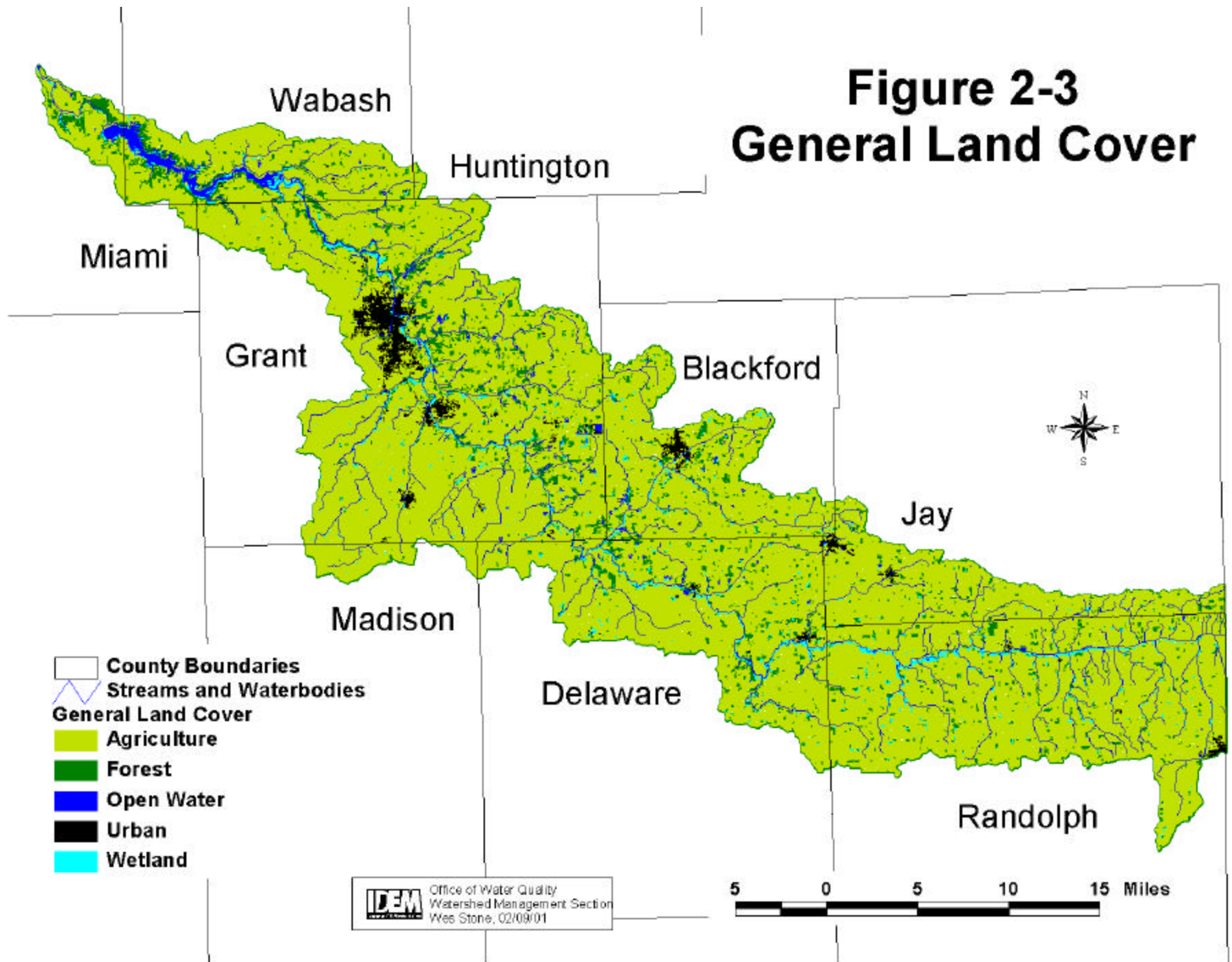
**Figure 2-1**  
**Mississinewa River Watershed**



**Figure 2-2**  
**14 digit Hydrologic Unit Code Areas**



# Figure 2-3 General Land Cover





# Figure 3-1 NPDES Facilities

