FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Environmental Assessment and Restoration,

Bureau of Watershed Restoration

SOUTHWEST DISTRICT • LITTLE MANATEE RIVER BASIN

TMDL Report

Fecal Coliform TMDL for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790)

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Acknowledgments

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2008 305(b) Report

http://www.dep.state.fl.us/water/docs/2008_Integrated_Report.pdf

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Region 4: Total Maximum Daily Loads in Florida

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Chapter 1: INTRODUCTION

1.1 Purpose of Report

This report presents the Total Maximum Daily Load (TMDL) for fecal coliform for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) located in the Tampa Bay Tributaries Basin – Little Manatee River Planning Unit **(Figure 1.1)**. These freshwater streams were verified impaired for fecal coliform, and were included on the Verified List of impaired waters for the Tampa Bay Tributaries Basin that was adopted by Secretarial Order in May 19, 2009. The TMDL establishes the allowable loadings to the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds that would restore the waterbody so that it meets its applicable water quality criteria for fecal coliform.

1.2 Identification of Waterbody

To provide a smaller-scale geographic basis for assessing, reporting, and documenting water quality improvement projects, FDEP divides basin groups into smaller areas called planning units. Planning units help organize information and management strategies around prominent sub-basin characteristics and drainage features. To the extent possible, planning units were chosen to reflect sub-basins that had previously been defined by the SWFWMD. Little Manatee River and South Fork Little Manatee River are located within the Little Manatee River Planning Unit. For assessment purposes, the Department has divided the Little Manatee River Planning Unit into water assessment polygons with a unique **w**ater**b**ody **id**entification (WBID) number for each watershed. Little Manatee River is identified as WBID 1742A and the South Fork Little Manatee River is identified as WBID 1790 (**Figure 1.1**).

1.2.1 Little Manatee River (WBID 1742A)

The Little Manatee River (WBID 1742A) watershed encompasses 15,110 acres. The predominant landuses are approximately 2,169 acres of urban and built-up, 2,627 acres of wetlands, and 4,314 acres of agriculture. Little Manatee River is located partially in Hillsborough and Manatee County. Refer to **Figure 1.2.** The climate in Hillsborough and Manatee Counties, specifically areas surrounding the Little Manatee River watershed, is sub-tropical with annual rainfall averaging approximately 52.70 inches, although rainfall amounts can vary greatly from year to year (CLIMOD, 2008). Based on data from a 30-year period (1971 – 2000), the average summer temperature is 90.2^{o}F, and the average winter temperature is 74.7^{o}F (CLIMOD, 2008). The topography of the Little Manatee River watershed reflects its location within the Southwestern Florida Flatwoods or Southern Coastal Plains ecoregion. Elevations in the downstream portion or southern part of the watershed range from around 0 – 10 feet above sea level and in the upstream portion or northern part of the watershed around 50 – 60 feet above sea level (FDEP, 2008). The predominant soil types are shelly sand and clay downstream and medium fine sand and silt upstream (FDEP, 2008). No major human population centers exist within the watershed.

1.2.1 South Fork Little Manatee River (WBID 1790)

The South Fork Little Manatee River (WBID 1790) watershed encompasses 18,514 acres. The predominant landuses are approximately 2,615 acres of urban and built-up, 2,602 acres of wetlands, and 9,623 acres of agriculture. The South Fork Little Manatee River is co-located in Hillsborough and Manatee Counties. Refer to **Figure 1.2.** The climate in Hillsborough and Manatee Counties, specifically areas surrounding the South Fork Little Manatee River watershed, is sub-tropical with annual rainfall averaging approximately 52.70 inches, although rainfall amounts can vary greatly from year to year (CLIMOD, 2008). Based on data from a 30-year period (1971 – 2000), the average summer temperature is 90.2^{o}F, and the average winter temperature is 74.7^{o}F (CLIMOD, 2008). The topography of the South Fork Little Manatee River watershed reflects its location within the Southwestern Florida Flatwoods or Southern Coastal Plains ecoregion. Elevations in the downstream portion or southern part of the watershed range from around 50 – 60 feet above sea level and in the upstream portion or northern part of the watershed around 80 – 90 feet above sea level (FDEP, 2008). The predominant soil types are medium fine sand and silt downstream and clayey sand upstream (FDEP, 2008). No major human population centers exist within the watershed.

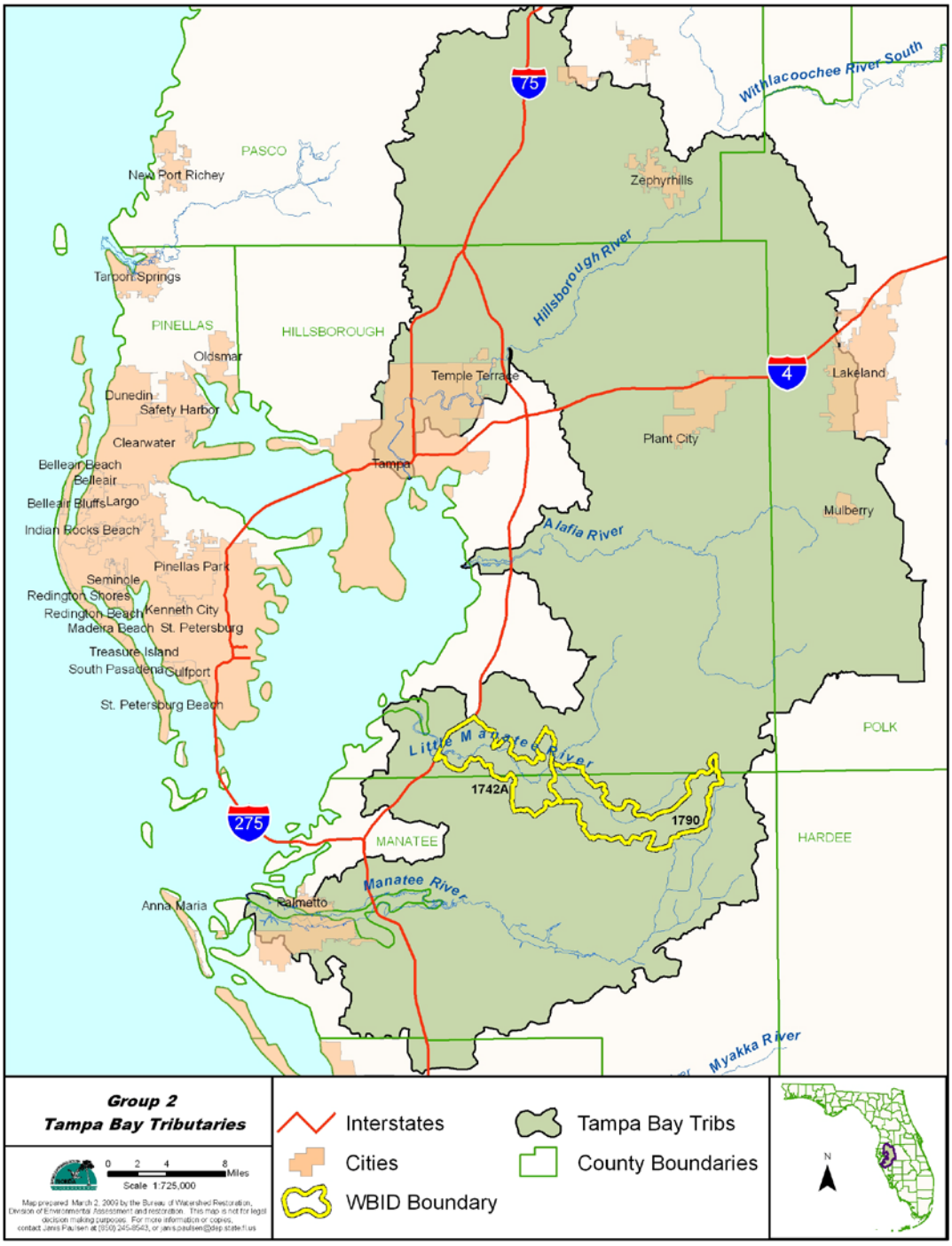

Figure 1.1 Location of Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) Watershed with Major Geopolitical Features in the Tampa Bay Tributaries Basin

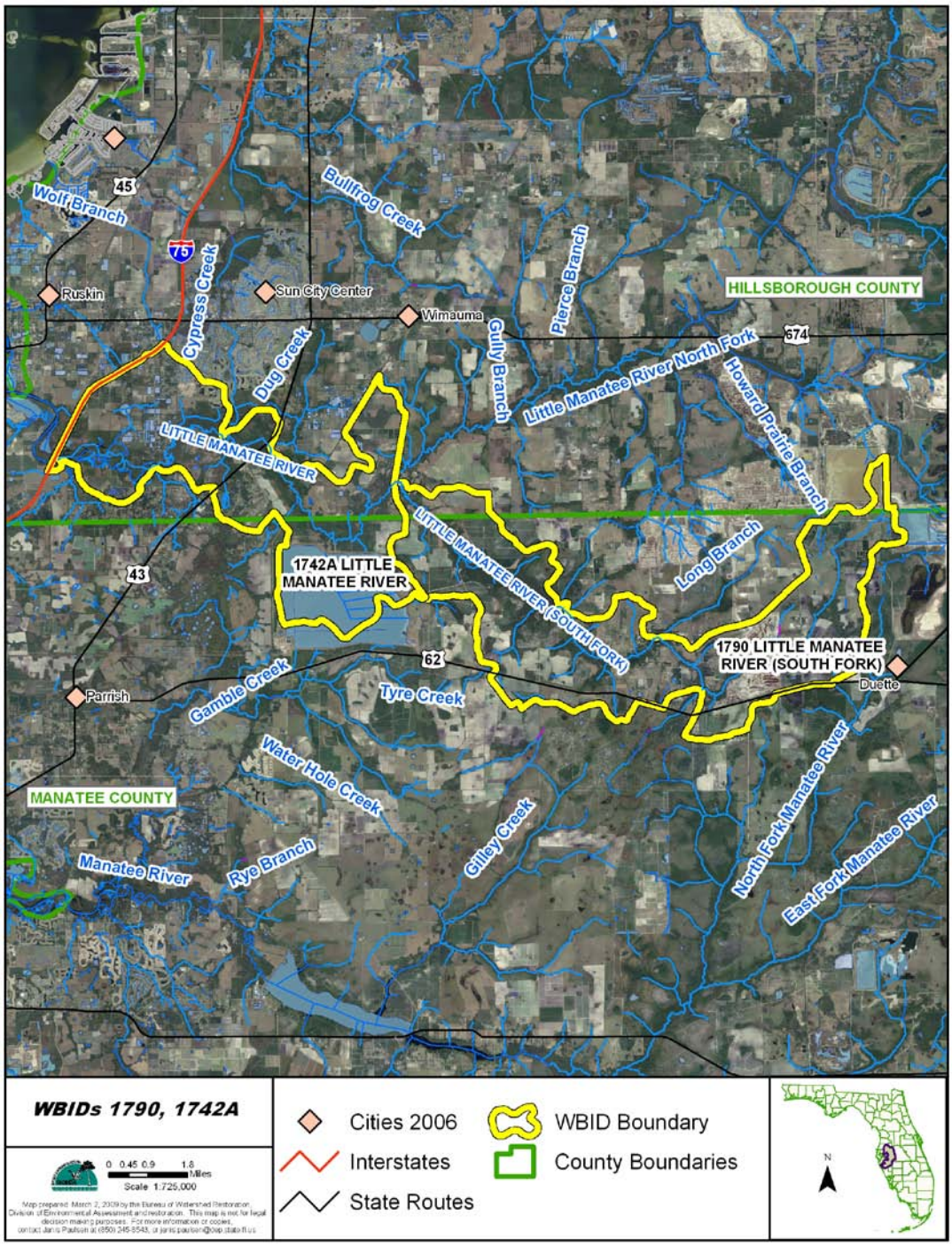

Figure 1.2 Location of Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) Watershed with Major Geopolitical Features in the Little Manatee River Planning Unit

1.3 Background

This report was developed as part of the Florida Department of Environmental Protection's (Department) watershed management approach for restoring and protecting state waters and addressing TMDL Program requirements. The watershed approach, which is implemented using a cyclical management process that rotates through the state's fifty-two river basins over a five-year cycle, provides a framework for implementing the TMDL Program–related requirements of the 1972 federal Clean Water Act and the 1999 Florida Watershed Restoration Act (FWRA, Chapter 99-223, Laws of Florida).

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet water quality standards, including its applicable water quality criteria and its designated uses. TMDLs are developed for waterbodies that are verified as not meeting their water quality standards. TMDLs provide important water quality restoration goals that will guide restoration activities.

This TMDL Report will be followed by the development and implementation of a Restoration Plan to reduce the amount of fecal coliform that caused the verified impairment of Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790). These activities will depend heavily on the active participation of the Southwest Florida Water Management District, local governments, businesses, and other stakeholders. The Department will work with these organizations and individuals to undertake or continue reductions in the discharge of pollutants and achieve the established TMDLs for impaired waterbodies.

Chapter 2: DESCRIPTION OF WATER QUALITY PROBLEM

2.1 Statutory Requirements and Rulemaking History

Section 303(d) of the federal Clean Water Act requires states to submit to the U.S. Environmental Protection Agency (EPA) lists of surface waters that do not meet applicable water quality standards (impaired waters) and establish a TMDL for each pollutant causing impairment of listed waters on a schedule. The Department has developed such lists, commonly referred to as 303(d) lists, since 1992. The list of impaired waters in each basin, referred to as the Verified List, is also required by the FWRA (Subsection 403.067[4], Florida Statutes [F.S.]); the state's 303(d) list is amended annually to include basin updates.

Florida's 1998 303(d) list included several waterbodies in the Tampa Bay Tributaries Basin. Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) are 1998 303(d) listed. However, the FWRA (Section 403.067, F.S.) stated that all previous Florida 303(d) lists were for planning purposes only and directed the Department to develop, and adopt by rule, a new science-based methodology to identify impaired waters. After a long rulemaking process, the Environmental Regulation Commission adopted the new methodology as Rule 62-303, Florida Administrative Code (F.A.C.) (Identification of Impaired Surface Waters Rule, or IWR), in April 2001; the rule was modified in 2006 and 2007.

2.2 Information on Verified Impairment

The Department used the IWR to assess water quality impairments in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds and verified the impairments for fecal coliform (**Table 2.1**). **Table 2.2** summarizes the data collected during the verification period (January 2001 – June 2008). As shown in **Table 2.1**, the projected year for the fecal coliform bacteria TMDLs was 2008, but the Settlement Agreement between EPA and Earthjustice, which drives the TMDL development schedule for waters on the 1998 303(d) list, allows an additional nine months to complete the TMDLs. As such, these TMDLs must be adopted and submitted to EPA by September 30, 2009. This waterbody was verified as impaired based on fecal coliform because, using the IWR methodology, more than 10 percent of the values exceeded the Class III waterbody criterion of 400 counts per 100 milliliters (counts/100mL) for fecal coliform. In the verified period, for the Little Manatee River (WBID 1742A) 27 exceedances out of 160 samples existed, and for the South Fork Little Manatee River (WBID 1790) 21 exceedances out of 81 samples existed.

The verified impairments were based on data collected by Hillsborough County, Manatee County, and Florida Department of Environmental Protection. WBID location and STORET stations are shown in **Figure 5.1**. **Figure 2.1 and 2.2** displays the fecal coliform data collected during the verification period (January 2001 – June 2008) for Little Manatee River and South Fork Little Manatee River, respectively.

Table 2.1 Verified Impairments for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790)

WBID	Waterbody Segment Name	Parameters Included on the 1998 303(d) List	Parameter Causing Impairment	Projected Year for TMDL Development*
1742A	Little Manatee River	Fecal Coliform	Fecal Coliform	2008
1790	South Fork Little Manatee River	Fecal Coliform	Fecal Coliform	2008

*The projected year for the fecal coliform bacteria TMDLs was 2008, but the Settlement Agreement between EPA and Earthjustice, which drives the TMDL development schedule for waters on the 1998 303(d) list, allows an additional nine months to complete the TMDLs. As such, these TMDLs must be adopted and submitted to EPA by September 30, 2009.

Table 2.2 Summary of Fecal Coliform Data Collected During Verification Period (January 2001 – June 2008) for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790)

Waterbody Segment Name	Total Number of Samples	IWR-required number of exceedances for the Verified List	Number of observed exceedances	Number of observed nonexceedances	Number of seasons data was collected	Mean	Median	Min	Max
Little Manatee River	160	22	27	133	4	539	200	20	8500
South Fork Little Manatee River	81	13	21	60	4	626.8	230	4	16600

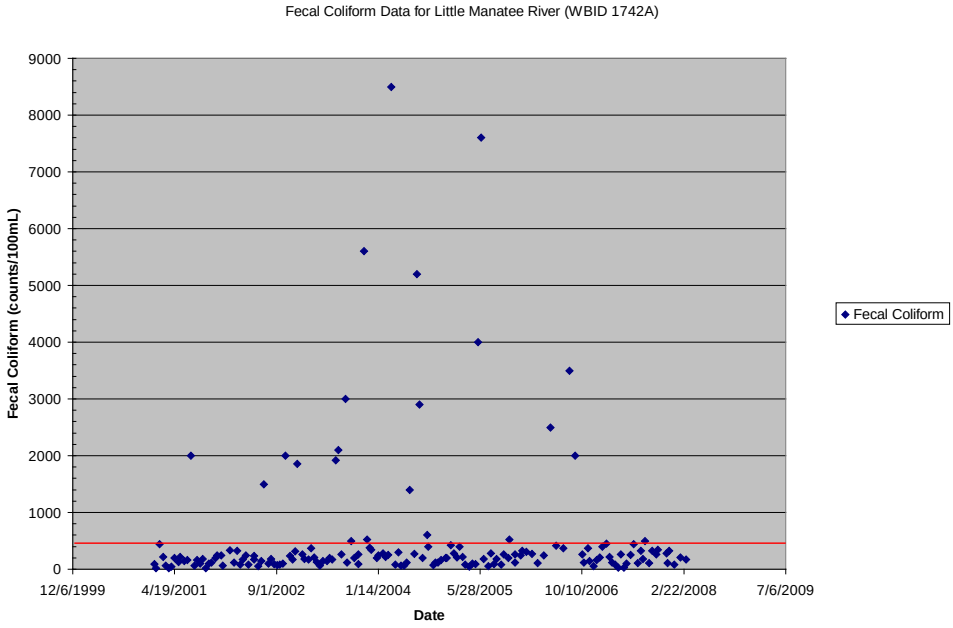

Figure 2.1 Fecal Coliform Measurements for Little Manatee River (Verification Period: January 2001 – June 2008)

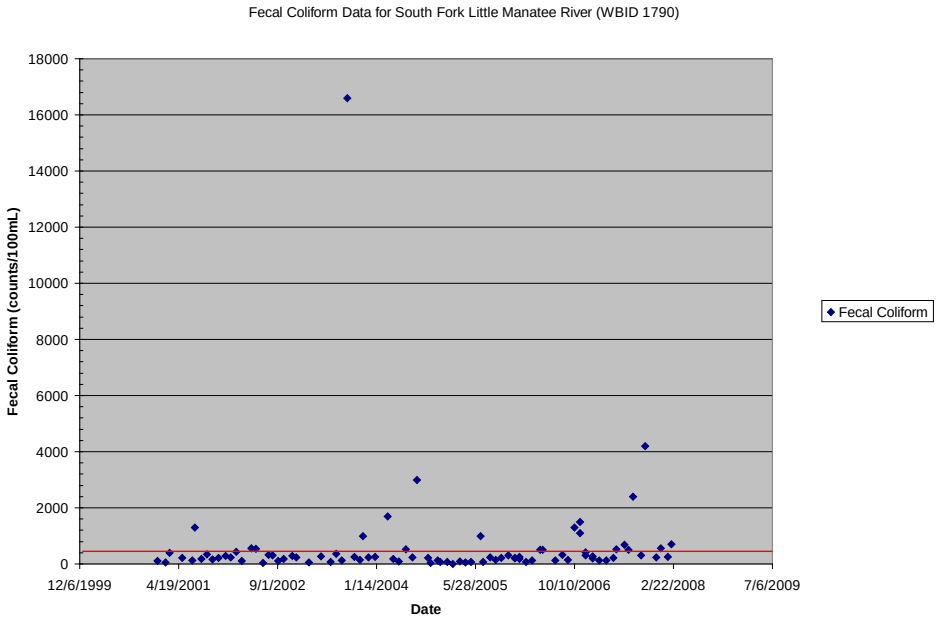

Figure 2.2 Fecal Coliform Measurements for South Fork Little Manatee River (Verification Period: January 2001 – June 2008)

Chapter 3. DESCRIPTION OF APPLICABLE WATER QUALITY STANDARDS AND TARGETS

3.1 Classification of the Waterbody and Criteria Applicable to the TMDL

Florida's surface waters are protected for five designated use classifications, as follows:

Class I	**Potable water supplies**
Class II	**Shellfish propagation or harvesting**
Class III	**Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV	**Agricultural water supplies**
Class V	**Navigation, utility, and industrial use (there are no state waters currently in this class)**

The Little Manatee River and the South Fork Little Manatee River are Class III waterbodies, with a designated use of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. The Class III water quality criteria applicable to the impairment addressed by this TMDL are fecal coliform.

3.2 Applicable Water Quality Standards and Numeric Water Quality Target

Numeric criteria for bacterial quality are expressed in terms of fecal coliform bacteria concentrations. The water quality criteria for protection of Class III waters, as established by Chapter 62-302, F.A.C., states the following:

> ***Fecal Coliform Bacteria:***
>
> *The most probable number (MPN) or membrane filter (MF) counts per 100 ml of fecal coliform bacteria shall not exceed a monthly average of 200, nor exceed 400 in 10 percent of the samples, nor exceed 800 on any one day.*

The criterion states that monthly averages shall be expressed as geometric means based on a minimum of 10 samples taken over a 30-day period. During the development of this TMDL there were insufficient data (fewer than 10 samples in a given month) available to evaluate the geometric mean criterion for fecal coliform bacteria. Therefore, the criterion selected for the TMDL was not to exceed 400 MPN/100mL in any sampling event for fecal coliform. The 10 percent exceedance allowed by the water quality criterion for fecal coliform bacteria was not used directly in estimating the target load, but was included in the TMDLs margin of safety (as described in subsequent chapters).

Chapter 4: ASSESSMENT OF SOURCES

4.1 Types of Sources

An important part of the TMDL analysis is the identification of pollutant source categories, source subcategories, or individual sources of fecal coliform in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds and the amount of pollutant loading contributed by each of these sources. Sources are broadly classified as either "point sources" or "nonpoint sources." Historically, the term point sources has meant discharges to surface waters that typically have a continuous flow via a discernable, confined, and discrete conveyance, such as a pipe. Domestic and industrial wastewater treatment facilities (WWTFs) are examples of traditional point sources. In contrast, the term "nonpoint sources" was used to describe intermittent, rainfall driven, diffuse sources of pollution associated with everyday human activities, including runoff from urban land uses, agriculture, silviculture, and mining; discharges from failing septic systems; and atmospheric deposition.

However, the 1987 amendments to the Clean Water Act redefined certain nonpoint sources of pollution as point sources subject to regulation under the EPA's National Pollutant Discharge Elimination Program (NPDES). These nonpoint sources included certain urban stormwater discharges, including those from local government master drainage systems, construction sites over five acres, and a wide variety of industries (see **Appendix A** for background information on the federal and state stormwater programs).

To be consistent with Clean Water Act definitions, the term "point source" will be used to describe traditional point sources (such as domestic and industrial wastewater discharges) and stormwater systems requiring an NPDES stormwater permit when allocating pollutant load reductions required by a TMDL (see **Section 6.1**). However, the methodologies used to estimate nonpoint source loads do not distinguish between NPDES stormwater discharges and non-NPDES stormwater discharges, and as such, this source assessment section does not make any distinction between the two types of stormwater.

4.2 Potential Sources of Fecal Coliform in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) Watersheds

4.2.1 Point Sources

NPDES Wastewater Facilities

No NPDES permitted surface water discharge wastewater facilities exists within the Little Manatee River (WBID 1742A) or South Fork Little Manatee River (WBID 1790) watersheds.

Municipal Separate Storm Sewer System Permittees

Municipal Separate Storm Sewer Systems (MS4s) may discharge fecal coliform to waterbodies in response to storm events. To address stormwater discharges, the EPA developed the NPDES stormwater permitting program. The stormwater collection systems in the Little Manatee River and the South Fork Little Manatee River watersheds are owned and operated by Hillsborough County (#FLS 000006), Manatee County (#FLS 000036), and FDOT. It should be noted that any MS4 permittee is only responsible for reducing the anthropogenic loads associated with stormwater outfalls that it owns, located within its MS4 jurisdiction, or otherwise has responsible control over, and it is not responsible for reducing other nonpoint source loads in its jurisdiction.

4.2.2 Land Uses and Nonpoint Sources

Additional fecal coliform loadings to Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) are generated from nonpoint sources in the basin. Potential nonpoint sources of coliforms include loadings from surface runoff, wildlife, livestock, pets, leaking sewer lines, and leaking septic tanks.

Nonpoint source pollution, unlike pollution from industrial and sewage treatment plants, comes from many diffuse sources. Nonpoint pollution is caused by rainfall moving over and through the ground. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water (EPA, 1994).

An exceedance under dry weather conditions could be considered as stemming primarily from baseflow, which carries the pollutant from the surficial aquifer. Baseflow pollution could result from many different sources, including failed septic tanks and sewer lines, which are covered in more detail later in this chapter. Livestock, pets, and wildlife (birds, raccoons, rabbits, and etc) could also contribute to the fecal coliform exceedances in the watershed because these animals have direct access to the stream, especially under low-flow conditions.

Wildlife

Wildlife deposit coliform bacteria with their feces onto land surfaces, where they can be transported during storm events to nearby streams. Some wildlife (such as otters, beavers, raccoons, and birds) deposits their feces directly into the water. The bacterial load from naturally occurring wildlife is assumed to be background. In addition, any strategy employed to control this source would probably have a negligible impact on attaining water quality standards.

Agriculture Animals

Agricultural animals are the source of several types of coliform loading to streams. Agricultural activities, including runoff from pastureland and cattle in streams, can affect water quality. Agricultural and Rangeland and occupy 28.5% and 52% of the total land area in the Little Manatee River (WBID 1742A) and the South Fork Little Manatee River (WBID 1790), watersheds respectively. Livestock data from the 2002 *Agricultural Census Report* for Hillsborough and Manatee Counties are listed in **Table 4.1** (U.S. Department of Agriculture, 2002).

Table 4.1 Livestock Distribution for Hillsborough and Manatee Counties

Livestock Distribution	Hillsborough County (number of livestock)	Manatee County (number of livestock)
Beef Cattle/Calves (4)	43,900	48,000
Dairy Cattle (4)	3,100	3,200
Goats (1)	680	undisclosed
Horses/Ponies (1)	2,273	1,565
Poultry-Broilers (1)	undisclosed	undisclosed
Poultry-Layers (1)	221	3,721
Sheep (1)	888	175

(#) – Data withheld to avoid disclosing data for individual farms.
Source: U.S. Department of Agriculture. 2002. *Agricultural Census Report*.

Land Uses

The spatial distribution and acreage of different land use categories were identified using the Florida Land Use, Cover, and Forms Classification System (FLUCCS) and the Southwest Florida Water Management District (SWFWMD) 2006 land use coverage contained in the Department's GIS library. Land use categories in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds were aggregated using the simplified Level 1 codes tabulated in **Table 4.1 and 4.2** and graphically displayed in **Figure 4.1**. The Little Manatee River (WBID 1742A) watershed encompasses 15,110 acres. The predominant landuses are estimated 2,169 acres of urban and built-up, 2,627 acres of wetlands, and 4,314 acres of agriculture. The South Fork Little Manatee River (WBID 1790) watershed encompasses 18,514 acres. The predominant landuses are estimated 2,615 acres of urban and built-up, 2,602 acres of wetlands, and 9,623 acres of agriculture.

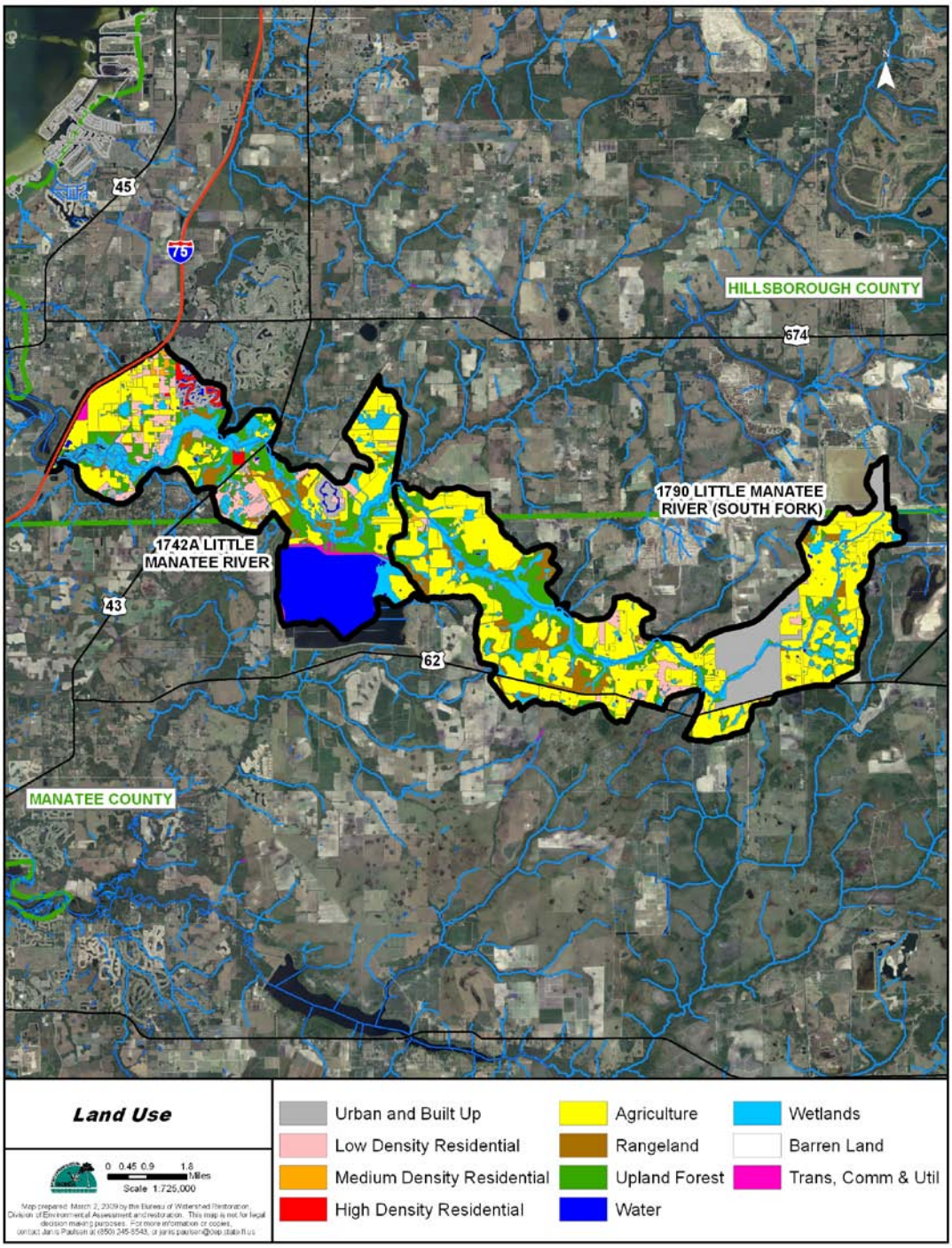

Figure 4.1 Principal Land Uses in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River Watersheds, 2006

Table 4.2 Classification of Land Use Categories in the Little Manatee River (WBID 1742A) Watershed

Level 1 Code	Land Use	Acreage	% Acreage
1000	Urban and Built-Up	663	4.39
1100	Residential Low Density	1,140	7.54
1200	Residential Medium Density	112	0.74
1300	Residential High Density	254	1.68
2000	Agriculture	4,314	28.55
3000	Rangeland	776	5.14
4000	Upland Forest/Rural Open	2,145	14.20
5000	Water	2,811	18.60
6000	Wetlands	2,627	17.39
7000	Barren Land	3	0.02
8000	Transportation, Communication, & Utilities	265	1.75
	TOTAL	15,110	**100.00**

Table 4.3 Classification of Land Use Categories in the South Fork Little Manatee River (WBID 1790) Watershed

Level 1 Code	Land Use	Acreage	% Acreage
1000	Urban and Built-Up	2,086	11.27
1100	Residential Low Density	514	2.77
1200	Residential Medium Density	15	0.08
1300	Residential High Density	0	0.00
2000	Agriculture	9,623	51.98
3000	Rangeland	1,312	7.09
4000	Upland Forest/Rural Open	2,309	12.47
5000	Water	38	0.21
6000	Wetlands	2,602	14.05
7000	Barren Land	0	0.00
8000	Transportation, Communication, & Utilities	15	0.08
	TOTAL	18,514	**100.00**

Urban Development

Pets (especially dogs) could be a significant source of coliform pollution through surface runoff in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds. In addition to pets, other animal fecal coliform contributors commonly seen in urban areas include rats, pigeons, and sometimes raccoons.

Studies report that up to 95 percent of the fecal coliform found in urban stormwater can come from nonhuman origins (Alderiso et al., 1996; Trial et al., 1993). The most important nonhuman fecal coliform contributors appear to be dogs and cats. In a highly urbanized Baltimore catchment, Lim and Olivieri (1982) found that dog feces were the single greatest source for fecal coliform and fecal streptococcus bacteria. Trial et al. (1993) also reported that cats and dogs were the primary source of fecal coliform in urban watersheds. Using bacteria source tracking techniques, Watson (2002) found that the amount of fecal coliform bacteria contributed by dogs in Stevenson Creek in Clearwater, Florida, was as important as that from septic tanks.

According to the American Pet Products Manufacturers Association (APPMA), about 4 out of 10 U.S. households include at least one dog. A single gram of dog feces contains about 23 million fecal coliform bacteria (Van der Wel, 1995). Unfortunately, statistics show that about 40 percent of American dog owners do not pick up their dogs' feces.

Table 4.4 shows the fecal coliform concentrations of surface runoff measured in two urban areas (Bannerman et al., 1993; Steuer et al., 1997). While bacteria levels were widely different in the two studies, both indicated that residential lawns, driveways, and streets were the major source areas for bacteria.

Table 4.4 Concentrations (Geometric Mean Colonies per 100 mL) of Fecal Coliform from Urban Source Areas (Steuer et al., 1997; Bannerman et al., 1993)

Geographic Location	Marquette, MI	Madison, WI
Number of storms sampled	12	9
Commercial parking lot	4,200	1,758
High-traffic street	1,900	9,627
Medium-traffic street	2,400	56,554
Low-traffic street	280	92,061
Commercial rooftop	30	1,117
Residential rooftop	2,200	294
Residential driveway	1,900	34,294
Residential lawns	4,700	42,093
Basin outlet	10,200	175,106

The number of dogs in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds are not known. Therefore, this analysis used the statistics produced by APPMA to estimate the possible fecal coliform loads contributed by dogs. Using county census (population density, housing units, etc.) and area (mi ^{2}) information, the census information was extrapolated for the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds. The Little Manatee River is co-located in Hillsborough

and Manatee Counties. The estimated human population in Hillsborough and Manatee County (calculated from the U.S. Census Bureau in 2007) was approximately 1,174,727 and 315,108, respectively. The extrapolated human population in the Little Manatee River (WBID 1742A) watershed was approximately 7,691 (Hillsborough County: 7,503 people or 444 persons per square mile; Manatee County: 188 people or 28 persons per square mile). According to the U.S. Census Bureau in 2007, there were 2.51 persons per household in Hillsborough County and 2.29 persons per household in Manatee County. The total number of households in the Little Manatee River (WBID 1742A) watershed is 3,083 (Hillsborough County: 82 households; Manatee County: 3,001 households), and the total number of households in the South Fork Little Manatee River is 414 (Hillsborough County: 82 households; Manatee County: 332 households). Assuming that 40 percent of the households in this area have 1 dog, the total number of dogs in the Little Manatee River watershed is about 1,233 (Hillsborough County: 1,200 dogs; Manatee County: 33 dogs).

The South Fork Little Manatee River is also co-located partially in Hillsborough and Manatee Counties. The estimated human population in Hillsborough and Manatee County calculated from the U.S. Census Bureau in 2007 was approximately 1,174,727 and 315,108, respectively. The extrapolated human population in the South Fork Little Manatee River (WBID 1790) watershed was approximately 965 (Hillsborough County: 205 people or 114 persons per square mile; Manatee County: 760 people or 28 persons per square mile). According to the U.S. Census Bureau in 2007, there were 2.51 persons per household in Hillsborough County and 2.29 persons per household in Manatee County. Assuming that 40 percent of the households in this area have 1 dog, the total number of dogs in the Little Manatee River watershed is about 166 (Hillsborough County: 33 dogs; Manatee County: 133 dogs).

According to the waste production rate for dogs and the fecal coliform counts per gram of dog wastes listed in **Table 4.5**, and assuming that 40 percent of dog owners do not pick up dog feces, the total waste produced by dogs and left on the land surface of residential areas would be 577,080 grams/day. The total fecal coliform load produced by dogs for Little Manatee River and South Fork Little Manatee River would be 4.8×10^{11} counts/day and 6.5×10^{10} counts/day of fecal coliform, respectively.

It should be noted that this load only represents the fecal coliform load created in the watershed and is not intended to be used to represent a part of the existing load that reaches the receiving waterbody. The fecal coliform load that eventually reaches the receiving waterbody could be significantly less than this value due to attenuation in overland transport.

Table 4.5 Dog Population Density, Wasteload, and Fecal Coliform Density

Type	Population density (an/household)	Waste load (g/an-day)	Fecal coliform density (fecal coliform/g)
Dog	0.4*	450	2,200,000

* Number from APPMA.
Source: Weiskel et al., 1996.

Septic Tanks

Septic tanks are another potentially important source of coliform pollution in urban watersheds. When properly installed, most of the coliform from septic tanks should be removed within 50 meters of the drainage field (Minnesota Pollution Control Agency, 1999). However, in areas with a relatively high ground water table, the drainage field can be flooded during the rainy season, and coliform bacteria can pollute the surface water through storm runoff. Septic tanks may also cause coliform pollution when they are built too close to irrigation wells. Any well that is installed in the surficial aquifer system will cause a drawdown. If the septic tank system is built too close to the well (e.g., less than 75 feet), the septic tank discharge will be within the cone of influence of the well. As a result, septic tank effluent may go into the well and once the polluted water is used to irrigate lawns, coliform bacteria may reach the land surface and wash into surface waters during the rainy season.

A rough estimate of fecal coliform loads from failed septic tanks in each watershed can be made using **Equation 4.1**:

$$L = 37.85 * N * Q * C * F \qquad \textbf{Equation 4.1}$$

Where,

L is the fecal coliform daily load (counts/day);
N is the total number of septic tanks in the watershed (septic tanks);
Q is the discharge rate for each septic tank;
C is the fecal coliform concentration for the septic tank discharge, and
F is the septic tank failure rate.

Based on 2007 Florida Department of Health (FDOH) onsite sewage GIS coverage (http://www.doh.state.fl.us/environment/programs/EhGis/EhGisDownload.htm), about 390 and 90 housing units (*N*) were identified as being on septic tanks in the Little Manatee River and South Fork Little Manatee River watersheds respectively (**Figure 4.2**). FDEP is aware that the FDOH onsite sewage GIS coverage does not include all septic tanks and when an area converts to sewer line the septic tank information is not removed. The discharge rate from each septic tank (*Q*) was calculated by multiplying the average household size by the per capita wastewater production rate per day. Based on the information published by the U.S. Census Bureau in 2007, the average household size for Hillsborough and Manatee Counties are about 2.51 and 2.29 people/household, respectively. The same population density was assumed for the Little Manatee River and South Fork Little Manatee River watersheds. A commonly cited value for per capita wastewater production rate is 70 gallons/day/person (EPA, 2001). The commonly cited concentration (*C*) for septic tank discharge is $1x10^6$ counts/100mL for fecal coliform (EPA, 2001).

No measured septic tank failure rate data were available for the watershed at the time this TMDL analysis was conducted. Therefore the failure rate was derived from the number of septic tank and septic tank repair permits for the county published by FDOH (http://www.doh.state.fl.us/environment/OSTDS/statistics/ostdsstatistics.htm). The number of septic tanks in the county was calculated assuming that none of the installed septic tanks will be removed after being installed (**Table 4.6 and 4.7**). The reported number of septic tank repair permits was also obtained from the FDOH website (**Table 4.6 and 4.7**).

Based on this information, a discovery rate of failed septic tanks for each year between 2002 and 2007 was calculated and listed in **Table 4.6 and 4.7**. Using the table, the average annual septic tank failure discovery rate for Hillsborough County is about 0.81 percent and for Manatee County is about 0.06 percent. Assuming that failed septic tanks are not discovered for about 5 years, the estimated annual septic tank failure rate is about 5 times the discovery rate, or 4.03 percent for Hillsborough County and 0.31 percent for Manatee County. Based on **Equation 4.1**, the estimated fecal coliform loading from failed septic tanks in the Little Manatee River and South Fork Little Manatee River watersheds located in Hillsborough County is approximately 5.21×10^{10} and 1.2×10^{10} counts/day, and the portion of the Little Manatee River and South Fork Little Manatee River watersheds located in Manatee County is approximately 8.46×10^{8} and 3.67×10^{9} counts/day.

Table 4.6 Estimated Septic Numbers and Septic Failure Rates for Hillsborough County, 2002–07

	2002	2003	2004	2005	2006	2007	Average
New installation (septic tanks)	986	1031	1005	1314	1236	487	1010
Accumulated installation (septic tanks)	100,483	101,469	102,500	103,505	104,819	106,055	103,138
Repair permit (septic tanks)	998	929	735	815	751	754	830
Failure discovery rate (%)	0.99	0.92	0.72	0.79	0.72	0.71	0.81
Failure rate (%)*	4.97	4.58	3.59	3.94	3.58	3.55	4.03

* The failure rate is 5 times the failure discovery rate.

Table 4.7 Estimated Septic Numbers and Septic Failure Rates for Manatee County, 2002–07

	2002	2003	2004	2005	2006	2007	Average
New installation (septic tanks)	438	400	333	296	231	67	294
Accumulated installation (septic tanks)	34,492	34,930	35,330	35,663	35,959	36,190	35,427
Repair permit (septic tanks)	25	22	27	22	22	12	22
Failure discovery rate (%)	0.07	0.06	0.08	0.06	0.06	0.03	0.06
Failure rate (%)*	0.36	0.31	0.38	0.31	0.31	0.17	0.31

* The failure rate is 5 times the failure discovery rate.

Sanitary Sewer Overflows

Sanitary sewer overflows (SSOs) do not exist within the Little Manatee River and South Fork Little Manatee River watersheds.

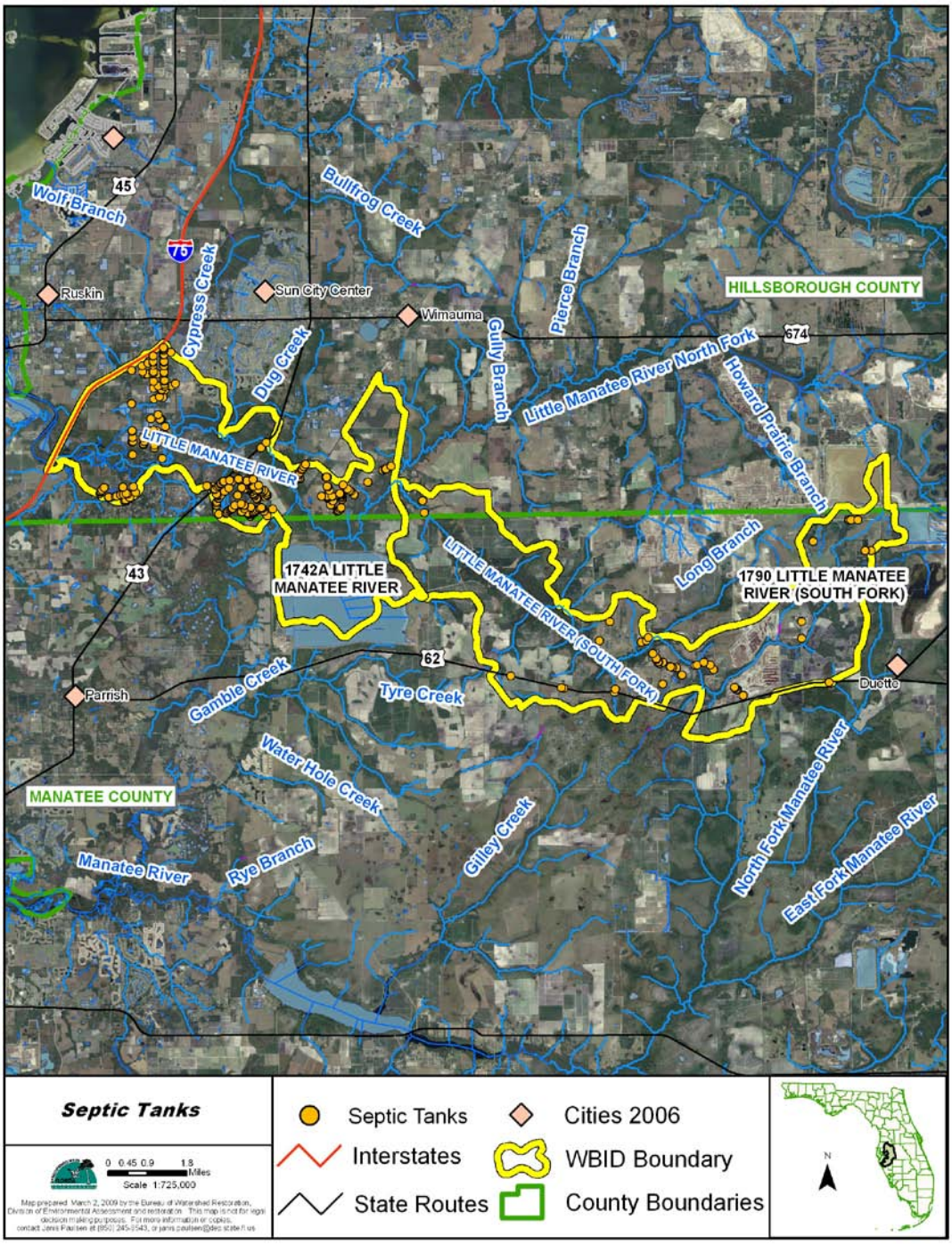

Figure 4.2 Distributions of Water Quality Stations and Onsite Sewage Systems (Septic Tanks) in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) Watersheds

Chapter 5: DETERMINATION OF ASSIMILATIVE CAPACITY

5.1 Determination of Loading Capacity

This fecal coliform TMDL was developed using the "percent reduction" method. For this method, the percent reduction needed to meet the applicable criterion is calculated for each value above the criterion. Then a median percent reduction is calculated.

5.1.1 Data Used in the Determination of the TMDL

The data used to develop this TMDL were mainly provided by Florida Department of Environmental Protection (Little Manatee River: 21FLGW 3555), Hillsborough County (Little Manatee River station: 21FLHILL 113), and Manatee County (South Fork Little Manatee River: 21FLMANAD1). **Figure 5.1** displays the locations of the water quality stations from which fecal coliform data was collected for Little Manatee River and South Fork Little Manatee River. The fecal coliform data used in this analysis for the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds are located in **Appendix B**. For graphical representation of the data refer to **Figure 2.1**.

5.1.2 TMDL Development Process

As described in **Section 5.1**, the percent reduction needed to meet the fecal coliform criterion was determined for each individual exceedance using the following equation:

$$\textbf{(2)}\ \frac{\textbf{[measured exceedance – criterion]*100}}{\textbf{measured exceedance}}$$

The fecal coliform TMDL was calculated as the median of the percent reductions needed over the data range where exceedances occurred (see **Appendix C** for data). The median percent reduction for this data period (January 2001 – June 2008) was 79 percent for Little Manatee River (WBID 1742A) and a 43 percent for South Fork Little Manatee River (WBID 1790).

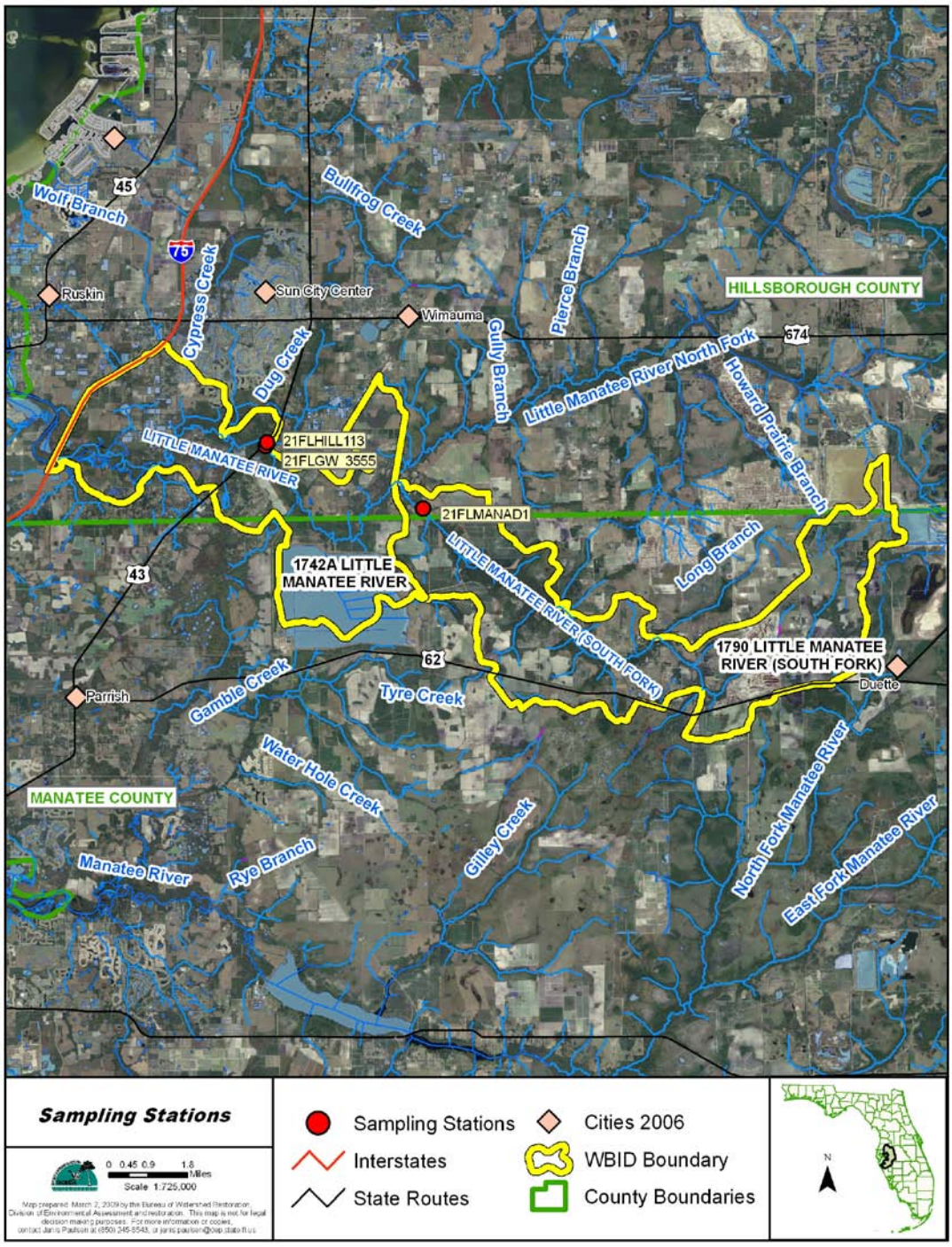

Figure 5.1 Water Quality Sampling Stations in Little Manatee River and South Fork Little Manatee River (WBID 1742A & 1790)

Define the Critical Condition

The critical condition for coliform loadings in a given watershed depends on many factors, including the presence of point sources and the land use pattern in the watershed. Typically, the critical condition for nonpoint sources is an extended dry period followed by a rainfall runoff event. During the wet weather period, rainfall washes off coliform bacteria that have built up on the land surface under dry conditions, resulting in the wet weather exceedances. However, significant nonpoint source contributions can also appear under dry conditions without any major surface runoff event. This usually happens when nonpoint sources contaminate the surficial aquifer, and fecal coliform bacteria are brought into the receiving waters through baseflow. In addition, livestock and wildlife having direct access to the receiving water can contribute to the exceedance during dry weather. The critical condition for point source loading typically occurs during periods of low stream flow, when dilution is minimized.

Based on **Figures 5.2 and 5.3** and the dominant type of landuse (urban land and agriculture) in this watershed, it is likely that many of the exceedances are from nonpoint sources and MS4s entering the waters through surface runoff. This could indicate that fecal coliform builds up on the land during dry periods and washes off into local waters during rain events.

5.1.3 Temporal Patterns

Measurements were sorted by month to determine whether there was a temporal pattern of exceedances. Monthly average rainfall data from Parrish, FL (086880) for the Little Manatee River and South Fork Little Manatee River watersheds were obtained and included in the analysis. Due to incomplete exceedance values for each month a seasonal analysis could not be performed. Refer to **Table 5.1 and 5.2** for summary statistics by month for fecal coliform and rainfall measurements. Refer to **Figures 5.2 and 5.3** for graphical representations.

Little Manatee River (WBID 1742A)

As shown in **Figure 5.2**, exceedances of the fecal coliform criteria in the Little Manatee River watershed occur across the entire span of the average monthly rainfall record and throughout all seasons implying potential fecal coliform bacteria sources during both baseflow and surface runoff events.

South Fork Little Manatee River (WBID 1790)

As shown in **Figure 5.3**, exceedances of the fecal coliform criteria in the South Fork Little Manatee River watershed occur across the entire span of the average monthly rainfall record and throughout all seasons implying potential fecal coliform bacteria sources during both baseflow and surface runoff events.

Table 5.1 Summary Statistics of Fecal Coliform and Rainfall Data for Little Manatee River (WBID 1742A) by Month

Month	Number of Cases	Minimum	Maximum	Median	Mean	Number of Exceedances	% Fecal Exceedances	Rainfall Mean
1	13	20	420	240	232.5	1	7.69	2.87
2	14	114	450	245	278	2	14.29	3.03
3	14	20	8500	125	728	1	7.14	2.87
4	13	23	300	100	139	0	0.00	2.23
5	13	26	4000	142	610	2	15.38	3.14
6	13	56	7600	180	998	5	38.46	6.8
7	13	58	5200	1750	971	4	30.77	8.35
8	13	58	3500	180	861	4	30.77	8.55
9	13	20	2000	200	370	3	23.08	7.11
10	14	68	2000	160	325	2	14.29	3.35
11	13	120	5600	230	646	2	15.38	2.02
12	14	56	1860	240	343	1	7.14	2.38

Table 5.2 Summary Statistics of Fecal Coliform and Rainfall Data for South Fork Little Manatee River (WBID 1790) by Month

Month	Number of Cases	Minimum	Maximum	Median	Mean	Number of Exceedances	% Fecal Exceedances	Rainfall Mean
1	7	65	260	235	197.5	0	0.00	2.87
2	7	4	700	70	207	2	28.57	3.03
3	6	89	1700	123.5	421	1	16.67	2.87
4	6	61	560	240	297	2	33.33	2.23
5	7	70	540	210	287	3	42.86	3.14
6	6	40	1000	440	455	3	50.00	6.8
7	7	70	1300	230	381	2	28.57	8.35
8	7	180	16600	330	3292	3	42.86	8.55
9	7	100	345	220	213	0	0.00	7.11
10	7	45	4200	180	892	2	28.57	3.35
11	7	130	1300	290	495	3	42.86	2.02
12	7	79	560	240	279	2	28.57	2.38

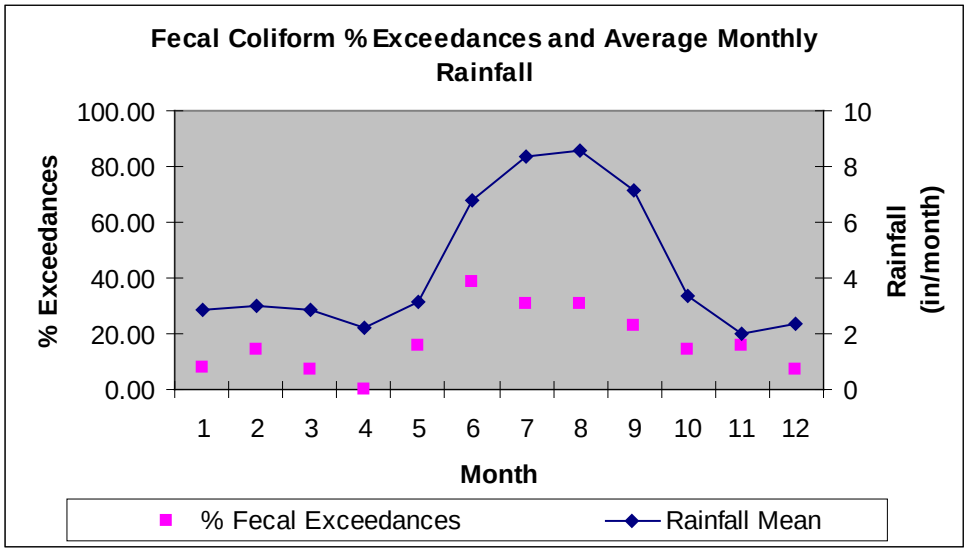

Figure 5.2 Fecal Coliform Exceedances and Rainfall for Little Manatee River (WBID 1742A) by Month

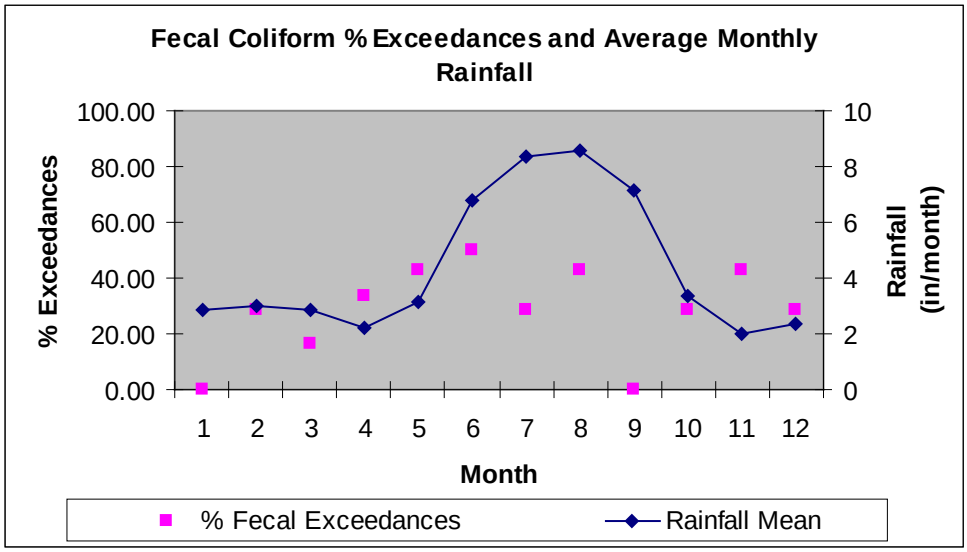

Figure 5.3 Fecal Coliform Exceedances and Rainfall for South Fork Little Manatee River (WBID 1790) by Month

5.1.4 Spatial Patterns

Little Manatee River (WBID 1742A)

Two stations (Stations: 21FLGW 3555 and 21FLHILL113) are located within the watershed. Spatial analysis of these two stations resulted in the determination thatno spatial pattern exists within the Little Manatee River watershed.

Station	N	Min	Max	Median	Mean
21FLGW 3555	85	23	7600	200	549
21FLHILL 113	75	20	8500	220	526

South Fork Little Manatee River (WBID 1790)

As only one station exists within the South Fork Little Manatee River watershed, no spatial pattern could be determined.

Chapter 6: DETERMINATION OF THE TMDL

6.1 Expression and Allocation of the TMDL

The objective of a TMDL is to provide a basis for allocating acceptable loads among all of the known pollutant sources in a watershed so that appropriate control measures can be implemented and water quality standards achieved. A TMDL is expressed as the sum of all point source loads (Waste Load Allocations, or WLAs), nonpoint source loads (Load Allocations, or LAs), and an appropriate margin of safety (MOS), which takes into account any uncertainty concerning the relationship between effluent limitations and water quality:

$$\textbf{TMDL} = \sum \textbf{WLAs} + \sum \textbf{LAs} + \textbf{MOS}$$

As discussed earlier, the WLA is broken out into separate subcategories for wastewater discharges and stormwater discharges regulated under the NPDES Program:

$$\textbf{TMDL} \cong \sum \textbf{WLAs}_{\textbf{wastewater}} + \sum \textbf{WLAs}_{\textbf{NPDES Stormwater}} + \sum \textbf{LAs} + \textbf{MOS}$$

It should be noted that the various components of the revised TMDL equation may not sum up to the value of the TMDL because a) the WLA for NPDES stormwater is typically based on the percent reduction needed for nonpoint sources and is also accounted for within the LA, and b) TMDL components can be expressed in different terms (for example, the WLA for stormwater is typically expressed as a percent reduction, and the WLA for wastewater is typically expressed as mass per day).

WLAs for stormwater discharges are typically expressed as “percent reduction” because it is very difficult to quantify the loads from MS4s (given the numerous discharge points) and to distinguish loads from MS4s from other nonpoint sources (given the nature of stormwater transport). The permitting of stormwater discharges also differs from the permitting of most wastewater point sources. Because stormwater discharges cannot be centrally collected, monitored, and treated, they are not subject to the same types of effluent limitations as wastewater facilities, and instead are required to meet a performance standard of providing treatment to the “maximum extent practical” through the implementation of BMPs.

This approach is consistent with federal regulations (40 CFR § 130.2[I]), which state that TMDLs can be expressed in terms of mass per time (e.g., pounds per day), toxicity, or **other appropriate measure**. The TMDL for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) is expressed in terms of MPN/day and percent reduction, and represent the maximum daily fecal coliform loads the stream can assimilate and maintain the fecal coliform criterion **(Table 6.1).**

Table 6.1 TMDL Components for Fecal Coliform in the Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) watersheds

WBID	Parameter	TMDL (counts/day)	WLA		LA (% reduction)	MOS
			Wastewater (counts/day)	NPDES Stormwater (% reduction)		
1742A	Fecal Coliform	400 / 100mL	N/A	79	79	Implicit
1790	Fecal Coliform	400 / 100mL	N/A	43	43	Implicit

N/A – Not applicable.

6.2 Load Allocation

A fecal coliform reduction of 79 and 43 percent for the Little Manatee River and the South Fork Little Manatee River watersheds are needed from nonpoint sources, respectively. It should be noted that the LA includes loading from stormwater discharges regulated by the Department and the water management districts that are not part of the NPDES Stormwater Program (see **Appendix A).**

6.3 Wasteload Allocation

6.3.1 NPDES Wastewater Discharges

No NPDES wastewater facilities permitted surface water dischargers exist within the Little Manatee River and South Fork Little Manatee River watersheds. The state already requires all NPDES point source dischargers to meet bacteria criteria at the end of the pipe. It is the Department's current practice not to allow mixing zones for bacteria. These requirements will also be applied to any possible future point sources that may discharge in the watershed to meet end-of-pipe standards for coliform bacteria.

6.3.2 NPDES Stormwater Discharges

A fecal coliform reduction of 79 and 43 percent for the Little Manatee River and the South Fork Little Manatee River watersheds are needed from nonpoint sources, respectively. Several NPDES Municipal Separate Storm Sewer System (MS4) permits exist within the Little Manatee River and South Fork Little Manatee River watersheds. The stormwater collection systems in the Little Manatee River watershed are owned and operated by Hillsborough County (#FLS 000006), Manatee County (#FLS 000036), and FDOT. The stormwater collection systems in the South Fork Little Manatee River watershed are owned and operated by Hillsborough County (#FLS 000006), Manatee County (#FLS 000036), and FDOT. It should be noted that any future MS4 permittee is only responsible for reducing the anthropogenic loads associated with stormwater outfalls that it owns or otherwise has responsible control over, and it is not responsible for reducing other nonpoint source loads in its jurisdiction.

6.4 Margin of Safety

Consistent with the recommendations of the Allocation Technical Advisory Committee (Department, February 2001), an implicit MOS was used in the development of this TMDL. An MOS was included in the TMDL by meeting the water quality criterion of 400 colonies/100mL, while the actual criterion allows for a 10 percent exceedance over that level.

Chapter 7: NEXT STEPS: IMPLEMENTATION PLAN DEVELOPMENT AND BEYOND

7.1 TMDL Implementation

Following the adoption of this TMDL by rule, the Department will determine the best course of action regarding its implementation. Depending upon the pollutant(s) causing the waterbody impairment and the significance of the waterbody, the Department will select the best course of action leading to the development of a plan to restore the waterbody. **Often** this will be accomplished cooperatively with stakeholders by creating a Basin Management Action Plan, referred to as the BMAP. Basin Management Action Plans are the primary mechanism through which TMDLs are implemented in Florida [see Subsection 403.067(7) F.S.]. A single BMAP may provide the conceptual plan for the restoration of one or many impaired waterbodies.

If the Department determines a BMAP is needed to support the implementation of this TMDL, a BMAP will be developed through a transparent stakeholder-driven process intended to result in a plan that is cost-effective, technically feasible, and meets the restoration needs of the applicable waterbodies. Once adopted by order of the Department Secretary, BMAPs are enforceable through wastewater and municipal stormwater permits for point sources and through BMP implementation for nonpoint sources. Among other components, BMAPs typically include:

- Water quality goals (based directly on the TMDL);
- Refined source identification;
- Load reduction requirements for stakeholders (quantitative detailed allocations, if technically feasible);
- A description of the load reduction activities to be undertaken, including structural projects, nonstructural BMPs, and public education and outreach;
- A description of further research, data collection, or source identification needed in order to achieve the TMDL;
- Timetables for implementation;
- Implementation funding mechanisms;
- An evaluation of future increases in pollutant loading due to population growth;
- Implementation milestones, project tracking, water quality monitoring, and adaptive management procedures; and
- Stakeholder statements of commitment (typically a local government resolution).

BMAPs are updated through annual meetings and may be officially revised every five years. Completed BMAPs in the state have improved communication and cooperation among local

stakeholders and state agencies, improved internal communication within local governments, applied high-quality science and local information in managing water resources, clarified obligations of wastewater point source, MS4 and non-MS4 stakeholders in TMDL implementation, enhanced transparency in DEP decision-making, and built strong relationships between DEP and local stakeholders that have benefited other program areas.

However, in some basins, and for some parameters, particularly those with fecal coliform impairments, the development of a BMAP using the process described above will not be the most efficient way to restore a waterbody, such that it meets its' designated uses. Why? Because fecal coliform impairments result from the cumulative effects of a multitude of potential sources, both natural and anthropogenic. Addressing these problems requires good old fashioned detective work that is best done by those in the area. There are a multitude of assessment tools that are available to assist local governments and interested stakeholders in this detective work. The tools range from the simple – such as Walk the WBIDs and GIS mapping - to the complex such as Bacteria Source Tracking. Department staff will provide technical assistance, guidance, and oversight of local efforts to identify and minimize fecal coliform sources of pollution. Based on work in the Lower St Johns River tributaries and the Hillsborough River basin, the Department and local stakeholders have developed a logical process and tools to serve as a foundation for this detective work. In the near future, the Department will be releasing these tools to assist local stakeholders with the development of local implementation plans to address fecal coliform impairments. In such cases, the Department will **rely on these local initiatives** as a more cost-effective and simplified approach to identify the actions needed to put in place a roadmap for restoration activities, while still meeting the requirements of Chapter 403.067(7), F.S.

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Appendices

Appendix A: Background Information on Federal and State Stormwater Programs

In 1982, Florida became the first state in the country to implement statewide regulations to address the issue of nonpoint source pollution by requiring new development and redevelopment to treat stormwater before it is discharged. The Stormwater Rule, as authorized in Chapter 403, F.S., was established as a technology-based program that relies on the implementation of BMPs that are designed to achieve a specific level of treatment (i.e., performance standards) as set forth in Chapter 62-40, F.A.C.

The rule requires the state's water management districts (WMDs) to establish stormwater pollutant load reduction goals (PLRGs) and adopt them as part of a SWIM plan, other watershed plan, or rule. Stormwater PLRGs are a major component of the load allocation part of a TMDL. To date, stormwater PLRGs have been established for Tampa Bay, Lake Thonotosassa, the Winter Haven Chain of Lakes, the Everglades, Lake Okeechobee, and Lake Apopka. No PLRG has been developed for Newnans Lake at the time this study was conducted.

In 1987, the U.S. Congress established Section 402(p) as part of the federal Clean Water Act Reauthorization. This section of the law amended the scope of the federal NPDES stormwater permitting program to designate certain stormwater discharges as "point sources" of pollution. These stormwater discharges include certain discharges that are associated with industrial activities designated by specific Standard Industrial Classification (SIC) codes, construction sites disturbing five or more acres of land, and master drainage systems of local governments with a population above 100,000, which are better known as municipal separate storm sewer systems (MS4s). However, because the master drainage systems of most local governments in Florida are interconnected, the EPA has implemented Phase 1 of the MS4 permitting program on a countywide basis, which brings in all cities (incorporated areas), Chapter 298 urban water control districts, and the Florida Department of Transportation throughout the fifteen counties meeting the population criteria.

An important difference between the federal and state stormwater permitting programs is that the federal program covers both new and existing discharges, while the state program focuses on new discharges. Additionally, Phase 2 of the NPDES Program will expand the need for these permits to construction sites between one and five acres, and to local governments with as few as 10,000 people. These revised rules require that these additional activities obtain permits by 2003. While these urban stormwater discharges are now technically referred to as "point sources" for the purpose of regulation, they are still diffuse sources of pollution that cannot be easily collected and treated by a central treatment facility similar to other point sources of pollution, such as domestic and industrial wastewater discharges. The Department recently accepted delegation from the EPA for the stormwater part of the NPDES Program. It should be noted that most MS4 permits issued in Florida include a re-opener clause that allows permit revisions to implement TMDLs once they are formally adopted by rule.

Appendix B: Fecal Coliform Data for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) during the Verification Period (January 2001 – June 2008)

Little Manatee River (WBID 1742A)

year	month	day	sta	result
2001	1	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	90
2001	1	17	21FLHILL113 / Little Manatee River at US 301 bridge	20
2001	2	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	440
2001	2	21	21FLHILL113 / Little Manatee River at US 301 bridge	220
2001	3	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	60
2001	3	21	21FLHILL113 / Little Manatee River at US 301 bridge	20
2001	4	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	44
2001	4	18	21FLHILL113 / Little Manatee River at US 301 bridge	200
2001	5	8	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	124
2001	5	16	21FLHILL113 / Little Manatee River at US 301 bridge	220
2001	6	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	140
2001	6	20	21FLHILL113 / Little Manatee River at US 301 bridge	160
2001	7	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2000
2001	7	25	21FLHILL113 / Little Manatee River at US 301 bridge	60
2001	8	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	160
2001	8	22	21FLHILL113 / Little Manatee River at US 301 bridge	100
2001	9	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	180
2001	9	19	21FLHILL113 / Little Manatee River at US 301 bridge	20
2001	10	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	96
2001	10	17	21FLHILL113 / Little Manatee River at US 301 bridge	120
2001	11	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	200
2001	11	14	21FLHILL113 / Little Manatee River at US 301 bridge	240
2001	12	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	240

2001	12	12	21FLHILL113 / Little Manatee River at US 301 bridge	60
2002	1	16	21FLHILL113 / Little Manatee River at US 301 bridge	330
2002	2	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	114
2002	2	20	21FLHILL113 / Little Manatee River at US 301 bridge	320
2002	3	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	78
2002	3	20	21FLHILL113 / Little Manatee River at US 301 bridge	170
2002	4	3	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	240
2002	4	17	21FLHILL113 / Little Manatee River at US 301 bridge	80
2002	5	13	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	175
2002	5	15	21FLHILL113 / Little Manatee River at US 301 bridge	230
2002	6	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	56
2002	6	19	21FLHILL113 / Little Manatee River at US 301 bridge	140
2002	7	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	1500
2002	7	24	21FLHILL113 / Little Manatee River at US 301 bridge	100
2002	8	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	180
2002	8	21	21FLHILL113 / Little Manatee River at US 301 bridge	90
2002	9	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	68
2002	9	18	21FLHILL113 / Little Manatee River at US 301 bridge	80
2002	10	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	102
2002	10	16	21FLHILL113 / Little Manatee River at US 301 bridge	2000
2002	11	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	230
2002	11	20	21FLHILL113 / Little Manatee River at US 301 bridge	170
2002	12	3	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	315
2002	12	11	21FLHILL113 / Little Manatee River at US 301 bridge	1860
2003	1	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	260
2003	1	15	21FLHILL113 / Little Manatee River at US 301 bridge	180
2003	2	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	170
2003	2	19	21FLHILL113 / Little Manatee River at US 301 bridge	370
2003	3	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	210
2003	3	19	21FLHILL113 / Little Manatee River at US 301 bridge	130

2003	4	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	66
2003	4	16	21FLHILL113 / Little Manatee River at US 301 bridge	140
2003	5	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	142
2003	5	21	21FLHILL113 / Little Manatee River at US 301 bridge	200
2003	6	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	170
2003	6	18	21FLHILL113 / Little Manatee River at US 301 bridge	1920
2003	7	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2100
2003	7	16	21FLHILL113 / Little Manatee River at US 301 bridge	260
2003	8	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	3000
2003	8	13	21FLHILL113 / Little Manatee River at US 301 bridge	120
2003	9	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	500
2003	9	17	21FLHILL113 / Little Manatee River at US 301 bridge	200
2003	10	8	21FLHILL113 / Little Manatee River at US 301 bridge	260
2003	10	8	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	90
2003	11	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	5600
2003	11	19	21FLHILL113 / Little Manatee River at US 301 bridge	520
2003	12	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	380
2003	12	10	21FLHILL113 / Little Manatee River at US 301 bridge	340
2004	1	8	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	200
2004	1	14	21FLHILL113 / Little Manatee River at US 301 bridge	240
2004	2	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	280
2004	2	18	21FLHILL113 / Little Manatee River at US 301 bridge	220
2004	3	3	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	250
2004	3	17	21FLHILL113 / Little Manatee River at US 301 bridge	8500
2004	4	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	82
2004	4	21	21FLHILL113 / Little Manatee River at US 301 bridge	300
2004	5	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	62
2004	5	19	21FLHILL113 / Little Manatee River at US 301 bridge	60
2004	6	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	114

2004	6	16	21FLHILL113 / Little Manatee River at US 301 bridge	1400
2004	7	8	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	270
2004	7	21	21FLHILL113 / Little Manatee River at US 301 bridge	5200
2004	8	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2900
2004	8	18	21FLHILL113 / Little Manatee River at US 301 bridge	200
2004	9	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	600
2004	9	15	21FLHILL113 / Little Manatee River at US 301 bridge	400
2004	10	11	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	68
2004	10	20	21FLHILL113 / Little Manatee River at US 301 bridge	120
2004	11	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	120
2004	11	17	21FLHILL113 / Little Manatee River at US 301 bridge	160
2004	12	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	200
2004	12	15	21FLHILL113 / Little Manatee River at US 301 bridge	200
2005	1	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	420
2005	1	19	21FLHILL113 / Little Manatee River at US 301 bridge	280
2005	2	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	210
2005	2	16	21FLHILL113 / Little Manatee River at US 301 bridge	400
2005	3	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	220
2005	3	16	21FLHILL113 / Little Manatee River at US 301 bridge	80
2005	4	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	42
2005	4	20	21FLHILL113 / Little Manatee River at US 301 bridge	100
2005	5	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	92
2005	5	18	21FLHILL113 / Little Manatee River at US 301 bridge	4000
2005	6	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	7600
2005	6	15	21FLHILL113 / Little Manatee River at US 301 bridge	180
2005	7	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	58
2005	7	20	21FLHILL113 / Little Manatee River at US 301 bridge	280
2005	8	3	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	92
2005	8	17	21FLHILL113 / Little Manatee River at US 301 bridge	180
2005	9	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	80

2005	9	21	21FLHILL113 / Little Manatee River at US 301 bridge	260
2005	10	13	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	200
2005	10	19	21FLHILL113 / Little Manatee River at US 301 bridge	520
2005	11	16	21FLHILL113 / Little Manatee River at US 301 bridge	260
2005	11	16	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	120
2005	12	13	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	240
2005	12	21	21FLHILL113 / Little Manatee River at US 301 bridge	320
2006	1	10	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	310
2006	2	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	270
2006	3	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	108
2006	4	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	240
2006	5	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2500
2006	6	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	410
2006	7	10	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	370
2006	8	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	3500
2006	9	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2000
2006	10	11	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	260
2006	10	18	21FLHILL113 / Little Manatee River at US 301 bridge	120
2006	11	8	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	370
2006	11	15	21FLHILL113 / Little Manatee River at US 301 bridge	140
2006	12	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	56
2006	12	20	21FLHILL113 / Little Manatee River at US 301 bridge	160
2007	1	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	210
2007	1	17	21FLHILL113 / Little Manatee River at US 301 bridge	400
2007	2	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	450
2007	2	21	21FLHILL113 / Little Manatee River at US 301 bridge	220
2007	3	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	120
2007	3	21	21FLHILL113 / Little Manatee River at US 301 bridge	80
2007	4	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	23
2007	4	18	21FLHILL113 / Little Manatee River at US 301 bridge	260

2007	5	3	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	26
2007	5	16	21FLHILL113 / Little Manatee River at US 301 bridge	100
2007	6	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	250
2007	6	20	21FLHILL113 / Little Manatee River at US 301 bridge	440
2007	7	10	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	106
2007	7	25	21FLHILL113 / Little Manatee River at US 301 bridge	320
2007	8	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	180
2007	8	15	21FLHILL113 / Little Manatee River at US 301 bridge	500
2007	9	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	110
2007	9	19	21FLHILL113 / Little Manatee River at US 301 bridge	320
2007	10	10	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	260
2007	10	17	21FLHILL113 / Little Manatee River at US 301 bridge	340
2007	11	28	21FLHILL113 / Little Manatee River at US 301 bridge	280
2007	12	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	110
2007	12	12	21FLHILL113 / Little Manatee River at US 301 bridge	320
2008	1	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	83
2008	2	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	210
2008	3	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	170

South Fork Little Manatee River (WBID 1790)

year	month	day	sta	result
2001	1	2	21FLMANAD1 / D1	102
2001	2	12	21FLMANAD1 / D1	56
2001	3	5	21FLMANAD1 / D1	390
2001	5	8	21FLMANAD1 / D1	210
2001	6	26	21FLMANAD1 / D1	130
2001	7	10	21FLMANAD1 / D1	1300
2001	8	13	21FLMANAD1 / D1	180
2001	9	10	21FLMANAD1 / D1	345
2001	10	8	21FLMANAD1 / D1	155
2001	11	6	21FLMANAD1 / D1	220
2001	12	11	21FLMANAD1 / D1	290
2002	1	7	21FLMANAD1 / D1	240
2002	2	4	21FLMANAD1 / D1	430

2002	3	5	21FLMANAD1 / D1	100
2002	4	22	21FLMANAD1 / D1	560
2002	5	15	21FLMANAD1 / D1	540
2002	6	19	21FLMANAD1 / D1	40
2002	7	17	21FLMANAD1 / D1	320
2002	8	7	21FLMANAD1 / D1	300
2002	9	4	21FLMANAD1 / D1	100
2002	10	2	21FLMANAD1 / D1	180
2002	11	13	21FLMANAD1 / D1	290
2002	12	4	21FLMANAD1 / D1	230
2003	2	5	21FLMANAD1 / D1	63
2003	4	9	21FLMANAD1 / D1	270
2003	5	28	21FLMANAD1 / D1	80
2003	6	25	21FLMANAD1 / D1	360
2003	7	23	21FLMANAD1 / D1	120
2003	8	20	21FLMANAD1 / D1	16600
2003	9	24	21FLMANAD1 / D1	250
2003	10	22	21FLMANAD1 / D1	150
2003	11	5	21FLMANAD1 / D1	1000
2003	12	3	21FLMANAD1 / D1	240
2004	1	7	21FLMANAD1 / D1	260
2004	3	10	21FLMANAD1 / D1	1700
2004	4	7	21FLMANAD1 / D1	181
2004	5	5	21FLMANAD1 / D1	91
2004	6	9	21FLMANAD1 / D1	520
2004	7	14	21FLMANAD1 / D1	230
2004	8	4	21FLMANAD1 / D1	3000
2004	9	29	21FLMANAD1 / D1	220
2004	10	13	21FLMANAD1 / D1	45
2004	11	17	21FLMANAD1 / D1	130
2004	12	1	21FLMANAD1 / D1	79
2005	1	5	21FLMANAD1 / D1	65
2005	2	2	21FLMANAD1 / D1	4
2005	3	9	21FLMANAD1 / D1	89
2005	4	6	21FLMANAD1 / D1	61
2005	5	4	21FLMANAD1 / D1	70
2005	6	22	21FLMANAD1 / D1	1000
2005	7	6	21FLMANAD1 / D1	70
2005	8	10	21FLMANAD1 / D1	240
2005	9	7	21FLMANAD1 / D1	136
2005	10	6	21FLMANAD1 / D1	220
2005	11	9	21FLMANAD1 / D1	300
2005	12	14	21FLMANAD1 / D1	210
2005	12	14	21FLMANAD1 / D1	200
2006	1	4	21FLMANAD1 / D1	260
2006	1	4	21FLMANAD1 / D1	182
2006	2	8	21FLMANAD1 / D1	70
2006	3	9	21FLMANAD1 / D1	127

2006	4	19	21FLMANAD1 / D1	500
2006	5	3	21FLMANAD1 / D1	500
2006	7	6	21FLMANAD1 / D1	130
2006	8	9	21FLMANAD1 / D1	330
2006	9	6	21FLMANAD1 / D1	145
2006	10	11	21FLMANAD1 / D1	1300
2006	11	8	21FLMANAD1 / D1	1500
2006	11	8	21FLMANAD1 / D1	1100
2006	12	6	21FLMANAD1 / D1	410
2006	12	6	21FLMANAD1 / D1	300
2007	1	10	21FLMANAD1 / D1	270
2007	1	10	21FLMANAD1 / D1	200
2007	2	13	21FLMANAD1 / D1	127
2007	3	20	21FLMANAD1 / D1	120
2007	4	25	21FLMANAD1 / D1	210
2007	5	9	21FLMANAD1 / D1	520
2007	6	20	21FLMANAD1 / D1	680
2007	7	10	21FLMANAD1 / D1	500
2007	8	1	21FLMANAD1 / D1	2400
2007	9	12	21FLMANAD1 / D1	300
2007	10	3	21FLMANAD1 / D1	4200
2007	11	27	21FLMANAD1 / D1	230
2007	12	19	21FLMANAD1 / D1	560
2008	1	24	21FLMANAD1 / D1	260
2008	2	13	21FLMANAD1 / D1	700

Appendix C: Fecal Coliform Percent Reduction for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) during the Verification Period (January 2001 – June 2008)

Little Manatee River (WBID 1742A)

year	month	day	Station	Result	Standard	% Reduction
2001	2	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	440	400	9.09
2001	7	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2000	400	80.00
2002	7	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	1500	400	73.33
2002	10	16	21FLHILL113 / Little Manatee River at US 301 bridge	2000	400	80.00
2002	12	11	21FLHILL113 / Little Manatee River at US 301 bridge	1860	400	78.49
2003	6	18	21FLHILL113 / Little Manatee River at US 301 bridge	1920	400	79.17
2003	7	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2100	400	80.95
2003	8	5	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	3000	400	86.67
2003	9	2	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	500	400	20.00
2003	11	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	5600	400	92.86
2003	11	19	21FLHILL113 / Little Manatee River at US 301 bridge	520	400	23.08
2004	3	17	21FLHILL113 / Little Manatee River at US 301 bridge	8500	400	95.29
2004	6	16	21FLHILL113 / Little Manatee River at US 301 bridge	1400	400	71.43
2004	7	21	21FLHILL113 / Little Manatee River at US 301 bridge	5200	400	92.31
2004	8	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2900	400	86.21
2004	9	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	600	400	33.33
2005	1	4	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	420	400	4.76
2005	5	18	21FLHILL113 / Little Manatee River at US 301 bridge	4000	400	90.00
2005	6	1	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	7600	400	94.74
2005	10	19	21FLHILL113 / Little Manatee River at US 301 bridge	520	400	23.08
2006	5	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2500	400	84.00
2006	6	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	410	400	2.44
2006	8	9	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	3500	400	88.57
2006	9	7	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	2000	400	80.00
2007	2	6	21FLGW 3555 / LITTLE MANATEE RIVER AT US HWY 301	450	400	11.11
2007	6	20	21FLHILL113 / Little Manatee River at US 301 bridge	440	400	9.09
2007	8	15	21FLHILL113 / Little Manatee River at US 301 bridge	500	400	20.00
					Median	79.17

South Fork Little Manatee River (WBID 1790)

year	month	day	Station	Result	Standard	% Reduction
2001	7	10	21FLMANAD1 / D1	1300	400	69.23
2002	2	4	21FLMANAD1 / D1	430	400	6.98
2002	4	22	21FLMANAD1 / D1	560	400	28.57
2002	5	15	21FLMANAD1 / D1	540	400	25.93
2003	8	20	21FLMANAD1 / D1	16600	400	97.59
2003	11	5	21FLMANAD1 / D1	1000	400	60.00
2004	3	10	21FLMANAD1 / D1	1700	400	76.47
2004	6	9	21FLMANAD1 / D1	520	400	23.08
2004	8	4	21FLMANAD1 / D1	3000	400	86.67
2005	6	22	21FLMANAD1 / D1	1000	400	60.00
2006	4	19	21FLMANAD1 / D1	500	400	20.00
2006	5	3	21FLMANAD1 / D1	500	400	20.00
2006	10	11	21FLMANAD1 / D1	1300	400	69.23
2006	11	8	21FLMANAD1 / D1	1500	400	73.33
2006	11	8	21FLMANAD1 / D1	1100	400	63.64
2006	12	6	21FLMANAD1 / D1	410	400	2.44
2007	5	9	21FLMANAD1 / D1	520	400	23.08
2007	6	20	21FLMANAD1 / D1	680	400	41.18
2007	7	10	21FLMANAD1 / D1	500	400	20.00
2007	8	1	21FLMANAD1 / D1	2400	400	83.33
2007	10	3	21FLMANAD1 / D1	4200	400	90.48
2007	12	19	21FLMANAD1 / D1	560	400	28.57
2008	2	13	21FLMANAD1 / D1	700	400	42.86
					Median	42.86

Appendix D: TMDL Public Comments for Little Manatee River (WBID 1742A) and South Fork Little Manatee River (WBID 1790) from Manatee County

August 20, 2009

Mr. Robert C. Brown
Environmental Protection Division Manager
Natural Resources Department
202 6th Avenue East
Bradenton, FL 34208

Dear Mr. Brown:

The Department appreciates the time and effort you and your staff put into reviewing these draft TMDLs. We have made necessary edits to some of the draft TMDL reports as a result of your comments. Because of your efforts, these final TMDLs will be improved. To aid you in reviewing our responses, we have included your comments, followed by a response to each (in blue), in the order in which they were presented.

1) The calculation methodology for both the fecal coliform and dissolved oxygen TMDLs utilizes the median of only the target load or concentration exceedances to determine a percentage reduction needed for the TMDL. The load reduction requirement is then assigned to all flow into the waterbody, including the significant amount of flow that is well within acceptable ranges.

   Manatee County recommends the TMDL calculation methodology be modified to either 1) include a determination of the percentage of the flow requiring the specified load reduction, or 2) utilize all data (both above and below the criterion) to determine the percentage reduction on all flow necessary to achieve the water quality criteria.

   Conceptually, we agree with your findings. However, in the absence of sufficient flow information in each watershed, it is difficult to determine what flow conditions are contributing to the water quality problems that have been identified. In other instances, we have used the "Kansas Method" and developed load duration curves for many of our TMDLs when adequate flow data are available for the basin and in the timeframe of the impairments. It is our experience with fecal coliform TMDLs that exceedances of the criteria can occur under all flow conditions. Still, if you have information indicating the high coliform (or low dissolved oxygen) conditions are limited to a particular set of flow conditions or sources, please provide it to us. While it may not change the percent reductions required by the TMDLs, that information may well help guide us in the Basin Management Action Plan (BMAP) process. In addition, the BMAP process does allow time to do added studies, to home on specific sources that need to be addressed and this could include gathering added flow data, if necessary.

   We have previously explored your suggestion of looking at all of the data. Two findings came from that evaluation. First, the required percent reduction calculated does not differ that much using either method. In fact, in some of the test cases, the required reductions increased by 5-10 percent. Second, the EPA's guidance is clear that intent of the TMDL program is to address the exceedances, not the times when water quality standards are being met. By focusing our (and your) efforts on the fixing the worst cases, water quality

should improve under all conditions. Given the tools in the toolbox for reducing fecal coliforms coming from nonpoint sources, it is hard enough to select a suite of Best Management Practices to meet the TMDL, but being able to find a tool good enough to differentiate by 5 or 10 percent is almost impossible.

2) The draft Fecal Coliform TMDLs for the Little Manatee River (WBID 1742A), the South Fork Little Manatee River (WBID 1790), and Gilly Creek (WBID 1840) assign Waste Load Allocations (WLAs) to Phase I NPDES Municipal Separate Storm Sewer Systems (MS4s), including Manatee County (NPDES Permit FLS000036). The Stormwater Management Program (SWMP) of Manatee County's NPDES MS4 permit was designed for and is implemented in the urbanized areas (UA) of the county. As shown on Figure 1, WBIDs 1742A, 1790, and 1840 lie entirely outside of Manatee County's Urban Area (UA), and therefore are not considered part of Manatee County's SWMP.

   The document has been revised to include the following text:
   Municipal Separate Storm Sewer System Permittees
   Municipal Separate Storm Sewer Systems (MS4s) may discharge fecal coliform to waterbodies in response to storm events. To address stormwater discharges, the EPA developed the NPDES stormwater permitting program. The stormwater collection systems in the Little Manatee River and the South Fork Little Manatee River watersheds are owned and operated by Hillsborough County (#FLS 000006), Manatee County (#FLS 000036), and FDOT. It should be noted that any MS4 permittee is only responsible for reducing the anthropogenic loads associated with stormwater outfalls that it owns, located within its MS4 jurisdiction, or otherwise has responsible control over, and it is not responsible for reducing other nonpoint source loads in its jurisdiction.

3) The draft TMDLs for the Little Manatee River (WBID 1742A) and the South Fork Little Manatee River (WBID 1790) attribute some of the fecal coliform load to leakage from centrally-collected sanitary sewer lines. Manatee County acknowledges these calculated loads are not utilized in the TMDL determination, but for accuracy, no central sewer collection systems exist within the Manatee County portion of these watersheds.

   The document has been revised to include the following text:
   Sanitary Sewer Overflows
   Sanitary sewer overflows (SSOs) do not exist within the Little Manatee River and South Fork Little Manatee River watersheds.

We appreciate your help and look forward to working with you to make the necessary improvements in water quality such that all the waters in Manatee County meet their designated uses. Please give me a call (850/245-8448) if you have any further questions or comments.

Sincerely,

Jan Mandrup-Poulsen, Administrator
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