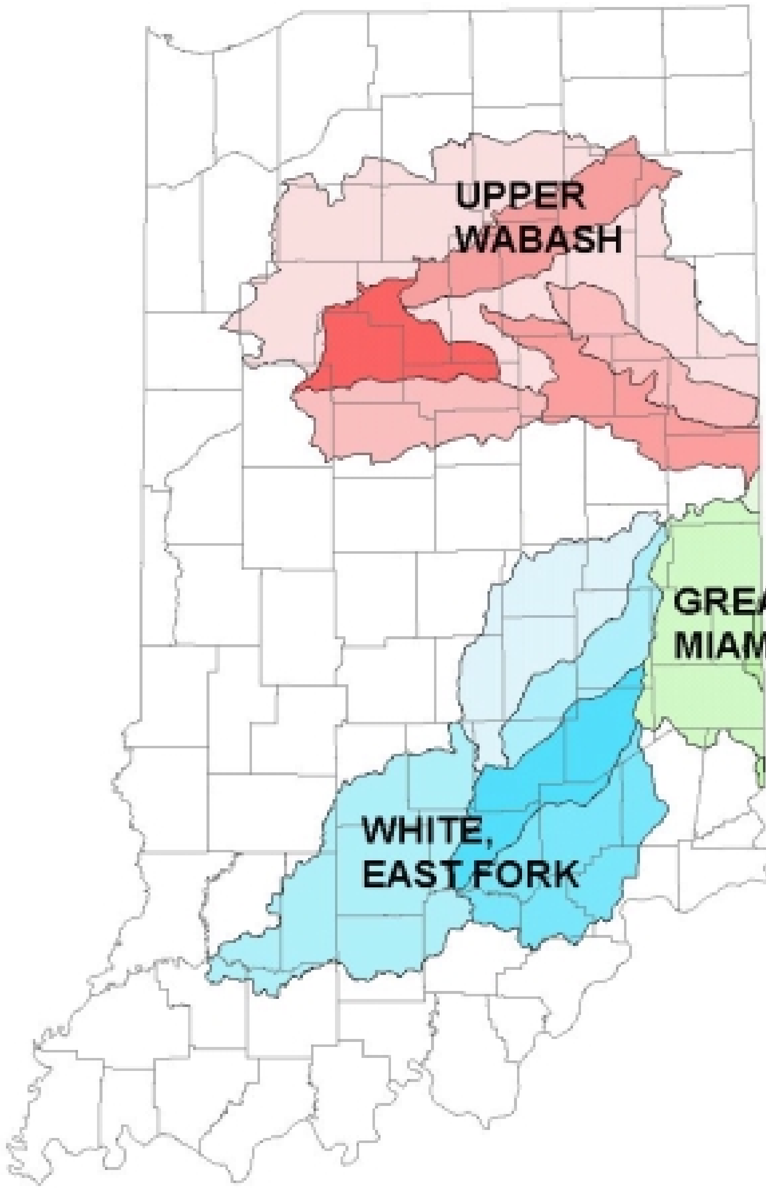
INDIANA WATER QUALITY REPORT

2000



Indiana Department of Environmental Management
Office of Water Management
Planning and Restoration Branch
Indianapolis, Indiana

IDEM/34/02/001/2000

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EXECUTIVE SUMMARY

Section 305(b) of the federal Water Pollution Control Act (the Clean Water Act most recently amended in 1987) requires states to prepare and submit to the U.S. Environmental Protection Agency (USEPA) a water quality assessment report of state water resources every two years. The Indiana Department of Environmental Management (IDEM), Office of Water Management (OWM), has prepared this report to meet the reporting requirements of Sections 106, 305(b), 314, and 319 of the Clean Water Act. This report follows the guidelines provided by USEPA (1997a).

Approximately 50 percent of the stream miles in the state have been monitored and assessed for support of aquatic life, fish consumption, and/or full body contact recreation since 1996. Of the stream miles assessed, 75.9 percent supported aquatic life use and 61.8 percent supported full body contact recreational use. One hundred percent of Indiana's Lake Michigan shoreline and the inland lakes that were assessed supported aquatic life use. The Lake Michigan shoreline partially supported full body recreational use. (See Table 1.)

The Indiana State Department of Health has issued a general fish consumption advisory for carp in all Indiana rivers and streams. All Indiana streams, the Indiana portion of Lake Michigan, and inland lakes assessed for this report have some fish consumption advisory (ISDH 1999). Therefore, Indiana has zero stream miles, zero Great Lakes shoreline miles, and zero inland lake acres that fully support fish consumption (Table 1).

Table 1 includes assessments based on the results of representative sample data sets collected from the White River, East Fork and Whitewater River basins in 1997; and from the Upper Wabash River basin in 1998. Assessments for the White River, West Fork basin, the Patoka River basin, and other assessments previously reported in 1998 are also included.

Table 1 Summary of Use Support - Waterbodies Reported 1998 through 2000

(values rounded to the nearest ten units)

Designated Use	Support	Threatened	Partial Support	Non Support	Assessed	Not Assessed
Rivers - in miles						
Aquatic life use	13,310		720	3,510	17,540	18,130
Fish consumption*			2,550	480	3,030	32,640
Primary Contact (RECR)	4,510		130	2,660	7,300	28,370
Great Lakes shoreline - in miles						
Aquatic life use	43				43	
Fish consumption*			43		43	
Primary Contact (RECR)			43		43	
Lakes, Reservoirs - in acres						
Aquatic life use	69,260				69,260	37,000
Fish consumption*			43,580	1,960	45,540	60,720
Primary Contact (RECR)						106,260

Source: Indiana 305(b) Assessment Database 2000 and IDEM Biological Studies Section data.

*Only waters for which fish tissue data support issuance of fish consumption advisories are classified as partial or nonsupport above. The Indiana Department of Health has issued a general fish consumption advisory for all other waters of the state. See Indiana Fish Consumption Advisory issued by the Indiana State Department of Health for health advisory descriptions.

The IDEM Office of Water Management believes that the most consistent way to evaluate overall use support is best represented by the stream miles supporting aquatic life use. Representative samples for fish community assessment were used to determine overall aquatic life use support as part of the rotating basin approach. Sample results from the White River, East Fork and Whitewater River basins in 1997; and from the Upper Wabash River basin in 1998 were used to obtain an unbiased estimate of aquatic life use support. A stratified random sampling design was used to computer generate sampling sites, which provided a representative sample set for each basin. Fish community index of biotic integrity (IBI) was determined for each sampling location, and the results of each year's sample data set were analyzed to estimate the percentage of stream miles supporting aquatic life use for each basin. In this way, a small number of representative samples were used to estimate aquatic life use support for a large geographic area.

The Office of Water Management has set a goal to develop a watershed approach that will integrate water management programs by focusing on watersheds. The watershed approach establishes a framework for coordinating and integrating the multitude of programs and resourceswithin adelineated geographic area.

A new surface water monitoring strategy 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 are assessed and reported in the following year. Watersheds assessed in the Upper Wabash, Whitewater, and White, East Fork basins are highlighted in this report. Assessments for Patoka and White, West Fork watersheds were highlighted in the 1998 report, which is on the IDEM Internet site (http://www.state.in.us/idem/owm/index.html). "Indiana 305(b) Report 1994-95" provides the most recent comprehensive report on Indiana water quality and is the baseline report for areas of the state for which water quality assessments have not yet been updated (IDEM 1994-95 and 1998c).

A new comprehensive report on Indiana water quality will replace the 1996 baseline report after the five-year rotating basin monitoring and comprehensive assessment of Indiana surface waters are completed. Indiana has elected to submit annual electronic updates to USEPA with an abbreviated written report submitted in even numbered years.

Causes of nonsupport are reported for each waterbody type: rivers, lakes, and Great Lakes shoreline. Mercury and polychlorinated biphenyls (PCBs) in fish tissue, which resulted in fish consumption advisories, were the predominating causes of nonsupport of streams and lakes, including Lake Michigan. Pathogens and parameters causing biological community response were over 1000 miles each. Other causes of partial or non support of aquatic life use included pesticides, priority organics, copper, lead, ammonia, cyanide, nutrients, low dissolved oxygen, total dissolved solids/ chlorides, habitat alterations, and oil and grease.

Fish tissue and surficial sediment were monitored for the presence of toxic pollutants. The Indiana Fish Consumption Advisory identifies fish species that contain toxicants at levels of concern for human consumption. The Great Lakes sport fish risk based approach was used to evaluate PCB contamination (Anderson 1993). As fish tissue and sediments from additional watersheds are analyzed for contaminants, it is expected that the miles of impaired streams and acres of impaired lakes and reservoirs due to fish consumption advisories will increase for the near term.

One hundred sixty-four lakes were monitored in 1996-97 and assessed using the Indiana Trophic State Index. An additional 75 lakes were monitored in 1998 bringing the total lakes monitored since 1996 to about 39.8 percent of the 600+ lakes in Indiana. Of the lakes monitored in 1998, 9 were classified as oligotrophic; 26 lakes were classified as mesotrophic; 34 lakes were classified as eutrophic; and 6 lakes were classified as hypereutrophic. Twenty were improving; 17 were stable; and 6 were degrading. There was no apparent trend for 33.5 percent of the monitored lakes.

Indiana revised state water quality standards for those waters in Indiana's Great Lakes basin after the final Great Lakes Water Quality Guidance was issued in 1995. The various criteria and procedures (or equivalent ones) identified in the Guidance were incorporated into Indiana's water quality standards and adopted by the Indiana Water Pollution Control Board effective in February 1997. USEPA responded in August 1999 with a letter highlighting several issues for IDEM to address. OWM responded within the required ninety days. Discussions to resolve outstanding issues are ongoing.

Water quality standards, including proposed sediment and wetland narrative criteria, for the area of the state outside the Great Lakes Basin are under development at this time. Wetland water quality standards are projected to be adopted by the end of 2000. These standards will contain use classifications, narrative criteria, and an antidegradation policy. Considerable macroinvertebrate and fish community data are being evaluated for the purpose of developing biocriteria. Indiana is currently working with USEPA Region 5 and other Region 5 states to develop nutrient criteria for different water body types throughout the Region affected by both point and nonpoint pollution.

Point source discharges to Indiana surface waters are permitted under the National Pollutant Discharge Elimination System (NPDES). In 1999, the permitting program focused on issuing new permits and renewing existing permits within state required time frames. On January 1, 1999 there were 75 administratively extended NPDES permits. During 1999, 330 NPDES permits were issued: 29 major permits and 301 minor permits. The year ended with a backlog of 99 administratively extended permits.

The Nonpoint Source Management Plan for Indiana was updated and approved by USEPA Region 5 in October 1999, enabling Indiana to receive a full allocation of Section 319 funding. Copies of the Plan are available on compact disc from the Watershed Management Section. Current nonpoint source program activities and grant opportunities are now available on the IDEM Internet site in downloadable documents.

The State Revolving Fund (SRF) provides low-interest loans to Indiana communities for wastewater and drinking water infrastructure improvements. In state fiscal year 1999, 28 wastewater projects totaling $161,469,000 and three drinking water loans totaling $8,600,000 were closed.

Waterbodies that provide partial support or do not support their designated use are reported to USEPA every two years as required in Section 303(d) of the Clean Water Act. Indiana lakes and streams on the 1998 List of Impaired Waters are in Appendix A. Indiana is not required to submit a revised list in 2000.

Support of designated uses was determined for each stream and lake waterbody using USEPA assessment guidelines (USEPA 1997b). The Indiana Trophic State (or eutrophication) Index, a modified version of the BonHomme Index developed for Indiana lakes in 1972, was applied to inland lake data. Results from the following six monitoring programs were integrated into one assessment for each waterbody.

- Physical/chemical water results (lakes and streams).
- Fish community assessments (streams).
- Benthic aquatic macroinvertebrate community assessments (streams).
- Fish tissue and surficial aquatic sediment contaminant results (lakes and streams).
- *E. coli* monitoring results (streams).
- Indiana Trophic State Index (lakes).

Ground water is an important resource for Indiana citizens, agriculture, and industry. The majority of the state's population use ground water for drinking water and other household uses. Of the population served by public water supplies, approximately 50 percent depend on ground water. In 1998, 4295 public water supply systems supplied ground water to a population of approximately two million people (IDEM 1999). Over one-half million Indiana homes have private wells for their water supply.

In 1998 IDEM began sampling nearly 400 wells representing 22 hydrogeologic setting types in the state. The Frankfort segment in the Central Till Plain (TF) and the southern valley fringe of the Kankakee Lowland in the Lake Michigan Rim (K1) have been added this year to the hydrogeologic settings summarized in the 1998 report. Ground water quality results indicate that pesticide detections occurred in 3 percent and 19 percent of wells sampled in TF and K1, respectively; however, detections did not exceed 50 percent of the maximum contaminant levels (MCL). Pesticides detected at low levels were 2,4-D, carbaryl, bentazon,and acid metabolites of DCPA. Nitrates were detected in 3 percent and 13 percent of wells in TF and K1, respectively; however, detections did not exceed 3 parts per million (ppm) in either setting.

BACKGROUND

Introduction

Indiana is located on the eastern edge of the North American great interior plains. The North - South continental divide traverses through northern Indiana draining watersheds into the Great Lakes basin and the Mississippi River and Ohio River systems. Surface water in the northern one-quarter of the state flows north into the Great Lakes and then through the St. Lawrence River to the Atlantic Ocean. The southern three-quarters of the state drains into the Ohio River or Illinois River and flows into the Mississippi River then south to the Gulf of Mexico. There are about 90,000 miles of rivers, streams, ditches, and drainage ways in Indiana of which 35,673 miles are listed in USEPA River Reach File 3 (RF3). State water types are described in Table 2. Additional state statistics may be found on the State Information Center Internet site http://www.state.in.us/sic/HTML/general_facts.html.

Table 2 Atlas

Description	Value	Units
Indiana population[1]	5,942,901	
Indiana surface area[2]	36,291	sq. mi.
Total miles of rivers and streams [3]	35,673	miles
Number of publicly-owned lakes/ reservoirs/ ponds[4]	575+	
Publicly-owned lakes/ reservoirs/ ponds [4]	106,205	acres
Great Lakes[4]	154,240	acres
Great Lakes shoreline[4]	43	miles
Fresh water wetlands[5]	813,000	acres

Source: [1]U.S. Census Bureau [2]State Information Center [3]Horizon Systems Corporation 1994 [4]USEPA 1993 [5]Rolley 1991

Water Pollution Control Program

The IDEM Office of Water Management has set a goal to develop a watershed approach that will integrate water management programs by focusing on watersheds. Water quality standards have been adopted for the Great Lakes Basin watersheds within the state; standards for the remaining waters of the state are being revised at this time. National Pollutant Discharge Elimination System (NPDES) permitting is the primary point source control process used in Indiana. Nonpoint source pollution is addressed through watershed management and planning projects.

Watershed Approach

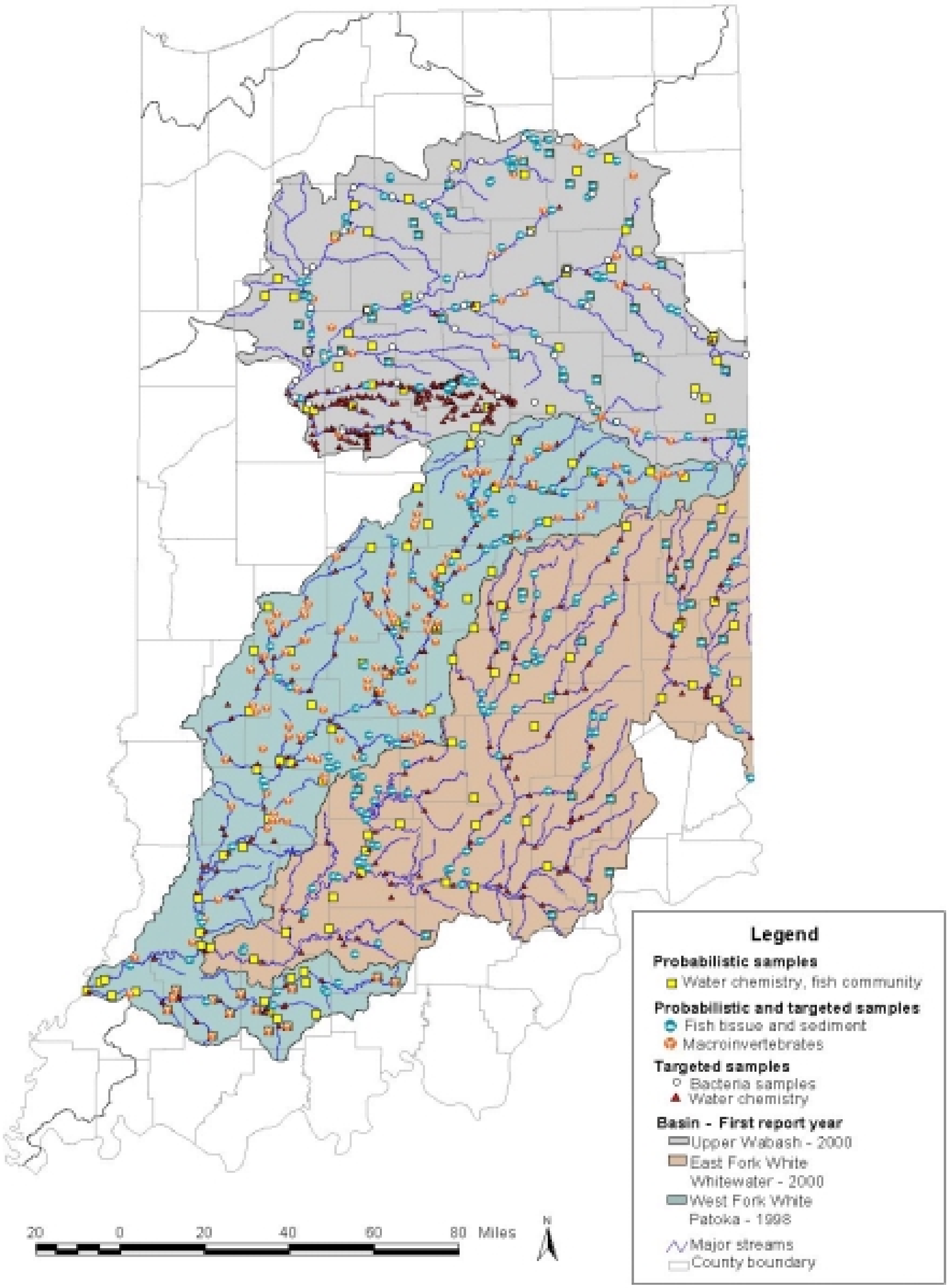
Environmental problems often cut across media and political jurisdictions. Consequently, environmental mitigation and protection require a comprehensive and collaborative approach that works with a multitude of programs and agencies. The watershed approach establishes a framework for coordinating and integrating the multitude of programs and resources. This approach directs the focus on water quality in a geographic area delineated by a watershed. In order for all of the waters of the State of Indiana to support designated uses, an integrated approach which includes a common information base and agreement on roles, priorities, and responsibilities for managing watershed activities must be implemented.

OWM has set a goal to develop key elements of a framework for integrating the Office of Water Management's programs into a comprehensive watershed management approach. The OWM will implement the watershed approach that will address water quality issues and facilitate local community involvement. A team has been established to work on development of watershed strategy and an initial meeting was held in late 1999. (IDEM/ USEPA 1999)

A statewide rotating basin approach to watershed monitoring was adopted in 1996. The rotating basin plan makes it possible to update water quality assessments on a five-year cycle for monitored watersheds throughout the state. Information that is no more than five years old is then available for use in planning watershed management activities. Monitoring locations for the basins reported 1998 through 2000 are illustrated on the map (Figure 1).

The Abbreviated Report on Indiana Water Quality submitted to USEPA in even numbered years in compliance with Clean Water Act Section 305(b) provides an overview of the watersheds assessed during the past two years. This report represents the third year of the new reporting cycle. An electronic update has been submitted each year with an abbreviated written report in even numbered years. A comprehensive report of waters of the state may be found in "Indiana 305(b) Report 1994-95" which is the most recent comprehensive report. Annual updates for the basin of interest and other areas which have undergone significant change and for which significant new data has been assessed are reported in the abbreviated written reports.

Figure 1 Monitoring Locations 1996 – 1998



Water Quality Standards Program

Indiana's water quality standards underwent significant revision in 1990. At that time, numerical criteria for all pollutants for which USEPA had developed either human health or aquatic life ambient water quality criteria were added to the standards. Procedures for developing additional criteria were also included in these rules. Additionally, all waters were designated for full body contact recreation and the bacteriological indicator organism was changed from fecal coliform to *E. coli* to conform to USEPA's guidance on bacteriological indicators. All waters, with the exception of 34 streams or stream reaches that were designated for limited use, were designated for warm water aquatic life use, full body contact recreational use, public water supply (where there are drinking water intakes from surface waters), industrial uses, and agricultural uses. Certain waters, where natural temperature conditions will support cold water fisheries, were so designated. For those waters where multiple uses exist, the criteria that support the most stringent uses must be met.

The 34 streams or stream reaches designated for limited use were placed in this category through use attainability analysis which confirmed the inability of each stream to fully support aquatic life use due to natural low flow conditions throughout much of the year. Thus, all waters in the state currently are designated for uses consistent with the requirements of the Clean Water Act or USEPA's implementing regulations and have criteria appropriate to support these uses.

In 1993, Indiana's rules and regulations, which guide the implementation of Indiana's water quality standards into Indiana's NPDES permits, were extensively revised. Although this resulted in significant changes to these rules, only minor changes to the water quality standards were made.

With the issuance of the final Great Lakes Water Quality Guidance in 1995, Indiana began the process to revise water quality standards and implement regulations for those waters in Indiana's Great Lakes basin. Many of Indiana's waters are located outside the Great Lakes basin and this rulemaking, for the most part, had no immediate effect on these waters. These revisions incorporated the various criteria and procedures (or equivalent ones) identified in the Guidance into Indiana's water quality standards. As a part of this rulemaking, Indiana also developed procedures to implement the antidegradation policy for all substances discharged to waters in the basin. These revisions were adopted by the Indiana Water Pollution Control Board effective in February 1997 and submitted to USEPA for approval. USEPA responded in August 1999 with a letter highlighting several issues for IDEM to address. OWM responded within the required ninety days. Discussions to resolve outstanding issues are ongoing.

Indiana is currently in the process of reviewing/revising the water quality standards applicable to waters in the rest of the state. Indiana is proposing to incorporate some aspects of the Great Lakes Water Quality Guidance into the water quality standards applicable to waters outside the Great Lakes basin with modifications where necessary. The criteria and methodology to calculate criteria represent the most recent scientific thinking on how to incorporate the existing toxicity data into criteria and should replace the existing criteria and calculation procedures that are currently used. Indiana is also proposing to incorporate into NPDES permits at least some of the procedures for implementing the water quality standards that were adopted for the Great Lakes basin. A proposal to adopt an antidegradation implementation procedure for all substances for waters outside the Great Lakes basin, which is similar to that adopted for waters in the basin, is also under consideration.

Considerable data on the macroinvertebrate and fish communities in many Indiana waters have been collected. Indiana is in the process of analyzing and evaluating the data for the purpose of developing biocriteria. Although Indiana is not at the stage in the evaluation of these data to propose numerical biocriteria, narrative biocriteria language that would allow the state to utilize the available data to assess the biological integrity of aquatic communities is proposed at this time.

IDEM is proposing to add water quality standards for wetlands during this review period. These standards would include narrative criteria, designated uses and an antidegradation policy and implementation procedure.

IDEM has also proposed a narrative sediment quality criterion for all waters in this review period. The proposed narrative standard addresses both historical sediment contamination problems and the prevention of sediment contamination in the future.

Indiana is currently working with USEPA Region 5 and the other Region 5 states to develop nutrient criteria for different water body types throughout the Region as directed by the Clean Water Action Plan. The plan calls for the development of nutrient criteria by the end of the year 2000 and for the states to put these criteria into state water quality standards in the next triennial review period. Indiana plans to actively participate in this effort.

Preliminary ground water rules were adopted by the Indiana Water Pollution control Board in November 1999. Public water supply definitions have been formalized to be consistent with federal Safe Drinking Water Act definitions. Consumer confidence reports establish minimum requirements for content of annual consumer confidence reports which public water suppliers deliver to their customers.

Point Source Program

Point source pollution in Indiana is controlled primarily through permits issued by IDEM for discharges to surface water under the National Pollutant Discharge Elimination System (NPDES). All facilities which discharge to waters of the State must apply for and receive an NPDES permit. Unpermitted dischargers and permittees out of compliance with their permit conditions are referred for enforcement action.

The limits established in each NPDES permit are required to protect all designated and existing uses of the water body. Besides issuing NPDES permits, the program includes these other activities: wastewater treatment plant inspections, operator assistance and training, compliance data tracking, and enforcement.

In 1999, the permitting program focused on issuing new permits and renewing existing permits within state required time frames. On January 1, 1999 there were 75 administratively extended (a.k.a. backlogged) NPDES permits. These are permits that have expired; but, because the permittee applied for renewal of their NPDES permit prior to its expiration date, have been extended by IDEM. The permittee is allowed to continue discharging under the limits in their expired permit. During 1999, 330 NPDES permits were issued: 29 major permits and 301 minor permits. The year ended with a backlog of 99 administratively extended permits.

The NPDES permitting program is augmented by OWM staff that issue pretreatment permits to industries that discharge to municipal wastewater treatment plants, that do not operate their own pretreatment programs, and for urban wet-weather discharges. The staff also oversee and audit municipal pretreatment programs in 45 municipalities with industrial dischargers. Storm water runoff associated with land disturbing activities of 5 acres or more and with industrial activities are now regulated by permits. A strategy for managing and maintaining combined sewer collection systems is in the implementation stage. The goal of these additional permitting and management activities is to reduce untreated discharges to surface water.

Toxic pollutants are addressed by permit limits for discharge of specific chemicals and by whole effluent toxicity limits. Other Office of Water Management branches and sections provide permit compliance, and facility operation technical support for wasteload allocation modeling, monitoring. These program areas work closely with the NPDES permitting program to ensure that permit limits are adequate for protection of designated uses and that dischargers remain in compliance with these limits.

Dischargers in the Great Lakes basins must now comply with Indiana's water quality standards for Great Lakes waters. Permits for dischargers within the Lake Michigan and Lake Erie basins are written to incorporate Indiana's water quality standards implemented as a result of the federal Great Lakes Initiative (GLI).

The point source control program, through field inspection staff, identifies NPDES point source outfalls in Indiana by using the global positioning system. This will provide better location information for USEPA's Permit Compliance System and ultimately for monitoring, modeling, and designated use evaluation of lakes and streams. The inspectors are acquiring the position coordinates using handheld global positioning system units whenever they visit a site with a location which is not already verified in the Permit Compliance System.

Indiana wastewater treatment inspections have increased three fold over a nine-year period. Inspectors review operation and maintenance of wastewater treatment plants permitted under the National Pollutant Discharge Elimination System. They can provide referrals for operator assistance and training, and for enforcement action as needed.

In summary, NPDES permits are the focal point of the point source control program. A major effort is being made to stay in contact with permittees through the inspection program. Regulatory efforts are also focused on urban point sources such as pretreatment and combined sewers, which are now being regulated through the NPDES program. The project to locate all NPDES discharge points should provide valuable information for monitoring, assessment, and compliance programs. The recent change in monitoring strategy to a rotating basin approach is expected to provide a baseline of water quality information for the majority of the state's surface waters within five years. The new surface water monitoring strategy provides a framework for implementing and measuring the effectiveness of point source controls for Indiana surface waters.

Nonpoint Source Control Program

The nonpoint source program is administered by the Watershed Management Section, Planning Branch, Office of Water Management, IDEM. Program elements include Section 319 grants, watershed restoration projects with local groups, watershed planning assistance, and watershed assessment. The Section will also be involved in the nonpoint source component of total maximum daily load calculations in the state. Figure 2 displays the locations of Section 319 projects, which are listed in Table 3.

Figure 2 Section 319 Projects

* See Table for Project Names and other Statewide Projects.

Table 3 Section 319 Grants

1990

001 Upper Eel River Project
002 On-Site Waste Disposal *
003 Forestry Education
004 Lagrange Co. Project
005 Upper Eel River Project
006 Upper Tippecanoe R. Project
007 Urban Runoff Demo
008 Wetlands Evaluation (Ph. I)
009 Abandoned Mine Lands

1991

010 Urban Erosion *
011 Indiana Dunes (Ph. I)
012 Trail Creek
013 Juday Creek
014 Farmstead Assessment *
015 Atmospheric Deposition (Ph. I)
016 Atmospheric Deposition (Ph. II)
017 Constructed Wetlands (Ph. I)
018 Mill Creek
019 Lake Co. Conservationist
020 Well/Surface Monitoring
021 Fish Creek

1992

022 Urban NPS Ed./Training *
023 Lake Salinda (Ph. I)
024 Lake Salinda (Ph. II)
025 Starve Hollow Watershed
026 Farm Progress Show
027 Wetland Restoration
028 Livestock Waste Mgmt. Software *
029 Pesticide Database *
030 NPS Specialist *
031 Upper Eel River Watershed
032 Urban Erosion *
033 Grand Calumet River BMP's
034 Constructed Wetlands (Ph. II)
035 Irrigation Scheduling *

1993

036 MAX Program *
037 Fall Creek Watershed
038 Urban NPS Education
039 Augusta Lake Remediation (Ph. I)
040 Pesticide/Fertilizer Education *
041 Wetlands Evaluation (Ph. II)
042 Little Four Mile Cr. Watershed
043 AOC/Technical Assistance
044 Reforestation of Wetlands
045 Maumee Watershed
046 Indiana Dunes (Ph. II)

1994

047 Indian/Pine Watershed
048 Lake Monroe Watershed
049 Forestry BMP's *
050 Wabash Watershed
051 Upper Wabash R. Restoration
052 1995 Farm Progress Show
053 Crop Nutrient Training *
054 Quality of Precip./Grand Cal
055 West Boggs Lake
056 Information Specialist *
057 Filter Strips
058 Augusta Lake (Ph. II)
059 NPS Training Seminars *
060 Know Your Watershed *
061 Groundwater Monit. Network *
062 CROPS *
063 Quality of Precip./Grand Cal
130 Tree Seedling Production *
184 NPS Management Plan*
185 NPS Program Assistance*

1995

064 NPS Liaison *
065 Juday Creek
066 Yard Maint. Practices *
067 GIS Technical Support *
068 Friar Tuck Acid Drainage Wetland
069 Public Info/WS Coordinator
070 Upper Eel River WQ Project
071 Lks. Shafer/Freeman Sed. Traps
073 Wabash Watershed Wetland Restoration
074 Monroe Watershed BMP's & Coord.
75 NAPRA (Ph. I) *

76 076 NAPRA (Ph. II) *
077 Fall Creek Watershed Model
078 IN State Mgmt. Groundwater WQ *
125 IN Lakes Conference '98 *
131 Watershed Coordinator
132 Trees for 2000 (Ph. II)

1996

079 Animal Waste Mgmt. Specialist
080 Flatrock R. Watershed Coordinator
081 Nutrient, Pesticide & Sediment
082 Pigeon Creek WQ
083 Pub. Water Supply Wellfield Map. *
084 Indiana WETnet (Ph. II) *
085 White Lick Urban Conservation
086 NPS Info Specialist *
087 CRM Implementation *
088 Clean Lakes Program *
089 L. Mississinewa Watershed
090 Eagle Creek Bioengineering
091 Upper Eel River Watershed
092 Watershed Partnership 2000
093 Shoreline stablilization
094 Pigeon Creek Watershed BMP's
095 NW IN Technical Assistance
126 Definition and Digitization *
127 Lake Monroe Watershed
128 1998 Farm Progress Show *
129 Clean Lakes Program *
133 Glacial Deposit Map in 3D *
134 Animal Waste Violations *

1997

096 NRCS Liaison *
097 Clean Lakes Program *
098 Eller Creek Erosion Control
099 Project WET Coordinator *
100 Forestry BMP's Go Statewide *
101 GIS Coverage for Confined Livestock *
102 State Pesticide Mgmt. Plan *
103 Community Based Watershed Prot. *
104 Mobile Education Unit
105 IN Rivers & Streams (Ph. III) *
106 Intensive Grazing Mgmt. Assistance
107 Blue R. Riparian Corridor Reforestation
108 Watershed Education
109 Mine Spoil Absorption Medium
110 Indian/Pine Watershed: BMP's & Assessment
182 Watershed Training*
183 Volunteer Monitoring Video*

1998

111 Suspended Stream Sediment *
112 Spring Mill Lake
113 Information Specialist *
114 Eagle Creek Coordinator
115 Wellhead Protection Education *
116 St. Joseph Watershed
117 IN Rivers & Streams (Ph. IV) *
118 NPS Evaluation Tool *
119 Constructed Wetlands
120 Animal Waste Mgmt Specialist
121 Nitrogen Management
122 Manure Mgmt Planning Tool *
123 Juday Cr. Bank Stabilization
124 France Park Wetlands
135 Watershed Manager
136 WQ Improvement
137 Landuse Conversion
138 Probability-based Lake Survey *
139 Farm-A-Syst Coordinator *
198 WQ Monitoring & Education

1999

140 Watershed Advisor *
141 Watershed Advisor *
142 Clean Lakes Program *
143 Brine Rem. for Oil & Gas Wells
144 Indiana Lakes Education *
145 On-Farm Assessment for Waste Mgmt. *
146 Teays Valley Mobile Educ. Unit
147 Public Information Specialist
148 Septic System Improvements
149 Tech. Assistance, Septic Systems *
150 Local Capacity Bldg./Urban WQ Training *
151 Tech. Assistance in the Wildcat
155 Revegetation and Restoration
176 St. Marys Nutrient Management, Phase I
181 Watershed Advisor*
175 Nutrient Management

1999 Incremental

156 Groundwater Nitrate Study
157 White River Land Treatment
159 Livestock Management Planning
160 Reclamation Coordinator
161 Integrated Nutrient Management
162 Upper Eel Manure Management
163 Logging BMPs
165 Diagnostic Study
166 Wildcat Creek, Jerome East
167 E. coli Genotyping
168 Eagle Creek Coordinator
169 Kilmore Creek Land Treatment
170 Pigeon Creek Bank Stabilization
171 Cedar Lake Watershed Protection
172 St. Marys Watershed Project
173 Highland-Pigeon Coordinator
174 BMP Installation
177 NAPRA Model*
178 Trees for Cleaner Water*
179 Core-4 Demonstration, Phase I
180 Core-4 Demonstration, Phase II

2000

186 Wabash River Expedition
187 Indian Lake
188 Tippecanoe Watershed
189 Farm Progress Show, 2000*
190 Public Outreach Project
191 IASWCD District Program Development*
192 Ed. & Tech. Support for Local Officials*
193 Septic System Demonstration
194 Trittipo Ditch Bank Stabilization
195 Nutrient & Manure Monitoring
196 Wolf Lake Conservation Area
197 White River Technical Assistance

In partnership with other agencies, the Section leads the development of the Unified Watershed Assessment, a requirement of the Clean Water Action Plan of 1998. Through evaluation of water quality data, natural resource concerns, and human activities that may have the potential to impact water quality, the watersheds in the state are prioritized for restoration work. The 2000 update of the Unified Watershed Assessment characterizes the 361 11-digit hydrologic units in the state for 15 different parameters. Copies of the Unified Watershed Assessment are available from the Watershed Management section.

The Nonpoint Source Management Plan for Indiana was updated and approved by USEPA Region 5 in October 1999, enabling Indiana to receive a full allocation of Section 319 funding. Copies of the plan are available on compact disc from the Watershed Management Section.

The Assessment Branch now administers the Clean Lakes Program. The Operations Branch administers projects funded by 104(b)(3) and 205(j) grants.

Current nonpoint source program activities and grant opportunities including downloadable documents and applications may be found on the Watershed Management Section internet page at www.state.in.us/idem/owm/index.html.

Coordination with Other Agencies

The Indiana Department of Environmental Management has working relationships with other state and federal agencies interested in the improvement of Indiana water quality. In addition, results of projects completed by local and regional government, university and nonprofit organizations are integrated into reporting processes whenever possible.

The USDA Natural Resources Conservation Service (NRCS) maintains a water quality liaison position at IDEM, and the two agencies cooperatively support three watershed conservationist positions for NRCS personnel working in the nonpoint source program at IDEM.

Activities in wetlands or other waters of the U.S., which may affect water quality, are regulated under Clean Water Act Section 404. Activities require approval by IDEM through Clean Water Act Section 401 water quality certification programs. IDEM works cooperatively with two U.S. Army Corps of Engineers districts, the Indiana Department of Natural Resources (IDNR), the U.S. Fish and Wildlife Service and other agencies in administering the Clean Water Act Section 401 Water Quality Certification Program.

The IDEM is working with IDNR to develop and implement a stream volunteer monitoring program. The program goal is to electronically store results for use by IDEM technical staff to supplement or enhance department water quality assessments. IDNR volunteer monitoring outreach staff are taking the lead in developing this program through the Hoosier Riverwatch program.

This year the Office of Water Management requested water quality data and results from state and local agencies, industry, and nonprofit organizations in order to broaden the scope of information available for assessment of Indiana surface waters. Water quality data, reports or information for watersheds in the White River, Whitewater River, and Upper Wabash River basins were received in response to the request from the following organizations:

- Anderson University
- Howard County Health Department
- Indiana American Water Company
- Indiana Department of Natural Resources
- Tippecanoe Environmental Lake and Watershed Foundation
- U.S. Army Corps of Engineers

Cost/Benefit Assessment

Cost Information

The Wastewater and the Drinking Water State Revolving Fund (SRF) Loan Programs are low-interest loan programs created to assist Indiana communities with wastewater and drinking water infrastructure improvement needs. Cities, towns, counties, regional sewer/water districts, conservancy districts, and water authorities are eligible for this program. On July 1, 1999 private and not-for-profit public water systems became eligible for drinking water money also. Any wastewater treatment plant construction and drinking water infrastructure projects where there is an existing pollution abatement need is eligible for SRF funding. The SRF Program assists communities based on need and determines the loan interest rates by the median household income.

During state fiscal year (SFY) 1998, the SRF Program closed on 11 loans. This was possible, in part, due to several changes and reductions in the requirements and to a public outreach initiative on the SRF program's flexibility. Unlike the old construction grants program, Indiana saw a significant increase in interest by communities. The total wastewater SRF funds disbursed to five Indiana communities during SFY 1998 was $39,539,432. Farmland, Zanesville, West Lafayette, Swayzee, and Ashley experienced immediate improvement in water quality, a reduction in sewer overflows and an increased ability to treat wastewater.

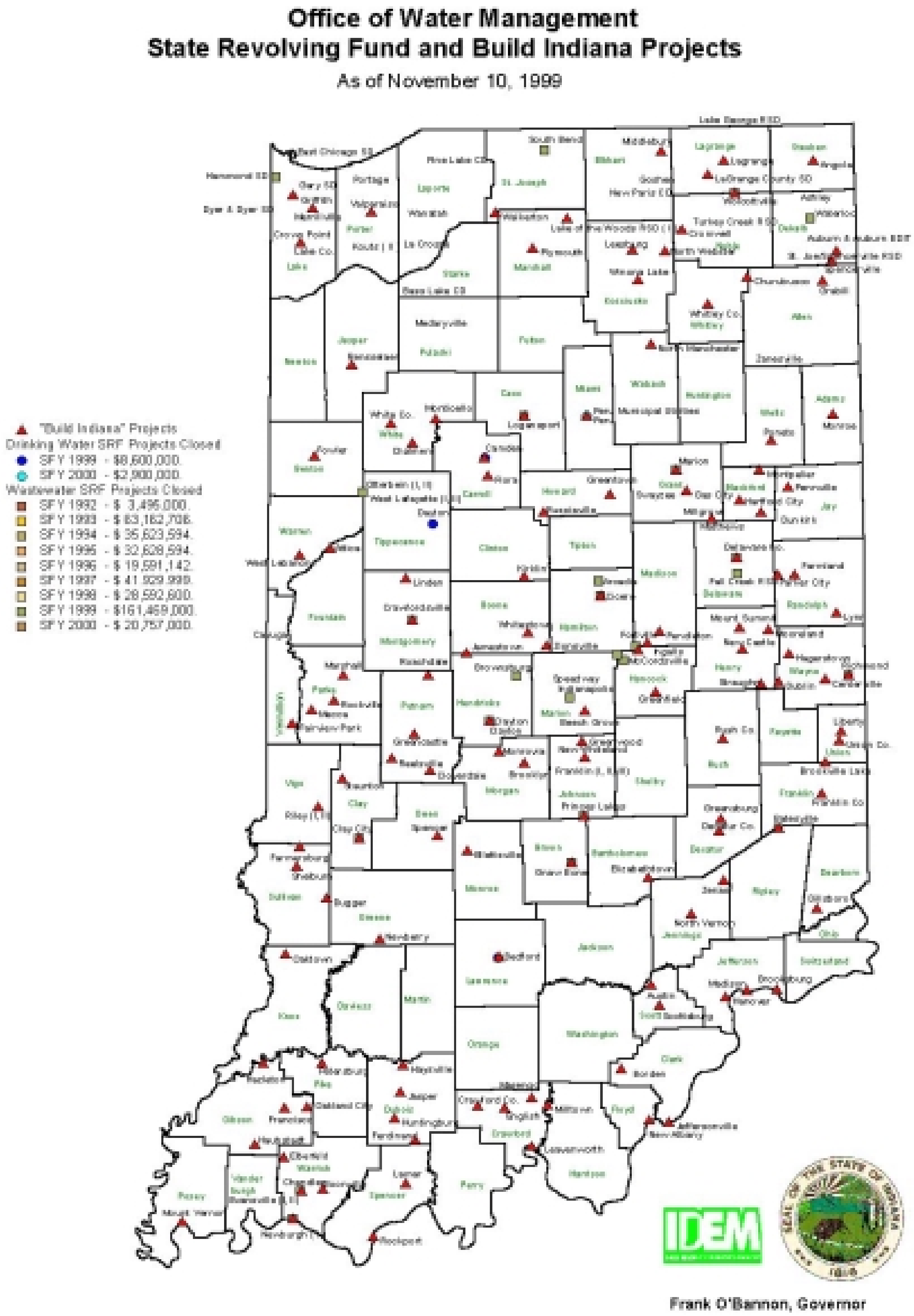
At the start of SFY 1999, Indiana's Wastewater SRF saw a significant increase in interested communities. This resulted in 28 loan closures during SFY 1999. SFY 2000 continued to show the program's popularity, with $473 million in projects on the project priority list (as of January 2000). Water quality in Indiana rivers and streams is expected to improve as aresult of the assistance of the State Revolving Fund to communities (Figure 3).

The goal of the Drinking Water State Revolving Fund is to ensure safe drinking water to Indiana's water consumers by giving maximum priority to proposed projects that provide greater protection to public health or ensure Safe Drinking Water Act compliance. During 1998 and 1999, the Drinking Water State Revolving Fund closed on 3 loans totaling $8,600,000. With loans provided by this program, the percentage of the 891 community water systems that met all drinking water health standards increased 4 points from 89% to 93%. As of January 2000, 56 projects were on the Drinking Water State Revolving Fund Project Priority List totaling $147,196,000 in requested funding.

Benefits Information

Indiana water quality improvements result in enhanced recreational opportunities, more aquatic diversity, healthier sport fish populations, safe drinking water, increased use of beaches, and healthier aquatic ecosystems. Benefits of water pollution abatement and control have not been quantified in dollars in the past. With better accounting systems and direction through the Performance Partnership Agreement with USEPA, the Office of Water Management hopes that resources to quantify the enormous benefits of water pollution abatement will be available in the future.

Figure 3 State Revolving Fund Loans 1992 - 1999



Special State Concerns and Recommendations

Indiana's rotating basin monitoring strategy provides the foundation upon which a watershed approach to water quality management is being built. The watershed monitoring program, using a probabilistic sampling design, provides a cost-effective means to leverage a small sample size for assessment of a large geographic area.

USEPA's National Health and Environmental Effects Research Laboratory (NHEERL) Western Ecology Division in Corvallis, Oregon uses computer software to randomly generate statistically valid representative sampling locations from USEPA's Reach File 3 stream coverage for IDEM. Multiple media are sampled at each location once in the summer or fall. Sampling results currently include parameters for water chemistry, sediment chemistry, fish tissue chemistry, fish community, macroinvertebrate community, and habitat.

The results of the probabilistic monitoring program provide an unbiased representation of the ambient water quality in the basin sampled. The probabilistic sampling program provides a comprehensive watershed assessment for the entire basin sampled. For instance, the entire Upper Wabash basin was assessed for aquatic life use support based on the probabilistic monitoring program results. Seventy-five percent of the stream miles in the basin support aquatic life designated use. The assessment does not, however, provide information on which seventy-five percent support and which twenty-five percent are impaired.

This creates a dilemma for water quality analysts and assessors trying to identify streams to include on the state Section 303(d) list of impaired waters. The number of stream miles expected to be impaired is known, but it is not known where many of those streams are. While the probabilistic sampling methodology provides a cost-effective and scientifically valid unbiased process for assessing all waters in a basin, it does not specifically identify which waterbodies support or do not support their designated uses. This is a problem that requires careful consideration.

Some of the most useful information from the probabilistic sampling program are the biological assessments that provide an indication of the cumulative response of a stream. If the biological assessment results could be related directly to human activities (sources) in the watershed, then locating the activities could also lead to focusing targeted sampling and follow-up. It may be possible to leap over determining the cause to identifying an activity that causes biological impairment. Finding ways to extend scarce state resources to identify the specific locations of impaired waters will remain a challenge for the foreseeable future. USEPA should support efforts by states to analyze data and expand the use of probabilistic sampling results.

SURFACE WATER ASSESSMENT

Current Surface Water Monitoring Program

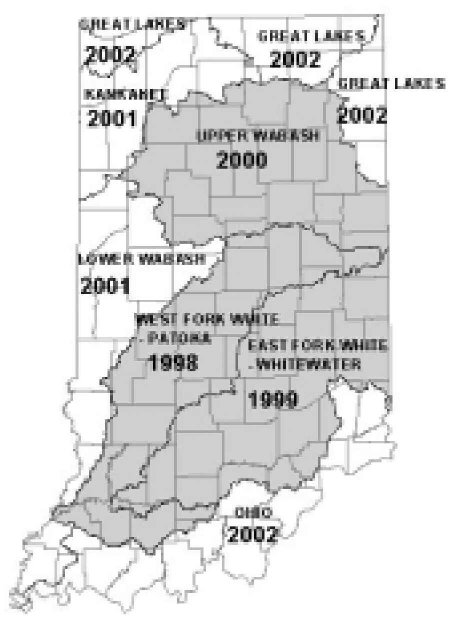
The Office of Water Management implemented a new surface water monitoring strategy in 1996 to assess the quality of Indiana waters within five years using a rotating basin approach. The monitoring strategy was revised and updated in 1998. The strategy is designed to provide technical data and information in support of:

- The biennial Report of Indiana Water Quality (305[b] Report)
- National Pollutant Discharge Elimination System permitting program
- The annual Fish Consumption Advisory (issued by the Indiana State Department of Health in cooperation with IDEM and the Indiana Department of Natural Resources)
- Drinking water source assessment
- Identifying past and emergent water quality trends

IDEM has adopted a rotating basin approach to monitor surface waters of the state (Figure 4). Approximately one-fifth of the state is scheduled for monitoring each year for five years. The monitoring results are analyzed and each waterbody is assessed in the second year. Waterbody impairments are generally reported in the third year. This report highlights the assessments for the second and third years of sampling being reported in 2000. The current five year rotating basin monitoring plan provides reports for watersheds as follows:

- 1998 White River, West Fork Basin and Patoka River Basin
- 1999 White River, East Fork Basin and Whitewater River Basin
- 2000 Upper Wabash River Basin
- 2001 Lower Wabash River Basin and Kankakee River Basin
- 2002 Great Lakes Basins and Ohio River Basin

Figure 4 Monitoring Strategy Report Years



The Office of Water Management's surface water quality monitoring strategy is designed to describe the overall environmental quality of each major river basin and to identify which waterbodies do not fully support designated uses. The surface water monitoring strategy was revised in 1998 to continue to meet the goal of assessing all waters of the state within five years while enhancing support of other Office of Water Management programs. Four goals of the monitoring program are:

- Measure the physical, chemical, bacteriological, and biological quality of the aquatic environment in all river basins and identify factors responsible for impairment.

- Assess the impact of human or other activities that occur in all river basins and the probable effects of these activities on drinking water source protection and on the quality of the dynamic ecosystem.

- Identify trends through analysis of environmental data from a variety of sources and make recommendations for the protection of designated uses of the water resources of the state.

- Provide environmental quality assessment reports to support the water quality management program in partnership with customers and stakeholders.

The monitoring strategy encompasses various monitoring networks staffed by the Office of Water Management or managed by the Office of Water Management through contractors. Elements of the sampling program include: fixed station monitoring; computer generated random sites sampled for fish community biotic integrity (IBI), benthic aquatic macroinvertebrate community biotic integrity (mIBI), fish tissue contaminants, surficial aquatic sediment contaminants, and water chemistry; pesticide water monitoring; *E. coli* sampling; National Pollutant Discharge Elimination System permitting support; total maximum daily load (TMDL) development; and targeted fish tissue and surficial aquatic sediment sites. The monitoring strategy and fact sheets with detailed descriptions of the monitoring programs are available on the IDEM Internet page (http://www.state.in.us/idem/owm/assessbr/assessindex.html) (IDEM 1998b).

The quality assurance project plans covering the major surface water sampling programs were prepared and forwarded to EPA Region 5 in June 1998 and June 1999. USEPA has not yet responded to these submissions. Pending approval of these documents by USEPA Region 5, these quality assurance project plans were approved and signed by IDEM/OWM Assistant Commissioner.

The Office of Water Management follows a rigorous and well-defined data quality assessment process for reviewing analytical results presented to the Assessment Branch. This allows the Assessment Branch staff to immediately categorize analytical results for appropriate use and to plan analytical requirements to meet the intended data quality and usage. Four data quality assessment levels have been defined.

The IDEM Assessment Branch stores sampling results in several file formats at this time. A new database that will link data from different media and be accessible to other IDEM staff is under construction. Results from the fixed station monitoring program have been stored in USEPA's storage and retrieval system (STORET) for samples collected through 1995. STORET is not available for batch upload at this time, and it appears that data stored in the system will only be available locally to IDEM.

The new 305(b) Assessment Database has been implemented by the IDEM Office of Water Management. Waterbody assessments for the hydrologic unit areas that were monitored in 1997 and 1998 are stored in the database and reported this year (Table 4). Stream assessment results are listed in appendix C by basin for each waterbody.

Table 4 Watersheds Reported this Year

Watershed name	Hydrologic unit code	Year monitored
Whitewater	05080003	1997
Upper Wabash	05120101	1998
Salamonie	05120102	1998
Mississinewa	05120103	1998
Eel – Blue	05120104	1998
Middle Wabash – Deer	05120105	1998
Tippecanoe	05120106	1998
Wildcat	05120107	1998
Driftwood	05120204	1997
Flatrock – Haw	05120205	1997
Upper East Fork White	05120206	1997
Muscatatuck	05120207	1997
Lower East Fork White	05120208	1997

Source: Indiana 305(b) Assessment Database

The Office of Water management is in the process of georeferencing waterbody segments in the 305(b) Assessment Database to USEPA Reach File 3. A geographical information system coverage of Indiana 14-digit hydrologic unit areas was recently finalized, and the waterbodies with be georeferenced to these also. Each stream waterbody corresponds to a 14-digit hydrologic unit area. The interactive data analysis capabilities are expected to be extremely useful for watershed management and planning.

Plan for Achieving Comprehensive Assessments

IDEM adopted a new surface water quality monitoring strategy in 1995 with the goal of monitoring all waters of the state of Indiana by 2001. A five-year rotating basin plan was chosen which would result in reporting on assessment of all waters of the state by 2003. Each year approximately 20% of the state's surface water streams will be assessed and reported the next year using this process. Reporting began with the White River, West Fork, watershed and the Patoka River watershed in 1998. The White River, East Fork and the Whitewater River watersheds were reported in 1999 as an electronic update. This year, 2000, Indiana's portion of the Upper Wabash basin is reported. This is the second abbreviated report for the rotating five-year assessments resulting from the new monitoring strategy. Approximately 50% of the stream miles in the state have now been assessed and reported.

Public lake assessments are rotated on a five-year plan, generally north to south across the state. Assessments were rescheduled beginning with the 1998 sampling rotation. The new schedule more closely resembles the stream monitoring schedule. Since lake distribution is denser in the northern area of the state, the schedules will not match exactly. Lake monitoring results will generally be available at the end of each monitoring year.

Ground water updates are provided as monitoring of Indiana's hydrogeologic settings progresses each year. The hydrogeologic settings that are assessed are added to the groundwater report, and new assessments replace older assessments.

The five-year rotating basin approach will provide reports of comprehensive assessments of approximately 20% of Indiana watersheds each year. Surface waters will be assessed and reported for the entire state using this approach by 2002. A combination of probabilistic and targeted monitoring designs are used to provide data for waterbody assessment and to support other IDEM Office of Water Management goals and programs.

Assessment Methodology and Summary Data

Use support status was determined for each stream waterbody using the assessment guidelines provided by USEPA (1997b). Results from six monitoring result types were integrated to provide an assessment for each stream waterbody reported here.

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

Lake assessments were based on the Indiana Trophic State (or eutrophication) Index, a modified version of the BonHomme Index developed for Indiana lakes in 1972. This multi-metric index combines chemical, physical, and biological data into one overall trophic score for each public lake and reservoir sampled. Scores range from 0 to 75. Lower values reflect lower concentrations of nutrients. This information is useful in evaluating watershed impacts on a lake.

Waterbodies are identified based on watershed areas known as 14- digit hydrologic unit areas (HUAs). These watersheds range from about 5,000 to 20,000 acres in Indiana. The average 14-digit hydrologic unit area in Indiana is about 12,000 acres or 20 square miles. River miles in a watershed appear as one waterbody with smaller segments designated when assessments for stream reaches differ. Each lake in a watershed is reported as a separate waterbody.

Large rivers with over 1,000 square miles of drainage area are tracked by reach of the mainstem within hydrologic unit areas. This way the wadeable streams and nonwadeable streams are separated so that issues, such as sampling techniques, which might bias results can be considered within a class of streams.

Lakes, reservoirs, and wetlands are tracked individually. They are reported with the hydrologic unit area in which they are located whether or not the lake or reservoir is separate, upstream, downstream, or within the mainstem of the hydrologic unit area.

Lake Michigan is tracked both as Great Lake shoreline miles and as a lake with its own USGS cataloging unit (eight-digit hydrologic unit code). The shoreline is assigned mileage units. Lake Michigan as a separate lake waterbody is assigned acre units; it is not included in the lake acre assessment values in this report. Hopefully, separate tracking will lead to better assessment and understanding of the water quality of the Indiana waters of this lake.

The assessment process was applied to each data sampling program. Then the individual assessments were integrated into an overall assessment for each waterbody by use designation: aquatic life support, fish consumption, and recreational use. Smaller segments were identified for stream reaches as needed when the assessment for a stream reach differed from the default waterbody segment 00 assessment.

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). USEPA 305(b) Guidelines were applied to sample results as indicated in Table 5 (USEPA 1997b).

Table 5 Criteria for Use Support Assessment

Parameter	Fully Supporting	Partially Supporting	Not Supporting
Aquatic Life Use Support			
Toxicants	Metals were evaluated on a site by site basis and judged according to magnitude of exceedance and the number of times exceedances occurred.		
Conventional inorganics	There were very few water quality violations, almost all of which were due to natural conditions.		
Benthic aquatic macroinvertebrate Index of Biotic Integrity (mIBI)	mIBI $\geq$ 4.	mIBI $<$ 4 and $\geq$ 2.	mIBI $<$ 2.
Qualitative habitat use evaluation (QHEI)	QHEI $\geq$ 64.	QHEI $<$ 64 and $\geq$ 51.	QHEI $<$ 51.
Fish community (IBI) (Lower White River, West Fork)	IBI $\geq$ 44.	IBI $<$ 44 and $\geq$ 22	IBI $<$ 22.
Fish community (IBI) (White, East Fork; Whitewater; and Upper Wabash basins)	IBI $>$ 34	IBI $\leq$ 34 and $\geq$ 32	IBI $<$ 32
Sediment 1998 - 1999 (PAHs = polynuclear aromatic hydrocarbons. AVS/SEM = acid volatile sulfide/ simultaneously extracted metals.)	All PAHs $\leq 75^{th}$ percentile. All AVS/SEMs $\leq 75^{th}$ percentile. All other parameters $\leq 95^{th}$ percentile.	PAHs or AVS/SEMs $> 75^{th}$ percentile. (Includes Grand Calumet River and Indiana Harbor Canal sediment results, and so is a conservative number.)	Parameters $> 95^{th}$ percentile as derived from IDEM Sediment Contaminants Database.

Table 5 Criteria for Use Support Assessment

Parameter	Fully Supporting	Partially Supporting	Not Supporting
Sediment (Upper Wabash)	In addition: Locations with results above probable effects concentration identified for further biological or toxicity assessment (Ingersoll and MacDonald 1999).		
Indiana Trophic State Index (lakes only)	Nutrients, dissolved oxygen, turbidity, algae growth, and sometimes pH were evaluated on a lake-by-lake basis. Each parameter judged according to magnitude.		
Fish Consumption			
Fish tissue	No specific Advisory*	Limited Group 2 - 4 Advisory*	Group 5 Advisory*
* Indiana Fish Consumption Advisory, 1999, includes a state wide advisory for carp consumption. Only site specific fish consumption advisories were considered in determining use support status.			
Recreational Use Support (Swimmable)			
Bacteria: at least 5 equally spaced samples over 30 days.	Meets both geometric mean and no more than one sample substantially > single sample maximum	Meets geometric mean. More than one sample > single sample maximum.	Exceeds geometric mean.
Bacteria: grab samples (cfu = colony forming units)	No more than one grab sample substantially > single sample maximum	More than 10% of samples substantially > single sample maximum. No samples > 10,000 cfu/100ml	More than 25% of samples substantially > single sample maximum or at least one sample > 10,000 cfu/100ml

Source: IDEM Assessment Branch

List of Impaired Waters

Waterbodies, which provide partial support or do not support their designated use, are reported to U. S. EPA every two years as required by Section 303(d) of the Clean Water Act. IDEM Office of Water Management prepared and submitted to USEPA the 1998 updated list of waters of the state that do not meet Clean Water Act goals.

The list was the result of technical review within the Office of Water Management and a public notice, meeting, and review process. Public notice of the draft list and procedure appeared in the February 1, 1998 Indiana Register. Three public meetings were held to allow the public to comment on the draft list and process. USEPA Region 5 also commented on the draft list and process. Together, these comments provided additional information, which influenced the content of the final 1998 303(d) list. The most recent copy of the list has been updated to clarify location and watershed nomenclature for several listed items. It is presented in Appendix A or may be viewed on the IDEM Internet site: (www.state.in.us/idem/owm/planbr/wqs/303d.html)

The USEPA has revised regulations requiring Section 303(d) list submission effective March 31, 2000. Indiana is not required to submit a list of impaired waters in 2000.

Rivers and Streams Water Quality Assessment

Designated Use Support

Rivers and streams in three basins were added to the waters assessed for uses designated in Indiana water quality standards (Indiana Legislative Services Agency, 1997). The standards have both narrative and numeric requirements that are used to evaluate designated use support. Indiana has several designated uses for surface water. The ability of waterbodies to support aquatic life use and recreational use were assessed for this report. Individual waterbody assessment results may be found on the IDEM Internet site at (http://www.state.in.us/idem/owm/planbr/wqs/quality.html).

Fish consumption advisories use data resulting from the bioaccumulation of pollutants in fish tissues and are tracked separately from other aquatic life use support parameters (USEPA 1997b). Fish consumption use was evaluated by using the Indiana Fish Consumption Advisory to indicate specific waterbodies that have limited fish consumption advisories. This report makes no assumptions regarding the relationship between the fish body burden of a contaminant and the state water quality standard for that contaminant developed and promulgated to provide for acceptable levels of human health protection under the Clean Water Act.

In addition to the use support criteria described in the Assessment Methodology Section of this report, summary information has been determined by adding water basin probabilistic assessment mileage for those basins that are reported in 2000 to the aggregated mileages reported in 1998. Summary information represents the first three years of assessment for the five-year rotating basin approach to statewide assessment.

Assessed waters are those waterbodies that were evaluated or monitored and classified for use support based on the assessment results. Waterbodies with monitoring data over five years old are evaluated. Streams that have been assessed with probabilistic monitoring results that do not correspond to specific stream reaches are also classified as evaluated (Table 6). See the Special State Concerns and Recommendations section. Waterbodies that have been monitored within the past five years are classified as monitored. Some monitored waterbodies include supplemental monitoring data mostly from fish tissue samples collected as early as 1987 (USEPA 1997b).

Table 6 summarizes the division of assessed stream miles into evaluated and monitored categories. The probabilistic monitoring program precludes relating every stream mile assessed for aquatic life use to the specific stream miles assessed for other uses at this time. In addition, the conversion from the Waterbody System Database to the 305(b) Assessment Database resulted in insufficient information in the new database for the streams reported in 1998. Therefore, an estimate of the total assessed stream miles that have been reported 1998 – 2000 are presented in the table.

Table 6 Summary of Fully Supporting, Threatened and Impaired Waters - Streams

National and State Uses (rounded to the nearest ten miles)

Degree of Use Support	Evaluated	Monitored	Total Assessed
TOTAL ASSESSED	6,170	11,400	17,570

Source: Indiana Water Quality Report 1998 and IDEM Biological Studies Section

Waterbodies are classified for designated use support as described in the Assessment Methodology Section. Individual use support for the state is determined by adding the stream miles assessed for each use individually. Table 7 summarizes use support for the stream miles in the state that have been reported 1998 – 2000. Indiana currently has about 77 stream miles classified as "not attainable" for aquatic life use; one not attainable stream mile was assessed for this report.

Table 7 Individual Use Support Summary - Streams

National and State Uses (rounded to the nearest ten miles)

Use	Size Assessed	Size fully supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Aquatic life support	17,541	13,310	0	720	3,510	1
Fish Consumption	3,030	0	0	2,550	480	0
Primary Contact (RECR)	7,300	4,510	0	130	2,660	0

Source: Indiana 305(b) Assessment Database and IDEM Biological Studies Section.

IDEM Office of Water Management believes that the most consistent way to evaluate overall use support is best represented by the stream miles supporting aquatic life use, which is a designated use in the Indiana Administrative Code. Representative samples for fish community assessment have been used to determine overall aquatic life support this year as part of the rotating basin watershed approach. Sampling locations randomly generated from Reach File 3 by USEPA's computer in Corvallis, Oregon were assessed by IDEM staff for fish community index of biotic integrity as part of the probabilistic monitoring program. The results of each year's sample data set were analyzed to determine the estimated aquatic life use support for the basin it represented. A small number of samples was used to represent and estimate aquatic life use support for a large watershed area. Previous assessments required large numbers of individual samples each representing a specific location and stream mileage. The two assessment methods are compared in Table 8. Total values are the sums of the shaded columns.

Table 8 Aquatic Life Use Support by Basin - Streams

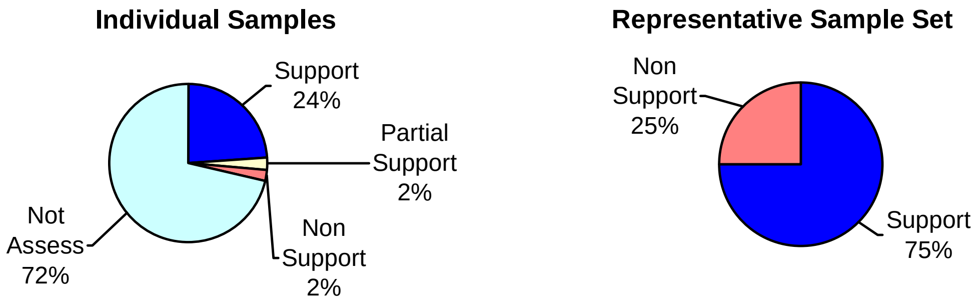
Rounded to nearest ten miles

Method	Individual Samples				Representative Sample Set		
Basin	Support	Partial Support	Non Support	Miles Assessed	Support	Non Support	Miles Assessed
Patoka River	620		40	660			
White River, West Fork	2850	720	120	3,680			
White River, East Fork	3,910	10	80	4,000	3100	1330	4,430
Whitewater River	1,320			1,320	1230	110	1,340
Upper Wabash (Indiana area upstream of Lafayette)	1,440	150	140	1,730	4520	1510	6,030
Other basins	990		410	1,400			
Total for 2000	13,310	720	3,510	17,540			

Source: Indiana 305(b) Assessment Database and IDEM Biological Studies Section.

A comparison of aquatic life use support using results from all available sample locations for all individual samples from all sample types (water chemistry, macroinvertebrate community assessment, fish community assessment, and qualitative habitat evaluation) and results for a representative sample set from fish community assessments are shown in Figure 5 for the Upper Wabash basin. Over 600 samples from various media were used to assess 1710 stream miles for aquatic life use support. Only 50 samples from a representative unbiased set of fish community IBI scores were needed to estimate aquatic life use support for 6030 stream miles using statistical inference. The IBI data set provided a statistically valid unbiased estimate of current water quality conditions for the entire basin (Figure 5).

Figure 5 Upper Wabash Aquatic Life Use Support Estimation Methods



Source: Indiana 305(b) Assessment Database 2000 and IDEM Biological Studies Section.

The pie charts illustrate the more comprehensive nature of results obtained from using a representative data set resulting from a probabilistic sampling design. A small number of samples from an unbiased representative sample set can be used to assess designated use support for a large area.

Targeted sampling plans are biased, because the sampling design is usually set up to choose sites where impairment is most likely, to sample periodically at fixed locations chosen because of a geographic feature, or to sample at specific stream discharge conditions. Water chemistry results, when used alone to assess water quality tend to be biased toward more miles supporting aquatic life use. In the Whitewater watershed, water samples indicated that all but 10 miles supported aquatic life use. The fish community representative results indicated that about 110 miles did not fully support aquatic life use. This is partly due to the fish community samples being statistically representative, but could be enhanced by the cumulative nature of the biological response.

A balanced approach is needed to apply the two sampling methods chosen for the rotating basin approach to water quality assessment in Indiana. The results presented this year will be used to refine the monitoring and assessment program to provide unbiased comprehensive watershed assessments and at the same time identify most likely causes and sources of impairment.

Causes/Stressors and Sources of Impairment of Designated Uses

Causes/ stressors are those pollutants or other stressors that contribute to the actual or threatened impairment of designated uses in a waterbody. Toxic substances listed in the state water quality numeric standards and conditions such as habitat alterations, presence of exotic species, etc. are all examples of causes or stressors. The stressor inhibits the waterbody from providing a habitat that can support aquatic life or creates a situation that is hazardous to human health or animal life.

Table 9 represents the total miles of streams affected by each cause/stressor in Indiana. A waterbody may be impaired by several different causes/stressors so that the total stream miles affected may actually be less than the total number of miles listed in the table.

PCBs (polychlorinated biphenyls) and mercury found in fish tissue and resulting in fish consumption advisories affect the most stream miles. Pathogens, measured as the indicator *E. coli*, identify the stream miles impaired for recreational use. The other parameters primarily indicate aquatic life use impairment. All of these are predictive indicators of use impairment.

Biotic community status represents streams where the cause of impairment is not identified. The fish and/or benthic macroinvertebrate community at sampling sites in the watershed have responded to as yet unidentified stressors. The category corresponds to national code "unknown".

Table 9 Summary of National and State Causes Impairing Waters – Streams

(Rounded to the nearest mile)

Cause/ Stressor	Size (miles)
Biotic community status	1091
Pesticides	78
Priority organics	69
PCBs	3113
Metals	2822
Copper	40
Lead	30
Mercury	2797
Unionized Ammonia	62
Cyanide	142
Other inorganics	3
Nutrients	6
Organic enrichment/Low DO	87
Salinity/TDS/chlorides	12
Other habitat alterations	26
Pathogens (*E. coli* indicator)	2400
Oil and grease	25

Source: Indiana 305(b) Assessment Database 2000
(1996 – 1998 IDEM monitoring results and 1998 Indiana 303(d) list)

Sources are the activities that contribute pollutants or stressors to surface water resulting in impairment of designated uses in a waterbody. The activities listed in Table 10 represent the total stream miles impaired due to each type of source. Several sources may contribute to impairment of a stream or stream reach, so that total miles in the table are greater than the actual stream miles impaired.

Table 10 provides more information than was available for the previous report in 1998. Eighteen additional source classifications were identified for this report including agricultural categories and additional sources resulting from urban activities. Illicit connections identify "straight pipes" from buildings in unsewered areas, which flow into state waters without any treatment. Contaminated sediments are largely due to PCBs that correlate with elevated PCB levels in fish tissue resulting in group 5 (do not eat) fish consumption advisories.

Table 10 Summary of National and State Sources Impairing Waters – Streams

(Rounded to the nearest mile)

Source	**Size (miles)**
Industrial Point Sources	72
Municipal Point Sources	199
Package Plants (Small Flows)	24
Combined Sewer Overflow	45
Collection System Failure	2
Agriculture	207
Crop-related Sources	19
Livestock	158
Urban Runoff/Storm Sewers	113
Other Urban Runoff	19
Illicit connections/illegal hook-ups/dry weather flows	90
Resource Extraction	39
Acid Mine Drainage	39
Land Disposal	75
Onsite Wastewater Systems (Septic Tanks)	72
Hydromodification	170
Channelization	162
Habitat Modification (other than Hydromodification)	59
Nonpoint source/ unknown origin	690
Contaminated Sediments	94
Natural Sources	6
Source Unknown	3476

Source: Indiana 305(b) Assessment Database 2000
(1996 – 1998 IDEM monitoring results and 1998 Indiana 303(d) list)

Lake Water Quality Assessment

Designated Use Support

The ability of inland lakes and reservoirs to support aquatic life was assessed using data collected for the Indiana Trophic State Index (TSI); a multi-metric measurement of the eutrophication (or nutrient enrichment) levels in lakes. The parameters measured include nitrogen, phosphorous, dissolved oxygen, water clarity, and plankton. Fish consumption support was assessed using the 1999 Indiana Fish Consumption Advisory. Recreational use and drinking water source use were not assessed. More information on drinking water source assessment may be found in the Drinking Water Source Assessment section.

The two waterbody types addressed here are:

- Great Lakes Shoreline - the Lake Michigan shoreline as reported in 1998 (Table 11).
- Lakes, Reservoirs – all lakes and reservoirs that have been monitored and assessed are included. USEPA's "significant public lakes" designation has not been used to differentiate between lakes. All lakes that were sampled are included as "significant public lakes" (Table 12). Many lakes and most reservoirs will also be tracked with rivers because they are a part of the linear watershed network having tributaries upstream and a downstream outlet.

The Indiana portion of Lake Michigan is under a limited fish consumption advisory issued by the Indiana State Department of Health. The Lake Michigan shoreline miles represented in Table 11 are under the same limited consumption advisory. Lake Michigan shoreline is also classified as partially supporting recreational use.

Table 11 Summary of Fully Supporting, Threatened and Impaired Great Lakes Shoreline

National and State Uses (shoreline miles)

Degree of Use Support	**Evaluated**	**Monitored**	**Total Assessed**
Size fully supporting all assessed uses	0	0	0
Size fully supporting all assessed uses but threatened for at least one use	0	0	0
Size impaired for one or more uses	0	43	43
Size not attainable for any use and not included in the line items above	0	0	0
TOTAL ASSESSED	0	43	43

Source: Indiana Water Quality Report 1998

All Indiana lakes and reservoirs, which have been monitored, are classified as supporting aquatic life use. Those lakes that have been sampled for fish tissue and sediment have limited fish consumption advisories because of PCB and mercury contamination. Table 12 represents the degree of use support for lakes reported in 1998 with the addition of lakes monitored in 1998.

Table 12 Summary of Fully Supporting, Threatened and Impaired Lakes, Reservoirs

National and State Uses (acres)

Degree of Use Support	Evaluated	Monitored	Total Assessed
Size fully supporting all assessed uses	0	25,580	25,580
Size fully supporting all assessed uses but threatened for at least one use	0	0	0
Size impaired for one or more uses	0	45,540	45,540
Size not attainable for any use and not included in the line items above	0	0	0
TOTAL ASSESSED	0	71,120	71,120

Source: Indiana Water Quality Report 1998 and Indiana Fish Consumption Advisory

Lakes are classified for support of designated uses as described in the Assessment Methodology section. Indiana's entire portion of the Lake Michigan shoreline was reported in 1998; the support classification appears in Table 13.

Table 13 Individual Use Support Summary – Great Lakes Shoreline

National and State Uses (in miles)

Use	Size Assessed	Size fully supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Aquatic life support	43	43	0	0	0	0
Fish Consumption	43	0	0	43	0	0
Primary Contact (RECR)	43	0	0	43	0	0

Source: Indiana Water Quality Report 1998

About 45,000 inland lake acres were assessed and reported in 1998. The lake acres assessed for 2000 were added to the lake acres reported in 1998 for total lake and reservoir use support acres (Table 14).

Table 14 Individual Use Support Summary – Lakes, Reservoirs

National and State Uses (in acres)

Use	Size Assessed	Size fully supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Aquatic life support	69,260	69,260	0	0	0	0
Fish Consumption	45,540	0	0	43,580	1,960	0
Primary Contact (RECR)	0	0	0	0	0	0

Source: Indiana 305(b) Assessment Database 2000 and IDEM Biological Studies Section.

Causes/ stressors are pollutants or other stressors that adversely impact the designated uses of a lake. PCBs and mercury are the fish tissue contaminants identified in fish consumption advisories. Pathogens (*E. coli* is the indicator measured.) identify recreational use impairment for Indiana's Lake Michigan shoreline (Tables 15 and 16).

Table 15 Summary of National and State Causes Impairing Great Lakes Shoreline

Cause/ Stressor	Size (acres)
PCBs	43
Metals	43
Mercury	43
Pathogens	43

Source: Indiana Water Quality Report 1998 and Indiana Fish Consumption Advisory

Table 16 Summary of National and State Causes Impairing Lakes, Reservoirs

Cause/ Stressor	Size (acres)
PCBs	6031
Metals	43,540
Mercury	43,540

Source: Indiana Water Quality Report 1998 and Indiana Fish Consumption Advisory

Sources are the activities that contribute pollutants or stressors to lakes resulting in impairment of designated uses. The sources of impairment for the Lake Michigan shoreline and inland lakes have not yet been identified as indicated in Tables 17 and 18, respectively.

Table 17 Summary of National and State Sources Impairing Great Lakes Shoreline

Source	Size (acres)
Source Unknown	43

Source: Indiana Water Quality Report 1998 and Indiana Fish Consumption Advisory

Table 18 Summary of National and State Sources Impairing Lakes, Reservoirs

Source	Size (acres)
Source Unknown	44,540

Source: Indiana Water Quality Report 1998 and Indiana Fish Consumption Advisory

Clean Lakes Program

Staff and students at Indiana University's School of Public and Environmental Affairs (SPEA), funded by a Section 319 grant, monitored 164 lakes in 1996 and 1997; 75 lakes in the Upper Wabash basin were monitored in 1998. The lake sampling rotation was revised in 1998 in order better to integrate lake sampling with the rotating basin monitoring strategy. The Indiana Clean Lakes samples are collected during July and August of each year since this is when the lake water column naturally stratifies. The results represent worst-case conditions for lake water quality, which is consistent with past monitoring and assessment efforts in Indiana and elsewhere.

A single set of water samples was collected from the deepest portion of each lake and analyzed at the SPEA laboratory in Bloomington, Indiana using standard methods (APHA 1992). All other chemical analyses and plankton counts were completed in the SPEA lab in Bloomington, Indiana. Dissolved oxygen, pH, and water clarity readings were taken in the field.

The Indiana Trophic State Index (TSI) is used to assign points for each of ten common water quality parameters. The total of these points for a particular lake is that lake's trophic or TSI score. Scores range from 0 to 75; the lower numbers indicate waters with the least amount of nutrient enrichment.

From 1972 to 1997, Indiana lakes and reservoirs were divided into three classes based on trophic scores. Class I lakes were the least impacted by nutrients, scoring between 0 and 25 points on the Indiana Trophic State Index. Class II lakes (26-50 points) showed an intermediate amount of nutrient enrichment. Class III lakes scored 51 to 75 points and demonstrated the highest level of enrichment or eutrophication. A fourth lake class, which included remnant and oxbow lakes, is no longer recognized. Waterbodies once listed in this class are more typical of wetlands than lakes.

Beginning with the 1998 report, Indiana lakes have been divided into five classes consistent with USEPA guidelines (USEPA 1997b). This methodology seems consistent with Indiana's original lake classification scheme described above. The lake classes used in this report, in order of increasing eutrophication, are:

- oligotrophic less than 15 points on the Indiana TSI scale;
- mesotrophic 16-31 TSI points;
- eutrophic 32-46 TSI points;
- hypereutrophic greater than 47 TSI points;
- dystrophic lakes with little plant growth despite the presence of nutrients; in Indiana these would typically be waterbodies affected by acid drainage in coal-mining areas of the state

During the 1998 season, TSI scores ranged from a low of 4 points on Kiser Lake in Kosciusko County to a high of 68 points on Black Lake, Whitley County. The average trophic score in this basin was 31 points, which is the upper end of the mesotrophic class (or the lower end of Class II in the original Indiana scheme).

Of the lakes sampled in 1998, approximately 12% fell into the oligotrophic category, 35% were classified as mesotrophic, 45% as eutrophic, and about 8% as hypereutrophic. None landed in the dystrophic class (Table 19). Using lake acreage in each classification, rather than the number of lakes, shows that 13% of the lake acreage fell into the oligotrophic category. The next three classes–in order–contained 50%, 34%, and 3% of the acreage monitored in 1998.

A summary of trophic status for the Upper Wabash Basin is presented in Table 19. All lakes monitored from 1996 through 1998 are included in Table 20. "Significant public lakes" means all lakes monitored regardless of ownership or access.

Table 19 Trophic Status of Significant Public Lakes - Upper Wabash Basin

	Number of Lakes	Lake Acres
Assessed	75	14,898
Oligotrophic	9	1,874
Mesotrophic	26	7,469
Eutrophic	34	5,042
Hypereutrophic	6	513
Dystrophic	0	0

Source: IDEM Biological Studies Section

Table 20 Trophic Status of Significant Public Lakes - Statewide

	Number of Lakes	Lake Acres
Total	600+	106,260
Assessed	239	69,051
Oligotrophic	51	6,635
Mesotrophic	88	44,858
Eutrophic	75	15,247
Hypereutrophic	25	2,311
Dystrophic	0	0

Source: Indiana Water Quality Report 1998 and IDEM Biological Studies Section

Based on lake monitoring efforts to date, Indiana is just beginning to have enough data points to do some cursory trend analysis (Tables 21 and 22). Of the lakes sampled during this period, 23% (19% of the acreage) appear to be stable; they are neither losing nor gaining in levels and effects of nutrients. These include:

Lake Cicott (Cass County);
Big Barbee, Hill, Oswego, and Silver lakes (Kosciusko);
Lake Maxinkuckee (Marshall);
Long and Lukens lakes (Wabash);
Shafer (White); and
Blue and Shriner lakes (Whitley).

Twenty-seven percent of the lakes (19% of the acres) show some water quality improvement due to decreasing eutrophication. The most significant and steadily decreasing TSI scores occurred on the following lakes:

South Mud (Fulton County) and Goose Lake (Whitley) – 26 points each;
Palestine Lake (Kosciusko) – 24 points;
North Little and Center lakes (Kosciusko) and Gilbert Lake (Noble) - 23 points;
Fletcher Lake (Fulton) – 21 points;
Little Barbee Lake (Kosciusko) – 19 points;
Irish Lake (Kosciusko) - 17 points;
Diamond Lake (Kosciusko) – 16 points;
Baugher Lake (Noble) and Hartz Lake (Starke) – 14 points; and
James Lake (Kosciusko) and Nyona Lake (Fulton) - 13 points each.

Other lakes exhibiting some improvement in nutrient levels (lower nutrient concentrations), although the trends are less strong or steady, include:

Everett Lake (Allen County) – 33 point decrease overall;
Yellow Creek Lake (Kosciusko) – 29 points;
Winona Lake (Kosciusko) – 21 points; and
Ridinger Lake (Kosciusko) – 15 points.

Eight percent of the lakes sampled in 1998 (3% of the acreage) show degraded water quality due to increasing eutrophication. The most significant and steady increases in nutrients occurred on:

Goose Lake (Kosciusko County) – 21 point increase overall;
Crane Lake (Noble) – 16 point increase; and
Little Chapman (Kosciusko) – 12 points.

The lakes in the Upper Wabash basin showed a 19% net acreage gain in overall improved water quality. The water quality trend is fluctuating or unknown for 42% of the lakes (59% of the acreage). A lack of trend detection here may be due to insufficient data points for a particular lake (i.e. it is new or was never sampled in the past). Lack of detectable trends can also be due to sampling error, methodology, abnormal seasonal effects, or changing activities in the surrounding watershed. Table 21 provides information on trends for lakes sampled in 1998. Table 22 provides cumulative trend information for lakes sampled 1996 – 1998. Trophic status and trends for lakes sampled during the 1997 and 1998 field seasons are listed in Appendix B.

Table 21 Trends in Trophic Status of Significant Public Lakes - Upper Wabash Basin

	Number of Lakes	Lake Acres
Assessed for trends	75	14,898
Improving	20	2,878
Stable	17	2,775
Degrading	6	462
Fluctuating	22	5,139
Unknown	10	3,644

Source: IDEM Biological Studies Section

Table 22 Trends in Trophic Status of Significant Public Lakes - Statewide

	Number of Lakes	Lake Acres
Assessed for trends	239	69,051
Improving	35	11,352
Stable	89	25,344
Degrading	28	20,398
Fluctuating	22	5,139
Unknown	65	6,818

Source: Indiana Water Quality Report 1998 and IDEM Biological Studies Section

It is important to note that, with the current targeted sampling design, results of an entire five-year cycle must be taken into account before attempting to draw conclusions about lake water quality statewide. Use of a random or stratified random sampling design might better answer such broad lake water quality questions more rapidly. But such information would be of little value to individuals interested in specific water bodies.

Efforts have been made to more closely align the five-year rotation of lake assessments with IDEM's current surface water monitoring strategy. The goal was to enable the comparison of the assessed water quality of lakes with that of adjoining rivers and streams. The difficulty with such an approach lies in the fact that lakes are not distributed equally around the state. Some basins contain few lakes, while others contain more lakes than can feasibly be sampled in a given year. Therefore, switching from a sampling regime that includes all lakes reservoirs to a probabilistic sampling design might be preferable in the future.

Wetlands Assessment

The Indiana Department of Environmental Management (IDEM) administers the Clean Water Act Section 401 Water Quality Certification (WQC) Program. IDEM regulates the placement of fill materials, excavation (in certain cases), and mechanical clearing of wetlands and other waterbodies. IDEM draws its authority from the federal Clean Water Act and from Indiana's water quality standards. IDEM regulates activities in conjunction with the U.S. Army Corps of Engineers.

Any person who wishes to place fill materials, excavate or dredge, or mechanically clear (use heavy equipment) within a wetland, lake, river, or stream must first apply to the Corps of Engineers for a Clean Water Act Section 404 permit. If the Corps of Engineers decides a permit is needed, then the person must also obtain a Clean Water Act Section 401 water quality certification from IDEM. Section 401 water quality certification information is available on the IDEM Internet page (http://www.state.in.us/idem/owm/planbr/wqs/401home.htm).

Under Clean Water Act Section 401, IDEM reviews the proposed activity to determine if it will comply with Indiana's water quality standards. The applicant may be required to avoid impacts, minimize impacts, or mitigate for impacts to wetlands and other waters. IDEM will deny water quality certification if the activity will cause adverse impacts to water quality. A person may not proceed with a project until they have received a certification from IDEM. A key goal of the program is to insure that all activities regulated by IDEM meet the no net loss of wetlands policy.

Development of Wetland Water Quality Standards

Protecting the quantity and quality of the Nation's wetland resources is a high priority. Wetland water quality standards are currently under development in Indiana. Wetland water quality standards are projected to be final adopted by the end of 2000. These standards will contain use classifications, narrative criteria, and an antidegradation policy.

Integrity and Extent of Wetland Resources

Wetlands occur in and provide benefits to every county in Indiana. The lack of quantitative information on some aspects of Indiana's wetland resources is a major obstacle to improving wetland conservation efforts.

The most extensive database of wetland resources in Indiana is the National Wetlands Inventory developed by the U.S. Fish and Wildlife Service. Indiana's National Wetlands Inventory maps were produced primarily from interpretation of high-altitude color infrared aerial photographs (scale of 1:58,000) taken of Indiana during spring and fall 1980-87. The maps indicate wetlands to type, using the Cowardin *et al.* classification scheme. The minimum size of a given wetland on National Wetland Inventory maps is typically one to three acres. Very narrow wetlands in river corridors and wetlands under cultivation at the time of mapping are generally not depicted. Forested wetlands are poorly described.

The Indiana Department of Natural Resources conducted the most recent and complete analysis of this database in 1991. According to the report, Indiana had approximately 813,000 acres of wetland habitat in the mid-1980s when the data were collected (Table 23). Wetland loss or gain since then is not known at this time. (Rolley 1991)

Table 23 Extent of Wetlands by Type

(rounded to nearest thousand acres)

Wetland type (Cowardin et al. 1979)	Historical extent (acres)	Most recent acreage (1991)
Palustrine scrub/shrub (PSS)		42,000
Palustrine forested (PFO)		504,000
Palustrine emergent (PEMB)		55,000
Palustrine emergent seasonally flooded (PEMC)		68,000
Palustrine emergent semi-permanently flooded (PEMF)		21,000
Palustrine open water (POW)		99,000
Lacustrine limnetic open water (L10W)		141,000
Riverine (R)		53,000
Total	5,600,000	813,000

Source: Rolley 1991.

Wetland Protection Activities

In addition to the review of applications for Section 401 Water Quality Certification, the program worked on additional projects devoted to wetland assessment and wetland protection:

- IDEM staff work closely with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, USEPA, and the Indiana Department of Natural Resources to evaluate projects in planning and to coordinate requirements for various state and federal permits related to wetlands.
- IDEM maintains a web page devoted to wetlands and water quality issues. This page is under development and is expected to include information on the status of Indiana's wetlands, current laws and rules, conservation programs, and links to other regulatory and non-regulatory wetland programs. The Water Quality Certification staff conduct outreach events at various locations to promote the importance of wetlands and to educate the public on regulations protecting wetlands.
- IDEM is working closely with other regulatory agencies on the development of an interagency agreement that addresses key issues governing the use of wetland mitigation banks in Indiana.
- IDEM continues to work closely with all partners in the Indiana Wetland Conservation Plan. Part of the implementation phase of the plan calls for the development of an Indiana-focused assessment protocol, which was field tested during the summer of 1999 by IDEM and other regulatory agencies.
- IDEM is implementing grant funds obtained from a USEPA Wetlands Protection grant to evaluate regulatory activities on wetland acreage. Anticipated products include a revised

certification database, which will be web-accessible, and a revised estimate of historic and current wetland losses.

- IDEM is implementing grant funds obtained from a USEPA Wetlands Protection grant to develop wetland outreach materials targeted to potential permittees, school-age children, and citizens interested in wetland protection. Materials will include a set of brochures, an application guidebook, and a wetland video to be produced by the end of 2000.

Wetland Compensatory Mitigation: An Ongoing Study

Over the course of the last two years IDEM has undertaken a review of wetland compensatory mitigation in Indiana. Wetland compensatory mitigation is the replacement of wetlands lost through the permitting process. Since its inception in 1986 IDEM has increasingly required the restoration, creation or enhancement of wetlands as compensation for wetland losses before it will issue a Water Quality Certification. The study revealed this increase in the number of mitigation sites required over the life of Water Quality Certification program (Figure 6).

Figure 6 Mitigation sites by Application Year

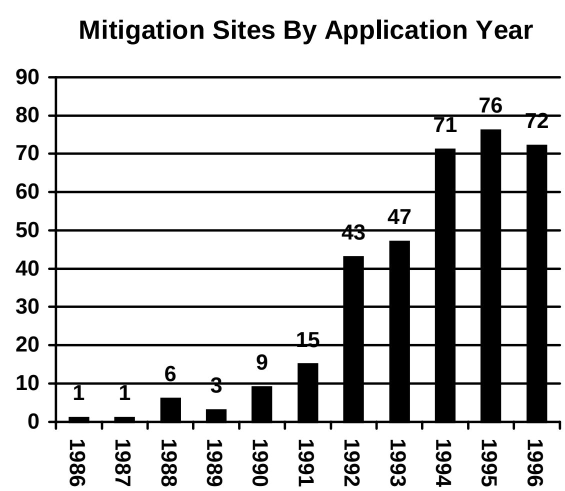
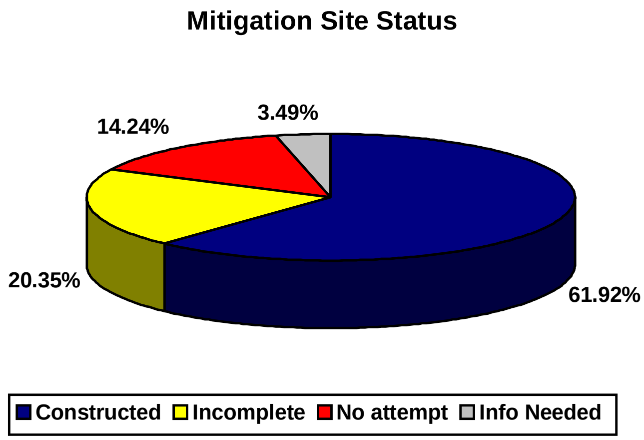


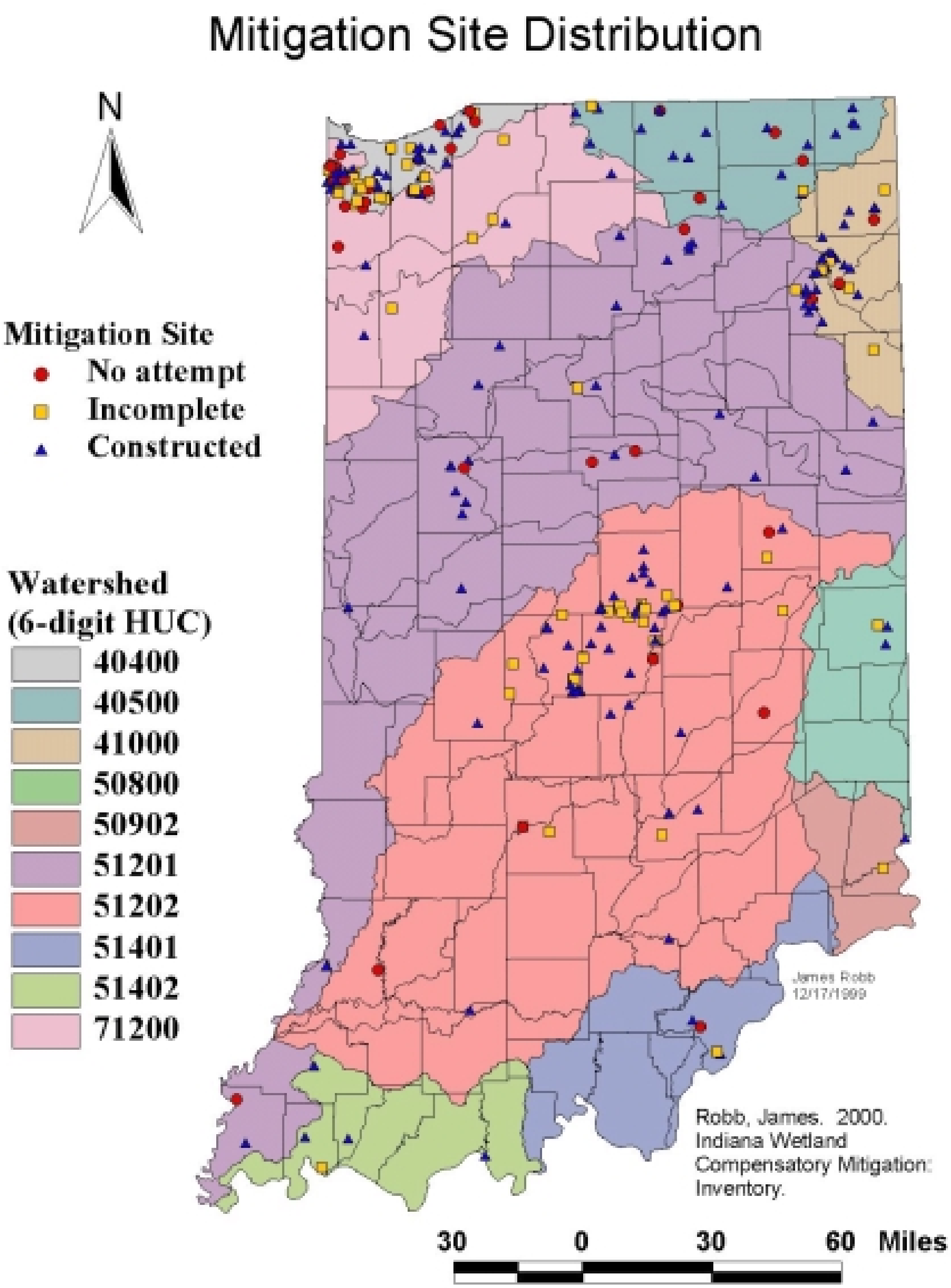
Figure 7 Mitigation Site Status



It also revealed significant compliance problems. The study inventoried 344 sites during the summer and fall of 1998 and the spring of 1999. Nearly 35% of the sites had not been completed. Applicants had made no attempt on 49 of the sites. Another 70 sites showed some signs of construction activity but had not been completed (Figure 7).

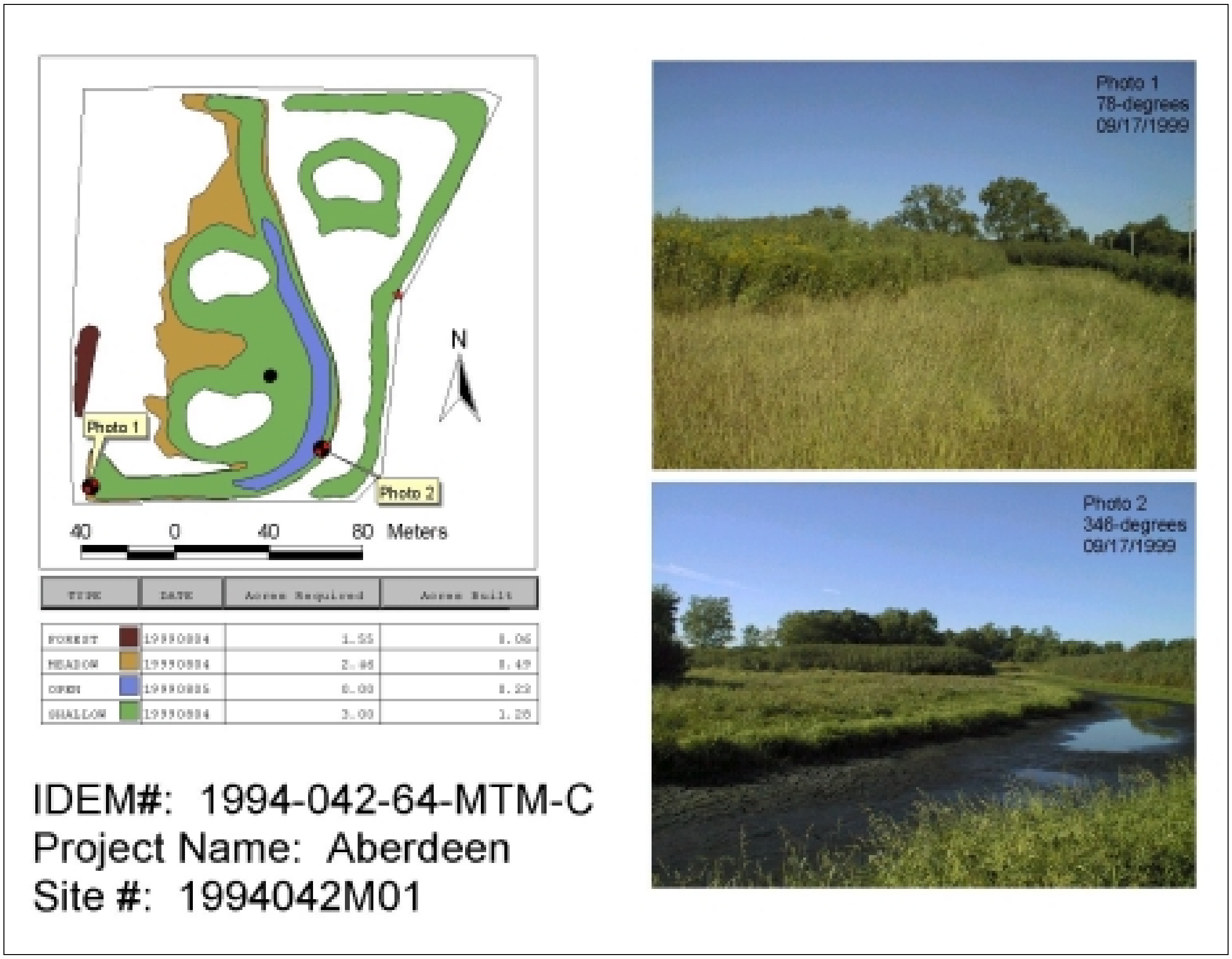
Over a third of the mitigation sites lie within watersheds feeding the Great Lakes. Nearly one-fifth of the mitigation sites lie in the Little Calumet-Galien watershed, the watershed directly abutting Lake Michigan (Figure 8).

Figure 8 Mitigation Site Distribution



During the summer of 1999 IDEM measured the wetland acreage and mapped the vegetation community in 33 randomly selected constructed mitigation sites. These data were still being processed at the time of this reporting. A single site has been provided below for reference (Figure 9).

Figure 9 Aberdeen Mitigation Site



Public Health/ Aquatic Life Concerns

The release of toxic materials into the aquatic environment can produce effects in several ways:

- Contaminants present in acutely toxic amounts may kill fish or other aquatic organisms directly.
- Substances present in lesser, chronically toxic, amounts can reduce densities and growth rates of aquatic organisms and/or bioaccumulate in their tissues that are consumed by humans.
- Toxic materials in the water could potentially affect human health by contaminating public water supplies; although, at this time IDEM has no data to indicate that there have been any adverse human health effects due to toxic substances in surface water supplies.

In the last several years, advances in analytical capabilities and techniques, and the generation of more and better toxicity information on chemicals have led to an increased concern about their presence in the aquatic environment and the associated effects on human health and other organisms. Because many pollutants are likely to be found in fish tissue and bottom sediments at levels higher than in the water, much of the data on toxic substances used for fish consumption assessments in this report was obtained through the fish tissue and surficial aquatic sediment monitoring program.

The Indiana Fish Consumption Advisory identifies fish species, which contain toxicants at levels of concern for human consumption, using the Great Lakes Task Force risk-based approach. The 1999 advisory is based on levels of polychlorinated biphenyl compounds and mercury found in fish tissue. While not all species of fish found in Indiana lakes and streams nor all waters have been tested, carp have generally been found to be contaminated with both polychlorinated biphenyls and mercury at levels of concern. All waters of the state are under some limited consumption advisory for at least some species (i.e. carp). For fish caught in waters not specifically listed in the Indiana Fish Consumption Advisory, a general Group 2 advisory has been issued (one meal/week for general population and one meal/ month for women who are pregnant or breastfeeding, women who plan to have children, and children under the age of 15). (ISDH 1999)

Fish consumption use is reported separately from aquatic life use in order to provide more information about each individual use. Concerns related to fish consumption advisories can be evaluated independently of the impact of other parameters affecting the support of aquatic communities. It is expected that as more lakes and streams are monitored, toxicants will be found at levels of concern in the new samples (i.e., mercury and/or PCBs). The measured miles of streams and acres of lakes affected by toxicants are expected to increase in the near term due to additional lakes and streams with specific fish consumption advisories.

A diverse and healthy fish population is considered an indication of good water quality. Serious public concern is generated when dead and dying fish are noted in the aquatic environment since this is sometimes evidence of a severe water quality problem and may indicate the long-term loss of use of affected water as a fishery. A fish kill can result from:

- The accidental or intentional spill of a toxic compound or oxygen-depleting substance into the aquatic environment.
- Continuous industrial or municipal discharge which may release, due to a system upset, an atypical effluent containing high concentration of pollutants.
- Natural causes such as disease, extreme draught, or depletion of dissolved oxygen from extreme weather conditions.

Spills recorded by the IDEM Office of Land Quality for 1996 through 1999 are listed in Table 24.

Table 24 Spills 1996 - 1999

Year	Spills	Fish Kills
1996	2,381	25
1997	2,268	24
1998	2,675	27
1999	2,588	39

Source: IDEM Office of Land Quality

Drinking Water Source Assessment

Source water assessment stakeholders, as part of a source water assessment advisory panel, participated with IDEM in the development of a source water assessment plan. IDEM with stakeholders has developed a source water assessment plan that will identify or delineate the areas (watersheds and wellheads) in Indiana that supply public drinking water. In the delineated source water areas, IDEM will inventory the potential sources of contamination from regulated facilities and assess water system susceptibility to contamination. IDEM submitted a source water assessment plan to the USEPA on February 4, 1999 and has requested an 18-month extension in addition to the initial two-year implementation period. Approximately 4300 source water assessments of Indiana's public water systems are projected to be completed by May 2003.

Implementation of Indiana's source water assessment plan will require contractual agreements to conduct source water assessments. It is anticipated that contractual agreements will be used for most aspects of the source water assessment plan. Agreements with other state and federal agencies such as the Indiana Geological Survey and the United States Geological Survey may be used to obtain or develop information about Indiana's ground water and surface water utilized as a water source by public water systems.

To assess Indiana's source water areas will require an inventory of potential contaminants and a determination of water system susceptibility to contamination. IDEM will use elements from the existing Wellhead Protection Program as tools for assessing the surface and ground water used as a source by public water systems. Assessing source water in Indiana will include delineating ground water within a 5 year time of travel or within a 3,000 feet radius of designated community public water system wells and for non-community ground water system wells, a fixed radius of 300 or 3000 feet will be used. Assessments of surface water public water systems will include delineating watershed boundaries upstream of the water system intakes. For both wellheads and watersheds, inventories of potential sources of contamination within source water areas will be developed within the guidelines of the Source Water Assessment Plan.

Existing information about Indiana's surface water and ground water that will be useful in assessing the source waters of public water systems will be obtained from both state and federal agencies such as the Indiana Department of Natural Resources and the United States Geological Survey. Public water system sanitary surveys, vulnerability assessments, water well logs, and existing monitoring data will also be used in assessing public water system susceptibility to contamination. In addition to using existing information, on-site visits will be made to public water systems to identify the location and proximity of potential sources of contamination and to accurately locate public water supply wells using a global positioning system.

Based on contaminant inventories, information obtained on-site from public water systems and from various state and federal water agencies, the susceptibility of public water systems to possible contamination will be determined. To manage and access the information generated by a state-wide assessment of Indiana's public water supply sources, the use of geographical information systems is proposed. To integrate data and information from a wide variety of sources, a geographical information system will be needed and will be used to describe source water assessment areas. Geographical information systems developed for source water assessment can also be used to communicate source water assessment findings to the public in electronic and graphic formats. Education and community outreach activities will also be used to disseminate source water assessment results.

GROUND WATER ASSESSMENT

Introduction to Indiana Ground Water

Ground water is an important resource for Indiana citizens, agriculture, and industry. The majority of the state's population use ground water for drinking water and other household uses. Of the population served by public water supplies, approximately 50 percent depend on ground water. In 1998, 4295 public water supply systems supplied ground water to a population of approximately two million people (http://www.state.in.us/idem/owm/index.html) (IDEM 1999). Over one-half million Indiana homes have private wells for their water supply. Ground water is also an integral component in Indiana's economy. During the growing season, ground water is withdrawn at an average rate of 282.9 million gallons per day (mgd) for crop and turf irrigation (based on a 90-day season). Industry withdraws an average 98.6 mgd of ground water, and 31.3 mgd is used for energy production (Ralph Spaeth, Indiana Department of Natural Resources, written communication, 2000).

Indiana’s potable ground water occurs in both unconsolidated and bedrock (consolidated) aquifer systems. The most productive aquifers are associated with glacially derived outwash sand and gravel deposits that occur in the major river valleys. Other good unconsolidated aquifers are found in the thick, inter-till sand and gravel deposits and outwashes of central and northern Indiana. The withdrawal potential in unconsolidated aquifers is up to 2000 gallons per minute (gpm). The major bedrock aquifers include the Pennsylvanian Age sandstones of southwestern Indiana, Mississippian Age limestones in the south central area, Devonian Age limestones and dolomites across northern and central Indiana, and Silurian Age limestones and dolomites in the north and central portions of the state. Major bedrock aquifers yield up to 600 gpm.

The ambient ground water quality throughout Indiana is variable and dependent upon the aquifer system, geologic setting, and depth of geologic formation. In general, the incidence of mineralized or even saline ground water increases at bedrock depths that exceed 300 feet. The majority of private and public wells in Indiana occur at depths of less than 200 feet. The chemical quality of the potable water is generally adequate to meet the basic needs for household, municipal, industrial, and irrigation uses. However, the waters are often hard, with hardness exceeding 180 parts per million (ppm) as calcium carbonate. Other constituents of importance to natural water quality are iron, manganese, sulfate, and hydrogen sulfide. Iron and manganese concentrations are often a nuisance, causing staining and deposits. Manganese concentrations are lowest along the Wabash River and Whitewater River and in Mississippian Age limestone aquifers. Sulfate levels are dependent on the geologic deposits. Concentrations exceeding 600 ppm sulfate have been noted in Allen, Harrison, Orange, Vermillion and Lake Counties. Hydrogen sulfide, which has an objectionable odor even at low concentrations, is produced from sulfate by oxidation-reduction reactions or biological reduction by anaerobic bacteria. It is generally present in the ground water underlain by limestone bedrock in northwestern regions of Indiana.

Ground Water Data for the 2000 305(b) Reporting Cycle

Ground water information contained in this report is based on guidelines provided and data requested by the USEPA. Among the information requested is an overview of the ten highest priority sources of ground water contamination in Indiana and the associated contaminants impacting ground water quality (Table 25) along with a summary of Indiana's ground water protection efforts (Table 26). Beginning with the 1996 305(b) report, the EPA requested ground water quality be assessed by hydrogeologic setting(s) or aquifer(s) rather than by county. In 1995, the Indiana Geological Survey (IGS) produced a document that describes 230 surface and subsurface geologic environments, or "hydrogeologic settings", occurring in Indiana. The hydrogeologic settings provide a conceptual model to interpret the sensitivity to contamination of ground water in relation to the surface and subsurface environment (Fleming and others 1995). Included in the analysis are the composition and geometry of the aquifers, thickness and variability of the confining units, surface and ground water interactions, and recharge/discharge relationships. For the 2000 305(b) report, ground water data is summarized for two hydrogeologic settings identified in the IGS document: the southern valley fringe of the Kankakee Lowland (K1), a setting highly sensitive to ground water contamination, and the Frankfort segment of the Central Till Plain, a setting less sensitive to contamination (Figure 10). Quantity and type of known contaminant and potential contaminant sources (Tables 27 and 28) and the occurrence of general contaminant groups (Tables 29 and 30) are summarized for both hydrogeologic settings. Unless noted otherwise, the 2000 305(b) report contains data for 1997 and 1998.

Major Sources of Ground Water Contamination

The major contaminant sources impacting Indiana ground water are listed by general activity types in Table 25. All sources listed are a potential threat to ground water; however, the degree to which the source is a threat to ground water depends on several factors, probably the most significant being hydrogeologic sensitivity. Other major risk factors include location of the contaminant source relative to drinking water sources, toxicity of contaminant, and the size of the population at risk. All risk factors listed in Table 25 were considered in selection of the ten priority contaminant sources, and those risk factors relevant to the highest priorities are identified. Classes of contaminants commonly associated with each highest priority contaminant source are also given.

Table 25 Major Sources of Ground Water Contamination

CONTAMINANT SOURCE	HIGHEST PRIORITY	FACTORS[1]	TYPE OF CONTAMINANT[2]
Agricultural Activities			
Agricultural chemical facilities			
Commercial fertilizer applications	✓	A, C, D, E	E
Confined animal feeding operations	✓	A, D, E	E, J
Farmstead agricultural mixing and loading procedures			
Irrigation practices			
Manure applications			
Pesticide applications			
Storage and Treatment Activities			
Land application			
Domestic and industrial residual applications			
Material stockpiles			
Storage tanks (above ground)			
Storage tanks (underground)	✓	A, B, C, D, E, F	B, C, D
Surface impoundments	✓	A, C, D, E, F	A, B, C, D, E, G, H, J
Waste piles			
Disposal Activities			
Deep injection wells			
Landfills (constructed prior to 1989)	✓	A, B, C, D, E, F	A, B, C, D, E, G, H, I, J
Permitted landfills (constructed 1989- present)			
Septic systems	✓	A, C, D, E, F, G	A, B, C, D, E, H, J
Shallow (Class V) injection wells	✓	A, B, C, D, E, I	A, B, C, D, E, H, J
Other			
Hazardous waste generators			
Hazardous waste sites			
Industrial facilities	✓	A, B, C, D, E, F	A, B, C, D, E, H, I, J
Liquid transport pipelines (including sewer)			
Materials spills (including during transport)	✓	A, B, C, D, E, F	A, B, C, D, E, H, I, J
Material transfer operations			
Small-scale manufacturing and repair shops			
Mining and mine drainage			
Salt storage (State and nonstate facilities) and road salting	✓	A, C, D, E, F	G
Urban runoff			

[1] Factors considered in selecting the contaminant source:
(A) human health and/or environmental risk (toxicity)
(B) size of the population at risk
(C) location of source relative to drinking water source
(D) number and/or size of contaminant sources
(E) hydrogeologic sensitivity
(F) documented State findings, other findings
(G) high to very high priority in localized areas, but not over majority of Indiana
(H) geographic distribution/ occurrence
(I) lack of information

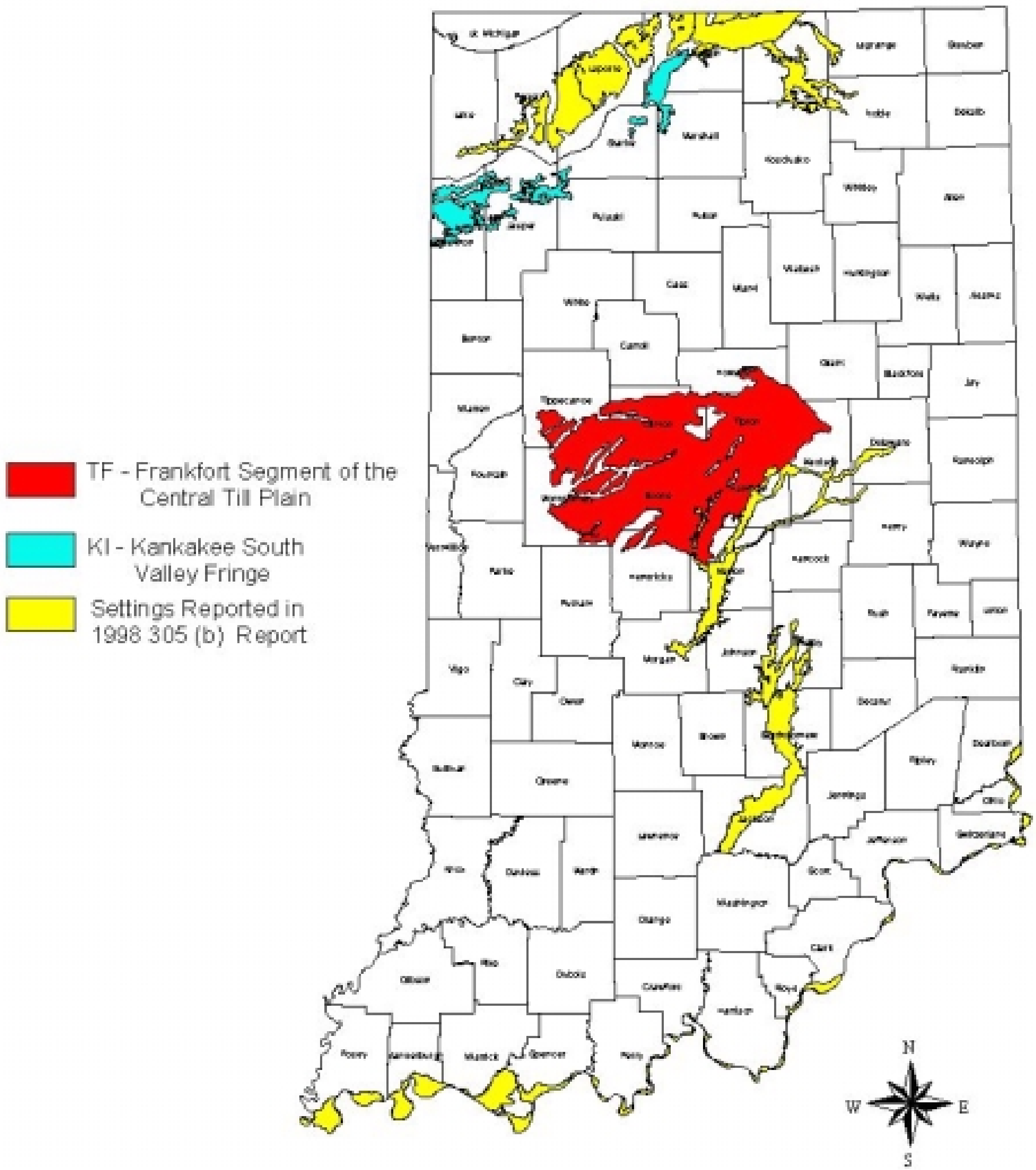
[2] Classes of contaminants associated with contamination source:
(A) Inorganic pesticides
(B) Organic pesticides
(C) Halogenated solvents
(D) Petroleum compounds
(E) Nitrate
(G) Salinity/ brine
(H) Metals
(I) Radionuclides
(J) Bacteria
(K) Protozoa
(L) Viruses

Nitrate is a potential contaminant from the following high priority sources listed in Table 25: commercial fertilizer applications, concentrated animal feeding operations (CAFOs), and septic systems. Nitrate, a highly mobile and soluble contaminant, is the most frequently detected ground water contaminant in rural areas; however, determining the source of nitrate can be difficult and costly. For the 1997 and 1998 crop production season, 495 million tons and 373 million tons, respectively, of commercial fertilizer containing nitrogen were sold in Indiana for application on some 12 million acres of cropland, most of which was applied to nearly 6 million acres of corn (Indiana Agricultural Statistics Service 1998-99). Unlike pesticides, the purchase and application of commercial fertilizer is not regulated by the Office of the Indiana State Chemist. When applied at the proper rate and time, commercial fertilizer poses little threat of contamination to ground water. Purdue University Cooperative Extension Service staff, United States Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) staff and private consultants assist crop producers in developing nutrient management plans that focus on meeting crop nutrient needs based on realistic goals. Concentrated animal feeding operations occur throughout Indiana, as livestock are an integral component of Indiana's agricultural economy. The Indiana Department of Environmental Management (IDEM) conducts a Confined Feeding approval program which requires large livestock and poultry producers to gain approval for construction, operation or expansion of their facilities; and the NRCS also works closely with groups of livestock producers who request financial and technical assistance for building or expanding livestock operations. The primary concerns associated with CAFOs are the proper storage and land application of the large volumes of ammonia-containing manure produced by these operations (the ammonia form of nitrogen is converted to nitrate through biological processes in the soil). Properly constructed and maintained septic systems provide satisfactory on-site treatment of domestic wastewater in rural and unsewered suburban areas of Indiana. However, improperly constructed or poorly maintained septic systems as well as systems operating in areas of high seasonal water tables or other ground water sensitive areas are also of concern as a source of nitrate contamination to ground water.

Landfills and underground storage tanks are a high priority ground water contamination concern largely due to practices or activities that occurred prior to construction standards and legislation established for the protection of ground water. Landfills constructed after 1988 have been required to adhere to stringent construction standards. Since 1988, underground storage tank registration, upgrading, closure activity and site assessment have been closely reviewed by the IDEM Underground Storage Tank (UST) Section. In accordance with federal and state mandates, as of December 22, 1998, Underground Storage Tanks installed prior to December 22, 1988, were to be either properly protected against spills, overflows and corrosion, or properly closed.

Discharges to surface impoundments such as pits, ponds, and lagoons are under regulated. In highly sensitive hydrogeologic settings occurring in northern Indiana (yellow shaded areas in St. Joseph and Elkhart Counties, Figure 10), surface impoundments have a surface water to ground water discharge relationship that is close to 100 percent. Many of these surface impoundments are industrial and have the potential to discharge metals, volatile organic compounds (VOCs), and synthetic organic compounds (SOCs) to ground water. Nitrates and salts have also been documented as ground water contaminants resulting from surface impoundments.

Figure 10 Map of Hydrogeologic Settings



Class V underground injection wells (UIWs) are widespread throughout the state and occur in high concentration in several areas including areas in which ground water is highly sensitive to contamination. Class V wells release a wide variety of contaminants into or above aquifers supplying drinking water. The large number and diversity of Class V wells combined with lack of information regarding effects of these wells on ground water pose a significant potential threat to ground water. Indiana Class V wells are regulated by the USEPA. The USEPA has targeted those Class V wells which pose the greatest environmental risks as candidates for more intensive regulations and enforcement. Two groups of particular interest are the industrial disposal wells (5W20) and automobile service station disposal wells (5X28) (Ground Water Protection Council).

Several cases of ground water contamination due to industrial facilities or their ancillary operations have been documented in Indiana. Although many contamination events occurred prior to the development of regulations for the storage and handling of industrial materials, ground water contamination still occurs as a result of either accidents or intentional dumping of waste. In May 1998, Indiana adopted rule 327 IAC 2-10-3(a)(11), which requires the secondary containment of hazardous materials. This rule requires that new facilities provide secondary containment unless there is less than 660 gallons at a facility that is not in an approved delineated wellhead protection area or less than 275 gallons at a facility that has been notified in writing by a water utility that it is in an approved delineated wellhead protection area. The secondary containment rule, along with outreach and education programs has alleviated the majority of problems; however, these activities continue to be a major potential source of contamination to ground water in Indiana.

The storage and extensive use of salt as a deicing agent during the winter months has an impact on ground water. Ground water contamination from road salt has been documented in Indiana. Efforts are being made by the Indiana Department of Transportation (IDOT) to build salt storage facilities in areas where ground water is not sensitive to contamination and to upgrade existing facilities to protect ground water.

Approximately fifty spills are reported on the average to IDEM per week. In 1998, over 2 million gallons of chemicals, industrial wastes, and agricultural product spills were reported. Ground water contamination as a result of spills can be avoided or minimized if spills are properly handled and cleaned up. Unreported spills and improperly executed follow up efforts create a concern for ground water contamination.

Ground Water Protection Programs

Programs to monitor, evaluate, and protect ground water resources in Indiana occur at all levels of government. At the state level, several ground water protection programs and activities have been implemented or are in the process of being implemented. Table 26 lists the state's ground water protection programs and activities, developmental stage of the program or activity, and the agency or agencies responsible for the program's implementation and/or enforcement.

Table 26 Summary of State Ground Water Protection Programs (through 12/31/98)

PROGRAM OR ACTIVITY	STATUS	STATE AGENCY/ ORGANIZATION
Active SARA Title III Program	fully established	IDEM-OER
Ambient ground water monitoring program	fully established	OISC*, IDEM-OWM
Aquifer sensitivity assessment	fully established	IDEM-OWM, IDNR, IGS, OISC
Aquifer mapping/basin studies	under development	IDNR, IDEM-OWM
Aquifer/ hydrogeologic setting characterization	fully established	IGS, IDEM-OWM, IDNR
Bulk storage program for agricultural chemicals	fully established	OISC
Comprehensive data management system	pending	IDEM-OWM
Complaint response program for private wells	fully established	IDEM-OWM
Confined animal feeding program	fully established	IDEM-OWM
EPA-endorsed Core Comprehensive State Ground Water Protection Program (CSGWPP)	under development	IDEM-OWM, GWTF
Ground water discharge permits for constructed wetlands	under development	IDEM-OWM
Ground water Best Management Practices	under development	OISC*, IDEM-OWM
Ground water legislation	fully established	IDEM, IDNR, OISC, ISDH
Ground water classification	pending	IDEM-OWM
Ground water quality standards	pending	IDEM-OWM
Interagency coordination for ground water protection initiatives	pending	GWTF
Land application of domestic and industrial residuals	fully established	IDEM-OWM
Nonpoint source controls	under development	IDEM-OWM
Oil and Gas	fully established	IDNR
Pesticide State Management Plan	under development	OISC*, IDEM-OWM
Pollution Prevention Program	fully established	IDEM-OPPTA
Reclamation	fully established	IDNR
Resource Conservation and Recovery Act (RCRA) Primacy	fully established	IDEM-OSHWM
Sensitivity assessment for drinking water/ wellhead protection	fully established	IGS, IDEM-OWM
Spill Monitoring	fully established	IDEM-OWM
State Superfund	fully established	IDEM-OSHWM/OER
State RCRA Program incorporating more stringent requirements than RCRA primacy	fully established	IDEM-OSHWM
State septic system regulations	fully established	ISDH
Underground storage tank installation requirements	fully established	IDEM-OER
Underground Storage Tank Remediation Fund	fully established	IDEM-OER
Underground Storage Tank Permit Program	fully established	IDEM-OER
Underground Injection Control Program	fully established for Class II wells	IDNR
Well abandonment regulations	fully established	IDNR
Wellhead Protection Program	fully established	IDEM-OWM
Well installation regulations	fully established	IDNR

* indicates lead agency involved in enforcement or implementation

Acronyms Used:

GWTF Governor's Ground Water Task Force
IDEM Indiana Department of Environmental Management
IDNR Indiana Department of Natural Resources
IGS Indiana Geological Survey
ISDH Indiana State Department of Health
OER Office of Environmental Response (IDEM)
OISC Office of the Indiana State Chemist
OPPTA Office of Pollution Prevention and Technical Assistance (IDEM)
OSHWM Office of Solid and Hazardous Waste Management (IDEM)
OWM Office of Water Management (IDEM)

Definitions: "pending" is used to describe those programs that have a written, draft policy "under development" is used to describe those programs still in the planning stages

A ground water protection program resides in the Ground Water Section at IDEM to protect and assist the private well owner. The Complaint Response Program receives over 300 calls annually from private well owners concerned with contamination of their drinking water from nearby sources. Approximately 20% of complaints are followed up with residential well testing. The Complaint Response Program also receives referrals from other IDEM program areas. One hundred sixteen private wells were monitored for ground water contamination in 1997 and 1998.

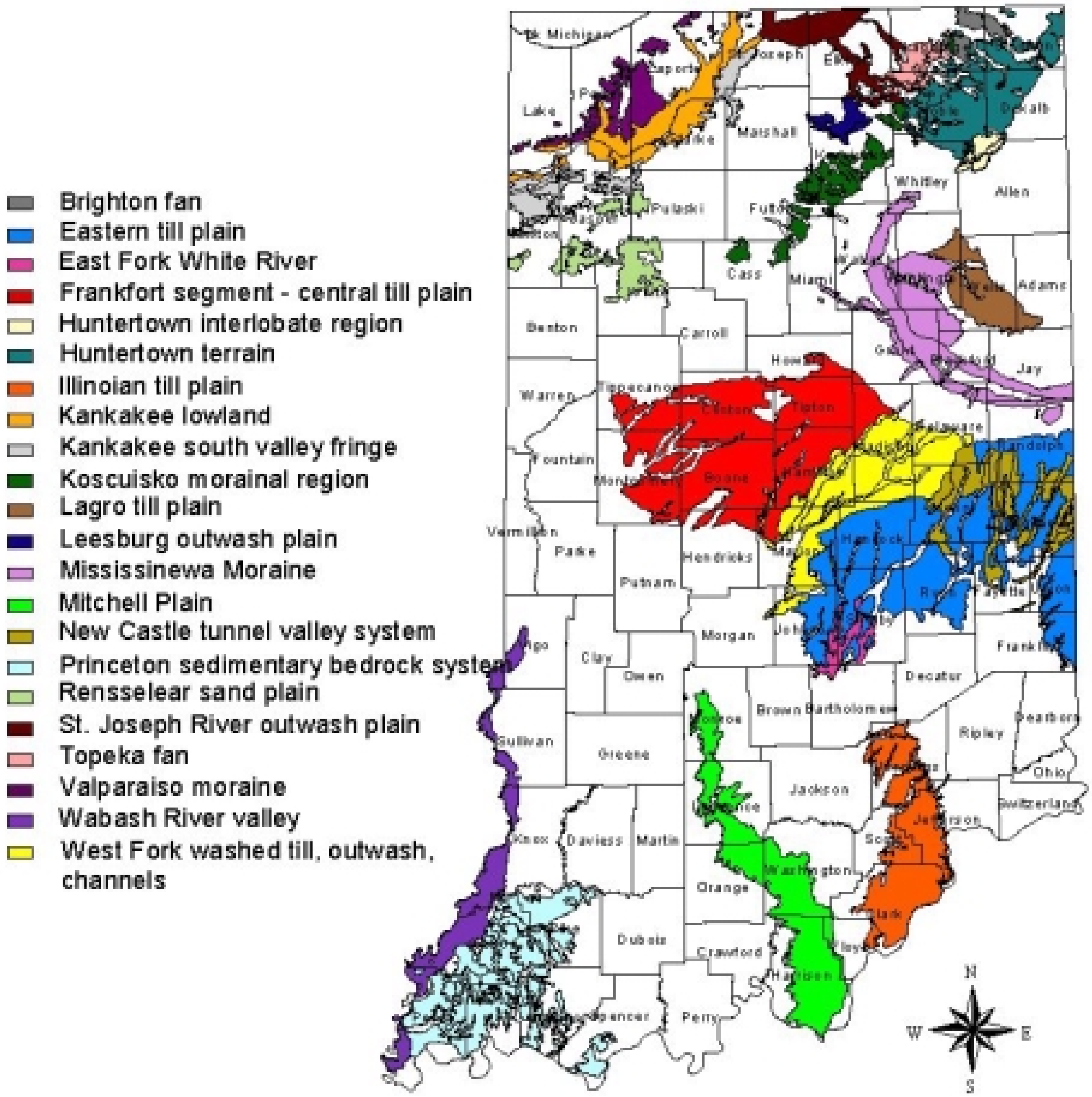
In 1997, a pilot project was conducted for the ground water monitoring network component of the Pesticide State Management Plan. The monitoring network was established to provide a statistical evaluation of trends in pesticide occurrence and concentrations in major hydrogeologic settings of the state. Of the 230 hydrogeologic settings identified by the Indiana Geological Survey, approximately 60 were grouped into 22 “type” hydrogeologic settings that represent the state (Figure 11). For the pilot project, wells representing two of the 22 “type” hydrogeologic settings were sampled for pesticides (SOCs), nitrates and metals along with general chemistry parameters. Quarterly sampling of the nearly 400 wells representing all 22 hydrogeologic settings was initiated in 1998. Wells are to be sampled every 3-4 months for seven consecutive periods.

Indiana is currently developing Ground Water Quality Standards. Draft rule language classifies ground water into one of three classes: drinking water, naturally limited or impaired drinking water. Ground water is classified as drinking water class unless there is an approved verification that conditions exist making it impractical to use as drinking water. IDEM may classify ground water as “naturally limited” when ground water is shown to have a yield of less than 200 gallons per day or a total dissolved solids concentration of more than 10,000 ppm. Additionally, ground water that contains hydrocarbons, is in a coal mined area, or is in an injection zone of a permitted Class I, II or III injection well or gas storage well is considered naturally limited. IDEM may classify ground water with historic or other unaddressed contamination as “impaired” if mechanisms are in place to ensure no exposure to ground water that contains unsafe levels of contamination. Historic contamination is contamination that resulted from a facility, practice, or activity that was unregulated or under-regulated to protect ground water at the time the contaminant was released. To qualify for the impaired class the contaminants known to be in the ground water must be identified.

The source water assessment program is developing a plan to identify the watersheds and wellheads in Indiana that supply public drinking water. In the delineated source water areas, IDEM will inventory the potential sources of contamination from regulated facilities and assess water system susceptibility to contamination. Approximately 4300 public water systems will have source water assessments completed by May 2003.

In March 1997 the Indiana Wellhead Protection Rule became effective, with EPA final approval of the Wellhead Protection Program in April of 1997. The Wellhead Protection Program is a proactive program that protects public water supplies from contamination. The Wellhead Rule outlines the minimum requirements community public water supplies must meet to comply with the Wellhead Protection Program. IDEM worked with the Town of Petersburg as a pilot project for developing wellhead protection plans.

Figure 11 Hydrogeologic Monitoring Networks for State Pesticide Management Plan



In addition to regulatory programs and other structured ground water protection activities listed in Table 26, there are several educational programs conducted in Indiana that place an emphasis on ground water protection. The Purdue University Extension program "Safe Water for the Future" is an umbrella for several programs that provide resources on drinking water protection for individuals and communities. The Farm*A*Syst and Home*A*Syst programs essentially are wellhead protection programs for rural and domestic private wells. A series of publications and brochures on wellhead protection are also available to assist communities working on wellhead protection. "Watershed Connections" brings together local contacts to produce a community-specific publication on water resources and their protection. Indiana Project WET (Water Education for Teachers) and Indiana's Water Riches are two general water education programs that provide information about ground water protection.

Several other coordinated education/information efforts conducted in Indiana address ground water protection. The statewide Clean Water Indiana education program focuses primarily on agriculture's contribution to water quality contamination from soil and water related resources. Aspects of this program that deal with ground water protection include nutrient and pest management, plugging abandoned water wells, and land use. The Water Quality (WQ) series of over 30 Purdue Extension publications addresses specific topics for the general public. Purdue Pesticide Programs publication "Pesticides and Water Quality" (PPP-35) describes the protection measures taken by manufacturers, handlers, and end users of pesticides to protect water quality and discusses the end "fate" of applied pesticides in the environment. "Your Link to Water Quality" is a brochure that provides resources available through Purdue Extension to address water quality concerns related to agriculture, homeowners, and communities.

Hydrogeologic Settings for the 2000 Report

Ground water contamination site and ground water quality data are summarized for the hydrogeologic settings selected for the Pesticide Monitoring Network pilot project in Tables 27-28 and Tables 29-30, respectively. The thick till plain of the Frankfort segment in the Central Till Plain (TF) and the southern valley fringe of the Kankakee Lowland in the Lake Michigan Rim (K1) along with hydrogeologic settings summarized in the 1998 305(b) report are illustrated in Figure 10. The following are descriptions of the TF and K1 hydrogeologic settings.

TF

The Frankfort segment occupies the northcentral part of the Central Till Plain, extending westward from near the West Fork of the White River to near the Wabash River just southwest of Lafayette. This segment generally constitutes a very thick till section that partly overlies a complex of buried bedrock valleys. Bedrock depth is typically over 150 feet in most of the segment, and approaches 400 feet over some parts of the Anderson Bedrock Valley. Shallow bedrock (less than 50 feet) is restricted to a few isolated places, mainly in the western parts of this segment. Bedrock in the eastern two-thirds of this segment is mostly limestone and dolomite. Shale and siltstone bedrock predominate in the western one-third of the segment, where lesser bedrock depths are more common. Sand and gravel aquifers tend to occur at great depth and are commonly associated with the bedrock surface.

The Frankfort segment is one of the largest hydrogeologic settings in Indiana, comprising an area of 1736 square miles. The Frankfort segment lies just north of Indianapolis and extends into eleven counties. The Frankfort segment is largely rural but contains four cities with populations greater than 3500: Crawfordsville (Montgomery County), Frankfort (Clinton County), Lebanon (Boone County) and Tipton (Tipton County).

K1 –

The southern valley fringe of the Kankakee Lowland occurs as an aeolian sand. In the northeastern segment, in Starke and southeastern LaPorte Counties, this unit occurs as both a blanket and in a moderate number of dunes, and mostly lies atop outwash. The southern segment of this region in Newton and Jasper Counties is a strongly dunal landscape ten or more miles wide that overlies morainal clays or limestone bedrock. The water table is shallow, in many areas less than 15 feet. K1 covers an area of 276 square miles and does not contain any cities with a population greater than 3500.

Summary of Contamination Sites

Type and frequency of contamination sites occurring in the TF and K1 hydrogeologic settings are reported in Tables 27 and 28, respectively. For those sites with ground water quality investigations, the number of the contamination sites with confirmed ground water contamination is included. Organization of this data by setting permits a better understanding of the stress occurring to the individual hydrogeologic setting. For program areas in which Universal Transverse Mercator (UTM) or latitude/ longitude coordinates were not available, sites having mailing addresses containing cities that were entirely or partially within a hydrogeologic setting were included. Due to this gross method of calculation, CERCLIS, LUST, RCRA, Class V UIW, Voluntary Remediation and Material Spills sites may be overestimated. Accuracy of contamination site information should increase in future reports as Global Positioning System (GPS) data and Geographic Information System (GIS) analyses continue to be incorporated into all IDEM program areas. Based on contamination site types considered, the average number of contamination or potential contamination sites per square mile for TF and K1 is 7.5 and 9.2, respectively.

Table 27 Summary of Ground Water Contamination Sites

Hydrogeologic Setting: Thick till plain of the Frankfort segment in the Central Till Plain

Map Unit: TF

Area: 1736 mi^2

Counties included: Boone, Clinton, Hamilton, Hendricks, Grant, Howard, Madison, Marion, Montgomery, Tippecanoe, Tipton

Data Reporting Period: 01/01/97 - 12/31/98

Source Type		Number of sites in area that are listed	Number of sites with confirmed ground water contamination	Ground Water Contaminants
Superfund		2	2*	SOCs, VOCs, PCBs
CERCLIS (non-NPL)		6	1	VOCs
DOD		0		
LUST		31	7	VOCs
RCRA Corrective Action		13 (370)	2	VOCs
UIW	Class I	0		
	Class II	0		
	Class III	0		
	Class V	2		
State Cleanup		1	1	VOCs
Voluntary Remediation		6	3	Metals, SOCs, VOCs
Material spills		167		
Total		228	14	

* Operation and maintenance phase of cleanup
CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System
DOD Department of Defense
NPL National Priority List
LUST Leaking Underground Storage Tanks
RCRA Resource Conservation and Recovery Act; ( )=total number RCRA treatment, storage and disposal facilities
UIW Underground Injection Wells

Table 28 Summary of Ground Water Contamination Sites

Hydrogeologic Setting: Southern valley fringe of the Kankakee Lowland in the Lake Michigan Rim

Map Unit: K1

Area: 276 mi^2

Counties included: Jasper, Marshall, Newton, Pulaski, St. Joseph, Starke

Data Reporting Period: 01/01/97 – 12/31/98

Source Type		Number of sites in area that are listed	Number of sites with confirmed ground water contamination	Ground Water Contaminants
Superfund		0		
CERCLIS (non-NPL)		0		
DOD		0		
LUST		2	0	
RCRA Corrective Action		0 (15)		
UIW	Class I	0		
	Class II	0		
	Class III	0		
	Class V	13		
State Cleanup		0		
Voluntary Remediation		0		
Material spills		15		
Total		30	0	

CERCLIS Comprehensive Environmental Response, Compensation, and Liability Information System
DOD Department of Defense
LUST Leaking Underground Storage Tanks
NPL National Priority List
RCRA Resource Conservation and Recovery Act; ( )=total number RCRA treatment, storage and disposal facilities
UIW Underground Injection Wells

Ground Water for Drinking Water Monitoring Data

Ground water quality data for hydrogeologic settings TF and K1 is summarized in Tables 29-30. Ground water quality data is separated according to data source (Community PWS, Noncommunity PWS, Complaint Response Program private well data and Pesticide Monitoring Network well data). The Public Water Supply (PWS) data is a summary of systems having mailing addresses containing cities that were entirely or partially within the TF or K1 hydrogeologic setting. All wells in the Complaint Response Program and Pesticide Monitoring Network have been geolocated and hydrogeologic setting identified.

Data obtained from Community and Noncommunity Public Water Supply (PWS) ground water systems was collected from the IDEM Drinking Water Branch PWS Compliance Section. Results are reported for volatile organic compounds (VOCs), synthetic organic compounds (SOCs), inorganic compounds (IOCs), nitrates (NO_3), and radionuclides. Community and Noncommunity nontransient systems are required to test for 30 regulated SOCs, and 21 VOCs. Community systems monitor for 12 regulated IOCs and sodium (a special monitoring requirement). Nontransient noncommunity systems monitor for 11 regulated IOCs (excluding sodium and fluoride). All public water supply systems including transient noncommunity are required to test for nitrates. Only community systems are required to monitor for radionuclides. Radionuclide monitoring consists of analysis for gross alpha particle activity. Samples collected by PWS are from entry points, which occur after treatment and before the distribution system. Entry point data can be from a single well or blended from two or more wells. For PWS data, the reporting period was dependent on sampling frequency requirements for the parameter group. For VOC, SOC, and IOC data, community and nontransient noncommunity systems are required to sample a minimum of once every three years (more frequently if certain levels of contaminants are detected); therefore, data for these parameters is summarized for the three year period, 1996-1998. Nitrates are an annual sampling requirement for all PWS systems; therefore, nitrate data is summarized for 1998. Only community systems are required to test for radionuclides. Established community systems tested for radionuclides in 1998; therefore radionuclide data is summarized for 1998. Public water supply system data indicates that ground water quality is generally good in both hydrogeologic settings. Nitrates were the most common contaminant detected in both hydrogeologic settings; however, concentrations were at low levels. Nitrate concentrations of 2 ppm or less are considered to be naturally occurring in ground water (Mueller and others, 1995). Less than 5 percent of the nitrates detected in both settings were at levels equal to or greater than 3 ppm.

Tables 29 and 30 include a separate summary of ground water quality data collected from private wells sampled within hydrogeologic settings TF and K1 by the IDEM Ground Water Section Complaint Response Program, 1993-98. Private well water samples were taken before treatment and from a single well. An extensive list of parameters was analyzed for private wells including over 100 VOCs, 60 SOCs and 30 metals. Limited data from private wells make ground water quality assessments for TF and K1 difficult; however, distribution of parameters tested in each setting is indicative of the contaminants of concern in that setting. The limited number of site investigations occurring in TF and K1 suggests private well owners are not concerned about ground water quality problems in these hydrogeologic settings.

New to the 2000 305(b) report is the Pesticide Monitoring Network data. Private and monitoring wells within the TF and K1 hydrogeologic settings were sampled in the summer of 1997.

Ground water was analyzed for 20 chlorinated acid pesticides and pesticide metabolites; 10 carbamate pesticides and pesticide metabolites; 187 pesticides and industrial chemicals in EPA 525.2 methods extended; nitrate-nitrite and Total Kjeldahl nitrogen; inorganics barium, calcium, iron, magnesium, potassium, and sodium; general chemistry parameters including chloride, total hardness, and sulfate; and the hydrogen isotope tritium (for the purpose of age dating). Ground water quality results indicate that pesticide detections occurred in 3% and 19% of wells sampled in TF and K1, respectively; however, detections did not exceed 50% of the MCL. Pesticides detected at low levels were 2,4-D, carbaryl, bentazon,and acid metabolites of DCPA. Nitrates were detected in 3% and 13% of wells in TF and K1, respectively; however, detections did not exceed 3 ppm in either setting. Tritium results are continuing to be evaluated.

Table 29 Summary of Ground Water for Drinking Water Monitoring Data.

Hydrogeologic Setting: Thick till plain of the Frankfort segment in the Central Till Plain

Map Unit: TF

Counties included: : Boone, Clinton, Hamilton, Hendricks, Grant, Howard, Madison, Marion, Montgomery, Tippecanoe, Tipton

Monitoring Data Type	Total No. of Entry Points[1] or Wells in Assess-ment	Parameter Groups	Number of Entry Points[1] or Wells					
			No detections above MDL; NO_3 < 1 ppm	Detection > MDL and < 50% of MCL; NO_3 >/= 1 and < 50% MCL	Detection = or > 50% of MCL and < MCL	Detection = or > MCL	Removed from service[3]	Special Treatment[3]
Entry point Ground Water Quality Data from Community PWS	50	VOC	46	4	0	0	0	0
	49	SOC	44	3	1	1	0	0
	56	IOC	0	54	2	0	0	0
	46	NO_3	35	10 (2)[7]	1	0	0	0
	51	Radionuclides	0	51	0	0	0	0
Entry point Ground Water Quality Data from Non-community transient[4] and non-transient PWS	27	VOC	21	6	0	0	0	0
	27	SOC	23	3	0	1	0	0
	25	IOC	0	25 (2)	0	0	0	0
	100	NO_3	89	11	0	0	0	0
		Radionuclides[5]						
Complaint Response Program - private wells	4	VOC	3	1	0	0	0	0
	2	SOC	1	1	0	0	0	0
	4	Metals	0	4	0	0	0	0
	2	NO_3	2	0	0	0	0	0
Pesticide Monitoring Network – private and monitoring wells[6]	29	SOC	28	1	0	0	0	0
	29	IOC	0	29	0	0	0	0
	29	NO_3	28	1 (0)	0	0	0	0

1 PWS system data collected per entry point (narrative)
2 Data collected from private wells in IDEM complaint response program , 1993-1998
3 Action due to contaminated ground water (source water)
4 Transient communities only required to monitor for NO_3
5 Radionuclides not required for noncommunity systems
6 Data collected during 1997 pilot study
7 NO_3 detections =/> 3 ppm

Table 30 Summary of Ground Water for Drinking Water Monitoring Data.

Hydrogeologic Setting: Southern valley fringe of the Kankakee Lowland in the Lake Michigan Rim

Map Unit: K1

Counties included: Jasper, Marshall, Newton, Pulaski, St. Joseph, Starke

Monitoring Data Type	Total No. of Entry Points[1] or Wells in Assessment	Parameter Groups	Number of Entry Points[1] or Wells: No detections above MDL; NO_3 < 1 ppm	Detection > MDL and < 50% of MCL; NO_3>/= 1 ppm and < 50% MCL	Detection = or > 50% of MCL and < MCL	Detection = or > MCL	Removed from service[3]	Special Treatment[3]
Entry point Ground Water Quality Data from Community PWS	10	VOC	9	0	0	1	0	0
	11	SOC	8	3	0	0	0	0
	12	IOC	0	12	0	0	0	0
	7	NO_3	4	3 (0)[7]	0	0	0	0
	12	Radionuclides	0	12	0	0	0	0
Entry point Ground Water Quality Data from Non-community transient[4] and non-transient PWS	4	VOC	3	1	0	0	0	0
	4	SOC	4	0	0	0	0	0
	4	IOC	0	4 (0)	0	0	0	0
	23	NO_3	22	1	0	0	0	0
		Radionuclides[5]						
Complaint Response Program - private wells[2]	2	VOC	2	0	0	0	0	0
	1	SOC	1	0	0	0	0	0
	1	Metals	0	1	0	0	0	0
	1	NO_3	1	0	0	0	0	0
	1	TPH[8]	1	0	0	0	0	0
Pesticide Monitoring Network – private and monitoring wells[6]	31	Pesticides	25	6	0	0	0	0
	31	IOC	0	31	0	0	0	0
	31	NO_3	28	4 (0)	0	0	0	0

[1] PWS system data collected per entry point (see narrative)
[2] Data collected from private wells in IDEM complaint response program,
[3] Action due to contaminated ground water (source water)
[4] Transient communities only required to monitor for NO_3
[5] Radionuclides not required for noncommunity systems
[6] Data collected during 1997 pilot study
[7] NO_3 detections =/> 3 ppm
[8] Total Petroleum Hydrocarbons

Future 305(b) Reporting Cycles

As IDEM and other agencies incorporate GIS analysis into their programs, determining ground water quality data and contamination site data will be much less cumbersome and results will be more accurate. Completion of the ground water database will also expedite acquisition of data. The database will store data collected and reported by state agencies on any well site throughout the state and will serve as the central clearinghouse for information pertaining to ground water in Indiana.

The 2002 305(b) report will include results from the 22 hydrogeologic settings studied in the Pesticide Monitoring Network. Thereafter, ground water studies will generally be conducted in concurrence with river basin or hydrologic units studied during the same time period. Efforts will be made to include available and accessible ground water quality data from other agencies and organizations in future reports.

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APPENDIX A 1998 List of Impaired Waterbodies

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Management 1998 303(d) List of Impaired Waterbodies*

1998 303(d) Number	Water Body	Location Reach	County	Parameter(s) of Concern	Severity Ranking	HUC	Date Targeted
				Lake Michigan Basin			
1	Beaver Dam Ditch	Crown Point	Lake	Impaired Biotic Communities	Medium	04040001	
2	Burns Ditch	Lake Station to Portage	Porter	FCA[1] for PCB[2] & Hg[3]; Pesticides; Lead; E. coli; Impaired Biotic Communities	High	04040001	
3	Crawford Ditch	Elkhart	Elkhart	Copper; Oil	Medium	04050001	
4	Crooked Lake	Burr Oak	Noble / Whitley	FCA for Hg	Low	04050001	
5	Deep River	Hobart	Lake	Impaired Biotic Communities	Medium	04040001	
6	Dunes Creek	Tremont	Porter	Impaired Biotic Communities	Medium	04040001	
7	Elkhart River	All	Elkhart	FCA for PCB & Hg; E. coli	Medium	04050001	
8	Grand Calumet River (East Branch)	Gary to East Chicago	Lake	FCA for PCB & Hg; Cyanide; Lead; Oil and Grease; Pesticides: Copper; Impaired Biotic Communities	High	04040001	1998-2000
9	Grand Calumet River (West Branch)	East Chicago to Hammond	Lake	FCA for PCB & Hg; Ammonia; D.O.[4]; Cyanide; Lead; Pesticides; Chlorides; Impaired Biotic Communities	High	04040001	1998-2000
10	Grand Calumet River Lagoons / Marquette Park Lagoon	Gary	Lake	FCA for PCB	Medium	04040001	1998-2000
11	Indiana Harbor Canal (IHC)	Whiting & East Chicago area	Lake	FCA for PCB & Hg; Pesticides; D.O.; Lead	High	04040001	1998-2000
12	Indiana Harbor Canal (Lake George Branch of)	East Chicago	Lake	FCA for PCB & Hg; D.O.; Oil and Grease; Pesticides; Impaired Biotic Communities	High	04040001	1998-2000
13	Jimmerson Lake	Nevada Mills	Steuben	FCA for Hg	Low	04050001	
14	Juday Creek	All	St. Joseph	FCA for PCB	Medium	04050001	
15	Lake George	Hobart	Lake	FCA for PCB	Medium	04040001	
16	Lake James	Crooked Lake	Steuben	FCA for Hg	Low	04050001	
17	Lake Michigan	Indiana portion	Lake / Porter / LaPorte	FCA for PCB & Hg; E.coli	High	04060200	
18	Lake Shipshewana	Shipshewana	Lagrange	FCA for PCB	Medium	04050001	
19	Lake Wabee	Milford	Kosciusko	FCA for Hg	Low	04050001	
20	Lake Wawasee	Syracuse	Kosciusko	FCA for PCB & Hg	Medium	04050001	
21	Little Calumet River	Porter to Chesterton	Porter	FCA for PCB & Hg; Cyanide; Pesticides; E. coli	High	04040001	
22	Little Calumet River	East of Chesterton	Porter / Laporte	FCA for PCB & Hg	Medium	04040001	
23	Little Calumet River	Hammond	Lake	FCA for PCB & Hg; Cyanide; Pesticides; Impaired Biotic Communities; D.O.	High	04040001	
24	Little Calumet River	Gary	Lake	FCA for PCB & Hg; Cyanide; Pesticides; Impaired Biotic Communities	High	04040001	
25	Long Lake	Pleasant Lake	Steuben	FCA for Hg	Low	04050001	
26	Marsh Lake	Fremont	Steuben	FCA for Hg	Low	04050001	
27	Mather's Ditch	Middlebury	Elkhart	D.O.; Endrin	Medium	04050001	
28	Mud Creek	Angola	Steuben	Ammonia, D.O.	Medium	04050001	
29	Niles Ditch	Crown Point	Lake	Impaired Biotic Communities	Medium	04040001	
30	Olin Lake	Valentine	Lagrange	FCA for Hg	High	04050001	
31	Oliver Lake	Valentine	Lagrange	FCA for Hg	Low	04050001	
32	Orland Tributary	Orland	Steuben	D.O.	Medium	04050001	
33	Pigeon Creek	All	Steuben	FCA for PCB & Hg	Medium	04050001	
34	Salt Creek	Portage / Valparaiso	Porter	E. coli	Low	04040001	
35	Snow Lake	Jamestown	Steuben	FCA for Hg & PCB	Medium	04050001	
36	St. Joseph River	All	St. Joseph / Elkhart	FCA for PCB & Hg; E. coli	High	04050001	
37	Trail Creek	Michigan City	LaPorte	FCA for PCB & Hg; Cyanide; E. coli	Medium	04040001	
38	Turkey Creek	Hobart	Lake	Impaired Biotic Communities	Medium	04040001	

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1998 303(d) Number	Water Body	Location Reach	County	Parameter(s) of Concern	Severity Ranking	HUC	Date Targeted
39	Wolf Lake	Indiana portion	Lake	FCA for PCB	Medium	04040001	
				Maumee River Basin			
40	Blue Creek	All	Adams	D.O.	Medium	04100004	
41	Cedar Creek	Cedarville	Allen / DeKalb	E. coli	Low	04100003	
42	Garrett City Ditch	Garrett	DeKalb	Ammonia	Medium	04100003	
43	Habegger Ditch	Berne	Adams	Ammonia	Medium	04100004	
44	Hamilton Lake	Hamilton	Steuben	FCA for Hg	Low	04100003	
45	Maumee River	All	Allen	FCA for PCB & Hg	Medium	04100005	
46	St. Joseph River	All	Allen	FCA for PCB & Hg	High	04100003	
47	St. Mary's River	All	Allen	FCA PCB & Hg	Medium	04100004	
48	Swartz-Carnahan Ditch	Hursh	Allen	D.O.	Medium	04100003	
49	Tiernan Ditch	Ft. Wayne	Allen	D.O.	Medium	04100003	
				Kankakee River Basin			
50	Beaver Creek	Morocco	Newton	Impaired Biotic Communities	Medium	07120002	
51	Cedar Creek	Lowell	Lake	Impaired Biotic Communities	Medium	07120001	
52	Cedar Lake	Cedar Lake	Lake	FCA for PCB	Medium	07120001	
53	Cobb Creek / Breyfogel Ditch	Hebron	Porter	D.O.; Impaired Biotic Communities	Medium	07120001	
54	Crooked Creek	Westville / Valparaiso	LaPorte / Porter	Impaired Biotic Communities	Medium	07120001	
55	Dyer Ditch	Dyer	Lake	Impaired Biotic Communities	Medium	07120003	
56	Iroquois River	All	Jasper / Newton	FCA for PCB	Medium	07120002	
57	Kankakee River	All	Lake / LaPorte	FCA for PCB & Hg; E. coli	Medium	07120001	
58	Pine Creek	North Judson	Starke	D.O.	Medium	07120001	
59	Unnamed Ditch	Wyatt	St. Joseph	E.coli	High	07120001	
				Wabash River Basin			
60	Big Pine Creek	All	Warren	FCA for PCB & Hg	Medium	05120108	
61	Big Raccoon Creek	Above Mansfield Reservoir	Putnam	Impaired Biotic Communities	Medium	05120108	
62	Big Raccoon Creek	All	Parke	FCA for PCB & Hg	Medium	05120108	
63	Center Lake	Warsaw	Kosciusko	FCA for PCB	Medium	05120106	
64	Cornstalk Creek	All	Putnam	Impaired Biotic Communities	Medium	05120108	
65	Deer Creek	All	Carroll	FCA for PCB & Hg	Medium	05120105	
66	Dugger Lake	Dugger	Sullivan	FCA for PCB	Medium	05120111	
67	Eel River	Counties Listed	Whitley / Miami	FCA for PCB & Hg	Medium	05140104	
68	Eel River	Roann	Wasbash / Miami	Cyanide	Medium	05140104	
69	Eel River	Cass County	Cass	FCA for Hg	Low	05140104	
70	Eel River	Wabash County	Wasbash	FCA for PCB	Medium	05140104	
71	Elliot Ditch	Lafayette	Tippecanoe	FCA for PCB	High	05120108	
72	Kokomo Creek	Kokomo	Howard	FCA for PCB; Ammonia; D.O.	High	05120107	1998-2000
73	Kokomo Reservoir #2	Kokomo	Howard	FCA for Hg	Low	05120107	
74	Lake Manitou	Rochester	Fulton	FCA for Hg	Low	05120106	
75	Lake Maxinkuckee	Culver	Marshall	FCA for Hg	Low	05120106	
76	Little Mississinewa River	Union City	Randolph	FCA for PCB	High	05120103	
77	Little Sugar Creek	Crawfordsville	Montgomery	FCA for PCB & Hg	High	05120110	
78	Little Wildcat Creek/Kelly West Ditch	Kokomo	Howard	D.O.	Medium	05120107	1998-2000
79	Mississinewa River	All	Randolph / Delaware / Grant	FCA for PCB & Hg	High	05120103	
80	North Ramp Creek	All	Putnam	Impaired Biotic Communities	Medium	05120108	
81	Otter Creek	Terre Haute	Vigo	FCA for PCB & Hg	Medium	05120111	
82	Pike Lake	Warsaw	Kosciusko	FCA for Hg	Medium	05120106	
83	Prairie Creek Ditch	Kokomo	Howard	D.O.	Medium	05120107	1998-2000
84	South Fork Wildcat Creek	Frankfort	Clinton	Cyanide	High	05120107	1998-2000
85	South Ramp Creek	All	Putnam	Impaired Biotic Communities	Medium	05120108	

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86	Sugar Creek	Terre Haute	Vigo	Impaired Biotic Communities	Medium	05120111	
87	Sugar Creek	All	Montgomery	FCA for PCB & Hg	High	05120110	
88	Sugar Creek	All	Parke	FCA for PCB	Medium	05120110	
89	Sulphur Creek	Hymera	Sullivan	Impaired Biotic Communities	Medium	05120111	
90	Tippecanoe Lake	Oswego	Kosciusko	FCA for Hg	Low	05120106	
91	Tippecanoe River	Rochester	Fulton	Cyanide	High	05120106	
92	Tippecanoe River	All	Kosciusko / Fulton / Pulaski	FCA for PCB & Hg	Medium	05120106	
93	Wabash River	Counties Listed	Wells / Huntington / Wabash / Miami / Cass / Carroll / Tippecanoe / Vigo / Sullivan Knox / Gibson / Posey	FCA for PCB & Hg	High	051201	
94	Wabash River	Counties Listed	Fountain / Vermillian	FCA for PCB	High	051201	
95	Wabash River	Andrews	Huntington	Cyanide	High	05120101	
96	Wea Creek	Lafayette	Tippecanoe	FCA for PCB	High	05120108	
97	Wildcat Creek	Kokomo	Howard / Carroll / Tippecanoe	FCA for PCB; Ammonia; D.O.;Cyanide; Lead; Nitrates	High	05120107	1998-2000
98	Winona Lake	Warsaw	Kosciusko	FCA for PCB	Medium	05120106	
White River Basin							
99	Bean Creek	Indianapolis	Marion	E. coli	High	05120201	
100	Beanblossom Creek	All	Brown / Monroe	E.coli	Low	05120202	
101	Big Walnut Creek	Putnam Co. Line to Eel River	Putnam	FCA for Hg	Low	05120203	
102	Buck Creek	All	Delaware	FCA for PCB & Hg; Impaired Biotic Communities	Medium	05120201	
103	Cataract Lake / Cagles Mill Lake	All	Putnam	FCA for Hg	Low	05120203	
104	Cicero Creek	Downstream of Morse Reservoir(196th . St.)	Hamilton	E.coli	Low	05120201	
105	Conneley Ditch	All	Clay	E.coli	Low	05120203	
106	Dollar Hide Creek	All	Marion	Impaired Biotic Communities	Medium	05120201	
107	Duck Creek	Elwood to S.R. 213	Madison / Tipton / Hamilton	E.coli	Low	05120201	
108	E.F. White Lick Creek	Headwaters to U.S. 40	Marion / Hendricks	Impaired Biotic Communities	Medium	05120201	
109	E.F. White Lick Creek	All	Hendricks	FCA for PCB	Medium	05120201	
110	Eagle Creek	Indianapolis	Marion / Boone	E. coli	High	05120201	
111	East Fork Fish Creek	Downstream of Vandalia	Owen	Impaired Biotic Communities	Medium	05120202	
112	Eel River	Brunswick to West Fork White River	Clay / Greene	E.coli	Low	05120203	
113	Eel River	From Splunge Creek to West Fork White River	Greene	FCA for PCB & Hg	Medium	05120203	
114	Fall Creek	All	Madison / Hamilton	FCA for PCB & Hg	Medium	05120201	
115	Fall Creek	Emerson Ave. in Indpls to West Fork White River	Marion	E.coli	High	05120201	1998-2000
116	First Creek	All	Greene Daviess Martin	E.coli	Low	05120202	

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117	Geist Reservoir	All	Hamilton / Marion	FCA for Hg	Low	05120201	
118	Hawkins Creek	All	Daviess	Impaired Biotic Communities	Medium	05120208	
119	Honey Creek	All	Johnson	Impaired Biotic Communities	Medium	05120201	
120	Indian Creek	All	Morgan	E.coli	Low	05120201	
121	Indianapolis Waterway Canal	Indianapolis	Marion	E. coli	High	05120201	
122	Jacks Defeat Creek	All	Monroe	Impaired Biotic Communities	Medium	05120202	
123	Jones Creek	All	Putnam	Impaired Biotic Communities	Medium	05120203	
124	Kessinger Ditch	All	Knox	E.coli	Low	05120202	
125	Killbuck Creek	All	Madison	FCA for PCB & Hg; E. coli	Medium	05120201	
126	Lake Lemon	All	Monroe	FCA for PCB	Medium	05120202	
127	Lambs Creek	All	Morgan	E.coli	Low	05120201	
128	Lick Creek	All	Greene / Owen	E.coli	Low	05120203	
129	Little Cicero Creek	All	Hamilton	Impaired Biotic Communities	Medium	05120201	
130	Little Deer Creek	All	Putnam	Impaired Biotic Communities	Medium	05120203	
131	Maiden Run	All	Putnam	Impaired Biotic Communities	Medium	05120203	
132	Mars Ditch	All	Marion	Cyanide; pH	High	05120201	
133	McCormick's Creek	All	Monroe / Owen	Impaired Biotic Communities	Medium	05120202	
134	Mill Creek	Upstream of U.S. 40	Hendricks	E.coli	Low	05120203	
135	Morse Reservoir	All	Hamilton	FCA for Hg	Low	05120201	
136	Pipe Creek	All	Madison	FCA for PCB & Hg; E.coli	Medium	05120201	
137	Pleasant Run	All	Marion	E.coli	High	05120201	1998-2000
138	Plum Creek	All	Putnam	Impaired Biotic Communities	Medium	05120203	
139	Plummer Creek	All	Greene	E.coli	Low	05120202	
140	Pogues Run	Indianapolis	Marion	E. coli	High	05120201	
141	Prairie Creek (North & South Forks)	All	Daviess	E. coli	Low	05120202	
142	Richland Creek	All	Monroe / Owen	FCA for PCB & Hg; E. coli; Impaired Biotic Communities	Medium	05120202	
143	South Fork Griffy Creek	All	Monroe	Impaired Biotic Communities	Medium	05120202	
144	State Ditch	All	Marion	Cyanide; pH; E. coli	High	05120201	
145	Stoney Creek	Noblesville	Hamilton	FCA for PCB; E.coli	High	05120201	
146	Stout Creek	All	Monroe	FCA for PCB & Hg	Medium	05120208	
147	Wabash and Erie Canal	Clay County	Clay	E.coli	Low	05120203	
148	West Fork White River	Fall Creek To Pleasant Run	Marion	FCA for PCB & Hg; E.coli; D.O.; Ammonia	High	05120201	
149	West Fork White River	Indianapolis from Pleasant Run to Little Buck Creek	Marion	FCA for PCB & Hg; Cyanide; D.O.; E. coli; Impaired Biotic Communities	High	05120201	
150	West Fork White River	Crooked Creek to Fall Creek	Marion	FCA for PCB & Hg	High	05120201	
151	West Fork White River	Cicero Creek to Crooked Creek	Hamilton / Marion	FCA for PCB & Hg; Impaired Biotic Communities	High	05120201	
152	West Fork White River	White Lick Cr. to Beanblossom Cr.	Morgan / Monroe	FCA for PCB & Hg; Cyanide; E. coli; Impaired Biotic Communities	Medium	05120201	
153	West Fork White River	Hamilton County	Hamilton	FCA for PCB & Hg; E. coli; Impaired Biotic Communities	High	05120201	
154	West Fork White River	Little Buck Creek to White Lick Creek	Marion / Johnson / Morgan	FCA for PCB & Hg; Cyanide; E. coli; Impaired Biotic Communities	High	05120201	
155	West Fork White River	Beanblossom Cr. to Buckhall Cr.	Monroe / Owen / Greene	FCA for PCB & Hg; Cyanide; E. coli; Impaired Biotic Communities	Medium	05120202	
156	West Fork White River	Richland Cr. to Black Cr.	Greene / Daviess / Knox	FCA for PCB & Hg; Impaired Biotic Communities	Medium	05120202	
157	West Fork White River	Madison County	Madison	FCA for PCB; E. coli; Impaired Biotic Communities	Medium	05120201	

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158	West Fork White River	Muncie to Madison County	Delaware	FCA for PCB & Hg; E.coli	Medium	05120201	
159	West Fork White River	All	Greene / Owen	FCA for PCB & Hg	Medium	05120202	
160	West Fork White River	Elnora to Maysville	Daviess / Knox	FCA for PCB and Hg; Lead; Impaired Biotic Communities	Medium	05120202	
161	West Fork White River	Maysville to East Fork White River	Daviess / Knox	FCA for PCB & Hg; Impaired Biotic Communities	Medium	05120202	
162	West Fork White River	Headwaters to Muncie	Randolph/ Delaware	FCA for PCB & Hg; Impaired Biotic Communities	Medium	05120201	
163	White Lick Creek	All	Hendricks / Morgan	FCA for PCB & Hg	Medium	05120201	
164	Big Blue River	All	Henry / Rush / Shelby / Johnson	FCA for PCB; Cyanide	Medium	05120204	
165	Brandywine Creek	All	Hancock	FCA for Hg	Low	05140104	
166	Clear Creek	All	Monroe	FCA for PCB; E. coli; Impaired Biotic Communities	High	05120108	
167	Dogwood Lake	Alfordsville	Daviess	FCA for Hg	Low	05120208	
168	East Fork Jackson Creek	All	Monroe	Impaired Biotic Communities	Medium	05120208	
169	East Fork White River	All	Jackson / Lawrence	FCA for PCB & Hg	High	05120108	
170	East Fork White River	All	Bartholomew / Martin	FCA for PCB	Medium	05120206	
171	Flat Rock River	All	Rush	FCA for Hg	Low	05120205	
172	Flat Rock River	All	Shelby	FCA for PCB & Hg	Medium	05120205	
173	Jackson Creek	All	Monroe	Impaired Biotic Communities	Medium	05120208	
174	Little Blue River	All	Shelby	FCA for PCB	Medium	05120204	
175	Little Sugar Creek	All	Hancock	FCA for PCB & Hg	Medium	05120204	
176	Monroe Reservoir	All	Monroe	FCA for Hg	Low	05120208	
177	Muddy Fork of Sand Creek	All	Decatur	FCA for PCB & Hg	Medium	05120206	
178	Muscatatuck River	All	Washington	FCA for PCB & Hg	Medium	05120207	
179	Pleasant Run	All	Lawrence	FCA for PCB	High	05120208	
180	Salt Creek	All	Lawrence	FCA for PCB & Hg	High	05120208	
181	Sand Creek	All	Decatur	FCA for PCB & Hg	Medium	05120206	
182	Sand Creek	All	Jennings	FCA for Hg	Low	05120206	
183	Sugar Creek	All	Hancock	FCA for Hg	Low	05120204	
184	Sugar Creek	All	Johnson	FCA for PCB	Medium	05120204	
185	West Fork Clear Creek	All	Monroe	Impaired Biotic Communities	Medium	05120208	
186	Yellowwood Lake	All	Brown	FCA for Hg	Low	05120208	
187	Young's Creek	All	Johnson	FCA for PCB	Medium	05120204	
188	White River	From the confluence of West Fork White River and East Fork White River to Wabash River	Pike / Gibson / Knox	FCA for PCB & Hg; Impaired Biotic Communities	Medium	05120202	
Great Miami River Basin							
189	Brookville Reservoir	Brookville	Franklin	FCA for Hg	Low	05080003	
190	East Fork Whitewater River	All	Wayne	FCA for PCB	Medium	05080003	
191	Great Miami River	All	Dearborn	FCA for PCB & Hg	High	05080002	
192	West Fork Whitewater River	All	Fayette	FCA for PCB & Hg	Medium	05080003	
193	Whitewater River	All	Dearborn	FCA for PCB & Hg	Medium	05080003	
194	Middle Fork Reservoir	Richmond / Middleboro	Wayne	FCA for Hg	Low	05080003	
Patoka River Basin							

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1998 303(d) Number	Water Body	Location Reach	County	Parameter(s) of Concern	Severity Ranking	HUC	Date Targeted
195	Patoka Reservoir	Ellsworth	Orange / Crawford / Dubois	FCA for Hg	Low	05120209	
196	Patoka River	Downstream of Patoka Reservoir	Dubois; Pike; Gibson	FCA for PCB & Hg	Medium	05120209	
197	South Fork Patoka River	All	Pike	Impaired Biotic Communities	High	05120209	
Ohio River Basin							
198	Bischoff Reservoir	Batesville	Ripley	FCA for Hg	Low	05090203	
199	Blue River	All	Harrison	FCA for PCB & Hg	Medium	05140104	
200	Cypress Creek	Booneville	Warrick	Chlordane	Medium	05140202	
201	Deam Lake	New Providence	Clark	FCA for Hg	Low	05140101	
202	Little Pigeon Creek	Dale	Spencer	D.O., Ammonia	Medium	05140201	
203	Ohio River	New Albany, Jeffersonville	Clark / Floyd	FCA for PCB; Lead; E. coli	Medium	05	
204	Ohio River	Evansville		FCA for PCB; Lead; E. coli	Medium	05	
205	Ohio River	Entire Length adjacent to Indiana	Dearborn Ohio Switzerland Jefferson Clark Floyd Harrison Crawford Perry Spencer Warrick Vanderburg Posey	FCA for PCB; E. coli	Medium	05090203 05140101 05140104 05140201 05140202	
206	Pigeon Creek	Evansville	Vanderburgh	FCA for PCB; Organics; Chlordane	High	05140202	
207	Silver Creek	New Albany	Floyd	FCA for PCB & Hg	Medium	05140101	
208	Versailles Lake	Versailles	Ripley	FCA for Hg	Low	05090203	

[1]FCA - Fish Consumption Advisory
[2]PCB - Polychlorinated Biphenyls
[3]Hg - Mercury
[4]D.O. - Dissolved Oxygen

*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 in many cases. This could mean that the sources are located outside state and national boundaries. Assessment and control of these pollutants may therefore require interstate and international measures which are beyond the scope of state environmental agencies. These waters have low priority for TMDL development. (Indiana Department of Environmental Management, 1998a).

APPENDIX B Lake Status and Trends

Lake	Size (acres)	Hydrologic unit area	County	Latitude	Longitude	Sample date	Trophic Score	Trophic Status	Trophic Trend
ST. JOSEPH – ELKHART BASIN									
Barton	94	04050001040	Steuben	41.75417	85.05972	9707 - 9708	9	O	I
Buck	20	04050001040	Steuben	41.64278	85.04278	9707 - 9708	27	M	S
Crooked	828	04050001040	Steuben	41.66472	85.04167	9707 - 9708	28	M	S
Failing	23	04050001040	Steuben	41.70472	85.00028	9707 - 9708	23	M	S
Fish	59	04050001040	Steuben	41.75	84.92556	9707 - 9708	45	E	F
Hog	48	04050001040	Steuben	41.76056	85.06361	9707 - 9708	8	O	I
Jimmerson	434	04050001040	Steuben	41.70722	85.05528	9707 - 9708	19	M	F
Lime (Gage)	30	04050001040	Steuben	41.71	85.12028	9707 - 9708	7	O	S
Little Otter	34	04050001040	Steuben	41.725	85.00833	9707 - 9708	34	E	F
Lk. Gage	332	04050001040	Steuben	41.70083	85.11167	9707 - 9708	16	M	S
Lk. George	488	04050001040	Steuben	41.75444	85.00444	9707 - 9708	8	O	S
Lk. James	1034	04050001040	Steuben	41.68861	85.35639	9707 - 9708	16	M	S
Lk. Pleasant	424	04050001040	Steuben	41.57361	85.01667	9707 - 9708	17	M	I
Loon	138	04050001040	Steuben	41.64111	85.04833	9707 - 9708	7	O	I
Marsh	56	04050001040	Steuben	41.72167	84.98722	9707 - 9708	22	M	I
Sally Owen	12	04050001040	Steuben	41.71556	85.11333	9707 - 9708	10	O	I
Snow	421	04050001040	Steuben	41.72917	85.03333	9707 - 9708	25	M	F
Wall	141	04050001040	LaGrange	41.72861	85.20444	9707 - 9708	17	M	S
Warner	17	04050001040	Steuben	41.725	85.13889	9707 - 9708	41	E	D
Bass	61	04050001080	Steuben	41.63611	85.09389	9707 - 9708	9	O	I
Big Bower	25	04050001080	Steuben	41.60361	85.05972	9707 - 9708	35	E	F
Booth	10	04050001080	Steuben	41.63694	85.02389	9707 - 9708	17	M	I
Fox	142	04050001080	Steuben	41.62528	85.0225	9707 - 9708	24	M	F
Golden	119	04050001080	Steuben	41.60306	85.06444	9707 - 9708	35	E	I
Hogback	146	04050001080	Steuben	41.625	85.08556	9707 - 9708	54	H	F
Little Bower	12	04050001080	Steuben	41.59194	85.03861	9707 - 9708	35	E	S
Long A (Pleasant)	92	04050001080	Steuben	41.58194	85.02083	9707 - 9708	42	E	I
Mud B (Pleas.)	16	04050001080	Steuben	41.58722	85.04556	9707 - 9708	23	M	I
Pigeon	61	04050001080	Steuben	41.63806	84.94278	9707 - 9708	42	E	F
Pleasant	53	04050001080	Steuben	41.75833	85.09028	9707 - 9708	17	M	F
Silver	238	04050001080	Steuben	41.63028	85.0625	9707 - 9708	9	O	F
Staynor (Stayner)	5	04050001080	Steuben	41.66194	85.17472	9707 - 9708	15	O	I
West Otter	118	04050001080	Steuben	41.63333	85.16667	9707 - 9708	31	M	F
Appleman	52	04050001100	LaGrange	41.62333	85.215	9707 - 9708	24	M	F
Beaver Dam	11	04050001100	Steuben	41.6975	85.19389	9707 - 9708	7	O	I
Big Long	388	04050001100	LaGrange	41.55	85.23333	9707 - 9708	24	M	F
Big Turkey	450	04050001100	Steuben	41.5825	85.1875	9707 - 9708	41	E	F
Green (Rawles)	62	04050001100	LaGrange	41.64583	85.19667	9707 - 9708	17	M	I

Trophic status: O-Oligotrophic, M-mesotrophic, E-Eutrophic, H-Hypereutrophic, D-Dystrophic

Trophic trends: I-Improving, S-Stable, D-Degrading, F-Fluctuating, U-Unknown

Lake	Size (acres)	Hydrologic unit area	County	Latitude	Longitude	Sample date	Trophic Score	Trophic Status	Trophic Trend
Henry	20	04050001100	Steuben	41.56972	85.17889	9707 - 9708	56	H	D
Lake of the Woods	136	04050001100	LaGrange	41.59583	85.21667	9707 - 9708	54	H	D
Little Turkey	135	04050001100	LaGrange	41.59583	85.21667	9707 - 9708	37	E	S
Little Turkey	58	04050001100	Steuben	41.53472	85.10667	9707 - 9708	55	H	S
McClish	35	04050001100	Steuben	41.5375	85.19583	9707 - 9708	50	H	D
Pretty	184	04050001100	LaGrange	41.57667	85.25139	9707 - 9708	21	M	F
MAUMEE BASIN									
Clear	800	04100003030	Steuben	41.74139	84.83861	9707 - 9708	15	O	F
Long B (Clear)	154	04100003030	Steuben	41.74472	84.8075	9707 - 9708	28	M	F
Round B (Clear)	30	04100003030	Steuben	41.74889	84.84111	9707 - 9708	6	O	I
Ball	87	04100003080	Steuben	41.53806	84.94722	9707 - 9708	46	E	F
Hamilton	802	04100003080	Steuben	41.55139	84.91667	9707 - 9708	24	M	F
WABASH BASIN									
Cecil M. Hardin (Raccoon, Mansfield)	2060	05120108160	Parke	39.71917	87.07222	9707 - 9708	32	E	F
Rockville	100	05120108180	Parke	39.75972	87.22028	9707 - 9708	53	H	D
Green Valley	45	05120111050	Vigo	39.51222	87.51111	9707 - 9708	32	E	F
North	20	05120111050	Vigo	39.48139	87.43944	9707 - 9708	37	E	U
Fowler Park	47	05120111060	Vigo	39.33778	87.37278	9707 - 9708	16	M	I
South	45	05120111070	Vigo	39.44139	87.46028	9707 - 9708	28	M	S
Turtle Creek	1556	05120111150	Sullivan	39.04527	87.52472	9707 - 9708	33	E	D
Canvasback	34	05120111160	Sullivan	39.08389	87.35083	9707 - 9708	5	O	U
Kickapoo	30	05120111160	Sullivan	39.16167	87.24833	9707 - 9708	22	M	S
Lenape	60	05120111160	Greene	39.16833	87.23611	9707 - 9708	43	E	S
Pintail	4	05120111160	Sullivan	39.11444	87.32639	9707 - 9708	6	O	U
Shakamak	56	05120111160	Sullivan	39.17694	87.24472	9707 - 9708	52	H	D
Sullivan	460	05120111160	Sullivan	39.10139	87.375	9707 - 9708	33	E	D
Turtle	18	05120111160	Sullivan	39.06694	87.33889	9707 - 9708	3	O	U
Twin Pit	14	05120111160	Sullivan	39.11222	87.36267	9707 - 9708	7	O	U
Griff(e)y	130	05120202010	Monroe	39.20472	86.52722	9707 - 9708	7	O	I
Midland	20	05120202030	Greene	39.12417	87.17361	9707 - 9708	47	H	U
Clear	3	05120202060	Greene	39.04972	87.23889	9707 - 9708	5	O	U
Frank	8	05120202060	Greene	38.96194	87.23944	9707 - 9708	22	M	U
Lonnie	4	05120202060	Sullivan	39.01833	87.25806	9707 - 9708	27	M	U
Narrow	9	05120202060	Sullivan	39.03444	87.25889	9707 - 9708	49	H	U
Redbud	4	05120202060	Sullivan	38.97722	87.25167	9707 - 9708	4	O	U
Shake 1	6	05120202060	Greene	38.96611	87.23167	9707 - 9708	3	O	U
Shake 2	5	05120202060	Greene	38.965	87.22778	9707 - 9708	5	O	U
Todd	8	05120202060	Greene	38.96944	87.23972	9707 - 9708	3	O	U
Glen Flint	380	05120203030	Putnam	39.72194	86.9475	9707 - 9708	16	M	U
Cagles Mill (Cataract)	1400	05120203050	Putnam	39.46056	86.88111	9707 - 9708	16	M	I
Yellowwood	133	05120208080	Brown	39.18333	86.3375	9707 - 9708	6	O	F

Trophic status: O-Oligotrophic, M-mesotrophic, E-Eutrophic, H-Hypereutrophic, D-Dystrophic

Trophic trends: I-Improving, S-Stable, D-Degrading, F-Fluctuating, U-Unknown

Lake	Size (acres)	Hydrologic unit area	County	Latitude	Longitude	Sample date	Trophic Score	Trophic Status	Trophic Trend
J. Edward Roush (Huntington)	900	05120101090	Huntington	40.84583	85.4544	9807 - 9808	24	M	F
Clare/Clair	43	05120101110	Huntington	40.89222	85.4683	9807 - 9808	26	M	D
Arnold's Pit	25	05120104	Whitley	41.08833	85.5444	9807 - 9808	48	H	U
Everett	43	05120104010	Allen	41.155	85.3144	9807 - 9808	33	E	I
Big Cedar (Tri-Lake)	131	05120104020	Whitley	41.25639	85.4562	9807 - 9808	8	O	F
Blue	239	05120104020	Whitley	41.23982	85.3619	9807 - 9808	30	M	S
Little Cedar	45	05120104020	Whitley	41.24833	85.4417	9807 - 9808	41	E	S
Round (Tri-Lake)	128	05120104020	Whitley	41.24861	85.4264	9807 - 9808	32	E	D
Shriner (Tri-Lake)	116	05120104020	Whitley	41.24444	85.4467	9807 - 9808	22	M	S
Black	24	05120104030	Whitley	41.19583	85.5842	9807 - 9808	68	H	S
Larwill	9	05120104030	Whitley	41.17194	85.6222	9807 - 9808	38	E	S
Long (at Laketon)	48	05120104050	Wabash	40.98278	85.8431	9807 - 9808	38	E	S
Lukens	46	05120104050	Wabash	40.9725	85.9361	9807 - 9808	35	E	F
North Little	12	05120104050	Kosciusko	41.08611	85.9019	9807 - 9808	29	M	I
Round	48	05120104050	Wabash	40.84611	85.4544	9807 - 9808	36	E	U
Silver	102	05120104050	Kosciusko	41.08083	85.9006	9807 - 9808	45	E	S
Lk. Cicott	65	05120105010	Cass	40.78417	86.7683	9807 - 9808	31	M	S
Sellers	32	05120106	Kosciusko	41.15333	85.7447	9807 - 9808	32	E	U
Backwater	140	05120106010	Kosciusko	41.315	85.6667	9807 - 9808	16	M	S
Banning	12	05120106010	Kosciusko	41.30167	85.7394	9807 - 9808	27	M	S
Baugher	32	05120106010	Noble	41.31556	85.6089	9807 - 9808	43	E	I
Big	228	05120106010	Noble	41.27891	85.5017	9807 - 9808	37	E	F
Big Barbee	304	05120106010	Kosciusko	41.28694	85.7056	9807 - 9808	35	E	S
Crane	28	05120106010	Noble	41.2775	85.4822	9807 - 9808	61	H	D
Crooked	144	05120106010	Whitley	41.26194	85.4797	9807 - 9808	18	M	U
Gilbert	28	05120106010	Noble	41.33028	85.5919	9807 - 9808	5	O	I
Goose	84	05120106010	Whitley	41.23861	85.5503	9807 - 9808	35	E	I
Horseshoe	18	05120106010	Noble	41.3	85.5897	9807 - 9808	33	E	F
Irish	182	05120106010	Kosciusko	41.29694	85.7336	9807 - 9808	28	M	I
James	282	05120106010	Kosciusko	41.31833	85.7192	9807 - 9808	27	M	I
Keyser/Kiser	5	05120106010	Kosciusko	41.31333	85.6517	9807 - 9808	4	O	S
Kuhn	137	05120106010	Kosciusko	41.28639	85.6917	9807 - 9808	15	O	F
Little Barbee	74	05120106010	Kosciusko	41.29222	85.7242	9807 - 9808	37	E	I
Little Crooked	13	05120106010	Whitley	41.25889	85.4678	9807 - 9808	31	M	F
Loon	222	05120106010	Whitley	41.26944	85.5406	9807 - 9808	43	E	S
New	12	05120106010	Whitley	41.26139	85.5531	9807 - 9808	25	M	U
Old	32	05120106010	Whitley	41.27083	85.5525	9807 - 9808	29	M	I
Oswego	62	05120106010	Kosciusko	41.33111	85.7836	9807 - 9808	26	M	S
Ridinger	136	05120106010	Kosciusko	41.26389	85.6647	9807 - 9808	45	E	I
Robinson	59	05120106010	Whitley	41.22194	85.6506	9807 - 9808	37	E	D
Sawmill	55	05120106010	Kosciusko	41.29972	85.7286	9807 - 9808	28	M	I

Trophic status: O-Oligotrophic, M-mesotrophic, E-Eutrophic, H-Hypereutrophic, D-Dystrophic

Trophic trends: I-Improving, S-Stable, D-Degrading, F-Fluctuating, U-Unknown

Lake	Size (acres)	Hydrologic unit area	County	Latitude	Longitude	Sample date	Trophic Score	Trophic Status	Trophic Trend
Sechrist	105	05120106010	Kosciusko	41.29528	85.7161	9807 - 9808	21	M	F
Smalley	69	05120106010	Noble	41.31389	85.58	9807 - 9808	44	E	F
Tippecanoe	768	05120106010	Kosciusko	41.33333	85.7542	9807 - 9808	13	O	F
Troy Cedar	15	05120106010	Whitley	41.23972	85.5772	9807 - 9808	29	M	U
Webster	773	05120106010	Kosciusko	41.325	85.685	9807 - 9808	36	E	U
Big Chapman (W)	581	05120106020	Kosciusko	41.28444	85.7947	9807 - 9808	7	O	I
Center	120	05120106020	Kosciusko	41.24583	85.8519	9807 - 9808	8	O	F
Little Chapman	177	05120106020	Kosciusko	41.27306	85.79	9807 - 9808	37	E	D
Little Pike	25	05120106020	Kosciusko	41.26222	85.8375	9807 - 9808	21	M	S
Pike	203	05120106020	Kosciusko	41.25778	85.8361	9807 - 9808	31	M	F
Winona	562	05120106020	Kosciusko	41.23333	85.8483	9807 - 9808	35	E	I
Caldwell	45	05120106030	Kosciusko	41.12583	85.9006	9807 - 9808	47	H	F
Crystal	76	05120106030	Kosciusko	41.23528	85.9839	9807 - 9808	11	O	F
Goose	27	05120106030	Kosciusko	41.19028	85.8814	9807 - 9808	36	E	D
Hoffman	180	05120106030	Kosciusko	41.27806	85.9872	9807 - 9808	32	E	F
Palestine	261	05120106030	Kosciusko	41.17333	85.9403	9807 - 9808	33	E	I
Beaver Dam	146	05120106040	Kosciusko	41.09278	85.975	9807 - 9808	52	H	F
Diamond	92	05120106040	Kosciusko	41.10306	85.9339	9807 - 9808	44	E	I
Hill	66	05120106040	Kosciusko	41.10639	85.9064	9807 - 9808	33	E	S
Loon	40	05120106040	Kosciusko	41.085	86.9358	9807 - 9808	41	E	F
Rock	56	05120106040	Kosciusko	41.04111	86.975	9807 - 9808	42	E	F
Yellow Creek	151	05120106040	Kosciusko	41.1025	85.9567	9807 - 9808	38	E	I
Manitou	714	05120106050	Fulton	41.06111	86.1936	9807 - 9808	43	E	U
Mt. Zion	28	05120106050	Fulton	41.01611	86.1478	9807 - 9808	21	M	U
Nyona	104	05120106050	Fulton	40.96333	86.1853	9807 - 9808	43	E	I
South Mud	94	05120106050	Fulton	40.95167	86.1928	9807 - 9808	40	E	I
Hartz	28	05120106061	Starke	41.17806	86.495	9807 - 9808	12	O	I
King	18	05120106061	Fulton	41.12861	86.4228	9807 - 9808	40	E	F
Langenbaum	48	05120106061	Starke	41.17167	86.4828	9807 - 9808	25	M	F
Maxinkuckee	1853	05120106061	Marshall	41.20639	86.4022	9807 - 9808	17	M	U
Bruce	245	05120106062	Fulton	41.07639	86.4628	9807 - 9808	47	H	F
Fletcher	45	05120106080	Fulton	40.90889	86.3369	9807 - 9808	24	M	I
Shafer	1291	05120106130	White	40.78472	86.7683	9807 - 9808	22	M	S
Freeman	1547	05120106140	Carroll	40.65778	86.7531	9807 - 9808	26	M	F
Fletcher	45	05120106080	Fulton	40.90889	86.3369	9807 - 9808	24	M	I
Shafer	1291	05120106130	White	40.78472	86.7683	9807 - 9808	22	M	S
Freeman	1547	05120106140	Carroll	40.65778	86.7531	9807 - 9808	26	M	F

Trophic status: O-Oligotrophic, M-mesotrophic, E-Eutrophic, H-Hypereutrophic, D-Dystrophic

Trophic trends: I-Improving, S-Stable, D-Degrading, F-Fluctuating, U-Unknown

APPENDIX C Stream Assessments

Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
	WHITEWATER BASIN																		
	BIG CEDAR CREEK - HEADWATERS																		
ING0387_00	BIG CEDAR CREEK - HEADWATERS	15.8		F		X	X												
	BIG CEDAR CREEK - LOWER																		
ING0388_00	BIG CEDAR CREEK - LOWER	19.4		F		X	X												
	BLUE CREEK - HEADWATERS (FRANKLIN)																		
ING0381_00	BLUE CREEK - HEADWATERS (FRANKLIN)	6.1		F		X	X												
	BLUE CREEK - NEUKAM BRANCH																		
ING0383_00	BLUE CREEK - NEUKAM BRANCH	4.13		F		X	X												
	BULL FORK SALT CREEK																		
ING0355_00	BULL FORK SALT CREEK	14.8		F		X	X												
	CLEAR FORK																		
ING0365_00	CLEAR FORK	6.5		F		X	X												
	DRY FORK - HEADWATERS																		
ING038D_00	DRY FORK - HEADWATERS	8.76		F		X	X												
	DRY FORK - LEE CREEK																		
ING038G_00	DRY FORK - LEE CREEK	0.87		F		X	X												
	DRY FORK - SOURS RUN/ SATERS RUN																		
ING038E_00	DRY FORK - SOURS RUN/ SATERS RUN	13.4		F		X	X												
	DUCK CREEK - HEADWATERS																		
ING0361_00	DUCK CREEK - HEADWATERS	16.8		F		X	X												
	EAST FOR WHITEWATER RIVER - ELLYS CREEK																		
ING037E_00	EAST FOR WHITEWATER RIVER - ELLYS CREEK	9.47		F		X	X												
ING037E_T1018	Whitewater River, East Fork	3.12		F		P	X					S							
	EAST FORK BLUE CREEK																		
ING0382_00	EAST FORK BLUE CREEK	6.18		F		X	X												
	EAST FORK WHITEWATER R - NEW PARIS																		
ING0372_00	EAST FORK WHITEWATER R - NEW PARIS	13.4		F		X	X												
	EAST FORK WHITEWATER RIVER - CLAY CREEK																		
ING037A_00	EAST FORK WHITEWATER RIVER - CLAY CREEK	23.6		F		X	X												
ING037A_T1015	Whitewater River, East Fork	4.57	1998	F		P	X					S							
	EAST FORK WHITEWATER RIVER - RICHLAND CREEK																		
ING037C_00	EAST FORK WHITEWATER RIVER - RICHLAND CREEK	24		F		X	X												
ING037C_T1017	Whitewater River, East Fork	2.78		F		P	X					S							
	EAST FORK WHITEWATER RIVER - SHORT CR																		
ING0376_00	EAST FORK WHITEWATER RIVER - SHORT CR	15.9		F		X	X												
ING0376_T1013	Whitewater River, East Fork	3.95	1996	F		P	N							M	M				
ING0376_T1027	Whitewater River, East Fork	1.73	1996	F		P	X								M				
	EAST FORK WHITEWATER RIVER - SIMPSON CREEK																		
ING037B_00	EAST FORK WHITEWATER RIVER - SIMPSON CREEK	7.63		F		X	X												
ING037B_T1016	Whitewater River, East Fork	2.79	1998	F		P	X					S							
	EAST FORK WHITEWATER RIVER - SMITH CREEK																		
ING0379_00	EAST FORK WHITEWATER RIVER - SMITH CREEK	32.2		F		X	X												
ING0379_T1014	Whitewater River, East Fork	4.57	1998	F		P	X								M				
	EAST FORK WHITEWATER RIVER - SPRING CREEK																		
ING037G_00	EAST FORK WHITEWATER RIVER - SPRING CREEK	5.46		F		X	X												
	EAST FORK WHITEWATER RIVER - WOLF CREEK																		
ING037J_00	EAST FORK WHITEWATER RIVER - WOLF CREEK	7.72		F		X	X												
ING037J_P1019	Brookville Reservoir	9.33		F		P	X					S							
	ELKHORN CREEK																		

Uses: F-Full support, P-Partial support, N-Non support, X-Not assessed, A-Not Attainable
* Biological community response; stressor not identified.

Cause/ Stressor magnitude: S-slight, M-moderate, H-High, T-Not impaired; more information needed.

Identification	Waterbody and Segment names			Use				Cause/Stressor										
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic Comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
ING0378_00	ELKHORN CREEK	36.9		F		X	X												
	GARRISON CREEK																		
ING034A_00	GARRISON CREEK	22.3		F		X	X												
	GREENS FORK CREEK - BLACK WATER BRANCH																		
ING0325_00	GREENS FORK CREEK - BLACK WATER BRANCH	11.2		F		X	X												
	GREENS FORK CREEK - COPY RUN																		
ING0321_00	GREENS FORK CREEK - COPY RUN	21.5		F		X	X												
	GREENS FORK CREEK - FRANKLIN CREEK																		
ING0326_00	GREENS FORK CREEK - FRANKLIN CREEK	9.14		F		X	F												
	GREENS FORK CREEK - WILLIAMSBURG CREEK																		
ING0324_00	GREENS FORK CREEK - WILLIAMSBURG CREEK	9.65		F		X	X												
	GREENS FORK CREEK -- MORGAN CREEK																		
ING0323_00	GREENS FORK CREEK -- MORGAN CREEK	31.1		F		X	X												
	HANNA CREEK - DUBOIS CREEK																		
ING037F_00	HANNA CREEK - DUBOIS CREEK	47.8		F		X	X												
	HOWARD CREEK																		
ING038F_00	HOWARD CREEK	0.5		F		X	X												
	LICK CREEK (FAYETTE)																		
ING0342_00	LICK CREEK (FAYETTE)	9.99		F		X	F												
	LICK CREEK - CLEAR CREEK																		
ING0377_00	LICK CREEK - CLEAR CREEK	18		F		X	X												
	LITTLE SALT CREEK - SOUTH FORK																		
ING0357_00	LITTLE SALT CREEK - SOUTH FORK	21.2		F		X	X												
	MARTINDALE CREEK - BEARD RUN																		
ING031C_00	MARTINDALE CREEK - BEARD RUN	14.4		F		X	F												
	MARTINDALE CREEK - DRY BRANCH																		
ING031D_00	MARTINDALE CREEK - DRY BRANCH	9.28		F		X	X												
	MARTINDALE CREEK - ECONOMY																		
ING031A_00	MARTINDALE CREEK - ECONOMY	8.21		F		X	X												
	MARTINDALE CREEK - JORDAN CREEK																		
ING0319_00	MARTINDALE CREEK - JORDAN CREEK	12.2		F		X	X												
	MIDDLE FORK EAST FORK WHITEWATER - HEADWATERS																		
ING0373_00	MIDDLE FORK EAST FORK WHITEWATER - HEADWATERS	22		F		X	X												
	MIDDLE FORK EAST FORK WHITEWATER R - MUD CR																		
ING0374_00	MIDDLE FORK EAST FORK WHITEWATER R - MUD CR	17.2		F		X	X												
ING0374_P1012	Middle Fork Reservoir	2.21	1998	F		P	X					S							
	MORGAN CREEK - WEST BROOK																		
ING031B_00	MORGAN CREEK - WEST BROOK	13.1		F		X	X												
	MUD CREEK - LITTLE MUD CREEK																		
ING0322_00	MUD CREEK - LITTLE MUD CREEK	22		F		X	X												
	NETTLE CREEK																		
ING0313_00	NETTLE CREEK	16.7		F		X	X												
	NOLANDS FORK - BUTLERS CREEK																		
ING0335_00	NOLANDS FORK - BUTLERS CREEK	10.9		F		X	F												
	NOLANDS FORK - COMMON RUN																		
ING0334_00	NOLANDS FORK - COMMON RUN	26.3		F		X	F												
	NOLANDS FORK - FOUNTAIN CREEK																		
ING0332_00	NOLANDS FORK - FOUNTAIN CREEK	23.3		F		X	F												
	NOLANDS FORK - HEADWATERS																		
ING0331_00	NOLANDS FORK - HEADWATERS	24.5		F		X	F												

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Identification	Waterbody and Segment names	Size in miles	303d List Year	Use: Aquatic Life	Use: Drinking Supply	Use: Fish Consumpt	Use: Contact Recr	Cause/Stressor: Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
	NOLANDS FORK - LONG CREEK/ FORK CREEK																		
ING0333_00	NOLANDS FORK - LONG CREEK/ FORK CREEK	35.4		F		X	F												
	PIPE CREEK - HEADWATERS																		
ING0363_00	PIPE CREEK - HEADWATERS	6.76		F		X	X												
ING0363_P1025	Headwater impoundment - Unnamed tributary	1.11		F		X	X												
ING0363_P1026	Heawater impoundment - Pipe Creek	0.3		F		X	X												
	PIPE CREEK - RUSSELL BRANCH																		
ING0364_00	PIPE CREEK - RUSSELL BRANCH	9.34		F		X	X												
	PIPE CREEK - WALNUT FORK																		
ING0366_00	PIPE CREEK - WALNUT FORK	10.1		F		X	X												
	SALT CREEK - ENOCHSBURG																		
ING0352_00	SALT CREEK - ENOCHSBURG	8.37		F		X	X												
	SALT CREEK - FREMONT BRANCH																		
ING0356_00	SALT CREEK - FREMONT BRANCH	8.69		F		X	X												
	SALT CREEK - HARVEY BRANCH																		
ING0354_00	SALT CREEK - HARVEY BRANCH	6.49		F		X	X												
	SALT CREEK - HEADWATERS																		
ING0351_00	SALT CREEK - HEADWATERS	11.9		F		X	X												
	SALT CREEK - RIGHTHAND FORK																		
ING0353_00	SALT CREEK - RIGHTHAND FORK	9.38		F		X	X												
ING0353_P1024	Lake Santee	2.18		F		X	X												
	SALT CREEK - TRIPLE LAKES																		
ING0358_00	SALT CREEK - TRIPLE LAKES	3.26		F		X	X												
	SAND RUN																		
ING038H_00	SAND RUN	2.48		F		X	X												
	SANES CREEK																		
ING034C_00	SANES CREEK	15		F		X	X												
	SILVER CREEK - WHITEWATER LAKE																		
ING037D_00	SILVER CREEK - WHITEWATER LAKE	25.7		F		X	X												
ING037D_P1028	Whitewater Lake	1.47		F		X	X												
	SIMON CREEK - HEADWATERS																		
ING0317_00	SIMON CREEK - HEADWATERS	10.9		F		X	X												
	SIMON CREEK - ROY RUN																		
ING0318_00	SIMON CREEK - ROY RUN	11.4		F		X	X												
	SYMONDS CREEK - GLUE RUN BRANCH																		
ING0315_00	SYMONDS CREEK - GLUE RUN BRANCH	26.8		F		X	X												
	TEMPLETON CREEK - FRANKLIN CREEK																		
ING037H_00	TEMPLETON CREEK - FRANKLIN CREEK	23.5		F		X	X												
	VILLAGE CREEK																		
ING0344_00	Village Creek - Fishers Creek	11.4		F		X	X												
ING0344_T1009	Whitewater River, West Fork	1.04		F		P	X					S			M				
	WEST FORK EAST FORK WHITEWATER RIVER																		
ING0375_00	WEST FORK EAST FORK WHITEWATER RIVER	26.6		F		X	X												
ING0375_T1023	Whitewater River, WF of East Fork	0.64		F		P	N							M	M				
	WHITEWATER RIVER - AWL BRANCH																		
ING0312_00	WHITEWATER RIVER - AWL BRANCH	2.21		F		X	X												
ING0312_T1002	Whitewater River, West Fork	6.54		F		P	X					S							
	WHITEWATER RIVER - BEAR CREEK																		
ING0349_00	WHITEWATER RIVER - BEAR CREEK	9.47		F		X	X												
ING0349_T1011	Whitewater River, West Fork	5.22	1998	F		P	X					S			M				
	WHITEWATER RIVER - CONNERSVILLE																		

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
ING0343_00	WHITEWATER RIVER - CONNERSVILLE	2		F		X	X												
ING0343_T1008	Whitewater River, West Fork	5.66	1998	F		P	X					S			M				
	WHITEWATER RIVER - CRIETZ CREEK																		
ING0316_00	WHITEWATER RIVER - CRIETZ CREEK	3.08		F		X	X												
ING0316_T1004	Whitewater River, West Fork	2.5		F		P	X					S							
	WHITEWATER RIVER - FALL/ WILSON CREEKS																		
ING0348_T1010	Whitewater River, West Fork	1.75		F		P	X					S			M				
	WHITEWATER RIVER - GOBLES CREEK																		
ING0386_00	WHITEWATER RIVER - GOBLES CREEK	18.9		F		X	X												
	WHITEWATER RIVER - JAMISON CREEK																		
ING038C_00	WHITEWATER RIVER - JAMISON CREEK	16		F		X	X												
ING038C_P1029	Souders Lake	0.26		F		X	X												
ING038C_T1022	Whitewater River - mainstem	2.99	1998	F		P	X					S			M				
	WHITEWATER RIVER - JOHNSON FORK																		
ING038B_00	WHITEWATER RIVER - JOHNSON FORK	20.6		F		X	X												
ING038B_T1021	Whitewater River - mainstem	2.21	1998	F		P	X					S			M				
	WHITEWATER RIVER - LAUREL																		
ING034B_00	WHITEWATER RIVER - LAUREL	7.96		F		X	X												
	WHITEWATER RIVER - LITTLE CEDAR CREEK																		
ING0385_00	WHITEWATER RIVER - LITTLE CEDAR CREEK	18.7		F		X	X												
	WHITEWATER RIVER - LITTLE CREEK																		
ING0311_00	Little Creek	4.83		F		X	X												
ING0311_T1001	Whitewater River, WF	8.08		F		P	X					S							
	WHITEWATER RIVER - METAMORA																		
ING0362_00	WHITEWATER RIVER - METAMORA	8.45		F		X	X												
	WHITEWATER RIVER - MILTON																		
ING031E_T1005	WHITEWATER RIVER - MILTON	5.86		F		P	X					S							
	WHITEWATER RIVER - MUD RUN																		
ING0341_00	WHITEWATER RIVER - MUD RUN	4.42		F		X	F												
ING0341_T1007	Whitewater River, West Fork	1.93	1998	F		P	F					S			M				
	WHITEWATER RIVER - NEW TRENTON																		
ING0389_00	WHITEWATER RIVER - NEW TRENTON	15.4		F		X	X												
ING0389_T1020	Whitewater River - mainstem	9.33	1998	F		P	X					S			M				
	WHITEWATER RIVER - PRONGHORN RUN																		
ING0314_00	WHITEWATER RIVER - PRONGHORN RUN	7.75		F		X	X												
ING0314_T1003	Whitewater River, West Fork	5.51		F		P	F					S							
	WHITEWATER RIVER - SHAKER RUN																		
ING0327_00	WHITEWATER RIVER - SHAKER RUN	7.5		F		X	X												
ING0327_T1006	WHITEWATER RIVER - West Fork	6.02	1998	F		P	X					S			M				
	WHITEWATER RIVER - SILLIMANS CREEK																		
ING034D_00	WHITEWATER RIVER - SILLIMANS CREEK	12.4		F		X	X												
	WHITEWATER RIVER - SNAIL CREEK																		
ING0368_00	WHITEWATER RIVER - SNAIL CREEK	15.1		F		X	X												
	WHITEWATER RIVER - WOLF CREEK/ BLUE CREEK																		
ING0384_00	WHITEWATER RIVER - WOLF CREEK/ BLUE CREEK	5.42		F		X	X												
	WHITEWATER RIVER - YELLOW BANK CREEK																		
ING0367_00	WHITEWATER RIVER - YELLOW BANK CREEK	9.38		F		X	X												
	WHITEWATER RIVER -LOGAN CREEK																		
ING038A_00	WHITEWATER RIVER -LOGAN CREEK	23.5		F		X	X												
	WILLIAMS CREEK - BRUSHY FORK																		
ING0345_00	WILLIAMS CREEK - BRUSHY FORK	12.3		F		X	X												

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Identification	Waterbody and Segment names	Size in miles	303d List Year	Use: Aquatic Life	Use: Drinking Supply	Use: Fish Consumption	Use: Contact Recreation	Cause/Stressor: Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
	WILLIAMS CREEK - BUNKER HILL																		
ING0346_00	WILLIAMS CREEK - BUNKER HILL	8.36		F		X	X												
	WILLIAMS CREEK - LITTLE WILLIAMS CREEK																		
ING0347_00	WILLIAMS CREEK - LITTLE WILLIAMS CREEK	8.5		F		X	X												
	UPPER WABASH BASIN																		
	ABOITE CREEK - BIG INDIAN/ LITTLE INDIAN CREEKS																		
INB01A6_00	Aboite Creek - Big Indian Creek	10.4		F		X	X												
INB01A6_T1027	Aboite Creek - Little Indian Creek	11.2		N		X	X	M											
	BACHELOR RUN - KUNS DITCH																		
INB055A_00	BACHELOR RUN - KUNS DITCH	12		F		X	X												
	BEARGRASS CREEK																		
INB0454_00	BEARGRASS CREEK	11.9		F		X	X												
	BIG CREEK - MOUTH																		
INB06F3_00	BIG CREEK - MOUTH	11.9		F		X	X												
	BIG MONON DITCH - LOWER																		
INB06B3_00	BIG MONON DITCH - LOWER	16.9		F		X	N							S					
	BLUE RIVER - BLUE LAKE/ MUD RUN																		
INB0422_T1024	Mud Run	4.97		F		X	X												
	BLUE RIVER - NORTH TRIBUTARY/ COLUMBIA CITY																		
INB0424_00	BLUE RIVER - NORTH TRIBUTARY/ COLUMBIA CITY	16.7		N		X	X	M											
	BOLLEY DITCH - LUKENS LAKE																		
INB0455_00	BOLLEY DITCH - LUKENS LAKE	9.22		P		X	X	M											
	CAMPBELLS RUN - CRIPE RUN																		
INB0735_00	CAMPBELLS RUN - CRIPE RUN	10.7		F		X	F												
INB0735_T1046	Campbells Run - mainstem	1.94		P		X	P						S	S					
	CAMPBELLS RUN - HEADWATERS																		
INB0734_00	Campbells Run and tributaries	17.3		F		X	F												
INB0734_T1045	Campbells Run - mainstem	2.5		F		X	P							S					
	CHIPPEWANUCK CREEK - GAST DITCH																		
INB064B_T1043	Chippewanuck Creek - Gast Ditch	8.18		F		X	X												
	DEEDS CREEK - HEETER DT - CHAPMAN LAKES																		
INB0623_T1038	Deeds Creek basin	7.74		F		X	X												
	DEER CREEK - BELL/ DRY FORK DITCH																		
INB0357_T1024	Mississinewa River - mainstem	4.13		F		X	X												
	DEER CREEK - CAMDEN																		
INB0558_T1007	Deer Creek	8.93	1998	X		P	X					S			M				
	DEER CREEK - JOHNS DITCH/ BRIDGE CREEK																		
INB055B_T1008	Deer Creek	4.73	1998	F		P	N					S		S	M				
INB055B_T1017	Bridge Creek basin	7.79		F		X	X												
	DEER CREEK - LITTLE DEER CREEK/ LITTLE CREEK																		
INB0356_T1023	Little Creek	4.38		N		X	X	H											
	DEER CREEK - ROBINSON BRANCH																		
INB055C_T1009	Deer Creek	3.2	1998	X		P	X					S			M				
	DEER CREEK - TONEY/ BROWN DITCHES																		
INB0553_T1006	Deer Creek U/S of Brown Ditch	5.4	1998	X		P	N					M		S	M				
INB0553_T1014	Munson Ditch and next tributary D/S on left bank	4.51		X		X	N							S					
INB0553_T1015	Deer Creek D/S of Brown Ditch	7.37	1998	X		P	X					M			M				
	EEL RIVER - CLEAR CREEK - NELSON CREEK																		
INB0448_T1012	Eel River - mainstem	2.01	1998	P		P	X			M					M				
	EEL RIVER - COUNTY FARM DITCH																		

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		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0431_T1003	Eel River - mainstem	3.44	1998	X		P	X					S			M				
	EEL RIVER - FLOWERS CREEK - WILSON RHODES DITCH																		
INB0461_T1016	Eel River - mainstem	4.88	1996	X		P	X					S			M				
	EEL RIVER - HOOVER																		
INB0471_T1019	Eel River - mainstem	8.1	1996	X		P	X					S							
	EEL RIVER - HORNEY CREEK																		
INB0477_T1022	Eel River - Logansport water intake	0.18	1996	X	X	P	X					S							
INB0477_T1023	Eel River - mainstem	3.55		X		P	X					S							
	EEL RIVER - HURRICANE CREEK																		
INB0442_T1007	Eel River - mainstem	3.46		F		X	X												
INB0442_T1026	Crazy Creek	3.77		F		X	X												
	EEL RIVER - MEXICO																		
INB0464_T1018	Eel River - mainstem	5.14	1996	X		P	X					S			M				
	EEL RIVER - MISHLER DITCH																		
INB0441_T1006	Eel River - mainstem	3.79	1998	F		P	X					S			M				
	EEL RIVER - MUD BRANCH																		
INB0475_00	MUD BRANCH	12.7		F		X	N							M					
INB0475_T1020	Eel River - mainstem	2.49	1996	X		P	X					S		M					
	EEL RIVER - OTTER CREEK/ LONG LAKE																		
INB0451_T1013	Eel River - mainstem	4.84	1998	P		P	X			M					M				
	EEL RIVER - PLUNGE/ WHEELER CREEKS																		
INB0443_T1008	Eel River - mainstem	1		F		X	X												
	EEL RIVER - PONY CREEK (LOWER)																		
INB0447_T1011	Eel river - mainstem	1.57	1998	P		P	X			M					M				
	EEL RIVER - ROANN/ SQUIRREL CREEK (LOWER)																		
INB0457_00	SQUIRREL CREEK (LOWER)	6.22		X		X	N							M					
INB0457_T1015	Eel River - mainstem	8.45	1996	X		P	X					S		M	M				
	EEL RIVER - SILVER CREEK (LOWER)																		
INB0453_T1014	Eel River - mainstem	3.03	1998	P		P	X			S	T				M				
	EEL RIVER - SIMONTON CREEK																		
INB0444_T1009	Eel River - mainstem	4.14	1998	F		P	X								M				
	EEL RIVER - SMITH/ KRIDER DITCHES																		
INB0413_T1001	Eel River - mainstem	7.13	1998	X		P	X					S			M				
	EEL RIVER - SOLON DITCH																		
INB0414_00	Solon Ditch and other tributaries	17.3		X		X	N							M					
INB0414_T1002	Eel River - mainstem	6.4	1998	X		P	N					S		M	M				
	EEL RIVER - STONY CREEK																		
INB0432_T1004	Eel River - mainstem	3.9	1998	X		P	X					S			M				
	EEL RIVER - SWANK CREEK																		
INB0445_00	Swank Creek	11.2		F		X	N							H					
INB0445_T1010	Eel River - mainstem	1.67	1998	P		P	X							H	M				
	EEL RIVER - TICK CREEK																		
INB0476_T1021	Eel River - mainstem	2.82	1996	F		P	N					S		M					
INB0476_T1027	Eel River - mainstem	0.96	1996	X		P	X					S							
INB0476_T1028	Tick Creek basin	2.35		F		X	X												
	EEL RIVER - WASHONIS CREEK																		
INB0462_00	EEL RIVER - WASHONIS CREEK	16.5		X		X	N							S					
INB0462_T1017	Eel River - mainstem	4.69	1996	X		P	N					S		S	M				
	EEL RIVER/ JOHNSON DT/ JOHNSON DRAIN																		
INB0412_00	EEL RIVER/ JOHNSON DT/ JOHNSON DRAIN	25.9		F		X	X												

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
	EIGHTMILE CREEK - UPPER MIDDLE																		
INB01B3_00	Eightmile Creek - upper middle	6.5		N		X	X	H											
	EIGHTMILE CREEK - WITZGALL DITCH																		
INB01B5_T1028	Witzgall Ditch - above Johnson Dt	3.54		F		X	X												
	GRASSY CREEK - BIG BARBEE/ SECHRIST LAKES																		
INB0617_T1036	Grassy Creek	5.38		P		X	X	S											
	GRASSY FORK DITCH - HARPER DITCH																		
INB0711_00	GRASSY FORK DITCH - HARPER DITCH	13.6		F		X	N							S					
	HOAGLAND DITCH - MINCH DITCH																		
INB06C7_00	HOAGLAND DITCH - MINCH DITCH	10.2		F		X	X												
	HONEY CREEK																		
INB01G8_00	Honey Creek	9.36		F		X	X												
	HONEY CREEK - SHAFER DAM																		
INB06CB_00	HONEY CREEK - SHAFER DAM	11.7		F		X	X												
	HUNTINGTON LAKE																		
INB0191_P1008	Huntington Lake	8.45		F		X	X												
	KILMORE CREEK - BOYLES DITCH																		
INB0749_00	KILMORE CREEK - BOYLES DITCH	14.4		F		X	N							S					
	KILMORE CREEK - SHANTY CREEK																		
INB0745_00	KILMORE CREEK - Shanty Creek	11.5		F		X	F												
	KILMORE CREEK - SR 29 TO KILMORE																		
INB0748_00	KILMORE CREEK - SR 29 TO KILMORE	7.18		F		X	F												
	KILMORE CREEK - STUMP DITCH																		
INB0747_00	KILMORE CREEK - STUMP DITCH	11.7		F		X	F												
	KOKOMO CREEK - HEADWATERS																		
INB071B_00	Finn Ditch and other tributaries	8.35		F		X	P							S					
INB071B_T1007	Kokomo Creek - mainstem headwaters	12	1996	F		N	P							S	H				
	KOKOMO CREEK - LOWER																		
INB071C_00	Martin - Youngman Ditch basin	6.96		X		X	N							M					
INB071C_T1026	Kokomo Creek - lower	4.29	1996	F		N	N							M	H	T	T		
	LAKE MANITOU - RAIN CREEK/ GRAHAM DITCH																		
INB0652_P1016	Lake Manitou	2.92		X		P	X					S							
	LAURAMIE CREEK																		
INB074C_00	LAURAMIE CREEK	18.1		F		X	N							M					
	LIMBERLOST CREEK - OAKLEY DITCH																		
INB0156_T1024	Limberlost Creek and tributaries above tributary 2	15.1		P		X	X	S											
	LITTLE DEER CREEK - RIDENOUR DITCH																		
INB0556_T1016	Deer Creek above Ridenour Ditch	6.38		F		X	X												
	LITTLE MISSISSINEWA RIVER																		
INB0312_T1002	Little Mississinewa River mainstem	8.42	1998	F		N	X								H				
	LITTLE RIVER - FLAT CREEK																		
INB01B8_00	Little River - Flat Creek	9.6		X		X	X												
	LITTLE RIVER - MUD CREEK																		
INB01BA_00	Little River - Mud Creek	4.16		F		X	N							M					
INB01BA_T1031	Mud Creek	3.84		P		X	N	S						M					
	LITTLE SALAMONIE RIVER - BUCKEYE CREEK																		
INB0214_T1001	Buckeye Creek	3.71		F		X	X												
	LITTLE WILDCAT CREEK - EAST AND WEST FORKS																		
INB0722_00	Little Wildcat Creek - east fork	7.21		F		X	N							S					
INB0722_T1009	Kelly West Ditch	1.83	1996	F		X	F												
INB0722_T1035	Unnamed tributary	0.3		N		X	P						S	S				S	

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Cause/ Stressor magnitude: S-slight, M-moderate, H-High, T-Not impaired; more information needed.

Identification	Waterbody and Segment names	Size in miles	303d List Year	Use: Aquatic Life	Use: Drinking Supply	Use: Fish Consumpt	Use: Contact Recr	Cause/Stressor: Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0722_T1036	Little Wildcat Creek - west fork	7.66		F		X	F												
	LITTLE WILDCAT CREEK - LOWER																		
INB0723_00	William Vogus Ditch basin	9.75		F		X	F												
INB0723_T1010	Little Wildcat Creek - mainstem	6.77	1996	F		X	N							S					
	LOON CREEK																		
INB01D2_00	Loon Creek basin	15.2		F		X	X												
	MAJENCIA CREEK - HEADWATERS																		
INB0244_00	MAJENCIA CREEK - HEADWATERS	6.05		P		X	X	H											
	MCKILLIP DITCH - MONON																		
INB06C3_00	MCKILLIP DITCH - MONON	18.3		F		X	X												
	MIDDLE FORK DITCH																		
INB0712_00	MIDDLE FORK DITCH	13		F		X	F												
	MIDDLE FORK WILDCAT CREEK - HARNESS DITCH																		
INB0731_T1041	Wildcat Creek, Middle Fork and other tributaries	10.5		F		X	F												
	MIDDLE FORK WILDCAT CREEK - HOG RUN																		
INB0736_00	MIDDLE FORK WILDCAT CREEK - HOG RUN	21.1		F		X	F												
	MIDDLE FORK WILDCAT CREEK - PETTIT																		
INB0737_00	MIDDLE FORK WILDCAT CREEK - PETTIT	13.2		F		X	N							S					
	MIDDLE FORK WILDCAT CREEK - ROBERTSON BRANCH																		
INB0732_00	Wildcat Creek Middle Fork - Robertson Br - unnamed tributary	11.8		F		X	F												
INB0732_T1042	Wildcat Creek, Middle Fork - mainstem	2.46		F		X	P							M					
	MIDDLE FORK WILDCAT CREEK - ROSSVILLE																		
INB0733_00	Middle Fork Willdcat Creek and other tributaries	13		F		X	F												
INB0733_T1027	Silverthorn Branch downstream of Rossville STP	0.67		A		X	N							M				S	
	MILL CREEK - PRATHER CREEK																		
INB0675_00	MILL CREEK - PRATHER CREEK	18.9		F		X	X												
	MILL CREEK - RIDGEWAY CREEK																		
INB01E7_00	Mill Creek basin	13.1		N		X	X	S											
	MILL CREEK - WILSON DITCH																		
INB0673_00	MILL CREEK - WILSON DITCH	22.2		F		X	X												
	MISSISSINEWA RIVER - BELOW DAM																		
INB036A_00	MISSISSINEWA RIVER - BELOW DAM	6.99		F		X	X												
	MISSISSINEWA RIVER - BOOTS/ MASSEY CREEKS																		
INB035D_00	Boots and Massey Creeks	9.56		P		X	X	H											
INB035D_T1019	Mississinewa River - mainstem	4.11		F		P	N				T	S		S	M				
	MISSISSINEWA RIVER - BOSMAN DITCH																		
INB0332_00	Bosman Ditch	4.25	1998	F		X	X												
INB0332_T1012	Mississinewa River - mainstem	11.7	1998	X		P	X					S			M				
	MISSISSINEWA RIVER - BRANCH/OCTAIN CREEKS																		
INB0354_T1017	Mississinewa River - mainstem	9.42	1998	X		P	X					S			M				
	MISSISSINEWA RIVER - CLEAR CREEK																		
INB0316_T1005	Mississinewa River - mainstem	2.58	1998	X		P	X								M				
	MISSISSINEWA RIVER - DAYS CREEK																		
INB0322_T1008	Mississinewa River - mainstem	1.21	1998	X		P	X								M				
	MISSISSINEWA RIVER - HOPPAS DITCH																		
INB0351_T1015	Mississinewa River - mainstem	3.78	1998	N		P	N	M				S		S	M				
	MISSISSINEWA RIVER - HOWES DITCH																		
INB0324_T1009	Mississinewa River - mainstem	4.54	1998	X		P	X								M				
	MISSISSINEWA RIVER - HUMMEL CREEK																		
INB0361_00	Hummel Creek	7.53		P		X	X	H											
INB0361_T1020	Mississinewa River	1.34	1998	F		P	N				T	S		S	M				
	MISSISSINEWA RIVER - JORDAN CREEK																		

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0313_00	Jordan Creek and other tributaries	9.05		F		X	X												
INB0313_T1003	Mississinewa River - mainstem	2.36	1998	F		P	X								M				
	MISSISSINEWA RIVER - LAKE BRANCH																		
INB0352_T1016	Mississinewa River - mainstem	2.89	1998	X		P	X					S			M				
	MISSISSINEWA RIVER - LITTLE CRANE POND DITCH																		
INB0362_T1021	Mississinewa River - mainstem	8.8	1998	F		P	N				T	S		H	M				
	MISSISSINEWA RIVER - MITCHELL DITCH																		
INB0311_T1001	Mississinewa River - mainstem above Ltl Mississinewa R	1.7	1998	X		P	X								M				
	MISSISSINEWA RIVER - MUD CREEK																		
INB0327_T1011	Mississinewa River - mainstem	1.62	1998	X		P	X					S			M				
	MISSISSINEWA RIVER - MUD/O'BRIEN CREEKS																		
INB0317_T1006	Mississinewa River - mainstem	0.85	1998	X		P	X								M				
	MISSISSINEWA RIVER - PIKE CREEK																		
INB0335_00	Pike Creek basin	11		F		X	X												
INB0335_T1014	Mississinewa River - mainstem	0.93	1998	F		P	X								M				
	MISSISSINEWA RIVER - PLATT NIBARGER DITCH																		
INB0326_T1010	Mississinewa River - mainstem	5.02	1998	F		P	X								M				
	MISSISSINEWA RIVER - PORTER/MILLER CREEKS																		
INB0315_T1004	Mississinewa River - mainstem	2.3	1998	X		P	X								M				
	MISSISSINEWA RIVER - RIDGEVILLE																		
INB0321_00	Unnamed tributary of Mississinewa R	1.79		F		X	X												
INB0321_T1007	Mississinewa River - mainstem	4.89	1998	F		P	X								M				
	MISSISSINEWA RIVER - WALNUT CREEK																		
INB035A_T1018	Mississinewa River - mainstem	4.16	1998	X		P	X					S			M				
	MISSISSSINEWA RIVER - HOLDREN DITCH																		
INB0334_T1013	Mississinewa River - mainstem	8.4	1998	F		P	N					S		M	M				
	MUD CREEK - HEADWATERS (TIPTON)																		
INB0713_00	MUD CREEK - HEADWATERS (TIPTON)	12.7		F		X	N							S					
	MUD CREEK - HOFFMAN DITCH																		
INB0683_00	MUD CREEK - HOFFMAN DITCH	17.9		F		X	X												
	MUD CREEK - NEFF/ BAKER DITCHES																		
INB0657_00	MUD CREEK - NEFF/ BAKER DITCHES	24.3		P		X	X	S											
	MUD CREEK - NORTH CREEK																		
INB0714_00	MUD CREEK - NORTH CREEK	14.1		N		X	N	S						H					
	MUD CREEK - SMITH DITCH																		
INB0656_00	MUD CREEK - SMITH DITCH	14.8		N		X	X	M											
	PAINT CREEK																		
INB0557_00	PAINT CREEK	17.7		F		X	X												
	PIKE CREEK (WHITE)																		
INB06E1_00	PIKE CREEK (WHITE)	29.2		F		X	X												
	PIPE CREEK - BUNKER HILL																		
INB01GB_00	Pipe Creek near Bunker Hill	14.7		F		X	X				T								
INB01GB_T1030	Pipe Creek - mainstem	1.95		F		X	N				T			M					
	PIPE CREEK - UPPER																		
INB01G3_00	Pipe Creek - upper	10		N		X	X	M											
	PRAIRIE CREEK (CLINTON)																		
INB0743_00	PRAIRIE CREEK (CLINTON)	21.1		F		X	F												
	ROCK CREEK - LOWER MIDDLE																		
INB0186_00	Rock Creek - lower middle	7.9		P		X	X	M											
	ROCK CREEK - MIDDLE																		
INB0184_00	Rock Creek - middle	3.87		P		X	X	M											
	ROCK CREEK - RYAN APPLETON DITCH																		

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0526_00	ROCK CREEK - RYAN APPLETON DITCH	24		F		X	X												
	SALAMONIE RIVER - BERGER DITCH																		
INB0213_00	SALAMONIE RIVER - BERGER DITCH	24.9		F		X	X												
	SALAMONIE RIVER - EAST CREEK																		
INB0224_00	SALAMONIE RIVER - EAST CREEK	5.09		F		X	N							H					
	SALAMONIE RIVER - LANCASTER																		
INB0242_00	SALAMONIE RIVER - LANCASTER	17.5		F		X	N				T			H					
	SALAMONIE RIVER - MILLER DITCH																		
INB0216_00	SALAMONIE RIVER - MILLER DITCH	5.32		N		X	N			S				H				S	
	SALAMONIE RIVER - RHOTON DITCH																		
INB0231_00	SALAMONIE RIVER - RHOTON DITCH	4.6		F		X	N							H					
	SALAMONIE RIVER - SALAMONIE DAM/ BACK CREEK																		
INB0248_00	SALAMONIE RIVER - SALAMONIE DAM/ BACK CREEK	8.32		F		X	X												
	SOUTH FORK WILDCAT CREEK - BLINN DITCH																		
INB0744_T1019	South Fork Wildcat Creek - mainstem	8.57	1992	N		X	N			S				S					
	SOUTH FORK WILDCAT CREEK - CARY CAMP																		
INB074E_00	SOUTH FORK WILDCAT CREEK - CARY CAMP	1.47		F		X	F												
INB074E_E1023	South Fork Wildcat Creek - mainstem	3.76		F		X	F												
	SOUTH FORK WILDCAT CREEK - DAYTON																		
INB074D_E1022	South Fork Wildcat Creek - mainstem	6.45		F		X	N							S					
INB074D_T1029	South Fork Wildcat Creek - mainstem	3.35		F		X	F												
INB074D_T1050	Unnamed tributary basin	9.94		N		X	X	M											
	SOUTH FORK WILDCAT CREEK - MICHIGANTOWN																		
INB0742_T1018	South fork Wildcat Creek - mainstem	9.28	1992	F		X	F												
INB0742_T1047	Unnamed tributary basin	4.47		N		X	X	H											
	SOUTH FORK WILDCAT CREEK - MULBERRY																		
INB074B_T1021	South Fork Wildcat Creek - mainstem	9.84	1992	F		X	F												
INB074B_T1049	Unnamed tributaries - upper reaches	5.89		F		X	F												
	SOUTH FORK WILDCAT CREEK - SPRING CREEK - LICK RUN																		
INB074A_00	Spring Creek - Lick Run	12.5		F		X	F												
INB074A_T1020	South Fork Wildcat Creek - mainstem	1.04	1992	F		X	N							S					
INB074A_T1048	Heavilon Ditch - headwater	3.14		N		X	P						S	S					M
	SOUTH FORK WILDCAT CREEK - TALBERT DITCH																		
INB0741_T1017	South Fork Wildcat Creek - mainstem	4.94	1992	X		X	X												
	SPRING CREEK - BLACK LAKE OUTLET																		
INB0433_00	Spring Creek - Black lake outlet	20		F		X	X												
	SPRING CREEK - CLEAR CREEK																		
INB0435_T1005	Eel River - mainstem	0.96	1998	X		P	X					S			M				
	SQUIRREL CREEK - BERGER DITCH																		
INB0456_00	SQUIRREL CREEK - BERGER DITCH	15		P		X	X	M											
	SWAMP CREEK																		
INB0746_00	SWAMP CREEK	14.1		F		X	F												
	TIPPECANOE RIVER																		
INB06F5_00	TIPPECANOE RIVER	20		F		X	F												
	TIPPECANOE RIVER - AGNEW DITCH - MOSS DITCH																		
INB0682_00	TIPPECANOE RIVER - AGNEW DITCH - MOSS DITCH	22		F		X	N							S					
	TIPPECANOE RIVER - BARTEE/ TAYLOR DITCHES																		
INB0666_00	TIPPECANOE RIVER - BARTEE/ TAYLOR DITCHES	29.8		X		X	N							S					
	TIPPECANOE RIVER - BRUCE LAKE OUTLET																		
INB0669_00	TIPPECANOE RIVER - BRUCE LAKE OUTLET	26.5		F		X	X												
	TIPPECANOE RIVER - CLARENCE BAKER DITCH																		

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0644_T1041	Tippecanoe River and tributary	13.2		X		X	N							S					
	TIPPECANOE RIVER - CROOKED LAKE/ BIG LAKE																		
INB0611_P1001	Crooked Lake	1.45	1998	X		P	X					S							
	TIPPECANOE RIVER - DANNER DITCH(LOWER) - ARM2																		
INB0638_T1012	Tippecanoe River - mainstem	1.03		X		P	X								M				
	TIPPECANOE RIVER - DEEDS CREEK - PIKE LAKE																		
INB0624_P1005	Pike Lake	1.38	1998	X		P	X								M				
INB0624_T1006	Tippecanoe River - mainstem	3.44	1998	X		P	X								M				
	TIPPECANOE RIVER - HARP DITCH																		
INB0693_00	TIPPECANOE RIVER - HARP DITCH	27.9		X		X	N							S					
	TIPPECANOE RIVER - HUFFER DITCH																		
INB0631_T1004	Tippecanoe River - mainstem	5.58		X		P	X								M				
	TIPPECANOE RIVER - JAMES/ TIPPECANOE LAKES																		
INB0618_P1002	Tippecanoe Lake	3.82	1998	X		P	X					S							
INB0618_T1003	Tippecanoe River - below Tippecanoe lake	0.31	1998	X		P	F					S			M				
	TIPPECANOE RIVER - LAKE FREEMAN																		
INB06E2_00	TIPPECANOE RIVER - LAKE FREEMAN	33.6		X		X	N							S					
	TIPPECANOE RIVER - MCMAHAN DT/ MILL CREEK																		
INB0653_00	TIPPECANOE RIVER - MCMAHAN DT	13.4		X		X	N							S					
	TIPPECANOE RIVER - PYLE/ POLE RUN DITCHES																		
INB0632_T1010	Tippecanoe River - mainstem	1.94	1998	X		P	X								M				
	TIPPECANOE RIVER - REDINGER DITCH																		
INB0648_T1014	Tippecanoe River - mainstem	2.25		F		P	X					S			M				
INB0648_T1042	Tippecanoe River - mainstem	1.08		X		P	X					S			M				
	TIPPECANOE RIVER - REISTER CREEK																		
INB0649_T1015	Tippecanoe River - mainstem	3.91		X		P	X					S			M				
	TIPPECANOE RIVER - RUPLE DITCH																		
INB0621_T1003	Tippecanoe River - mainstem	6.16	1998	X		P	X								M				
INB0621_T1037	Tippecanoe River - mainstem	0.64	1998	X		P	F								M				
	TIPPECANOE RIVER - SHATTO DITCH																		
INB0641_00	TIPPECANOE RIVER - SHATTO DITCH	23.2		F		X	X												
INB0641_T1013	Tippecanoe River - mainstem	3.95		F		P	X								M				
	TIPPECANOE RIVER - SMALLEY LAKE/ WILMOT POND																		
INB0613_00	TIPPECANOE RIVER - SMALLEY LAKE/ WILMOT POND	13.3		F		X	F												
	TIPPECANOE RIVER - TRIMBLE/ DORSEY DITCH																		
INB0635_T1011	Tippecanoe River - mainstem	2.76		X		P	X								M				
INB0635_T1040	Tippecanoe River - mainstem	1.74		F		P	N							S	M				
	TIPPECANOE RIVER - TYER WEISJAHN DITCH																		
INB066B_00	TIPPECANOE RIVER - TYER WEISJAHN DITCH	33		F		X	X												
	TIPPECANOE RIVER - WEBSTER LAKE																		
INB0614_00	Tippecanoe River - Gaff Ditch	10.9		F		X	X												
INB0614_P1034	Webster Lake	1.07		X		P	X					S							
	TIPPECANOE RIVER - WILSON/ COLLINS DITCHES																		
INB0662_00	TIPPECANOE RIVER - WILSON/ COLLINS DITCHES	26.1		X		X	N							S					
	TIPPECANOE RIVER - ZINK LAKE OUTLET																		
INB0654_T1018	Tippecanoe River - mainstem	10.3		F		P	X					S			M				
	TURKEY CREEK (TIPTON)																		
INB0715_00	TURKEY CREEK (TIPTON)	14.1		F		X	F												
	TURKEY CREEK - ASKREN/ ROUND PRAIRIE DITCHES																		
INB0716_00	TURKEY CREEK - ASKREN/ ROUND PRAIRIE DITCHES	14.4		F		X	F												
INB0716_T1030	Turkey Creek	3.17		F		X	N							S					

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
	WABASH RIVER - ASHER BRANCH																		
INB01E9_M1016	Wabash River mainstem	2.16	1998	X		P	X					S			M				
	WABASH RIVER - BELOW HUNTINGTON LAKE DAM																		
INB0192_M1009	Wabash River - below Huntington Lake dam	6.86	1998	F		P	X				T	S			M				
	WABASH RIVER - BELOW MISSISSINEWA R																		
INB01F1_00	Unnamed tributaries	14.6		F		X	N				T			S					
	WABASH RIVER - BENDER/ LESH DITCHES																		
INB0175_T1006	Wabash River mainstem	3.72	1998	X		P	X					S			M				
	WABASH RIVER - BIDDLE ISLAND																		
INB01H4_M1022	Wabash River mainstem	3.17	1998	X		P	X					S			M				
	WABASH RIVER - BOWEN DITCH																		
INB0561_M1010	Wabash River - mainstem	3.27	1996	X		P	X					M			M				
	WABASH RIVER - BRIDGE CREEK																		
INB0562_M1011	Wabash River - mainstem	3.89	1996	X		P	X					M			M				
	WABASH RIVER - BURR CREEK																		
INB01E2_M1013	Wabash River mainstem	3.71	1998	X		P	X					S			M				
	WABASH RIVER - CARLIN BRANCH																		
INB01E8_M1015	Wabash River mainstem	4.02	1998	X		P	X					S			M				
	WABASH RIVER - DANIEL CREEK																		
INB01EA_M1017	Wabash River mainstem	1.73	1998	X		P	X					S			M				
	WABASH RIVER - DOWTY DITCH																		
INB0174_T1005	Wabash River mainstem	2.68	1998	X		P	N					S		M	M				
	WABASH RIVER - ENGLE/JAMESTUTZ DITCHES																		
INB0161_T1025	Wabash River - mainstem	2.38		N		X	X	S	T									S	
INB0161_T1026	Jamestutz Ditch	4.56		F		X	X												
	WABASH RIVER - GRANTS RUN																		
INB0511_00	GRANTS RUN	37		F		X	N				T			M					
INB0511_M1001	Wabash River - mainstem	8.75	1996	F		P	N				T	S		M	M				
	WABASH RIVER - GRIFFIN DITCH																		
INB0176_00	Griffin Ditch	7.06		F		X	X				T								
INB0176_T1007	Wabash River mainstem	6.25	1998	F		P	X				T	S			M				
	WABASH RIVER - HALLS CREEK																		
INB0173_T1004	Wabash River mainstem	2.16	1998	X		P	X					S			M				
	WABASH RIVER - HARRISON CREEK																		
INB0573_00	HARRISON CREEK	2.79		F		X	N				T			M					
INB0573_M1012	Wabash River - mainstem	4.95	1996	F		P	N				T	M		M	M				
	WABASH RIVER - JOHNS CREEK																		
INB0172_T1003	Wabash River mainstem	1.29	1998	X		P	X					S			M				
	WABASH RIVER - LARGO/ ENYEARTS CREEKS																		
INB01E1_M1012	Wabash River mainstem	2.97	1998	X		P	X					S			M				
	WABASH RIVER - LOON CR TO SALAMONIE R																		
INB01D3_M1011	Wabash River mainstem	2.78	1998	X		P	X					S			M				
INB01D3_M1029	Wabash River - mainstem	4.52	1998	P		P	N		H		T	S		S	M				
	WABASH RIVER - MARKLEY DITCH																		
INB0171_T1002	Wabash River mainstem	1.39	1998	X		P	X					S			M				
	WABASH RIVER - MITCHELL CREEK																		
INB0533_M1004	Wabash River - mainstem	4.24	1996	X		P	X					S			M				
	WABASH RIVER - PLEASANT RUN/ TANNERY BRANCH																		
INB0534_00	PLEASANT RUN/ TANNERY BRANCH	14.4		X		X	N							S					
INB0534_M1005	Wabash River - mainstem	4.44	1996	X		P	N					M		S	M				
	WABASH RIVER - RATTLESNAKE CREEK																		

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Cause/ Stressor magnitude: S-slight, M-moderate, H-High, T-Not impaired; more information needed.

Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0532_00	RATTLESNAKE CREEK	13		F		X	X												
INB0532_M1003	Wabash River - mainstem	3.99	1996	X		P	X					S			M				
	WABASH RIVER - ROCK ISLAND																		
INB01H2_M1021	Wabash River mainstem	6.85	1998	X		P	X					S			M				
	WABASH RIVER - SILVER CREEK																		
INB01D1_00	Silver Creek basin	11.3		P		X	N		H		T			S					
INB01D1_M1010	Wabash River mainstem	3.23	1998	X		P	X					S			M				
	WABASH RIVER - THREEMILE CREEK																		
INB0163_00	Wabash River - Threemile Creek	6.36		X		X	N							H					
	WABASH RIVER - TREATY CR TO KENTNER CR																		
INB01E5_M1014	Wabash River mainstem	5.03	1998	X		P	N					S		S	M				
	WABASH RIVER - VERACRUZ																		
INB0164_00	Wabash River and tributary	4.21		X		X	N							H					
INB0164_T1001	Wabash River mainstem	4.96	1998	X		N	N					S		H	M				
	WABASH RIVER -KEEPS/ LITTLE ROCK CREEKS																		
INB0521_M1002	Wabash River - mainstem	3.51	1996	X		P	X					S			M				
INB0521_T1013	Keeps Creek basin	8.17		F		X	X												
	WALNUT CREEK - EAGLE CREEK/ CENTER LAKE																		
INB0628_P1008	Center Lake	0.6	1998	X	X	P	X								M				
	WALNUT CREEK - LITTLE WALNUT CREEK																		
INB0358_00	WALNUT CREEK - LITTLE WALNUT CREEK	9.46		F		X	X												
	WALNUT CREEK - MONROE PRAIRIE CREEK																		
INB0359_00	WALNUT CREEK - MONROE PRAIRIE CREEK	6.21		F		X	X												
	WEST HONEY CREEK - WALNUT FORK																		
INB0724_00	West Honey Creek	6.75		F		X	N							S					
	WILDCAT CREEK - CUTLER TO OWASCO																		
INB0729_00	Unnamed tributaries	8.58		F		X	X												
INB0729_E1015	Wildcat Creek - mainstem	8.92	1996	F		N	N							S	H				
	WILDCAT CREEK - DEARINGER DITCH - SHANGHAI																		
INB0726_00	Dearinger Ditch and other tributaries	13.8		F		X	F												
INB0726_T1012	Wildcat Creek - mainstem	5.72	1996	F		N	F								H				
	WILDCAT CREEK - DRY RUN																		
INB0751_E1024	Wildcat Creek - mainstem - OSRW	2.88	1996	F		P	N							S	M				
INB0751_T1028	Wildcat Creek - mainstem	4.82	1996	F		P	F				T				M				
	WILDCAT CREEK - HONEY CREEK																		
INB0725_00	Honey Creek	9.81		F		X	F												
INB0725_T1011	Wildcat Creek - mainstem	3.06	1996	F		N	F								H				
	WILDCAT CREEK - HURRICANE CREEK																		
INB0728_E1014	Wildcat Creek - mainstem	11	1996	F		N	F								H				
	WILDCAT CREEK - JEROME																		
INB0718_T1002	WILDCAT CREEK - JEROME	5.61	1996	F		N	N							M	H				
	WILDCAT CREEK - KITTY RUN/ EDWARDS DITCH																		
INB0721_00	Kitty Run and other tributaries	3.37		F		X	P							S					
INB0721_T1008	Wildcat Creek - mainstem	8.14	1996	N		N	N			S	T			S	H		T		
	WILDCAT CREEK - KOKOMO RESERVOIR NO 2																		
INB0719_00	Smith Ditch	0.5		F		X	F												
INB0719_P1003	Kokomo Reservoir No 2	4.79	1998	F		P	F					S							
INB0719_P1004	Kokomo Reservoir No 1	0.24		F		X	F												
	WILDCAT CREEK - MUD CREEK - IRWIN CREEK																		
INB0717_00	Mud Creek	4.13		F		X	F												
INB0717_T1001	Wildcat Creek - mainstem	1.39	1996	F		N	F								H				

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INB0717_T1031	Mud Creek - Irwin Creek	8.08		F		X	N							M					
	WILDCAT CREEK - PETES RUN																		
INB0727_00	Petes Run and other tributaries	11.9		F		X	F												
INB0727_T1013	Wildcat - mainstem	1.73	1996	F		N	N							S	H				
INB0727_T1040	Wildcat Creek - mainstem	1.57	1996	F		N	F								H				
	WILDCAT CREEK - PYRMONT																		
INB072A_00	Tributaries of Wildcat Creek	16.7		F		X	F												
INB072A_E1016	Wildcat Creek - mainstem	15.4	1996	F		P	F								M				
	WILDCAT CREEK - STAHL/ CANNON GOYER DITCHES																		
INB071A_T1005	Prairie Creek Ditch - upper	1.25	1998	F		X	N							M					
INB071A_T1006	Wildcat Creek - mainstem	2.95	1996	P		N	N			M	T			M	H				
INB071A_T1025	Wildcat Creek - upstream of water intake	0.23	1996	P	X	N	N			S	T			M	H				
INB071A_T1032	Prairie Creek Ditch - lower	1.34	1998	F		X	N							M					
INB071A_T1033	Cannon - Goyer Ditch	3.32		F		X	N							S					
INB071A_T1034	Wildcat Creek - mainstem	4.17	1996	F		N	F								H				
	WINONA LAKE - PETERSON/ KEEFER-EVANS DITCHES																		
INB0626_P1007	Winona Lake	1.8	1998	X		P	X								M				
INB0626_T1039	Peterson Ditch basin	13.8		F		X	X												
	WYLAND DITCH - SELLERS/ SHERBURN LAKES																		
INB0625_00	WYLAND DITCH - SELLERS/ SHERBURN LAKES	15.7		F		X	X												
	WHITE, EAST FORK BASIN																		
	BIG BLUE RIVER - BRANDYWINE CR TO DRIFTWOOD R																		
INW045_00	Lowell Ditch and Shaw Ditch	15.6		F		X	F												
INW045_T1010	Big Blue River - mainstem	18.2	1998	N		P	F			M					M				
	BIG BLUE RIVER - HEADWATERS																		
INW041_00	Tributaries - above Little Blue R	5.3		F		X	F												
INW041_T1001	Tributaries - including Little Blue R to Sixmile Cr	91.9		F		X	F												
INW041_T1002	Big Blue River - mainstem above Sixmile Cr	36	1998	N		P	N			M		M		M	M				
	BIG BLUE RIVER - SIXMILE CR TO LITTLE BLUE R																		
INW042_T1004	Big Blue River - mainstem	21.2	1998	N		P	X			M					M				
	BIG CREEK BASIN																		
INW071_00	Big Creek - headwaters to Middle Fork Cr	60		F		X	X												
INW071_T1003	Harberts Creek	11.6		F		X	X												
INW071_T1006	Big Creek - below Middle Fork Cr	90.7		F		X	N							H					
	BOGGS CREEK BASIN																		
INW08D_T1024	Little Boggs Creek - Lower Boggs Creek	29.9		F		X	F				T								
	BRANDYWINE CREEK BASIN																		
INW044_00	Brandywine Cr basin - Shelby Co	47.6		F		X	F												
INW044_t1009	Brandywine Cr - mainstem Hancock Co.	25.5	1998	F		P	F					S							
	BUCK CREEK BASIN																		
INW047_00	Buck Creek basin	74.2		F		X	N							S					
	CLIFTY CREEK BASIN																		
INW061_00	Clifty Creek - headwaters to Fall Fork	62.3		F		X	X												
INW061_T1002	Clifty Creek - Fall Fork to mouth	80.7		F		X	N							S					
	DRIFTWOOD RIVER																		
INW04A_00	Tibutaries	62.3		F		X	X												
INW04A_M1019	Driftwood River - mainstem	15.8		F		X	P							S					
	FLATROCK RIVER - below Conn's Cr to mouth																		
INW055_00	Tributaries	85.6		F		X	X												
INW055_T1004	Flatrock River - mainstem above Sidney Br	18.7	1998	F		P	N					M		S	M				

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INW055_T1005	Flatrock River mainstem - Sidney Br to White R	14.6	1998	F		X	N							S					
	FLATROCK RIVER - below Little Flatrock R																		
INW054_00	Flatrock River - below Greensburg water intake	69.8	1998	F		X	X												
INW054_T1003	Flatrock River - below Greensburg water intake	6.78	1998	F		P	X					M			M				
INW054_T1007	Flatrock River - above Greensburg water intake	2.1	1998	F	X	P	X					M			M				
	FLATROCK RIVER - Headwaters																		
INW051_00	Flatrock River - Headwaters to Shankatank Cr	76		F		X	X												
INW051_T1001	Flatrock River - Rush Co. line to Shankatank Cr	10.8	1998	F		P	X					S							
	FLATROCK RIVER - Middle reaches																		
INW052_00	Flatrock River - tributaries	47.5		F		X	X												
INW052_T1002	Flatrock River - Mainstem	27.9	1998	F		P	X					S							
	GRAHAM CREEK WATERSHED																		
INW072_00	Graham Creek watershed	105		F		X	F												
	GUTHRIE CREEK BASIN																		
INW083_00	Guthrie Creek and tributaries	70.2		F		X	X												
	INDIAN CREEK BASIN																		
INW08B_00	INDIAN CREEK BASIN	126		F		X	F												
	LITTLE BLUE RIVER BASIN																		
INW043_T1006	Tributaries - below Cotton Run	7.78		F		X	P							M					
INW043_T1007	Big Blue R - mainstem Lttl Blue R to Brandywine Cr	6.02	1998	F		P	F								M				
INW043_T1008	Duprez Ditch	5.46		F		X	F												
	LITTLE FLATROCK RIVER BASIN																		
INW053_00	Little Flatrock River basin	48		F		X	X												
	LOST RIVER - LOWER BASIN BELOW DRY BRANCH																		
INW08G_00	Lost River and tributaries	95.6		F		X	X												
INW08G_T1027	Lick Creek - above Paoli water intake	1.82		F	X	X	X												
INW08G_T1028	Lick Creek basin	53.4		F		X	X												
INW08G_T1029	Lost River - above Springs Valley intake	1.4		F	X	X	N							M					
INW08G_T1030	French Lick Creek - above French Lick water intake	0.4		F	X	X	X												
INW08G_T1031	French Lick Creek basin	28.9		F		X	X												
INW08G_T1037	Lost Creek - French Lick Cr to Sulphur Cr	5.59		F		X	N							M					
INW08G_T1038	French Lick Creek - Sand Creek to mouth	1.04		F		X	N							M					
INW08G_T1039	Lick Creek - Scott Hollow to mouth	6.5		F		X	N							M					
	LOST RIVER - UPPER BASIN																		
INW08F_00	LOST RIVER - UPPER BASIN	119		F		X	F												
	LOWER SALT CREEK																		
INW089_00	Lower Salt Creek tributaries	15.3		F		X	F												
INW089_T1008	Jackson Creek - East Fork	3.42	1998	P		X	N	M						S					
INW089_T1009	Jackson Creek	5.62	1998	P		X	N	M						S					
INW089_T1010	Clear Creek tributaries	12.9		F		X	N							S					
INW089_T1011	Clear Creek	19.2		X		N	N							S	H				
INW089_T1012	Little Salt Creek - headwaters	25.7		F		X	F												
INW089_T1013	Little Salt Creek - below Henderson Creek	23.2		F		X	F				T								
INW089_T1015	Pleasant Run	7.99	1998	X		N	X								H				
INW089_T1016	Salt Creek - Clear Creek to Little Salt Creek	5.19	1998	F		N	X					H			H				
INW089_T1017	Salt Creek - Little Salt Creek to mouth	19.7	1998	F		N	X					H			H				
INW089_T1034	Salt Creek - Monroe Reservoir to Clear Creek	1.22		F		N	F								H				
	MONROE RESERVOIR AND TRIBUTARIES																		
INW088_P1007	Monroe Reservoir	47.2	1998	X	X	P	X					S							
	MUSCATATUCK RIVER - CAMMIE THOMAS DT TO MOUTH																		
INW07B_00	Muscatatuck River - tributaries	29.4		F		X	X												

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biotic comm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/chloride	Ammonia
INW07B_M1001	Muscatatuck River - mainstem	21.7	1998	F		P	X					M			M				
INW07B_T1002	Delaney Creek basin	26		F		X	X												
	MUSCATATUCK RIVER - VERNON FORK																		
INW077_00	Vernon Fork - Otter Cr to unnamed tributary	10.4		F		X	F												
INW077_T1008	Vernon Fork and tributaries	71		F		X	N							S					
	MUSCATATUCK RIVER BASIN - DENS FD TO CAMMIE THOMAS DT																		
INW079_T1004	Muscatatuck River - Dens Ford to Grassy Cr	8.03		F		X	X				T								
INW079_T1009	Muscatatuck River - mainstem Grassy Cr to Cammie Thos Dt	13.4	1998	X		P	X					M			M				
	MUSCATATUCK RIVER BASIN - DEPUTY TO AUSTIN																		
INW073_00	Muscatatuck River - Graham Cr to above White Oak Br	44.3		F		X	N							M					
INW073_T1007	Muscatatuck River - White Oak Br to Dens Ford	21.7		F		X	X												
INW073_T1012	Muscatatuck River - above Stucker Fork water intake	1		X	X	X	X												
INW073_T1015	Muscatatuck River - above Dens Ford	2.7		P		X	X						M						
	MUSCATATUCK RIVER, VERNON FK, NORTH FK																		
INW075_T1013	Vernon Fork, North Fk - above Muscatatuck St Dev intake	1		F	X	X	F												
INW075_T1014	Vernon Fork, North Fk - above North Vernon water intake	5		F	X	X	F												
	MUTTON CREEK BASIN																		
INW078_00	Mutton Creek basin	55.1		F		X	N							S					
	OTTER CREEK BASIN																		
INW076_00	Otter Creek basin	59.6		F		X	F												
	SALT CREEK BASIN - MIDDLE FORK																		
INW087_00		34.2		F		X	N				T			S					
	SALT CREEK BASIN, NORTH FORK																		
INW085_00	Salt Creek, NF - above Lower Schooner Cr	96.5		F		X	X												
INW085_P1036	Yellowwood Lake	1.33		X		X	X												
INW085_T1006	Salt Creek, NF - below Lower Schooner Cr	1.37		F		X	X				T								
	SAND CREEK BASIN																		
INW063_00	Tributaries above Panther Creek	39.6		F		X	X												
INW063_T1001	Tributaries including Wyaloosing Creek to mouth	74.7		F		X	X												
INW063_T1004	Sand Cr and Muddy Cr - above Cobbs Fork	37.2	1998	F		P	X					M			M				
INW063_T1005	Sand Creek - Panther Cr to Rock Cr	3.21	1998	F		P	X					M			M				
INW063_T1006	Sand Creek - Rock Cr to Wyaloosing Cr	19.9	1998	F		P	X					S							
INW063_T1007	Tributaries - including Panther Cr to Wyaloosing Cr	32.6		F		X	X												
INW063_T1008	Sand Creek - Wyaloosing Cr to mouth	10.4	1998	F		P	X					S							
INW063_T1013	Sand Creek - Cobbs Fork to Panther Cr	8.12	1998	F	X	P	X					M			M				
	SOUTH FORK SALT CREEK BASIN																		
INW086_00	South Fork Salt Creek Basin	68.8		F	X	X	N				T			S					
	STUCKER FORK BASIN																		
INW074_00	Stucker Fork tributaries	74.1		F		X	F												
INW074_T1005	Stucker Fork - Stucker Ditch	35.2		F		X	F											T	
	SUGAR CREEK - SNAIL CREEK																		
INW048_00	Snail Creek basin	27		F		X	X												
INW048_T1013	Sugar Creek - Buck Cr to Little Sugar Cr	10.5		F		X	P							S					
INW048_T1014	Little Sugar Creek basin - Johnson Co	25.8		F		X	N							S					
INW048_T1015	Sugar Cr - tributaries	11		F		X	F												
INW048_T1016	Sugar Cr - mainstem Little Sugar Cr to Youngs Cr	12.2	1998	F		P	X								M				
	SUGAR CREEK - YOUNGS CREEK																		
INW049_00	Tributaries	58.1		F		X	N							S					
INW049_T1017	Youngs Creek - mainstem	30.6	1998	F		P	N							S	M				
INW049_T1018	Sugar Creek - mainstem Youngs Cr to Driftwood R	17.5	1999	F		P	F								M				

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Identification	Waterbody and Segment names			Use				Cause/Stressor											
		Size in miles	303d List Year	Aquatic Life	Drinking Supply	Fish Consumpt	Contact Recr	Biocomm*	Copper	Cyanide	Lead	Mercury	Low DO	Pathogens	PCBs	Pesticides	Organics	TDS/ chloride	Ammonia
	SUGAR CREEK BASIN - ABOVE BUCK CR																		
INW046_00	Mainstem and tributaries	31.4		F		X	X												
INW046_T1011	Sugar Creek - mainstemabove Little Sugar Cr	45.3	1998	F		P	N					S		M					
INW046_t1012	Little Sugar Creek - mainstem Hancock County	8.86	1998	F		P	X					M			M				
	WHITE CREEK BASIN																		
INW065_00	South Fork White Cr watershed	6.84		F		X	X												
INW065_T1010	Unnamed Tributary	3.48		N		X	X						M				M	M	
INW065_T1011	White Cr and tributaries	70.6		F		X	X				T								
	WHITE RIVER, EAST FORK																		
INW064_00	Tributaries - Sand Cr to White Cr	36		F		X	X												
INW064_M1009	White River, EF - mainstem	37.3	1998	F		P	X					S			M				
INW064_M1014	White River, EF - upstream of Seymour water intake	2	1998	F	X	P	X					S			M				
	WHITE RIVER, EAST FORK - BELOW HAW CR TO SAND CR																		
INW062_00	White River, EF - tributaries	46.3		F		X	X												
INW062_M1003	White River, EF - mainstem	20	1998	F		P	X												
	WHITE RIVER, EAST FORK - BOGGS CREEK TO LOST RIVER																		
INW08E_00	White River tributaries	31		F		X	X												
INW08E_M1025	White River, East Fork - mainstem	14.6		F		P	X								M				
INW08E_T1026	Haw Creek Basin	10.2		F		X	X												
	WHITE RIVER, EAST FORK - HAW CREEK																		
INW056_00	Haw Creek watershed	48.1		F		X	F												
INW056_T1006	White River, EF - Columbus	1.94	1998	F		P	F								M				
	WHITE RIVER, EAST FORK - INDIAN CREEK TO BOGGS CREEK																		
INW08C_00	Beaver Creek Basin and Beech Creek	36.4		F		X	X												
INW08C_M1023	White River, East Fork - mainstem	14.1		F		P	X								M				
INW08C_T1032	Beaver Creek - impoundment above Huron	1.82		N		X	X	H					S						
	WHITE RIVER, EAST FORK - LOST RIVER TO MOUTH																		
INW08H_00	White River, East Fork tributaries	157		F		X	F												
INW08H_M1033	White River, East Fork - mainstem	34.8		F		X	F				T								
	WHITE RIVER, EAST FORK - SALT CREEK TO INDIANA CREEK																		
INW08A_00	Karst area tributaries	11.1		F		X	X												
INW08A_M1022	White River, East Fork - mainstem	17.2	1998	F		P	X				T	M			M				
INW08A_M1035	White River, East Fork - County line to Indian Creek	11.5		F		P	X				T				M				
	WHITE RIVER, EF - GUTHRIE CR TO ABOVE SALT CR																		
INW084_00	Tributaries	10.2		F		X	X												
INW084_M1005	White River, EF - mainstem	7.54	1998	F		P	X					M			M				
INW084_M1021	White River, EF - above Bedford water intake	1.4	1998	F	X	P	X					M			M				
INW084_T1004	White River, EF - above Bedford water intake	26.2	1998	F		X	F												
	WHITE RIVER, EF - MUSCATATUCK R TO TWIN CR																		
INW081_00	Tributaries including Twin Creek	50.1		F		X	X												
INW081_M1001	White River, EF - mainstem	20	1998	F		N	X					S			M				
INW081_P1018	John Hay Lake	5.14		F	X	X	X												
	WHITE RIVER, EF - TWIN CR TO GUTHRIE CR																		
INW082_00	Tributaries - Clifty, Sugar, Fishing Creeks	34.3		F		X	X												
INW082_M1002	White River, EF - Twin Cr to Fishing Cr	13.6	1998	F		P	X					M			M				
INW082_M1019	White River, EF - above Mitchell water intake	2.96	1998	F	X	P	X					M			M				
INW082_M1020	White River, EF - Mitchell to Guthrie Cr	3.2	1998	F		P	X					M			M				
	WHITE RIVER, EF - WHITE CR TO MUSCATATUCK R																		
INW066_00	Tributaries	55.1		F		X	F												
INW066_M1012	White River, EF - mainstem	33.8	1998	F		P	F					S			M				

Uses: F-Full support, P-Partial support, N-Non support, X-Not assessed, A-Not Attainable
* Biological community response; stressor not identified.

Cause/ Stressor magnitude: S-slight, M-moderate, H-High, T-Not impaired; more information needed.

APPENDIX D Metadata

Indiana 305(b) Electronic Update 2000
March 27, 2000

Database Manager:
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Data Dictionary and Notes:

The period covered by this update includes water quality assessments reported in 1999 and 2000 for the White River, East Fork, Whitewater River, and Upper Wabash River basins.

USGS Cataloging units included in this update are: Driftwood 05102204, Flatrock-Haw 05120205, Upper East Fork 05120206, Muscatatuck 05120207, Lower East Fork White 05120208, Whitewater 05080003, Upper Wabash 05120101, Salamonie 05120102, Mississinewa 05120103, Eel – Blue 05120104, Middle Wabash – Deer 05120105, Tippecanoe 05120106, and Wildcat 05120107.

The data files submitted this year are in the 305(b) Assessment Database file format. These records may be identified in the Indiana 305(b) assessment database file (INdata00) by the cataloging unit numbers listed above. Other waterbody records converted by USEPA contractor RTI and received with the new database are not a part of this update. The record format was not compatible with the new database structure; the converted records may not be accurate. Only records in the above cataloging units are included in this update.

Records previously submitted in the Waterbody System format are scheduled for revision within the next two years. Records for the White River, West Fork and Patoka River watersheds, which were submitted in 1998, may no longer be up to date. These records were converted to the Assessment Database format, but were not compatible with the file structure. Please contact the Indiana database manager before using any Waterbody System or 305(b) Assessment Database records outside the cataloging units identified above.

The following **assessment method, cause, and source codes were added to the database**:

METHODCODE	METHODNAME	METHODNATEQ
376	Qualitative Habitat Evaluation Index, QHEI; by professional	375
323	Macroinvertebrate community assessment, mIBI family level	320
332	Fish community assessment, IBI	330
730	Rotating basin probabilistic water chemistry, fish IBI, QHEI, mIBI	700
245	Rotating basin probabilistic physical/ chemical	240
422	Water/ E. coli grab samples	
421	Water/ five E. coli samples in 30 days	
CAUSECODE	**CAUSENAME**	**CAUSENATEQ**
101	Biotic community status	
SRCCODE	**SRCNAME**	**SRCNATEQ**
8010	Nonpoint source/ unknown origin	
1060	Livestock	1000

Waterbody segments were classified as monitored if surface water data reviewed and used for assessment were no more than five years old. Fish tissue and surficial sediment results used for fish consumption advisories may be older than five years. Segments with monitoring site(s) upstream and/or downstream, which were applicable to the segment, were classified as monitored. **Waterbody segments were classified as evaluated** if the primary data used for assessment was more than five years old or the assessment was based on other monitored segments in the watershed.

Sample start and end dates represent the earliest sample and latest sample reviewed in the process. For instance, a waterbody that was monitored in 1998 may have sample date range of 1987 to 1998 because fish tissue sample results from 1987 were reviewed for the assessment and considered still applicable.

Cause/stressor magnitude codes were assigned to each parameter within a waterbody based on the following process.

High (H)-- Waters with acute criteria violations of state water quality standards for toxic substances or ammonia; a group 5 (do not eat any fish) fish consumption advisory for PCBs or mercury; scores of very poor or less based on biological assessments; and waters with *E. coli* values above 10^4.

Medium (M)-- Waters with chronic criteria violations of state water quality standards for toxic substances, ammonia or dissolved oxygen; waters scoring poor on biological assessments; waters which had group 3 or 4 fish consumption advisories for mercury or group 2,3, or 4 for PCBs; and waters where *E. coli* values from 10^3 to 10^4 predominate.

Slight(S)-- Waters with violations of state water quality standards for pH, chlorides, etc.; waters with group 2 or 3 fish consumption advisories for mercury; and waters where *E. coli* values less than 10^3 predominate.

State assigned (T)-- The "T" designation is used as a marker to identify waterbody segments for which more information is needed in order to evaluate this parameter. All other information for the segment indicates full support of the use and the waterbody is classified as fully supporting. The marker is used for:

- Low level metals samples, which were neither collected nor analyzed using clean techniques. The results were unreliable by themselves; other related data such as source, discharge volume, loading were not readily available at the time of assessment.
- Low level cyanide results, which were unreliable; analytical test method evaluation is in progress.

The waterbody will be reevaluated when additional assessment information is available.

Source magnitude codes generally correspond to the cause magnitude code for each waterbody.