

# Town of Chesterfield

## Storm Water Quality Management Plan Part B Baseline Characterization Report 327 IAC 15-13-7

Permit Number INR040143

Revision 1: October 18, 2004



Prepared by:

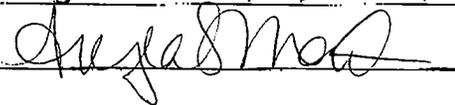
RQAW Corporation  
4755 Kingsway Drive  
Indianapolis, IN 46205-1547  
(317)255-6060  
[www.rqaw.com](http://www.rqaw.com)

Town of Chesterfield  
Storm Water Quality Management Plan  
Part B - Baseline Characterization Report  
327 IAC 15-13-7

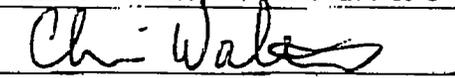
Certification

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name of Qualified Professional: Angela S. Martin, PE, CHMM, RQAW Corporation

Signature of Qualified Professional:  Date: 10-18-04

Name of MS4 Operator: Chris Walters, Town Utilities Supervisor

Signature of MS4 Operator:  Date: 10-18-04

## Part B Baseline Characterization Report Table of Contents

|   |           |
|---|-----------|
| <b>1. INTRODUCTION.....</b>   | <b>1</b>  |
| <b>2. SUMMARY OF DATA COLLECTION .....</b>  | <b>4</b>  |
| 2.1. SUMMARY OF GENERAL DATA ON MS4 ENTITY AND SYSTEM .....                                     | 4         |
| 2.2. SUMMARY OF BASELINE DATA COLLECTION .....  | 5         |
| 2.2.1. <i>Indiana Department of Environmental Management – Assessment Branch</i> .....          | 5         |
| 2.2.2. <i>IDEM Watershed Section</i> .....  | 6         |
| 2.2.3. <i>Indiana Department of Natural Resources (DNR)</i> .....                               | 6         |
| 2.2.4. <i>U.S. Geological Survey (USGS)</i> .....   | 7         |
| 2.2.5. <i>Madison County</i> .....  | 7         |
| 2.2.6. <i>Municipal Wastewater Dischargers</i> .....  | 7         |
| 2.2.7. <i>Industrial Storm Water Dischargers</i> .....  | 7         |
| 2.2.8. <i>Army Corp of Engineers (ACOE)</i> .....   | 8         |
| 2.2.9. <i>U.S. Environmental Protection Agency (USEPA)</i> .....                                | 8         |
| <b>3. LAND USE EVALUATION .....</b>   | <b>9</b>  |
| 3.1. LAND USE .....   | 9         |
| 3.2. EVALUATION OF STRUCTURAL AND NON-STRUCTURAL BEST MANAGEMENT PRACTICES ..                   | 11        |
| 3.3. DISCUSSION OF SENSITIVE AREAS .....  | 12        |
| <b>4. REVIEW OF EXISTING/AVAILABLE WATER QUALITY DATA .....</b>                                 | <b>16</b> |
| <b>5. IDENTIFICATION OF POTENTIAL AREAS OF CONCERN .....</b>                                    | <b>21</b> |
| 5.1. DEFINITION OF MS4 AND WATERS OF THE STATE .....  | 21        |
| 5.2. REPORT ON NEW DATA.....  | 21        |
| <b>6. RESULTS OF DATA EVALUATION .....</b>  | <b>22</b> |
| 6.1. CHARACTERIZATION OF MS4 CONDITIONS .....   | 22        |
| 6.1.1. <i>Sensitive Areas for Priority Attention</i> .....                                      | 22        |
| 6.1.2. <i>Areas with Potential for Storm Water Quality Problems</i> .....                       | 22        |
| 6.1.3. <i>BMP Evaluation Results</i> .....  | 22        |
| 6.1.4. <i>Potential Sites for Additional BMPs</i> .....   | 22        |
| 6.2. CHARACTERIZATION OF WATER QUALITY DATA .....   | 22        |
| 6.2.1. <i>Key Observations on Water Quality</i> .....   | 22        |
| 6.2.2. <i>Conclusions from Data Analysis</i> .....  | 23        |
| 6.3. STRATEGY FOR CONTINUED CHARACTERIZATION EFFORTS.....                                       | 24        |
| 6.4. FOLLOW-UP WORK PRIOR TO SUBMITTAL OF STORM WATER QUALITY MANAGEMENT PLAN<br>– PART C ..... | 24        |
| <b>7. AREAS WITH POTENTIAL FOR CAUSING STORM WATER QUALITY PROBLEMS</b>                         | <b>25</b> |
| 7.1. CSO POINTS ONE (1) AND TWO (2) .....   | 25        |
| 7.1.1. <i>Potential negative effects</i> .....  | 25        |

7.1.2. *Mitigation plans* ..... 25

7.2. MAKE PEACE PARK ..... 25

7.2.1. *Potential negative effects* ..... 25

7.2.2. *Mitigation plans* ..... 26

7.3. WALBRIDGE ACRES ..... 26

7.3.1. *Potential negative effects* ..... 26

7.3.2. *Mitigation Plans*..... 26

**8. CORRELATION OF COLLECTED DATA, LAND USAGE AND WATER QUALITY.. 27**

8.1. KNOWN WATER QUALITY PROBLEMS BY DISCHARGE TYPE..... 27

8.2. BMP ASSESSMENT ..... 27

8.2.1. *Structrual BMPs* ..... 28

8.2.2. *Non-Structural BMPs*..... 28

**9. ADDITIONAL CONSIDERATIONS ..... 29**

## Appendices

Appendix A      Land Use Map

## 1. INTRODUCTION

The Town of Chesterfield (Chesterfield) is located in Madison County, Indiana between Anderson, Indiana and the eastern border of Madison County. Figure 1, Town of Chesterfield Location Map, is a location map for Chesterfield. Chesterfield is located west of Interstate I69.

In an effort to comply with Part B, of the SWQMP the Town of Chesterfield conducted a number of field surveys, data searches and coordinated with Madison County on identifying the locations of contributing water courses to the waters of the state. Chesterfield has one major water course in or adjacent to the boundary of the Town of Chesterfield’s MS4 area, White River. The portion of White River north of Chesterfield is on Indiana's Impaired Body water list. The 14 digit HUCs associated with White River in this area are shown in Table 1, Watersheds Associated with the Town of Chesterfield. Both 14 digit HUCs are on Indiana’s 303(d) list as impaired.

The White River is an impaired water body in Madison County due to areas outside the Town of Chesterfield’s jurisdiction and Chesterfield contributes little to the cause of the river’s classification as an impaired body. Muncie, Indiana is a large CSO community upstream of Chesterfield. The Town of Chesterfield’s contribution to the water quality problems in the White River are the CSO discharges 2-3 times per year. Connections to Mill Creek from storm drains are limited because of the combined sewers in town. Run-off from areas adjacent to Mill Creek, and flow in Mill Creek prior to Chesterfield also contribute small amounts of pollutants to the river.

Chesterfield will need to develop methods to differentiate flows and pollutants entering Mill Creek from the South of town, to those Chesterfield contributes from surface run-off, CSO points and Storm Sewer Connections.

Table 1  
Watersheds Associated with the Town of Chesterfield

| 14-Digit HUC   | HUC Name                               | 303 (d) Support Status | Parameters of Concern                        |
|----------------|--|------------------------|--|
| 05120201030020 | White River-Shoemaker Ditch (Delaware) | Impaired               | <i>E. Coli</i>                               |
| 05120201030030 | White River-Turkey Creek               | Impaired               | <i>E. Coli</i> , Impaired Biotic Communities |

Mill Creek (shown on the USGS Map as Chesterfield Branch of the White River) is a Madison County legal drain. The watershed is J.M. Donnely C.C. 21958. Both the White River and Mill Creek receive discharges from Chesterfield MS4 conveyances. Since Mill Creek flows from the south, through town into the White River, it is potentially contaminated prior to entering the Town of Chesterfield, but Chesterfield has two (2) CSO points on Mill Creek identified in Appendix A, Land Use Map.

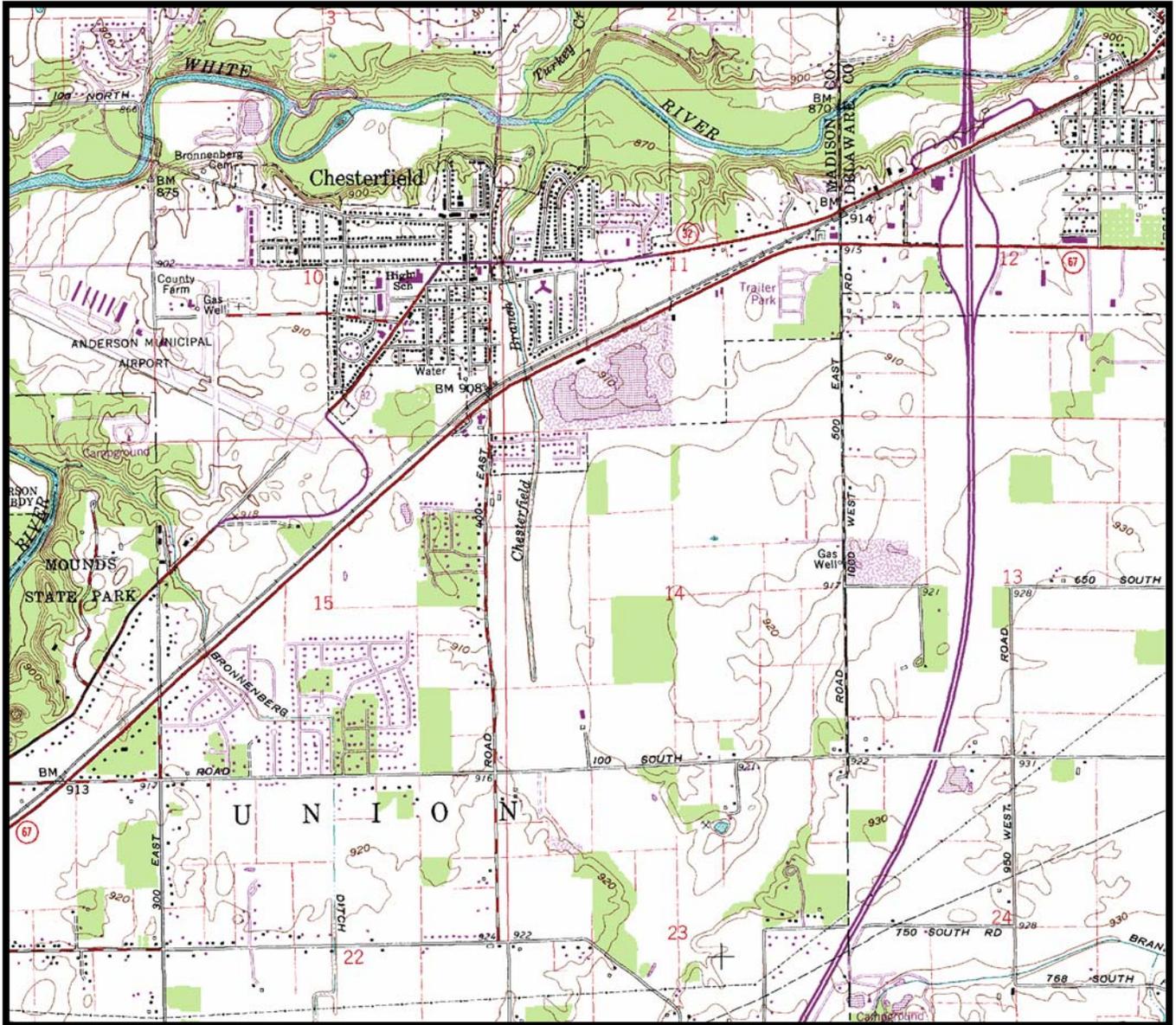
The Town of Chesterfield has determined to use existing data to establish a baseline. The only parts of the White River Chesterfield is responsible for is the river craft access point at the Walbridge Acres Park. This is an access point only, and there are no beaches along the river, adjacent to town. Chesterfield uses Mill Creek for storm drainage in addition to the two (2) CSO points. Because of the combined sewers, storm waters that would go to Mill Creek and White River during mild rain events, do not, which actually aids in the water quality, however during heavier rains, the two (2) CSO points do contribute some pollution to these waters. It should be noted however that Chesterfield does not routinely discharge through these CSOs.

The Town of Chesterfield is in the planning process for a CSO separation project that will eliminate the two (2) CSO points within Chesterfield's MS4 jurisdiction, but add storm drains to Mill Creek. This project will be performed with some best management practices such as basins to collect street debris, and the planting of additional vegetation along Mill Creek to reduce erosion. The project will be fully compliant with Indiana's Rule 5 on erosion control practices during construction.

Chesterfield is in the process of setting up a storm water utility to charge commercial and industrial user fees to treat storm water run-off.

Correlations between the land usage, the collected data, and water quality are presented as a part of this report.

Figure 1  
Town of Chesterfield Location Map



## 2. SUMMARY OF DATA COLLECTION

### 2.1. Summary of General Data on MS4 Entity and System

The following describes the municipal separate storm sewer system (MS4) entity in general, providing a context for the evaluation of the water quality data and other data sources in the preparation of this report. Chesterfield is a MS4 entity required to comply with the NPDES Phase II storm water requirements because it is within an urbanized area.

A summary of the rule's definition of an MS4 from Chesterfield's perspective is a system of conveyances designed or used for collecting or conveying storm water that is owned by Chesterfield. The Town of Chesterfield owns and operates combined sewers, but no publicly owned treatment works. According to the rule, the conveyance may include:

- ❖ Roads with drainage systems,
- ❖ Municipal streets,
- ❖ Catch basins,
- ❖ Curbs,
- ❖ Gutters,
- ❖ Ditches,
- ❖ Manmade channels, and
- ❖ Storm drains.

Chesterfield's MS4 consists of roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, and storm drains. Madison County has two (2) legal drains with Chesterfield limits. Any drainage systems and ditches associated with federal, state, or municipally owned roads located within the Town of Chesterfield that are not owned and maintained by Chesterfield, for example, State Road 67, are not part of Chesterfield's MS4. These drainage systems may contribute storm water to the Chesterfield MS4 system, but any pollutants from these roads are not under the control, nor under the responsibility of Chesterfield.

General discussions with Madison County employees and officials indicate that there is a general agreement that the most prevalent water quality and storm water quality concern in Madison County is *E. Coli*. The sources of this bacteria include communities with combined sewer overflows, failing, poorly designed, or illegally connected septic systems, and small, unregulated confined feeding operations. Other sources of *E. Coli* are wild animals and pets.

## 2.2. Summary of Baseline Data Collection

The following describes the process utilized to identify, gather, and evaluate data for this Baseline Characterization Report. Information was requested from many sources on the two (2) watersheds Chesterfield is located within, which are shown in Table 1, Watersheds Associated with the Town of Chesterfield. The following paragraphs outline the sources solicited for information.

### 2.2.1. *Indiana Department of Environmental Management - Assessment Branch*

#### 2.2.1.1. Biological Studies

- ❖ Fish Community Assessments (1996, 1997, 2000, and 2003) were requested via email and received via email from Indiana Department of Environmental Management (IDEM).
- ❖ Fish Tissue Contaminant (1986 - 2003) information was requested via email from IDEM. An email response indicating that IDEM was working on gathering the data was received, but no data have been received by the date of this report.
- ❖ Sediment Contaminant (1986 - 2003) information was requested from Jim Stahl at IDEM. An email response indicating that IDEM was working on gathering the data was received, but no data have been received by the date of this report.
- ❖ Macroinvertebrate Community (1990 - 2003) information was requested via email and received via email from IDEM.
- ❖ Habitat Analysis were requested and received via email from IDEM.
- ❖ Lake Water Quality Assessments were not requested because they were deemed irrelevant to Chesterfield.

#### 2.2.1.2. Surveys

The following information was requested and received via email from IDEM:

- ❖ Pesticides Monitoring (1997 - 2001),
- ❖ Fixed Station (162 active sites) Ambient Monitoring (1990 - 2003),
- ❖ Watershed Surveys (1996 - 2004),
- ❖ Source Identification (2000 - 2001),
- ❖ *E. Coli* Monitoring (1998 - 2003), and
- ❖ Special Studies (2000 - 2003).

### **2.2.1.3.Environmental Toxicology and Chemistry**

The final draft *West Fork White River, Muncie to Hamilton-Marion County Line TMDL for E. Coli Bacteria Study, 2004* for White River was reviewed. The final draft of this study addressed Duck Creek, Killbuck Creek, Pipe Creek, and the West Fork of the White River.

### **2.2.1.4.Existing Studies and Reports**

- ❖ Upper White River Restoration Action Strategy (January 2001),
- ❖ West Fork White River, Muncie to Hamilton-Marion County Line TMDL for *E. Coli* Bacteria Data Report (December 30, 2002),
- ❖ West Fork White River, Muncie to Hamilton-Marion County Line TMDL for *E. Coli* Bacteria Final Report (2004), and
- ❖ 2004 Integrated Water Quality Monitoring and Assessment Report (2004).

### **2.2.2. IDEM Watershed Section**

Mr. Brett Canaday of the Madison County Soil & Water Conservation District was contacted about watershed restoration projects. He provided information about watershed grants known to him. The final draft of *Upper White River Watershed Restoration Action Strategy* was issued in January, 2001. The *2004 Integrated Water Quality Monitoring Assessment Report (2004 303(d) Report)* was reviewed.

### **2.2.3. Indiana Department of Natural Resources (DNR)**

#### **2.2.3.1.Hoosier Riverwatch**

Data was downloaded from the Hoosier Riverwatch database located at [www.HoosierRiverwatch.com](http://www.HoosierRiverwatch.com). No data was deemed useable for this study because the locations of the sampling were not defined in enough detail.

#### **2.2.3.2.Fisheries Section**

- ❖ The DNR Fisheries Section fishing reports website was reviewed with little success for information that may be relevant to Chesterfield.
- ❖ An email was sent to DNR's Fisheries Section Chief, with no response at the date of this report.

### **2.2.3.3. Lake and River Enhancement (LARE) Program**

The LARE website was searched for relevant data. A study on lakes in the Anderson parks system was found, but judged not to be relevant.

### **2.2.4. U.S. Geological Survey (USGS)**

- ❖ Fixed Station Ambient Monitoring (1993–2003) for five (5) sites on White and Miami River Basins (near New Palestine, Indianapolis, Centerton, Hazleton, and Roachdale) are available. An email request to USGS was not answered.
- ❖ USGS Project Sites (1940s–2002) can provide older data that is sediment related; newer data (1970s or more recent) is primarily pH, temperature, dissolved oxygen, and specific conductivity. An email request to USGS was not answered.
- ❖ National Water Quality Assessment (NAWQA) project for White River has data on pesticides, organics, and inorganics. An email request to USGS was not answered.

### **2.2.5. Madison County**

The Madison Soil and Water Conservation Districts (SWCDs) representative provided information on a watershed improvement plan. The Madison County Health Department was contacted and provided a letter of explanation.

### **2.2.6. Municipal Wastewater Dischargers**

Chesterfield is a CSO community. The requirement for a Stream Reach Characterization Report was waived. Chesterfield has completed a Long Term Control Plan. No Long Term Control Plans have been approved in the State of Indiana.

### **2.2.7. Industrial Storm Water Dischargers**

Based on the IDEM provided Rule 6 permitted facility list for Madison County, only one facility had a Chesterfield address: Delco Remy America - Liberty Park, permit number INR00D099, SIC code 3714, 330 Liberty Park Facility, Chesterfield, discharging to the West Fork White River via Anderson MS4. This facility has been determined to be outside of Chesterfield corporate limits, although it has a Chesterfield address.

**2.2.8. *Army Corp of Engineers (ACOE)***

Sediment and water quality data for dredging, assessment, or certification project preparation has been requested from the ACOE was requested from the ACOE, but no response has been received.

**2.2.9. *U.S. Environmental Protection Agency (USEPA)***

The USEPA may have data from special projects or grants in Indiana. The Region V Storm Water Coordinator was contacted and the data requested. The Coordinator returned the phone call and indicated he didn't think EPA had much more information than Indiana, but he would find out and forward that information. No information from US EPA has been received.

### 3. LAND USE EVALUATION

#### 3.1. Land Use

The MS4 area is the corporation boundaries for Chesterfield as shown in Appendix A, Land Use Map. Land usage is identified in Appendix A, Land Use Map, showing the majority of Land Usage in the Town of Chesterfield as either residential or park-related. Some commercial sites and one industrial site are marked. Table 2, Land Use Allocation, shows the approximate acres and percentage of coverage of each land use type. Table 3, Land Use Descriptions, provides further information on each land use type.

Based on the land use allocations, the primary source for pollutants in storm water would be residential or park related.

Table 2  
 Land Use Allocation

| Land Use                    | Approximate Area (Acres) | Approximate Percentage of Total |
|-----------------------------|--------------------------|---------------------------------|
| Commercial                  | 20                       | 1.2%                            |
| Parks and Recreation        | 50                       | 3.1%                            |
| Industrial                  | 25                       | 1.5%                            |
| Residential                 | 1490                     | 90.6%                           |
| Roadways, Street and Alleys | 55                       | 3.3%                            |
| Ponds and Water Bodies      | 5                        | 0.3%                            |
| Total                       | 1645                     | 100%                            |

\* Date taken from Aerial Photography flown in February 2004.

Table 3  
 Land Use Descriptions

| <b>Land Use</b>                 | <b>Description</b>  |
|---------------------------------|---|
| Commercial                      | The Commercial areas include two (2) shopping centers and a small strip of land from Veterans Blvd. along State Road 32 east to Vine Street, north and south of State Road 32. The Commercial areas include a shopping center, with a grocery store and retail shops including a gas station west of the Mill Creek Community Center, and a shopping center which is largely deserted except for two (2) restaurants and a financial institution. |
| Parks and Recreational          | Two (2) town- and township-controlled parks are located within Chesterfield. Walbridge Acres and Make Peace Park are used for a combination of little league baseball and basketball courts. Walbridge Acres Park has a boat access point to the White River, with a gravel access to the river. There are no beaches or formal swimming areas in either park.  |
| Industrial                      | The only industrial usage in Chesterfield is a warehousing operation on the west side of town, south of State Road 32. Wayne Products sells cleaning products to industries in Anderson, and stores paper products, cleaning fluids, and solvents and other similar products at this facility.  |
| Residential                     | The largest residential usage is for single family homes, occupying an average of 1/3 of an acre per house. There are several multi-family housing units in town, with several churches and one trailer park. Most residential properties have turf lawns surrounding the residential properties.   |
| Roadways and Streets and Alleys | Chesterfield has two (2) State highways including State Road 32 which splits the town into a North and South Zone and State Road 67 which is located on the southwest area of the town. In addition Chesterfield owns and maintains a street network that totals to approximately 55 acres of paved roadway.  |
| Ponds and Water Bodies          | The only standing water body in town, is the small lake at Walbridge Acres Park. This was constructed when Walbridge was originally built, and is not used by swimmers, fishers or any other recreational users in town. Chesterfield staff state that it was built for aesthetics.   |

### 3.2. Evaluation of Structural and Non-Structural Best Management Practices

Prior to discussing the locations of Structural and Non-Structural BMPs a definition for local municipal leaders is important.

*Structural BMPs* are engineered systems for controlling the impacts of storm water run-off before it leaves the site. Examples include detention and retention ponds, under parking lot storage, pavements that are porous and allow water to flow downward through the pavement and during construction erosion control and sediment control. Some other examples on an area wide basis are catch basins which allow sediment to drop out into the basin before the water flows to the receiving streams.

*Non Structure BMPs* are used to reduce the storm water run-off impact at the source. Examples are minimizing areas which contribute to run-off such as asphalt and concrete parking areas, pavements and trails, maximizing natural grass and vegetation, avoiding steep slopes in development and maximizing the time of concentration of storm water on a site.

Reviewing the in-field survey of Chesterfield, and Appendix A, Land Use Map, Chesterfield has no retention or detention basins, and many of the storm drains are combined sewers, which results in a significant amount of storm water being piped to the Anderson, Indiana wastewater treatment plant. Chesterfield has no known structural BMPs.

The Town of Chesterfield is currently in the planning stages of a large combined sewer separation project, which, when finished, will result in Chesterfield operating completely separated sewers with sanitary sewers carrying only wastewater, and old storm lines being converted to storm-only sewers. The addition of basins to catch sediment and road run-off will be designed as a best management practice.

The Mill Creek Ditch that runs through the center of town, north to the White River is part of the Madison County MS4, as it is a legal drain. Chesterfield's two (2) CSO points discharge directly to this legal drain. The Town of Chesterfield has not historically discharged large amounts of combined sewage into the ditch. The weirs at the CSO points are set high, resulting in only 2-3 overflows per year.

Nonstructural BMPs include the East Central Indiana Solid Waste District (ECISWD) "Cleanup Day" events that target collection of household hazardous wastes. The ECISWD location in Anderson, which opened in the summer 2004, operates the Madison County Recycling Center. The center accepts newspaper, other paper, cardboard, magazines, green, brown, clean glass, various plastics,

aluminum and steel cans, batteries, and tires. The ECISWD website lists used motor oil receiving facilities.

### 3.3. Discussion of Sensitive Areas

Sensitive waters are defined by the regulation in italics. For clarity, each of the types of sensitive areas identified as needing priority protection is addressed below in non-italic type:

*a waterbody identified as needing priority protection or remediation based on:*

*(A) having threatened or endangered species or their habitat;*

Figure 2 is the Endangered, Threatened and Rare Species; High Quality Natural Communities, and Significant Natural Areas Documented from Madison County, Indiana provided by the DNR on April 26, 2004. Figure 3 is the Endangered, Threatened and Rare Species Map provided by DNR on April 26, 2004. According to the DNR, the Indiana Natural Heritage Data Center database used to provide the data on endangered, threatened, and rare (ETR) species provides information on ETR species, high quality natural communities, and natural areas. For the most part, the data in the Indiana Natural Heritage Data Center is not the result of a comprehensive field study and may not show all ETR species, high quality natural communities, and natural areas.

The data does not indicate ETR species, high quality natural communities, and natural areas within Chesterfield limits.

*(B) usage as a public surface water supply intake;*

Due to matters of national security, the exact location of public surface water intakes is no longer available. IDEM Office of Water Quality, Groundwater Section employees including Section Chief Jim Sullivan and Bob Hamilton were contacted regarding this information. At the time of this report, no known public surface water intakes are known in Madison County; however, Indianapolis-Marion County has several surface water intakes. In the general area of immediately or at least 25 miles downstream of Chesterfield, there are no known public water intakes.

*(C) usage for full body contact recreation, such as bathing beaches; or*

DNR provided a list of recreation facilities from Indiana Recreation Facility Inventory in the county showing that the Town of Chesterfield has only two (2) recreational facilities within its jurisdiction. The two (2) recreational areas in town are listed in Table 4, Recreational Facilities in Chesterfield. These facilities

do not have beaches, bathing swimming or fishing facilities. Walbridge Acres Park has a boat access ramp, for smaller trailer pulled fishing boats, which typically use outboard engines. This access point is used frequently during the summer months only. Although there is access to the White River, the river is already listed as an impaired waterbody. Full body contact may occur in areas not necessarily listed. Discussions with the Town of Chesterfield’s Utilities Supervisor indicate the only known full body contact, other than listed recreational facilities, is possibly at Mounds State Park, which is outside of Chesterfield’s town limits.

Table 4  
 Recreational Facilities in Chesterfield

| Facility             | Beach | Lake with Swimming | River Name  | River Access |
|----------------------|-------|--------------------|-------------|--------------|
| Walbridge Acres Park | No    | No                 | White River | No           |
| Makepeace Park       | No    | No                 | Mill Creek  | No           |

Chesterfield will need to develop specific strategies, and implement these strategies for the Mill Creek contributions to the White River. The CSO project while removing human organic waste overflows, will contribute storm water discharges, and will need to be designed to remove solids and other material prior to discharge in Mill Creek.

*(D) exceptional use classification as found in 327 IAC 2-1-11(b), outstanding state resource water classification as found in 327 IAC 2-1-2(3) and 327 IAC 2-1.5-19(b).*

No water bodies in Chesterfield meet the exceptional use classification or the outstanding state resource water classification.

Figure 2

Endangered, Threatened and Rare Species; High Quality Natural Communities, and Significant Natural Areas Documented from Madison County, Indiana provided by the DNR on April 26, 2004

April 26, 2004

ENDANGERED, THREATENED AND RARE SPECIES,  
HIGH QUALITY NATURAL COMMUNITIES, AND SIGNIFICANT NATURAL AREAS DOCUMENTED  
FROM MADISON COUNTY, INDIANA

| TYPE                              | SPECIES NAME                | COMMON NAME                | STATE | FED | LOCATION                  | DATE | COMMENTS |
|-----------------------------------|-----------------------------|----------------------------|-------|-----|---------------------------|------|----------|
| Dot # 1                           |                             |                            |       |     |                           |      |          |
| Bird                              | ARDEA HERODIAS              | GREAT BLUE HERON           | **    | **  | T20NR07E 21               | 1997 |          |
| Dot # 2                           |                             |                            |       |     |                           |      |          |
| Wetland                           | WETLAND - FEN               | FEN                        | SG    | **  | T20NR08E 27 NH<br>NWQ NWQ | 1984 |          |
| Wetland                           | WETLAND - MARSH             | MARSH                      | SG    | **  | T20NR08E 27 NH<br>NWQ NWQ | 1984 |          |
| Dot # 3                           |                             |                            |       |     |                           |      |          |
| Bird                              | LANIUS LUDOVICIANUS         | LOGGERHEAD SHRIKE          | SE    | **  | T19NR08E NEAR<br>IRONDALE | 1924 |          |
| Dot # 4                           |                             |                            |       |     |                           |      |          |
| Vascular<br>Plant                 | HYPERICUM<br>PYRAMIDATUM    | GREAT ST.<br>JOHN'S-WORT   | SE    | **  | T19NR08E 09 NEQ<br>NEQ    | 1996 |          |
| Dot # 5                           |                             |                            |       |     |                           |      |          |
| Vascular<br>Plant                 | ONOSMODIUM<br>HISPIDISSIMUM | SHAGGY<br>FALSE-GROMWELL   | SE    | **  | T19NR08E 09               | 1907 |          |
| Dot # 6                           |                             |                            |       |     |                           |      |          |
| <u>MOUNDS FEN NATURE PRESERVE</u> |                             |                            |       |     |                           |      |          |
| Vascular<br>Plant                 | DESCHAMPSIA                 | TUFTED HAIRGRASS           | SR    | **  | T19NR08E 16 NWQ           | 1990 |          |
| Vascular<br>Plant                 | CESPITOSA                   |                            |       |     | SEQ                       |      |          |
| Vascular<br>Plant                 | JUGLANS CINEREA             | BUTTERNUT                  | WL    | **  | T19NR08E 09 & 16          | 1982 |          |
| Vascular<br>Plant                 | SELAGINELLA APODA           | MEADOW SPIKE-MOSS          | SE    | **  | T19NR08E 16 NWQ           | 1992 |          |
| Vascular<br>Plant                 | SELAGINELLA APODA           | MEADOW SPIKE-MOSS          | SE    | **  | SEQ                       |      |          |
| Vascular<br>Plant                 | SPIRANTHES LUCIDA           | SHINING<br>LADIES'-TRESSES | SR    | **  | T19NR08E 16 NWQ           | 1992 |          |
| Vascular<br>Plant                 | SPIRANTHES LUCIDA           | SHINING<br>LADIES'-TRESSES | SR    | **  | SEQ                       |      |          |
| Wetland                           | WETLAND - FEN               | FEN                        | SG    | **  | T19NR08E 16 NWQ           | 1990 |          |
| Wetland                           | WETLAND - FEN               | FEN                        | SG    | **  | SEQ                       |      |          |
| Dot # 7                           |                             |                            |       |     |                           |      |          |
| <u>MOUNDS STATE PARK</u>          |                             |                            |       |     |                           |      |          |
| Forest                            | FOREST - UPLAND<br>MESIC    | MESIC UPLAND FOREST        | SG    | **  | T19NR08E 16 SH            | 1990 |          |
| Insect                            | CORDULEGASTER<br>BILINEATA  | BROWN SPIKETAIL            | **    | **  | T19NR08E 09 & 16          | 1998 |          |

STATE: SX=extirpated, SE=endangered, ST=threatened, SR=rare, SSC=special concern, WL=watch list,  
SG=significant,\*\* no status but rarity warrants concern  
FEDERAL: LE=endangered, LT=threatened, LELT=different listings for specific ranges of species, PEproposed  
endangered, PT=proposed threatened, BSA=appearance similar to LE species,\*\*=not listed

1

April 26, 2004

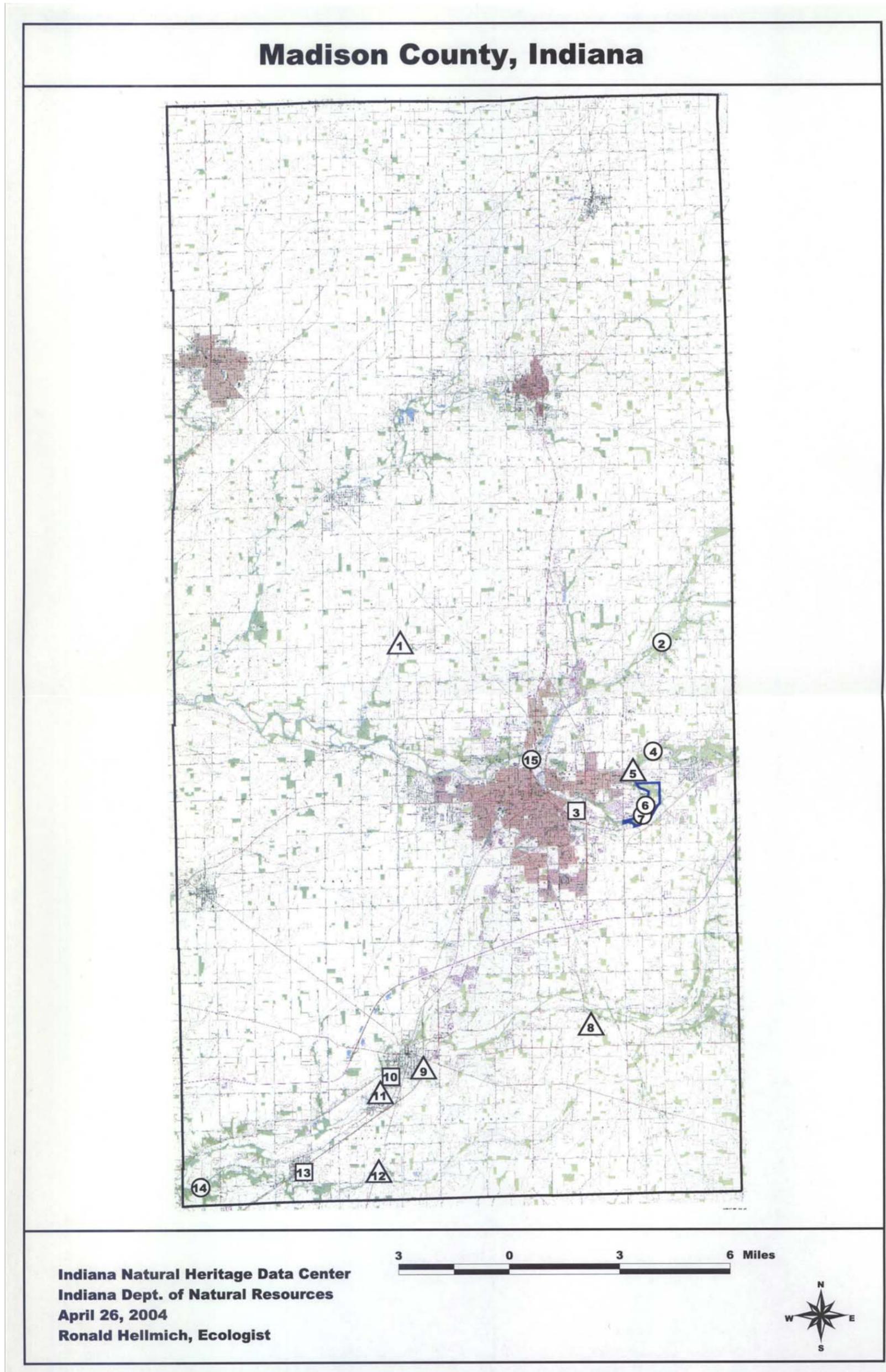
ENDANGERED, THREATENED AND RARE SPECIES,  
HIGH QUALITY NATURAL COMMUNITIES, AND SIGNIFICANT NATURAL AREAS DOCUMENTED  
FROM MADISON COUNTY, INDIANA

| TYPE              | SPECIES NAME                    | COMMON NAME                  | STATE | FED | LOCATION                   | DATE | COMMENTS           |
|-------------------|---------------------------------|------------------------------|-------|-----|----------------------------|------|--------------------|
| Dot # 8           |                                 |                              |       |     |                            |      |                    |
| Mammal            | TAXIDEA TAXUS                   | AMERICAN BADGER              | SE    | **  | T18NR08E 17 NWQ<br>NWQ NWQ | 2000 |                    |
| Dot # 9           |                                 |                              |       |     |                            |      |                    |
| Mammal            | TAXIDEA TAXUS                   | AMERICAN BADGER              | SE    | **  | T18NR07E 21                | 1983 |                    |
| Dot # 10          |                                 |                              |       |     |                            |      |                    |
| Bird              | NYCTICORAX                      | BLACK-CROWNED<br>NIGHT-HERON | SE    | **  | T18NR07E                   | 1949 |                    |
| Bird              | NYCTICORAX                      | BLACK-CROWNED<br>NIGHT-HERON | SE    | **  | PENDLETON                  |      |                    |
| Bird              | RALLUS ELEGANS                  | KING RAIL                    | SE    | **  | T18NR07E<br>PENDLETON      | 1930 |                    |
| Bird              | RALLUS ELEGANS                  | KING RAIL                    | SE    | **  | PENDLETON                  |      |                    |
| Dot # 11          |                                 |                              |       |     |                            |      |                    |
| Mammal            | TAXIDEA TAXUS                   | AMERICAN BADGER              | SE    | **  | T18NR07E 29                | 1984 |                    |
| Dot # 12          |                                 |                              |       |     |                            |      |                    |
| Vascular<br>Plant | JUGLANS CINEREA                 | BUTTERNUT                    | WL    | **  | T17NR07E 05                | 1933 |                    |
| Dot # 13          |                                 |                              |       |     |                            |      |                    |
| Vascular<br>Plant | VALERIANELLA<br>CHENOPODIIFOLIA | GOOSE-FOOT<br>CORN-SALAD     | SE    | **  | NEAR INGALLS               | 1913 |                    |
| Dot # 14          |                                 |                              |       |     |                            |      |                    |
| Vascular<br>Plant | POA PALUDIGENA                  | BOG BLUEGRASS                | WL    | **  | T17NR06E 04 NEQ<br>NEQ SWQ | 1996 |                    |
| Dot # 15          |                                 |                              |       |     |                            |      |                    |
| Mollusk           | PLEUROBEMA CLAVA                | CLUBSHELL                    | SE    | LE  | T19NR07E 1989WQ<br>NWQ NEQ |      | WEATHERE<br>SHELLS |
| Mollusk           | TOXOLASMA PARVUM                | LILLIPUT                     | **    | **  | T19NR07E 1989WQ<br>NWQ NEQ |      | FRESH DEA          |

STATE: SX=extirpated, SE=endangered, ST=threatened, SR=rare, SSC=special concern, WL=watch list,  
SG=significant,\*\* no status but rarity warrants concern  
FEDERAL: LE=endangered, LT=threatened, LELT=different listings for specific ranges of species, PEproposed  
endangered, PT=proposed threatened, BSA=appearance similar to LE species,\*\*=not listed

2

Figure 3  
Endangered, Threatened and Rare Species Map provided by DNR on April 26, 2004



#### **4. REVIEW OF EXISTING/AVAILABLE WATER QUALITY DATA**

A very large quantity of existing and available water quality data was obtained. Most of the information was provided in a watershed by watershed basis. The Madison County Department of Health provided a countywide summary. That summary points to failing and illegally connected septic systems as a large source of surface water contamination. Illegally connected septic systems often use the existing storm water conveyance system as a sewage conveyance system straight to surface waters without treatment. Failing septic systems often enter storm water conveyance systems during storm events. The Madison County Health Department Letter is included as Figure 4.

The water quality standards summarized in Table 5, Selected Indiana State Water Quality Standards, are several of the approximately 90 standards in existence. These selected standards were chosen as they were judged to be those most likely to be impacted by wet weather. This table is largely recreated from the Stream Reach Characterization and Evaluation Study conducted by Anderson, Indiana in 2003. These water quality criteria were deemed to be most significant in some part because they have been considered by US EPA and Anderson, Indiana to be important for the West Fork of the White River. Since this watershed comprises a large portion of Madison County, these criteria were judged appropriate.

As far as Fish Community Assessments, two (2) indexes are used. The QHEI is a Qualitative Habitat Evaluation Index used to score the available habitat for potential biological community structure. The higher the score, the more diverse and better quality the habitat is. The highest available QHEI is 100. IDEM considers a QHEI total score of <51 to be poor for habitat, meaning habitat quality could have a negative effect on the biological communities present. The Fish Community Index of Biotic Integrity (IBI) is used to determine biological integrity. Table 6, Fish Community Index of Biologic Integrity Scores and Integrity Class, from IDEM's Surface Water Quality Assessment Program Fish Community Sampling Program document shows the possible scores and the integrity class assigned to those scores.

Figure 4  
Madison County Health Department Letter

Richard H. Shafer, M.D.  
Health Officer



Stephen L. Ford, R.E.H.S.  
Administrator

RQAW CORPORATION

FEB 12 2004

February 11, 2004

Angie Martin  
RQAW  
4755 Kingsway Drive  
Indianapolis, Indiana 46205

Dear Ms. Martin,

This letter is in response to your request for information regarding sewage issues that the Madison County Health Department (MCHD) is currently addressing. At the present, we are involved with several sewage discharge issues throughout Madison County that most certainly have a negative impact on public waterways.

A number of problems are being investigated outside of the Town of Alexandria in Monroe Township. Sewage discharge above ground and into storm drains have been documented in the housing additions of Phillips Land and Gas, Plate Glass, Thomas Sleeth's 1<sup>st</sup>, D.M. Scott, and Innsdale. On-site sewage disposal systems experience problems due to restrictive soils and, in many cases, reduced lot sizes which prohibit properly-sized lateral fields. Some properties do not utilize an on-site lateral field resulting in direct sewage discharge into a tile or storm drain which eventually discharges into Pipe Creek or other public waterway.

South Elwood Addition and Sycamore Hills in Pipe Creek Township are two areas where sewage issues are being or have been addressed. Most situations involve sewage discharge into storm drains or directly into Duck Creek or Little Duck Creek. The Wilburn Addition and Yarling Addition and surrounding areas have also been an area of failed sewage disposal systems and sewage discharge into side ditches. On January 23, 2004, a letter was provided to Mr. Jerry Bridges, Madison County Council of Governments, detailing this department's involvement with sewage related issues for the Wilburn Addition and Yarling Addition, 750 West, and State Road 37 and the need for sanitary sewer.

Richland Woods located in Richland Township has been a problem area for several years. In 1986, the Madison County Board of Health issued a moratorium on sewage disposal system permits for new home construction. Instances of failed sewage disposal systems and discharge into storm drains and catch basins have been periodically reported to this office.

Madison County Government  
Center Annex  
206 East 9th Street  
Anderson, Indiana 46016  
641-9523 • 641-9524  
Fax: 765-646-9203

Nursing/HIV-STD Services  
646-9206

WIC  
646-9272

Page 2  
Angie Martin

One area that the MCHD is currently addressing is located along 1700 North, east of 150 East in Van Buren Township. Sewage discharge from failed sewage disposal systems and into adjacent tiles and an open ditch have been documented. This area is similar to many areas in Madison County where soil conditions, most notably a seasonal high water table, make for difficult sewage disposal conditions. This coupled with restrictive lot sizes pose difficult, if seemingly unsolvable, problems.

There are two unincorporated areas in Madison County that contain a number of residential and non-residential properties and several sewage disposal challenges. Perkinsville, located in Jackson Township, is situated adjacent to White River. The MCHD has documented sewage discharge into catch basins and directly into White River. One such investigation has resulted in an extraordinary step being taken by a business owner in this area. In order to eliminate his sewage discharge into the river, a partnership was established with a local church to combine wastewater from the two structures and discharge into a constructed wetland. Unfortunately, many property owners may not have these same resources available and although a certain percentage of wastewater discharge into White River was eliminated, we believe there may be other contributing properties. Although the majority of the soils in this area are well-drained, small lot sizes are prevalent and can make installing a properly-sized sewage disposal system very difficult. Fishersburg, in Stony Creek Township, is a second unincorporated area whose sewage problems have been well documented. Since at least 1982, the MCHD has investigated sewage issues and performed dye tests to determine the specific sources of the problems. Sewage discharge directly into Addison Ditch and ultimately into Stony Creek has been a serious public health threat. Fortunately, plans are in place to extend sanitary sewer to Fishersburg which will eliminate illegal sewage discharge into associated waterways.

We hope that you will find this information beneficial and should you require further assistance, please do not hesitate to contact us.

Respectfully,

Brandon Clidence  
Environmental Supervisor

**Table 5**  
**Summary of Indiana State Water Quality Standards Chosen for Baseline Monitoring Report Comparison**

| Parameters                               | AAC<br><sup>1</sup> Maximum   | CCC 4-Day Average      |              |                       |
|--|---|------------------------|--------------|-----------------------|
|  |   | Outside of Mixing Zone |              | Point of Water Intake |
|  |   | Aquatic Life (CAC)     | Human Health | Human Health          |
| Copper <sup>1</sup> (ug/l)               | 21 - 152  | 14 - 83                |              |                       |
| Lead <sup>1</sup> (ug/l)                 | 105 - 1,488   | 4.1 - 58.0             |              | 50                    |
| Nickel <sup>1</sup> (ug/l)               | 1,678 - 9,763   | 203 - 1,229            | 100          | 13.4                  |
| Zinc <sup>1</sup> (ug/l)                 | 138 - 808   | 125 - 732              |              |                       |
| NO <sub>2</sub> + NO <sub>3</sub> (mg/l) |   |                        |              | 10                    |
| Total Ammonia <sup>2</sup> (mg/l)        | 0.5 - 28.7  |                        |              |                       |
| Total Cyanide (ug/l)                     | 22  | 5.2                    |              | 200                   |
| pH                                       | No pH values below 6 or above 9, except daily fluctuations that exceed pH 9 and are correlated with photosynthetic activity, shall be permitted.  |                        |              |                       |
| Dissolved Oxygen (mg/l)                  | Concentrations of dissolved oxygen shall average at least 5 mg/l per calendar day and shall not be less than 4 mg/l at any time.  |                        |              |                       |
| <i>E. Coli</i> (#/100 ml)                | <i>E. Coli</i> bacteria shall not exceed 125 #/100 ml as a geometric mean based on not less than five (5) samples equally spaced over a thirty day period nor exceed 235 #/100 ml in any one sample in a thirty day period during the recreation season (April through October inclusive).<br>For public water supply, the coliform bacteria group shall not exceed 5,000 #/100 ml a monthly average value; nor exceed this number in more than 20% of the samples examined during any month; nor exceed 20,000 #/100 ml in more than 5% of such samples. |                        |              |                       |
| Dissolved Solids (mg/l)                  | Dissolved solids shall not exceed 750 mg/l in all waters.   |                        |              |                       |
| Sulfates (mg/l)                          | Sulfates shall not exceed 250 mg/l in all waters.   |                        |              |                       |

<sup>1</sup> The AAC (acute aquatic criterion) and CAC (chronic aquatic criterion) for copper, lead, nickel, and zinc are calculated using the associated hardness value. The ranges shown are the ranges calculated for each observation in the database.

<sup>2</sup> The maximum total ammonia criterion is calculated using the associated pH value. The range shown is the possible range

Table 6  
 Fish Community Index of Biologic Integrity Scores and Integrity Class

| Total IBI Score | Integrity Class | Attributes  |
|-----------------|-----------------|---|
| 58-60           | Excellent       | Comparable to pristine conditions, exceptional assemblage of species.                             |
| 48-52           | Good            | Decreased species richness, intolerant species in particular: sensitive species present.          |
| 40-44           | Fair            | Intolerant and sensitive species absent; skewed trophic structure.                                |
| 28-34           | Poor            | Top carnivores and many expected species absent or rare: omnivores and tolerant species dominant. |
| 12-22           | Very Poor       | Few species and individuals present; tolerant species dominant; diseased fish frequent.           |
|                 | No fish         | Repeated sampling finds no fish.  |

The watersheds within the Town of Chesterfield include the White River-Shoemaker Ditch (Delaware) (05120201030020) and White River - Turkey Creek (05120201030030).

The eastern portion of this watershed is located in Madison County with the western portion in Delaware County. Portions of the City of Anderson as well as the Town of Chesterfield are located within this watershed. The City of Anderson and the Town of Chesterfield are CSO communities. Land use in the county outside the incorporated areas is predominately Fields and Pastures, Single Family Residential, and Farmsteads. There are small sections of High Density Residential, Light Industrial, Heavy Industrial, and Parks and Open Spaces in the watershed.

Portions of this watershed are identified as a 303(d) impaired waterbody for *E. Coli*, impaired biotic communities, and fish consumption advisory for PCBs.

No Fish Community Assessments were provided for this watershed. Macroinvertebrate Community information was obtained for this watershed. There were a total of two (2) samples taken in 1992 and 1996 in White River-Turkey Creek, 05120201030030. The habitat scores were 62 and 71. Habitat scores less than 54 are considered too low. The Macroinvertebrate Index Biotic Integrity (MIBI) scores were 3.4 and 4.8. MIBI scores less than 2.2 are considered impaired.

IDEM Assessment Branch provided data on this HUC from multiple samples taken in 1996 and 2001. Copper, lead, nickel and zinc, total ammonia, nitrates and nitrites, total

cyanide, pH, dissolved solids, and sulfates were well within Indiana state water quality standards in the only sample that had results for those parameters taken in 2001. *E. Coli* results from 2001 ranged from 93 to 2000 CFU/100 ml well outside the Indiana water quality standard of 235 CFU/100 ml. The 235 CFU/100ml limit was used because the data does not lend itself to averages.

According to the 2004 303(d) Report, aquatic life is partially to not supported, fish consumption is partially supported, and primary contact is not supported. The causes and impairments sited include slightly impaired biotic communities, a moderately impaired PCB and sulfate levels, and slightly impaired mercury and pathogen levels.

## 5. IDENTIFICATION OF POTENTIAL AREAS OF CONCERN

### 5.1. Definition of MS4 and Waters of the State

Open ditches including roadside ditches and legal drains are classified as conveyances and are therefore portions of the Madison County MS4, and are not waters of the state. The points where open ditches enter receiving waters are defined as MS4 outfalls.

No new receiving waters have been identified since the NOI submittal, based on the definition applied to the open ditches as described above. Receiving waters are identified in Table 1, Watersheds Associated with the Town of Chesterfield.

### 5.2. Report on New Data

No additional new data sources were created in order to provide additional information on water quality conditions within this community.

## 6. RESULTS OF DATA EVALUATION

### 6.1. Characterization of MS4 Conditions

#### 6.1.1. *Sensitive Areas for Priority Attention*

The Town of Chesterfield has not identified any areas for priority attention. Chesterfield has chosen to continue efforts for combined sewer separation.

#### 6.1.2. *Areas with Potential for Storm Water Quality Problems*

The two (2) CSO outfalls are areas with potential for storm water quality problems.

#### 6.1.3. *BMP Evaluation Results*

Chesterfield has no known structural BMPs. The effectiveness of the non-structural BMPs will be measured upon implementation of the Part C. As stated previously, the town is implementing the BMP of separating their sewers.

#### 6.1.4. *Potential Sites for Additional BMPs*

New and continuing development will require storm water retention resulting in storage BMPs. Possibly the most effective BMP is the separation of sewers.

At this time, the water treatment BMPs including those BMPs to remove floatables, eroded soil, and petroleum products, such as vortex type units, do not need to be installed in existing facilities. During development of the ordinance for post construction run-off, the Town of Chesterfield will explore requirements for BMPs for new construction. Presumably, the soon to be released DNR Indiana Storm Water Quality Manual will provide specific guidance on requirements for and selection of post construction BMPs.

### 6.2. Characterization of Water Quality Data

#### 6.2.1. *Key Observations on Water Quality*

The following key observations were developed during the data review and evaluation process regarding the existing water quality conditions in

the MS4 Area. Chesterfield is located within watersheds associated with impaired waterbodies. These waters are listed as impaired waters due to high concentrations of *E. Coli* and impaired biotic communities. *E. Coli* is a bacterium that inhabits the intestinal tract of humans and other mammals. The presence of *E. Coli* in high concentrations in waterbodies may indicate a source of raw sewage, either human or from nature, is entering the waterbody. High levels of *E. Coli* preclude a waterbody from being safe for full body contact, *i.e.*, swimmable. There are combined sewer overflow (CSO) communities upstream of and in Chesterfield. The elevated *E. Coli* levels are at least partially due to the CSOs. Small unregulated confined feeding/livestock and pets can also contribute to *E. Coli* loadings. Wastewater treatment plants are not required to disinfect from October to April. The lack of disinfection results in *E. Coli* passing through the wastewater treatment plant into the receiving stream. Research is ongoing to determine if receiving streams are then "preloaded" with *E. Coli* prior to April, the beginning of recreation season.

#### **6.2.2. *Conclusions from Data Analysis***

The watersheds associated with Chesterfield are of 303(d) impaired waters. The waters are listed as impaired for *E. Coli* and impaired biotic communities.

Sources of *E. Coli* include CSO communities upstream from the impaired waters, failing septic systems, discharges from wastewater treatment facilities from October to April when disinfection is not required, confined feeding/livestock, pets, and wildlife. The CSO communities are being required and monitored by IDEM to develop Long Term Control Plans to reduce/eliminate additional *E. Coli* discharges to the waterbodies. IDEM is considering requiring year round disinfection. IDEM should consider regulating smaller exempt confined feeding/livestock farms. Chesterfield will consider pet feces management in future ordinances. Wildlife feces are not an item that can be controlled and will have to be considered an uncontrollable source of *E. Coli*.

The TMDL studies for impaired biotic communities will search for the cause of the impaired biotic communities. The TMDL development schedule for these TMDL studies indicates these studies will be several years.

There are very few industrial and commercial sources of storm water pollution in the Town of Chesterfield.

6.3. Strategy for Continued Characterization Efforts

Some additional data has been requested, but not yet received. If any data is received before the submission of the Part C that has a substantial effect on this report, it will be included in an amendment submitted in conjunction with the Part C.

Chesterfield has no current plans to implement monitoring by the town alone. It will consider these efforts, should it become aware of pollution, water quality problems and other issues in waters originating outside the town, passing through the Mill Creek. It will also consider monitoring should it enlarge its boundaries by annexation, to include other MS4 conveyances.

The Town of Chesterfield will consider partnering with another entity either private or public that has an interest in the surface waters in or near Chesterfield. Chesterfield feels once the CSO project is complete that it will not be contributing any significant water quality problems to the White River, such as *E. Coli*, high or low pH's or microorganisms that demand oxygen depleting the availability for aquatic life. It is probable that the Town of Chesterfield could consider sampling the separated sewer system to prove the lack of contaminants

6.4. Follow-up Work Prior to Submittal of Storm Water Quality Management Plan - Part C

Considering the vast amount of data available indicating that Madison County waters of the state have elevated levels of *E. Coli*, no additional monitoring will be conducted in the first year of the permit to continue efforts to characterize general and specific water quality conditions in the MS4 Area.

## 7. AREAS WITH POTENTIAL FOR CAUSING STORM WATER QUALITY PROBLEMS

The Town of Chesterfield has three (3) areas within the MS4 jurisdiction that have the potential for causing storm water problems, and will soon be contributing much more storm water run-off, once Chesterfield completes a planned CSO project. While this is not a current source or problem it will need to be addressed in future updates.

### 7.1. CSO Points one (1) and two (2)

Appendix A, Land Use Map, shows the location of Chesterfield's two (2) CSO points. One is at the intersection of Mill Creek with SR 32 and the second is two (2) blocks south of SR 32.

#### 7.1.1. *Potential negative effects*

Potential negative effects include contribution of biochemical oxygen demand, reducing available oxygen for aquatic life, increased ammonia in the waters, increased suspended solids, increased or decreased pH and harmful bacterial and pathogens such as *E. Coli*, coliform and fecal coliform.

#### 7.1.2. *Mitigation plans*

Mitigation plans include removing the CSO points. Chesterfield will do this with a CSO separation project.

### 7.2. Make Peace Park

Chesterfield has an area at the north part of Make Peace Park where it stores sand, salt and aggregate for the local roads and streets department use. These materials are not currently housed in concrete apron bins, but simply left piled on the ground in several locations. During storm events, run-off from the piles can end up in Mill Creek, and the White River.

#### 7.2.1. *Potential negative effects*

The primary types of aggregates used are limestone and some gravel. Limestone dust contributes to the sediment in the stream and river, and can alter water chemistry. Salt residue can be harmful to aquatic life and to some type of vegetation.

### **7.2.2. *Mitigation plans***

Chesterfield plans to construct concrete aprons, and wooden storage bins, with a covered roof to house the material. This will greatly limit or stop the run-off from stock piles of materials.

### **7.3. Walbridge Acres**

Walbridge Acres has a boat ramp access point, to the White River. This point has a gravel drive back to the boat ramp.

#### **7.3.1. *Potential negative effects***

Potential negative effects involve erosion from the surrounding soil

#### **7.3.2. *Mitigation Plans***

Chesterfield can work with the IDNR to plant additional vegetation, native to the area along the banks, and potentially pave the boat ramp or place a porous pavement material limiting erosion from the access and egress of boaters.

## 8. CORRELATION OF COLLECTED DATA, LAND USAGE AND WATER QUALITY

A review of data for chemicals, organics and metals revealed no contributing sources in the Town of Chesterfield. Stream quality monitoring data for the IDEM Station 21IN173896 was not available; this is the nearest station to Chesterfield, and is upstream from Chesterfield. It would not be useful as a tool to monitor any pollutants Chesterfield might contribute to the White River.

Due to the limited direct monitoring stations, and availability of information near Chesterfield, direct correlations between the Chesterfield Contributions to water quality problems, and the water quality problems is not clear. Because of the costs, Chesterfield is not eager to perform monitoring on its own, and can only make assumptions as to the effect of its known discharges on water quality in Mill Creek and the White River.

### 8.1. Known Water Quality Problems by Discharge Type

Chesterfield knows it discharges during heavy rain events through its two (2) CSO points. It is aware of the types and concentrations of the constituents of raw wastewater, and the effects these constituents have on Indiana Waters. It is also aware that at two (2) other locations other than the CSO points, additional sediment due to erosion and run-off from stockpiles of material is present. What is not known is to the extent that these problems are contributing to overall water qualities in Mill Creek and the White River. The CSO discharges only occur during heavy rains, which clearly result in diluted concentrations of wastewater entering the MS4 waters. Also, it is known that the effects of the wastewater in the MS4 waters are greatly diminished at some distance from the entry points. Erosion from stockpiles occurs only during rain events, and the erosion must flow some distance to reach Mill Creek, also mitigating the concentrations of salt and solids entering the Mill Creek. Erosion from boats entering the White River can be far reaching depending on the geometry of the channel at the entrance location.

### 8.2. BMP Assessment

Since Chesterfield knows there is some effect on receiving waters from its activities, but cannot correlate data available with noticeable MS4 water degradation, it will need to perform additional field investigations, and determine the amounts run-off and concentrations entering the receiving streams during Part C Structural and Non Structural BMP assessment and plans for implementation of additional BMPs.

### **8.2.1. *Structrual BMPs***

Chesterfield has no formal retention or detention ponds, underground pavement storage tanks, or other large scale structural BMP. It does have a number of storm water catch basins, which it maintains on a routine schedule.

### **8.2.2. *Non-Structural BMPs***

Chesterfield has taken an active role in maintaining vegetation along Mill Creek, limiting erosion along Make Peace Park properties by building gentle slopes and planting grass and vegetation, and is considering porous trail material for a project that the Madison County Council of Governments is planning from Mounds State Park, through Chesterfield, along Make Peace Park and Walbridge Acres Park on towards Daleville in Delaware County.

## 9. ADDITIONAL CONSIDERATIONS

- ❖ Chesterfield, in addition to the required Part B and Part C provisions, will need to determine what the Town of Chesterfield is contributing to water quality problems and also identify any outside water quality problems, so it is not held accountable for problems created by another entity.
- ❖ Chesterfield will need to modify its existing storm water collection system, to catch and trap sediment, once the separation project begins. Because of additional storm water entering the stream and river, Chesterfield will be more aware of run-off from business, commercial and industrial sites, and residences in the Town of Chesterfield.
- ❖ Chesterfield owns and operates its own street sweeper. This sweeper is operated twice per month. During the CSO separation, and after the sewers in Chesterfield are 100% separated, Chesterfield will need to use the sweeper more frequently, in addition to performing additional storm sewer maintenance.
- ❖ Chesterfield is creating a storm water utility, to assess and charge for Chesterfield's storm water drainage. As a part of this Chesterfield will develop methods to charge businesses, and homes at different rates depending on items such as roof area, impervious areas, and green space areas.
- ❖ Chesterfield is investigating porous pavement materials for parks and trails in the Town of Chesterfield. These materials can aid in reducing run-off, and may be used near the storage areas at Make Peace Park and for use near the boat ramp at the Walbridge Acres Park.

# Appendix A Land Use Map