CITY OF FORT WAYNE, IN

Use Attainability Analysis - 2020 Update

CITY UTILITIES

WATER THAT WORKS

Table of Contents

Table of Contents 1
Executive Summary 1
1 Introduction 5
1.1 Purpose and Objectives 7
Table 1.1-1 Status Summary of LTCP Implementation (as of December 2019) 9
Table 1.1-2 Current Proposed LTCP Capital Cost Estimate 10
Figure 1.1-1 Map Depicting City's CSO-Impacted Waters 13
2 Indiana's Recreational Water Quality Standards That Currently Apply to the CSO-Impacted Waters 14
3 Federal and State Law Pertaining to UAAs as a Prerequisite to Certain Changes to the Designated Use of a Waterbody 14
3.1 General Regulatory Requirements for UAAs 14
3.2.2 State Policy for Application of the CSO Wet Weather Limited Use Subcategory 16
4 Determination of Existing Use 16
4.1 Identification of Existing Uses 17
4.1.1 Recreational Activities 17
Table 4.1-1 Observed Recreational Uses of CSO-Impacted Waters May – October 2005 18
Table 4.1-2 Use Observations of Active River Organizations During Favorable River Conditions 19
Table 4.1-3 Use Observations of Active River Organizations During Unfavorable River Conditions 20
4.1.2 Water Quality of CSO-Impacted Waters 21
4.1.2.1 LTCP's Summarization of Water Quality of CSO-Impacted Waters 21
4.1.2.2 Evaluation of 1975-2006 Bacteriological Data from the CSO-Impacted Waters 22
Table 4.1-4 Exceedances of Applicable Bacteriological Standards for Full Body Contact Recreation from 1975 to 2006 23
Figure 4.1-1 Box-Whisker Plots for Historical Bacteria Data by Decade – St. Marys River (at Spy Run) 26
Figure 4.1-2 Box-Whisker Plots for Historical Bacteria Data by Decade – St. Joseph River (at Tennessee Avenue) 26
Figure 4.1-3 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at Anthony Boulevard) 27
Figure 4.1-4 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at Landin Road) 27
Figure 4.1-5 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at SR101) 28

4.1.2.3 Evaluation of 2016-2018 Stream Monitoring Data from Upstream of the CSO-Impacted Waters 28

Figure 4.1-6 E. coli Sampling Results 2016-2018 – St. Marys River 30

Figure 4.1-7 E. coli Sampling Results 2016-2018 – St. Joseph River 30

Figure 4.1-8 E. coli Frequency Distributions – St. Marys River 31

Figure 4.1-9 E. coli Frequency Distributions – St. Joseph River 31

4.1.3 Existing Use Conclusions 32

4.2 Revision of the Recreational Use Designation for the City's CSO-Impacted Waters Will Not Remove Existing Uses 33

Figure 4.2-1 Annual Overflow Frequency in a Typical Year 34

5 Attaining the Current Recreational Designated Use Is Not Feasible During Wet Weather Conditions 35

5.1 Reasons for Infeasibility of Attainment of Full-body Contact Recreation During Wet Weather Conditions 35

5.2 Factor 1: Naturally Occurring Pollutant Concentrations 35

5.3 Factor 2: Intermittent High Flow Conditions 36

5.3.1 Background on USGS Field Program and Safety Guidelines 37

Figure 5.3-1 Fort Wayne Area USGS Gaging Stations 38

5.3.2 Reviewing Historical Safety Decisions by USGS Field Staff 38

Figure 5.3-2 USGS Field Measurements St. Marys at Ferguson Road USGS 04182000 - Data from 1980-2019 40

Figure 5.3-3 USGS Field Measurements St. Joe at Mayhew Road USGS 04180500 - Data from 1984-2019 41

Figure 5.3-4 USGS Field Measurements Maumee at Anthony Boulevard USGS 04182900 - Data from 2012-2019 42

Figure 5.3-5 USGS Field Measurements Maumee at Coliseum Boulevard USGS 04182950 - Data from 2003-2019 43

Figure 5.3-6 USGS Field Measurements Maumee at Landin Road USGS 04183000 - Data from 1980-2019 44

Figure 5.3-7 USGS Field Measurements Maumee at Antwerp Ohio USGS 04183500 - Data from 2013-2019 45

Figure 5.3-8 USGS Field Measurements Spy Run near Park Drive USGS 04182808 - Data from 2008-2019 46

Table 5-3.1 Modeled Instream Peak Flow, Velocity, and Depth During CSO Activations Remaining After LTCP Implementation 47

5.3.3 Assessing Wading Safety Criterion Using Model Projections 48

Figure 5.3-9 Projected Safety Factors During Post-LTCP Activation Events at Two USGS Stations Without Wading Data 48
Figure 5.3-10 Location of Three CSO-Impacted Streams 49
Figure 5.3-11 Projected Safety Factors During Post-LTCP Activation Events on CSO-Impacted Streams 50
5.4 Factor 3: Human-Caused Conditions or Sources of Pollution 50
5.4.1 Increased Bacterial Pollution from Domesticated Animals Associated with Human Populations 51
5.4.2 Increased Bacterial Pollution Caused by Urbanization 51
5.4.3 Inability to Remedy Human-Caused Bacterial Contamination 52
5.5 Factor 6: Substantial and Widespread Economic and Social Impact 53
5.5.1 Substantial Economic and Social Impact 54
5.5.1.1 Background 54
5.5.1.1.1 Median Household Income 55
Figure 5.5-1 Map Depicting Sewer Service Area and Wayne Township within Allen County 56
5.5.1.2 Municipal Preliminary Screener 56
5.5.1.2.1 Municipal Preliminary Screener Value for CSO Compliance with Existing Water Quality Standards 57
Table 5.5-1 Capital Costs for CSO Control Measures for Complete Capture and Control of CSOs 58
Table 5.5-2: Total Capital Needed – Full Control 58
5.5.1.2.2 Municipal Preliminary Screener Value for Proposed CSO LTCP 59
Table 5.5-3 Capital Costs for LTCP Control Measures 60
Table 5.5-4: Total Capital Needed - LTCP 60
5.5.1.2.3 Additional Considerations for Municipal Preliminary Screener Values 61
Table 5.5-5 Summary of Relevant MPS Values 62
5.5.2 Secondary Test 63
5.5.2.1 Indicators for Secondary Test 63
Table 5.5-6 Summary of Secondary Indicators per U.S. EPA Benchmarks 64
5.5.2.2 Secondary Score 64
5.5.2.3 Contraindications to the Secondary Scoring Result 64
5.5.2.4 Additional Considerations Beyond the Secondary Test 66
Chart 5.5.2.4-1 Fort Wayne Per Capita Income as a Percentage of National Average 66
Chart 5.5.2.4-2 Comparative Change in Per Capita Income of Similar Cities between 2001 and 2017 67

Chart 5.5.2.4-3 Per Capita Personal Income in 2017 67
Chart 5.5.2.4-4 Manufacturing Location Quotient 68
5.5.3 Substantial Impacts Matrix 69
Table 5.5-7 Substantial Impacts Matrix 69
5.5.4 Availability of Grants 71
5.5.5 Widespread Economic and Social Impact 71
6 Public Outreach 72
6.1 2010 Public Outreach 72
6.2 2019 Outreach 73
7.0 A Revision of the Current Recreational Use Designation for the CSO-Impacted Waters Is Warranted, as Demonstrated by this UAA, With Respect to Wet Weather Conditions 74
7.1 The Current Recreational Use Designation Cannot Be Attained in the CSO-Impacted Waters during Wet Weather Conditions that Result in CSO Impacts 76
7.2 Specific Revision Requested to the Full-Body Contact Recreation Use Designation for the City's CSO-Impacted Waters 78
Table 7.2-1 Summary of UAA Factors and Durations of Impact Supporting Wet Weather Limited Use 79
APPENDIX A: Description of the *Typical Precipitation Year*, as excerpted from Chapter 3 of the City's LTCP. 82
APPENDIX B-1: Screening-level Spreadsheet Analysis of the Potential Impact of CSO Wet-weather Bacteria Loads on the Maumee River Downstream of Fort Wayne 85
Figure 1 Screening-Level Analysis of Bacteria Levels Remaining as Function of Distance Downstream of SR101 87
APPENDIX B-2: Model-Based Assessment of the Impact of Upstream Bacteria Sources on River Reaches in Fort Wayne 88
Figure 1 – Extent of Water Quality Model 89
Figure 2 – Predicted E. coli 30-day geomean for calendar year 1995 91
Figure 3 – Predicted E. coli 30-day maximum value for calendar year 1995, Upstream boundary loads only 91
APPENDIX C-1: Recreational Use Report 92
APPENDIX C-2: 2019 River Use Observation Survey Form 110
APPENDIX C-3: Four Tributary Segments – Maps and Photographs 112
APPENDIX D: Stream Data, Legacy STORET Database 122
APPENDIX E: Stream Data, IDEM's AIMS Database 367
APPENDIX F: Stream Data, City of Fort Wayne Sampling Program 378
APPENDIX G: Data Set for St. Joseph River @ Tennessee Avenue 403

APPENDIX H: Data Set for St. Marys River @ Spy Run 409
APPENDIX I: Data Set for Maumee River @ Anthony Boulevard 415
APPENDIX J: Data Set for Maumee River @ Landin Road 421
APPENDIX K: Data Set for Maumee River @ SR 101 427
APPENDIX L: Substantial and Widespread Economic and Social Impact – Supporting Information 433
Section 1 – Annual Operation and Maintenance (O&M) Cost Information 433
Section 2 - Debt Service Information and Payment Requirements 434
Section 3 - Capital Improvement Program Information 436
Section 4 - Residential Flow Share 439
Section 5 - Residential Customer Count 440
Section 6 - Median Household Income 441
Section 7 - Residential Indicator / Municipal Preliminary Screener Values 441
Exhibit L-1: Comparison of Current LTCP and Full Control CIP's 2008-2025 443
Exhibit L-2: Current LTCP and All Sewer CIP Costs 2019-2025 445
Exhibit L-3: Full Control and All Sewer CIP Costs 2019-2025 447
Exhibit L-4: Stormwater CIP Costs 2019-2025 449
Exhibit L-5: Sewer Service Area and Wayne Township Median Household Income 451
Exhibit L-6: Full Control No Stormwater Costs 454
Exhibit L-7: Full Control Includes Stormwater Costs 458
Exhibit L-8: Approved LTCP No Stormwater Costs 462
Exhibit L-9: Approved LTCP Includes Stormwater Costs 466
APPENDIX M: Precision of Cost Estimating for CSO Control Measures 470
APPENDIX N-1: Public Participation Meetings February 17, 2010 472
APPENDIX N-2: Public Participation Meetings April 15, 2019 498
APPENDIX O: IDEM Letter Approving 2010 UAA 531
APPENDIX P: St. Joseph River Milestone Report (2017) 534

Executive Summary

This document updates the 2010 UAA submitted to IDEM in May 2010 and, following IDEM approval, to EPA Region V. It also replaces the 2019 UAA Update submitted to IDEM in September 2019 and the 2020 UAA Update submitted to IDEM in March 2020. The 2010 UAA supports a revision to the current recreational use designation for waters impacted by CSO discharges from the City's combined sewer system to allow Indiana's CSO Wet Weather Limited Use subcategory to be applied only during the times the water quality is affected by the few annual storm events that cause CSO discharges following full implementation of the City's LTCP. The following bullet points summarize the contents of this Updated UAA.

- Section 1.1 provides background information concerning the City's CSO-Impacted Waters, the elements and associated costs of the City's LTCP, and the need for a UAA to support the short-term application of the CSO Wet Weather Limited Use subcategory, once LTCP implementation has been completed, in lieu of the current full-body contact recreation use during the few annual periods of wet weather when CSO discharges will contribute bacterial contamination to those waters.

- Section 2 describes the full-body contact recreation use designation that applies under current state water quality standard rules to the CSO-impacted Waters and the associated water quality criteria for bacteria required to support the recreational use.

- Section 3 summarizes federal regulatory requirements for UAAs to support removal or revision of a designated use and for the application of Indiana's alternative recreational use, the CSO Wet Weather Limited Use subcategory.

- Section 4 addresses the topic of "existing use" in relation to the proposed use of UAAs to remove or revise a designated use and provides specific information relating to the City's CSO-Impacted Waters to allow a determination of the existing use of those waters with respect to the current designated use for full-body contact recreation.

- Section 4.1.1 reviews a survey of recreational activities observed in or on the CSO-Impacted Waters.

- Section 4.1.2, as a general matter, presents a summary of bacterial quality data from the CSO-Impacted Waters from 1975 through 2018 and shows that the bacterial quality of those waters, including periods of dry weather and wet weather, has routinely exceeded water quality criteria specified for full-body contact recreation.

- Section 4.1.2.2 provides a summary of bacterial quality data collected from CSO-Impacted Waters within the City's urban area over the period of 1975 through 2006. Tabular information is provided on the percentage of samples from each of five sampling locations on the three major CSO-Impacted Waters that exceed bacteriological criteria for full-body contact recreation. Also, graphs are provided that summarize statistical analyses of the bacterial quality data for each of the five sampling locations for each decade since the mid-

1970s. The overall conclusions drawn from this data are that the bacterial quality of all three rivers has consistently failed, at high percentages of the database, to attain applicable water quality criteria required for full-body contact recreation. In addition, there has been little change in the characteristic bacterial quality of these rivers over the period from 1975 to 2006.

- Section 4.1.2.3 describes a review of bacterial quality data acquired by the City's river sampling program at two sampling locations each for the St. Joseph River and the St. Marys River for the recent period of 2016 through 2018. One sampling location for each river is immediately upstream of the City's urban area and one is near the downstream confluence of the two rivers. The conclusion drawn from this data review is that upstream bacterial contamination in both rivers is regularly present at levels that prevent the water quality of either river from meeting recreational water quality criteria, both upstream and downstream of CSO discharge points. This point is further reemphasized by the water quality modeling conducted by the City as recounted in Appendix B-2, which demonstrates that upstream bacterial contamination alone in the St. Joseph and St. Marys Rivers, with no bacterial input from CSOs or the stormwater sewer system, will result in nonattainment of recreational water quality criteria in the Maumee River, as well as the St. Joseph and St. Marys Rivers.

- Section 4.1.2.4 addresses the existing recreational use of the City's CSO-Impacted Waters and explains (1) the absence of full-body contact recreational activities in these waters, particularly during those infrequent wet weather conditions that will produce CSO discharges once LTCP implementation is complete; and (2) to the extent that any full-body contact recreation has occurred in these waters since 1975 during such wet weather conditions, it has occurred in waters with water quality that is characteristically impaired for recreational use.

- Section 4.2 explains that there are no existing recreational uses of the CSO-Impacted Waters that would be inconsistent with the requested revisions to the current recreational use designation of these waters since the water quality of these waters, at least since 1975, has not been sufficient to support recreational uses much of the time, and certainly not during wet weather conditions of the severity that will result in CSO discharges from the City's CSS following full implementation of its approved LTCP.

- Section 5.0, as a general matter, explains why attainment of the current recreational use designation for the CSO-Impacted Waters is not feasible during the rare wet weather conditions that will produce CSO discharges following full implementation of the City's LTCP.

- Section 5.1 lists the four UAA factors from 40 CFR 131.10(g) that are relied upon by the City to demonstrate the non-attainability of the current recreational use designation for the CSO-Impacted Waters during wet weather conditions that result in CSO discharges. These include: factor 1, naturally occurring contamination precludes attainment of the designated use; factor 2, natural, ephemeral, intermittent, or low-flow conditions or water levels prevent use attainment; factor 3, human-caused sources of contamination prevent attainment of the designated use and cannot be feasibly remediated; and factor 6, controls more stringent than

those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

- Section 5.2 discusses the highly probable contribution of naturally-occurring sources of bacterial contamination (i.e., avian and mammalian wildlife) to the instream water quality of the St. Marys River and the St. Joseph River upstream of the City's urban area, and also within the urban area, that routinely exceeds levels supportive of full-body contact recreation. Such naturally- occurring bacterial contamination is conveyed downstream through the CSO-impacted segments of these waters and the Maumee River, which results from their confluence.

- Section 5.3 explains that high flow conditions expected in the CSO-Impacted Waters during and after the infrequent post-LTCP CSO activations will make the waters unsafe for recreational activity, independent of water quality conditions. These conclusions are based on both historical records from USGS field programs and projections from the City's calibrated model.

- Section 5.4 discusses the highly probable contribution of human-caused sources of bacterial contamination (e.g., livestock and domesticated pets) to the instream water quality of the St. Marys River and St. Joseph River upstream of the City's urban area, and also within the urban area, that routinely exceeds levels supportive of full-body contact recreation. This section also explains that urban development as a human-caused condition and in particular increased imperviousness contribute to bacterial contamination, by increasing stormwater runoff rates to the local rivers. As with naturally-occurring bacterial contamination, the bacterial contamination from human-caused sources is conveyed downstream through the CSO-impacted segments of these waters and the Maumee River. It is observed in Sections 5.2 and 5.4 that it is practically infeasible to separate the relative impacts of naturally-occurring sources of bacterial contamination and human-caused sources of bacterial contamination to the St. Marys River, the St. Joseph River, and the Maumee River.

- Section 5.4.2 briefly recounts the human-caused sources of bacterial contamination associated with the City's urbanized area. The infeasibility of sufficiently remediating human-caused sources of bacterial pollution is discussed in Section 5.4.3.

- Section 5.5.1.2 reviews the calculation of the indicator used to assess whether the costs of CSO controls are likely to impose a substantial economic burden on the City pursuant to EPA guidance. This indicator – sometimes referred to as the Municipal Preliminary Screener and elsewhere as the Residential Indicator - when applied to the projected costs of complete elimination of CSO discharges from the City, clearly shows that a markedly substantial economic burden would be incurred by the City's utility ratepayers if such measures were required. Application of this indicator to the costs of the City's approved LTCP, particularly when focused on the City's most populous township (which also has the highest percentage of households below the federal poverty level) or when LTCP costs are supplemented with costs of implementation of the City's separate stormwater management program, shows a substantial economic impact.

- Section 5.5.2 addresses the application of the "secondary test" prescribed by EPA guidance to assess the City's general socioeconomic health, given that the Municipal Preliminary Screener indicates that the costs of CSO controls more stringent than those posed by the LTCP would result in a substantial economic burden. The secondary test produces scores in the mid-range level. Sections 5.5.2.3 and 5.5.2.4 review additional financial information concerning the City that strongly suggests that the secondary test scores referenced above are overly optimistic as a general indicator of the City's economic status.

- Section 5.5.3 displays the Substantial Impacts Matrix based on the Municipal Preliminary Screener values for various alternative scenarios considered and the Secondary Test scores. A high, or substantial, economic burden is indicated by the Matrix if the City were required to implement more stringent CSO controls than prescribed by the approved LTCP. Section 5.5.5 provides the City's rationale for its substantial economic impact being considered widespread as well. As a result, it is concluded that the imposition of costs of controls more stringent than those required by the LTCP would result in a substantial and widespread economic and social impact. The extent of this burdensome impact would be markedly greater if the City were to be required to eliminate all CSO discharges under all wet weather conditions.

1 Introduction

The City of Fort Wayne, Indiana (the "City") submits this Updated Use Attainability Analysis (the "Updated UAA") to supplement the *City of Fort Wayne, Indiana, Use Attainability Analysis: Recreational Use – St. Marys, River, St. Joseph River, and Maumee River*, previously approved by IDEM in 2010 (the "2010 UAA") and further support a revision of the recreational use designation for waters impacted by combined sewer overflow ("CSO") discharges from the City's combined sewer system ("CSS").[1] The requested revision would have a limited effect since it would apply Indiana's CSO Wet Weather Limited Use subcategory to CSO-impacted waters only during the times of impact from those few CSO activation events that remain following implementation of the City's approved Long-Term Control Plan (LTCP).

As contemplated by the IDEM and EPA-approved LTCP[2] and the Consent Decree,[3] the City developed the 2010 UAA in accordance with 40 CFR 131.10(g) and formally submitted it to IDEM in May 2010 requesting the above-referenced water quality standards revision. Based on positions previously expressed by EPA Region V, that submission was predicated only on subdivision (6) of 40 CFR 131.10(g) ("Factor 6"), which relies upon the substantial and widespread economic and social impact that would be incurred by the City and its utility ratepayers if more stringent CSO controls were required. Following substantial consultation with EPA Region V's Water Division staff, IDEM approved the 2010 UAA on August 30, 2010[4] and proceeded, at EPA Region V's request, to draft a proposed rule to reflect the revision requested by the City. Unfortunately, little to no further progress on the City's request has since been made. This Updated UAA is provided to facilitate final agency action on the City's now longstanding request.

Included within this Updated UAA is updated economic impact data informed by nearly twelve years' of LTCP implementation in continued support of the 2010 UAA's approval on the basis of Factor 6. Also included in the Updated UAA are substantial information and data which support the requested water quality standard revision on the basis of 40 CFR 131.10(g)(1), (2) and (3) (respectively, "Factor 1," "Factor 2,"and "Factor 3"). Factor 1 is based on naturally occurring pollution, Factor 2 concerns flow conditions or water levels preventing attainment of the use, and Factor 3 relates to human caused pollution sources that cannot be remediated. For the reasons stated in this Updated UAA, the City believes that approval of request is independently appropriate under Factor 1, Factor 2, and Factor 3, and that continued approval is appropriate under Factor 6.

[1] Use attainability analyses ("UAAs") are generally explained in Section 3.1 of this Updated UAA. Briefly, a UAA is a compilation of information prescribed by federal regulation that justifies the elimination of a designated use, such as recreational use, for a particular body of water through a demonstration that attainment of the designated use is infeasible.
[2] See, e.g. LTCP Sections 1.4.4, 1.4.7, and 5.0-5.4.
[3] See, e.g., Consent Decree paragraph 84(a). The Consent Decree is identified and briefly described in Section 1.1 of this Updated UAA.
[4] The IDEM approval letter is attached as Appendix O.

As IDEM and EPA review the Updated UAA, it may be useful to consider the following brief history of the City's efforts to facilitate completion of the requested revision of water quality standards:

- Consent Decree and LTCP negotiations among IDEM, EPA,[5] DOJ [6] and the City were expressly premised, in part, upon the City's pursuit of a use attainability analysis ("UAA") under 40 CFR 131.10(g) based on the substantial and widespread socioeconomic impact of Factor 6. This underlying premise dates to the beginning of those negotiations in 2001.

- Consistent with this premise of the Consent Decree and LTCP, the City's work on development of the 2010 UAA began even before the Consent Decree's entry on April 1, 2008. Indeed, an initial draft of the 2010 UAA was provided to IDEM and EPA Region V for comment in March 2008. The initial draft contemplated Factors 1 and 3, as well as Factor 6, but the City subsequently deleted the Factors 1 and 3 components from the draft after being advised by EPA Region V that agency policy would not favor approval on such grounds.

- Multiple conferences with EPA Region V Water Division staff regarding the draft UAA resulted in many revisions being made to the draft to address EPA comments

- In July 2009, EPA Region V's Water Division staff, following favorable input from EPA Headquarters staff, notified the City to proceed with submittal of the final version of the draft UAA to IDEM to begin the formal review and approval process.

- Following public meetings conducted at IDEM's request, the City submitted a final version of the 2010 UAA to IDEM in May 2010. IDEM formally approved the UAA on August 30, 2010 and advised the City that IDEM would prepare a proposed rule to revise the recreational use designation for the City's affected waters that would be submitted to the State's rulemaking board by the end of the year. IDEM proceeded to draft a proposed rule.

- On or about October 20, 2010, the City received an email from EPA Region V expressing concern with the 2010 UAA, as approved by IDEM. Over the ensuing years, the City met numerous times with EPA staff in an attempt to work through and resolve agency concerns while preserving the City's objective of achieving finality for its ratepayers with respect to CSO controls. These meetings revealed, in part, that EPA Region V believed that a UAA should not be approved until the LTCP implementation was complete so as to eliminate uncertainties in cost projections for construction of CSO controls. EPA Region V also indicated a belief that, during each future triennial review, a full redetermination of the 2010 UAA would be required in which any debts associated with LTCP implementation that have been retired since the previous triennial review would no longer be considered in assessing whether a substantial economic burden was still posed by any CSO control requirements more stringent than those prescribed by the LTCP.

[5] The U.S. Environmental Protection Agency.
[6] U.S. Department of Justice.

In sum, new positions expressed by EPA Region V staff beginning in late 2010 effectively precluded subsequent progress in gaining federal approval of the UAA, and the reasonable certainty sought by the City and its ratepayers. In an effort to achieve such reasonable certainty, which the City considers to be imperative, the City has prepared this Updated UAA. While the City respectfully disagrees with the above-mentioned position of EPA Region V that a UAA should not be approved until LTCP implementation is complete, the advanced state of implementation of the City's LTCP achieved during the nearly 9-year period following IDEM's 2010 UAA approval provides what should be more than adequate certainty concerning CSO control costs to be incurred by the City. Accordingly, the City renews its request for a revision of the recreational use designation for waters impacted by CSO discharges from the City's combined sewer system to apply Indiana's CSO Wet Weather Limited Use subcategory to the City's CSO-impacted waters (the "CSO-Impacted Waters")[7] during the times of impact from those few wet weather events that produce CSO discharges.

1.1 Purpose and Objectives

Several waters within and downstream of the City are impacted under wet weather conditions by overflows from the century-old combined sewer system that serves the older part of the City. The waters, the CSO-Impacted Waters, include segments more specifically identified below of the Maumee River, the St. Joseph River, the St. Marys River, Baldwin Ditch, Harvester Drain, Spy Run Creek, and Natural Drain #4.

The City has been working to reduce its combined sewer overflows since the late 1990s. A LTCP to address the water quality impacts of the City's CSOs was submitted to IDEM and was approved by the agency in December 2007.[8] The key elements of the approved LTCP have been made obligations of the Consent Decree which was approved by order of the U.S. District Court for the Northern District of Indiana entered in Case No. 2:07-cv-00445-PPS-APR on or about April 1, 2008.

In the years prior to the start of its formal LTCP implementation in 2008, the City constructed over $46M in early action sewer separation projects. As other early action projects, the City completed construction of a new Wastewater Treatment Plant ("WWTP") Headworks facility and had construction underway on a new, expanded primary treatment facility for its WWTP. Those two projects represented a combined investment of approximately $63M and were foundational to the City's ability to increase its WWTP capacity as part of its LTCP.

As originally approved, the City's LTCP provided for CSO Control Measures that will achieve a high level of control for the remaining CSOs in the City's combined sewer system at a capital cost of over $305 Million[9] and the expenditure of many more millions of dollars in additional

[7] Specific waters which constitute CSO-Impacted Waters are identified within Section 1.1 below.
[8] EPA concurrence with the City's LTCP, as approved by IDEM, was stated in the Consent Decree at the time of its lodging with the federal district court in late December 2007.
[9] This figure, denominated in 2005 dollars, includes the capital cost component of recent improvements to the headworks and primary treatment units of the WWTP, which will facilitate improved capability to handle higher wet weather flow rates. As a result of final design of control measures, including but not limited to those reflecting the two modifications to the Consent Decree, the final cost of implementation will be higher, as discussed below.

annual operations and maintenance expenses and debt service costs. The scope of the City's approved LTCP is summarized as 15 control measure project groups which are shown below in Table 1.1-1.[10]

When fully implemented, the LTCP will reduce the number of overflow events for the City's CSO outfalls from as high as 20 to 71 annual events[11] in the "typical year" to a maximum of 4 annual overflow events for which it will not be feasible to treat excess CSO flows to meet currently applicable water quality criteria for full body contact recreation. Moreover, CSO discharges to the St. Joseph River, the City's highest quality waterway, will be markedly reduced under the LTCP such that only a single annual overflow event in the "typical year" will occur for which it will not be feasible to treat excess CSO flows to meet water quality criteria for full body contact recreation. This represents an exemplary level of control for previously uncontrolled wet weather discharges of combined sewage to the City's CSO-Impacted Waters.[12]

Since the initial approval of the Consent Decree, Fort Wayne has received approval for two modifications to the Consent Decree that provide improved performance and/or accelerated completion dates for LTCP control measures.

- Modification #1 was approved on January 26, 2015 in U.S. District Court for the Northern District of Indiana. This modification eliminated the original LTCP concept of satellite disinfection and storage for the St. Joseph River CSOs and revised the LTCP scope to provide for conveying those flows to the WWTP for full treatment.

- Modification #2 was approved on May 23, 2019 in U.S. District Court for the Northern District of Indiana. This modification allows for the elimination of all remaining satellite disinfection facilities from the LTCP and their replacement by relief sewers or storage facilities. More significantly, this modification also provides for the replacement of the original Wayne Street and St. Marys parallel interceptor projects with a deep rock tunnel and relief sewer.

Table 1.1-1 also provides a summary of the status of the City's implementation of its LTCP and demonstrates the City's commitment to complete the agreed upon LTCP and achieve the prescribed level of control as described above. Highlights of the LTCP implementation to date:

- All work for the CSOs along the St. Joseph River was completed by 2014 and those outfalls are now in compliance with the LTCP's level of control. Compliance for the St. Joseph River projects was achieved four years earlier than the original LTCP deadline.

[10] The description of the LTCP's control measures in Table 1.1-1 reflect the effect of two modifications to the Consent Decree that are briefly described in following text.
[11] The 19 CSO regulators with highest activation rates in the City's combined sewer system range from 20 to 71 annual overflow events in the "typical year". The "typical year" is an artificial construct that is intended to represent those annual precipitation events that have the highest probability of occurrence in any year, based on statistical evaluation of 48 years of precipitation records for the Fort Wayne area. Appendix A to this UAA provides a detailed description of the derivation of the "typical year" for purposes of LTCP development by the City.
[12] A brief description of the CSO control measures selected in the LTCP will be provided in a later section.

- The City has improved its WWTP, Wet Weather Storage Ponds and Wet Weather Pump Station to capacities greater than what was originally targeted in the LTCP.
- The deep rock tunnel (called the 3RPORT Tunnel) is the largest project in the LTCP and is currently under construction. The project consists of a 16' diameter tunnel, approximately five miles in length and 200-250 feet below the surface. The pump station to dewater the tunnel and the sewers that will connect the tunnel to the existing collection system are in various phases of design and construction as well.

Table 1.1-1 Status Summary of LTCP Implementation (as of December 2019)

CSOCM No.	Control Measure	AFO Deadline per CD*	Planning & Design Status	Construction Status	Commissioning Status
1	Plant Phase II – Primaries	2008	100%	100%	100%
2	Plant Phase III – Increase Peak Flow	2015	100%	100%	100%
3	Early Floatable Control	2010	100%	100%	100%
4	CSSCIP – Phase I	2013	100%	100%	100%
5	WW Pond Storage & Dewatering	2013	100%	100%	100%
6	CSSCIP – Phase II	2018	100%	100%	100%
7 & 8	St. Joe River Relief Sewers	2015	100%	100%	100%
9	CSO 61 & 62 Relief Sewer	2018	100%	100%	100%
	CSO 54 Satellite Storage	2020	95%	0%	0%
10	Morton Street to WW Ponds	2019	100%	100%	100%
11	3RPORT Tunnel	2023	100%	60%	0%
	3RPORT Consolidation Sewers	2023	70%	10%	0%
	3RPORT Dewatering Pump Station	2023	85%	0%	0%
12	Foster Park Relief Sewer	2025	35%	0%	0%
13	Late Floatable Control	2025	70%	40%	40%
14	CSO 64 Satellite Storage	2025	5%	0%	0%
15	WW Pond High Rate Treatment	TBD	n/a	n/a	n/a

**Achievement of Full Operation – dates revised as per CD Modifications No1. and CD Modifications No. 2*

To achieve the LTCP progress identified in Table 1.1-1, the City has invested significantly in its infrastructure. In the years 2008 - 2018, the City has already made capital investments of over $187M in LTCP projects and is currently projecting a total capital investment of approximately $340M to complete the LTCP.[13] The current proposed LTCP capital cost estimate is shown in Table 1.1-2.

[13] All monetary values appearing in this Updated UAA are stated in 2005 Dollars unless otherwise expressly indicated.

Table 1.1-2 Current Proposed LTCP Capital Cost Estimate

CSOCM No.	Control Measure		Capital Cost (2005 $ Value)
1	Plant Phase II – Primaries	$	-
2	Plant Phase III – Increase Peak Flow	$	17,430,300
3	Early Floatable Control	$	1,780,000
4	CSSCIP – Phase I	$	8,050,000
5	WW Pond Storage & Dewatering	$	34,030,000
6	CSSCIP – Phase II	$	25,770,000
7 & 8	St. Joe River Relief Sewers	$	5,140,000
9	CSO 61 & 62 Relief Sewer, CSO 54 Storage	$	6,380,000
10	Morton Street to WW Ponds	$	10,270,000
11	3RPORT Tunnel, Sewers, Pump Station	$	219,350,00
12	Foster Park Relief Sewer	$	10,630,000
13	Late Floatable Control	$	410,000
14	CSO 64 Satellite Storage	$	690,000
15	WW Pond High Rate Treatment	$	-
	Total Capital Cost	**$**	**339,930,000**

Notwithstanding the impressive control levels to be provided by the LTCP, which go beyond the point of diminishing returns from a cost-effectiveness perspective, the CSO Control Measures specified by the LTCP will not, as alluded to above, achieve compliance with Indiana's water quality standards for full-body contact recreation under the relatively severe wet weather conditions occurring up to four times in a "typical" year for the St. Marys River and Maumee River and once in a typical year on the St. Joseph River. The City submits, as documented in its LTCP and as further documented in this Updated UAA, that further improvements in water quality of its CSO-Impacted Waters cannot be achieved without the expenditure of funds beyond that which is affordable by the City. Thus, although the LTCP will achieve much at high cost to the City and its ratepayers, the City will not be able to comply at all times during a "typical year" with the Clean Water Act's water quality requirements unless the current recreational use designation for the City's CSO-Impacted Waters can be revised on a site-specific basis to reflect the capabilities of the approved LTCP.

Consequently, a revision to the full body contact recreation use designation set by Indiana water quality standards for the CSO-Impacted Waters is requested by the City such that the CSO wet weather limited use subcategory that is conditionally available under Indiana law may be applied. More specifically, the CSO wet weather limited use subcategory would apply to the relevant waters only during the few times, annually, of impact from CSO discharges. The requested revision to the recreational use designation of the impacted waters is predicated upon the following independent grounds: (i) the substantial and widespread economic and social impact (Factor 6) that would be incurred by the community of Fort Wayne if compliance with the water quality criteria associated with the full body-contact recreational use designation were required at all times; (ii) the fact that attainment of the current recreational use during those few post-LTCP CSO activation events will be prevented by unsafe flow conditions (Factor 2); and (iii) the fact that attainment of the current

recreational use during those few post-LTCP CSO activation events will be prevented by the irremediable bacteria levels arising from a combination of naturally occurring and human caused sources (Factors 1 and 3).

The City's LTCP is predicated, in part, upon a proposed revision in the designated recreational use for the City's urban waters to Indiana's CSO wet weather limited use subcategory to be applied to periods of CSO discharges. To obtain approval for this revision in designated recreational use for the City's CSO-Impacted Waters, it is necessary for the City to establish eligibility for and perform a use attainability analysis that justifies the revision consistent with relevant federal and state law.

This document describes federal and state requirements associated with a UAA, updates the City's 2010 UAA for further consideration by state and federal agencies, and requests approval by those agencies of a revision to the recreational designated use for CSO-Impacted Waters to the Indiana CSO Wet Weather Limited Use. The CSO-Impacted Waters specifically include the following:[14]

- St. Marys River (from its junction with Natural Drain #4 near Tillman Road, to the confluence with St. Joseph River)
- Natural Drain #4 (from CSO Outfall 054 near the intersection of Hollis Lane and Mercer Avenue, to its junction with the St. Marys River)
- St. Joseph River (from CSO Outfall 052, located immediately south of Coliseum Blvd., near N. Anthony Boulevard, to the confluence with St. Marys River)
- Spy Run Creek (from CSO Outfall 036, located north of W. State Street along Eastbrook /Westbrook Drive, to its junction with the St. Marys River south of 4th Street)
- Baldwin Ditch (from CSO Outfalls 061 and 062 near the intersection of E. State Street and Barnhart Avenue, to its junction with the Maumee River near CSO Ponds 1 and 2)
- Harvester Drain (from CSO Outfall 064 to its junction with the Maumee River)
- Maumee River (from its origin at the confluence of the St. Marys River and St. Joseph River in the City to the boundary between the states of Indiana and Ohio).

For clarity of further reference to these waterbodies, the parenthetically identified reaches represent those portions of the waterbodies which are projected to be impacted by *E. coli* in excess of the bacteriological criteria to protect full-body recreational use as a result of the few uncontrolled CSO discharges which statistically would occur in the "typical year" consistent with approved performance criteria after full implementation of the City's LTCP.[15] These few CSO

[14] See Figure1.1-1 for a map depicting the City's CSO-Impacted Waters.

[15] Given the manner in which Indiana NPDES regulations apply the bacteriological criteria for recreational use directly as end-of-pipe limits so that no mixing zone is allowed, essentially every untreated CSO discharge will result in exceedances of the recreation-based water quality criteria for *E. coli*. The areal extent and duration of the *E. coli*

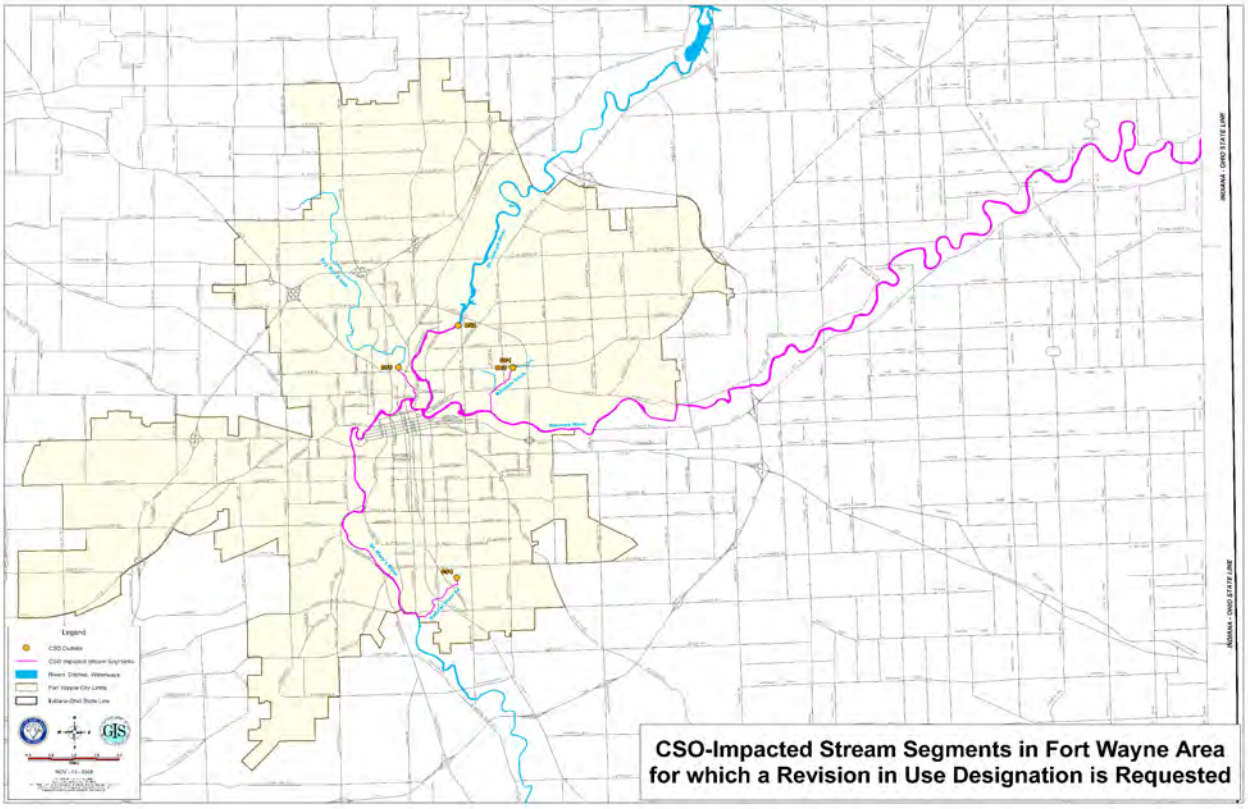
impacts of limited duration are typically overshadowed by the well-documented impacts of other sources of *E. coli* to these waterbodies. Therefore, these same reaches are proposed to be addressed by a rulemaking of the Indiana Environmental Rules Board to apply the CSO Wet Weather Limited Use designation in lieu of the current full-body contact recreation designation during those particular wet weather conditions under which CSO discharges occur. The extent of the reaches identified above that are projected to be impacted by CSO discharges after implementation of the LTCP is determined for all waterbodies except the Maumee River as follows: the upstream point of beginning is marked by the location of the first CSO that will remain after LTCP implementation. The downstream endpoint for each reach is the point of confluence with a larger waterbody still within the area of the City's combined sewer system.[16] For the Maumee River, which begins within the area of the combined sewer system, the downstream endpoint has been determined by a one-dimensional water quality model described in Appendix B-1.

It also is critical to emphasize that, while the few CSO discharges remaining following LTCP implementation would have a discernible short-term impact on the bacterial concentrations of these "CSO-Impacted Waters" if other sources of contamination were absent, all of these identified reaches, as well as their corresponding upstream reaches, would already exceed water quality criteria associated with full body-contact recreational use designation due to bacterial contamination entering these reaches from sources other than CSOs. This conclusion is widely supported by decades of water quality data as presented in detail in Section 2 below, and further demonstrated through application of the City's detailed water quality model as described in Appendix B-2. Model results indicate that even with all urban sources within the City (CSOs, stormwater sewers, and nonpoint sources) eliminated or treated to a hypothetical zero bacteria concentration, recreational use criteria would be regularly and consistently violated in the identified reaches due to upstream sources.

exceedance resulting from a CSO discharge event will vary with a number of factors, including the severity of a specific storm event, the near-term history of precipitation activity preceding that event, the typical volume/flow rate of discharge from a particular CSO for such conditions, and the receiving stream flow corresponding to such conditions. While recognizing this variability, the description of the CSO-Impacted Waters provided above in Section 1.1 provides a reasonable worst-case description of the extent of substandard bacterial quality in these waters during wet weather conditions of a typical year.

[16] Available data collected by the City shows these waterbodies to exhibit substandard *E. coli* values throughout their respective segments under many conditions including most wet weather events, with or without concurrent CSO discharges.

Figure 1.1-1 Map Depicting City's CSO-Impacted Waters



As will be explained and supported, the request of this Updated UAA rests upon the following independent bases:

- Naturally occurring pollutant concentrations prevent attainment of the full-body contact recreational use (Factor 1);
- Natural, ephemeral, intermittent, or low-flow conditions or water levels [that] prevent the attainment of the use (Factor 2);
- Human-caused sources of pollution prevent attainment of the full-body contact recreational use and cannot be feasibly remedied (Factor 3);
- Substantial and widespread social and economic impacts would be caused by a requirement to implement controls beyond those contained in the City's LTCP as approved by IDEM and EPA (Factor 6).

The conclusion of this Updated UAA is that the currently designated recreational use is not attainable and is not an existing use in the City's CSO-Impacted Waters during and for a short period of time following wet weather events that exceed the high level of CSO control provided for in the LTCP. The remainder of this Updated UAA provides the specific rationale and summarizes the factual support for this conclusion.

2 Indiana's Recreational Water Quality Standards That Currently Apply to the CSO-Impacted Waters

All surface waters within Indiana's portion of the Great Lakes drainage basin, including the receiving waters for the City's CSOs, are designated for full-body contact recreation by the water quality standards rule for such waters adopted by the former Indiana Water Pollution Control Board. 327 IAC 2-1.5-5(a)(1). Indeed, with rare exceptions for temporary alternate uses, all Indiana surface waters are designated for full-body contact recreation. The following numeric water quality criteria for *E. coli* are established by these water quality standards to support the designated recreational use during the annual recreational season of April through October:

- Geometric mean of 125 colony-forming units per 100 milliliters (cfu/100 mL) based upon five equally spaced samples taken in a one-month period.
- Single sample maximum of 235 cfu/100 mL.

327 IAC 2-1.5-8(e)(2).

These bacteriological water quality criteria are intended to protect full-body immersion contact (such as occurs during swimming and some other water recreational activities) from unreasonable risk of disease. The water quality standards apply these criteria to all waters, whether or not they are officially designated as public swimming areas and whether or not any particular water body is reasonably suited for full-body contact recreation. While appropriate for some waters during certain periods, this designation clearly is not attainable in all waters, under all conditions.

Many Indiana water bodies have not and do not currently meet the *E. coli* criteria specified for full-body contact recreation swimming all the time – especially during and following wet weather events. For example, in its 2018 Integrated Water Quality Monitoring and Assessment Report, IDEM identifies 2,759 miles (77.50%) of evaluated stream miles in the Great Lakes Basin alone as not attaining the recreational use due to excessive bacteria levels.[17] Those portions of the St. Mary's River, St. Joseph River and Maumee River affected by the City's CSOs are included in this list of non-attaining waters.

3 Federal and State Law Pertaining to UAAs as a Prerequisite to Certain Changes to the Designated Use of a Waterbody

3.1 General Regulatory Requirements for UAAs

Federal water quality regulations[18] describe the purpose of a UAA to be as follows: a UAA provides the informational base upon which a State may demonstrate that removing a designated use for a specific waterbody or establishing subcategories of the use which require less stringent

[17] These data tend to be consistent with EPA's statement, "The bacteria standard is one of the most commonly violated water quality standards in terms of both the number of water bodies and stream miles impaired." See *National Management Measures to Control Nonpoint Source Pollution from Urban Areas.* (U.S. EPA 2005.)
[18] *See* 40 CFR 131.10(g) and 40 CFR 131.10(j)(2).

water quality criteria is justified because attaining the designated use is not feasible. The specific grounds on which the infeasibility of attaining a designated use may be demonstrated include:

(1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
(2) Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met; or
(3) Human caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
(4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in attainment of the use; or
(5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses; or
(6) Controls more stringent than those required by sections 301(b) and 306 of the Act would result in substantial and widespread economic and social impact.

40 CFR § 131.10 (g).

A UAA is defined by federal regulations as "a structured scientific assessment of the factors affecting the attainment of the use, which may include physical, chemical, biological, and economic factors as described in § 131.10(g)."[19]

3.2 EPA and Indiana Policies Support the Coordination of LTCP Development with Review of the Potential Appropriateness of Water Quality Standard Revisions

3.2.1 EPA Policy and Guidance

EPA's *Combined Sewer Overflow (CSO) Control Policy*[20] states that one of its key elements is the "development of the long-term plan …[in coordination] with the review and appropriate revision of water quality standards and implementation procedures on CSO-Impacted Waters to ensure that the long-term controls will be sufficient to meet water quality standards." As part of the analysis, "States should evaluate whether the designated use could be attained if CSO control were implemented."[21] In 2002, the EPA published further national guidance on coordinating the development of CSO long-term control plans with water quality standards reviews.[22] This guidance recognizes the unique relationship between CSOs, designated uses and water quality standards in CSO-impacted water bodies. In this document, EPA calls for a water quality standards review to be conducted in conjunction with LTCP development and specifies that appropriate and attainable standards should be established for CSO-Impacted Waters.

[19] 40 CFR 131.3(g).
[20] 59 *Federal Register* 18688, April 19, 1994
[21] *Id*., at III.B, paragraph 2
[22] Guidance: Coordinating CSO Long Term Control Planning with Water Quality Standards Reviews; EPA Document #833R01002, July 2001.

3.2.2 State Policy for Application of the CSO Wet Weather Limited Use Subcategory

Indiana law is reflective of EPA's regulation and guidance. During its 2005 session, the Indiana legislature enacted P.L. 54-2005, also known as Senate Enrolled Act (SEA) 620. Among other provisions, this legislation establishes:

- A CSO Wet Weather Limited Use subcategory of recreational use for CSO impacted waters with an approved long-term control plan; and
- A requirement for the Indiana Environmental Rules Board to adopt rules to implement the new recreational use subcategory.

Under the state rule implementing SEA 620, 327 IAC 2-1-3.1, the CSO wet weather limited use subcategory may be applied to the CSO-impacted waters of a CSO community if the following actions occur:

(i) the proposed revision to the designated use, as supported by an approved UAA, is approved by IDEM and adopted as a rule amendment by the Indiana Environmental Rules Board;
(ii) EPA approves the state rulemaking, on the basis of the UAA supporting the change in use designation, in accordance with 40 CFR 131.10, 4 CFR 131.20, and 40 CFR 131.21; and
(iii) a CSO LTCP based on the adoption of the CSO wet weather limited use has been approved by IDEM and incorporated into the community's NPDES permit. The water quality-based requirements for the CSO wet-weather limited use subcategory's application to a particular waterbody are determined through the approved CSO LTCP.

4 Determination of Existing Use

As stated above, the City's LTCP is predicated on the revision of the currently applicable use designation of full body contact recreation for the City's CSO-Impacted Waters to allow application of Indiana's CSO Wet Weather Limited Use Subcategory during wet weather conditions in which CSO discharges occur after full implementation of the CSO controls to be provided through implementation of the LTCP.

Under federal regulations at 40 CFR 131.10(g), a water body's designated use cannot be removed (or revised to a less protective level) if it is an "existing use." An "existing use" is defined at 40 CFR 131.3(e) as a "use *actually attained* in the water body on or after November 28, 1975, whether or not they are included in the water quality standards." (Emphasis added.)

For reasons summarized in this section, the City has concluded, in accordance with IDEM guidance on existing use determinations,[23] that no existing recreational uses in the City's CSO-Impacted Waters will be removed by the application of the CSO Wet Weather Limited Use Subcategory to those waters.

[23] *Application of Existing Use Concept in Conducting Use Attainability Analyses for Long Term Control Plan Communities for Primary Contact Recreational Uses*, IDEM Nonrule Policy Document No. Water-014, April 11, 2008 ("*IDEM Existing Use Guidance*").

4.1 Identification of Existing Uses

The proposed CSO Wet Weather Limited Use Subcategory, if approved, will only be applicable to the City's CSO-Impacted Waters during those wet weather conditions which result in CSO discharges after full implementation of the CSO controls provided for in the LTCP.[24] Consequently, the existing use determination by the City focuses only on the nature of existing uses in the pertinent waters during such wet weather conditions. To identify existing recreational uses during such wet weather conditions, the *IDEM Existing Use Guidance* prescribes that CSO communities "should describe the kind(s) and extent of recreation that has typically occurred during periods of CSO-impact to the waterbody and the water quality associated with the recreation during such periods."[25] [*Emphasis added*.] This guidance document goes on to state that:

> "In situations where CSO impacts affect the bacteriological quality of the waterbody such that the criteria supporting the designated recreational use have not been attained, then the existing use of that waterbody will consist of such representative recreational activities occurring under impacted water quality conditions. Such conditions fall short of attainment of the designated recreational use of full-body contact recreation . . . ." [26]

4.1.1 Recreational Activities

A review was conducted by the City of its CSO-Impacted Waters during the 2005 recreational season to document recreational activities. The results of its review, as summarized in the Recreational Uses component of its Sensitive Areas Report provided to IDEM and EPA in July 2005,[27] indicated that recreational activities involving or approaching full-body contact with area rivers within CSO-impacted reaches have been virtually non-existent. No information was obtained during this review or from surveys taken of City residents indicating any occurrence of such activities in the CSO-Impacted Waters during or soon after storm events.[28] The following table summarizes observations by City Water Resources staff during weekly inspections along each of the three main waters during the spring, summer and early fall of 2005.

[24] Thus, the CSO Wet Weather Limited Use Subcategory would be in effect only rarely, given that the City is obligated by its approved LTCP to allow untreated CSO discharges to the St. Marys River and/or the Maumee River for only 4 storm events in a typical year and to the St. Joseph River for only 1 storm event in a typical year.
[25] *IDEM Existing Use Guidance*, *op. cit*., p. 4.
[26] *Ibid*., p. 6.
[27] *See* Appendix C-1, *Recreational Use Report*, City of Fort Wayne Utilities, July 7, 2005.
[28] Given that sunny, dry weather is more conducive to recreational activity, the lack of primary contact recreation on the impacted rivers during favorable conditions supports the likelihood that such recreational activities do not occur during or following storm events.

Table 4.1-1 Observed Recreational Uses of CSO-Impacted Waters May – October 2005

St. Joseph River				
	Activity	**Frequency Observed**	**Number of Users**	**Weather**
	Fishing from side of river	3	11	Sunny, warm
	Children playing along streambank	1	3	Sunny, warm
	Jet skiing	1	2	Sunny
St. Marys River				
	Fishing – mostly from bank	6*	11	Sunny to partly cloudy
	Boating	Weekly at two locations	4	Sunny to varied conditions
	Canoeing	1	1	Sunny
	Children playing along streambank	Weekly at 3 locations	2-4 on each occasion	Varying conditions
Maumee River				
	Fishing from bank or bridge at 3 locations	Various times over summer	1-4 at 2 locations 1-10 at 1 location	Varied conditions Warm and dry
	Fishing from bank at Anthony St.	1	4	Sunny
	Boating at 2 locations	1	2 at each location	Sunny

* Fishing at one location by 2 to 4 individuals was observed once per week.

To assess the continued accuracy of the above-described survey, the City solicited additional survey information in January 2020 from organizations with known high interest in the river and well-positioned to know of river activities: the St Joseph River Watershed Initiative ("SJRWI"),[29] the Upper Maumee Watershed Partnership ("UMWP"),[30] the Tri-State Watershed Alliance ("TSWA"),[31] and the Fort Wayne Parks Department ("FWPD").[32] Specifically, the City asked these organizations to report how often they observed (a) the CSO-impacted segments of St. Joseph River, St. Marys River, and two segments of the Maumee River[33] during the recreational season (April through October) and (b) recreational uses of those segments during the recreational season. The survey asked the organizations to report their observations (1) during dry weather or low river conditions ("Favorable River Conditions") and (2) during or within 48 hours of a large rain event

[29] See sjrwi.org.
[30] See uppermaumeewatershed.com.
[31] See omirivers.org. This organization was formerly known as the Maumee Watershed Alliance.
[32] See fortwayneparks.org. Area outfitters were also asked to complete the survey but did not respond. A copy of the survey form is attached as Appendix C-2.
[33] The survey defined the upstream segment of the Maumee River to run from the confluence to the Hosey Dam and the downstream segment to run from the Hosey Dam to the Allen County border.

or high river conditions ("Unfavorable River Conditions"). Results of the survey are presented in Tables 4.1-2 and 4.1-3[34] below.

Table 4.1-2 Use Observations of Active River Organizations During Favorable River Conditions

River Activity	Activity Observed Almost Every Day	Activity Observed Multiple Times a Month	Activity Observed a Few Times a Month	Activity Observed Only a Few Times	Activity Not Observed at All
St. Joseph River (St. Joe Dam south to Maumee River confluence). This segment is observed weekly by the SJRWI, TWWA, and FWPD and multiple times a month by the UMWP.					
Fishing	2		1		1
Boating	2	1		1	
Water Skiing, Paddle Boarding		2	1	1	
Swimming/Wading				1	3
St Mary's River (Tillman Road north to Maumee River confluence). This segment is observed daily during the work week by the FWPD, weekly by the TSWA, and monthly by the SJRWI. The UMWP observes this segment less frequently than monthly.					
Fishing	2		1		1
Boating	3				1
Water Skiing, Paddle Boarding	1	1	1		1
Swimming/Wading				1	3
Maumee River (St Joseph River to Anthony Blvd / Hosey Dam). This segment is observed weekly by the TSWA and FWPD weekly, multiple times a month by the UMWP and monthly by the SJRWI.					
Fishing	2			1	1
Boating	2			2	
Water Skiing, Paddle Boarding			2	1	1
Swimming/Wading					4
Maumee River (Hosey Dam east to County line). This segment is observed weekly by the UMWP and monthly by the SJRWI and the TSWA. FWPD does not observe this segment.					
Fishing	1		1	1	
Boating	1			2	
Water Skiing, Paddle Boarding				1	2
Swimming/Wading					3

[34] Some organizations completed multiple surveys reflecting the observations of different members or groups of members. Whenever a response differed among the same organization, Tables 4.1-2 and 3 reflect the highest frequency. For example, if different organization members respectively reported observing an activity daily and monthly, the daily observation was used.

Table 4.1-3 Use Observations of Active River Organizations During Unfavorable River Conditions

River Activity	Activity Observed Almost Every Day	Activity Observed Multiple Times a Month	Activity Observed a Few Times a Month	Activity Observed Only a Few Times	Activity Not Observed at All
St. Joseph River (St. Joe Dam south to Maumee River confluence). This segment is observed weekly by the SJRWI, TWWA, and FWPD and multiple times a month by the UMWP.					
Fishing			1	1	2
Boating					4
Water Skiing, Paddle Boarding					4
Swimming/Wading					4
St Mary's River (Tillman Road north to Maumee River confluence). This segment is observed daily during the workweek by the FWPD, weekly by the TSWA, and monthly by the SJRWI. The UMWP observes this segment less frequently than monthly.					
Fishing				1	3
Boating				1	3
Water Skiing, Paddle Boarding					4
Swimming/Wading					4
Maumee River (St Joseph River to Anthony Blvd / Hosey Dam). This segment is observed weekly by the TSWA and FWPD weekly, multiple times a month by the UMWP and monthly by the SJRWI.					
Fishing				1	3
Boating					4
Water Skiing, Paddle Boarding					4
Swimming/Wading					4
Maumee River (Hosey Dam east to County line). This segment is observed weekly by the UMWP and monthly by the SJRWI and TSWA. The FWPD does not observe this segment.					
Fishing			1		2
Boating					3
Water Skiing, Paddle Boarding					3
Swimming/Wading					3

These results are consistent with those of the City's 2005 survey. Full body contact (swimming and wading) is rare during Favorable River Conditions and non-existent during Unfavorable River Conditions. Similarly, water skiing and paddle boarding does not occur during Unfavorable River Conditions. Fishing and boating (including kayaking) – recreational activities somewhat common in some segments during Favorable River Conditions – were observed at low frequencies in some segments during Unfavorable River Conditions. However, fishing observed during Unfavorable River Conditions was always from the shore, and the single boating observation during Unfavorable River Conditions was in the form of scheduled power boat tours (i.e. no kayaking).

Likewise, with the exception of occasional fishing and kayaking during Favorable River Conditions, no recreational uses have been observed for the CSO-impacted segment of Spy Run

Creek, the only tributary of the City's CSO-Impacted Waters of even modest size.[35] And no recreational uses have been observed for the CSO-impacted segments of remaining three small local tributaries - the Baldwin Ditch, Natural Drain #4 and Harvester Drain.[36] The absence of recreational uses for these tributary segments is consistent with the lack of any public access points, their small size and intermittent flows, and many existing culverts.[37] The City is the dominant property owner along all of these tributary segments except Harvester Drain which lies entirely within an industrial area.[38]

4.1.2 Water Quality of CSO-Impacted Waters

The following subsections summarize water quality characterizations of CSO-Impacted Waters using sampling data ranging from 1975 to 2018. As will be shown by these detailed presentations, the City's CSO-Impacted Waters are characteristically impaired for full-body contact recreational use during and after those wet weather conditions are associated with the few projected CSO discharge events to occur after full implementation of the LTCP. That is, the water quality of CSO-Impacted Waters are impaired by fecal coliform and/or E. coli levels substantially exceeding applicable criteria for full-body contact recreation. That impairment is due to a multitude of sources, including but certainly not limited to, CSO discharges. The bacteriological water quality criteria would not have been attained under conditions representative of post-LTCP activation events.

4.1.2.1 LTCP's Summarization of Water Quality of CSO-Impacted Waters.

A characterization of the water quality of the City's CSO-Impacted Waters is summarized in Chapter 2 of the 2007 LTCP. The bacteriological quality during wet weather, as shown by the collected data, indicates that the St. Marys River, St. Joseph River, and Maumee River consistently fail to meet applicable water quality standards for full-body contact recreation during wet weather events. Wet weather sampling data collected by Malcolm Pirnie in 1996 and summarized on Table 2.5.3.3 of the LTCP indicates that during the four sampled rain events every grab sample collected for analysis exceeded the full-body contact recreation single sample *E. coli* limit of 235 cfu/100 ml. In addition, wet weather sampling data collected by the City in 2005 and summarized in Section 2.5.3.1 of the LTCP indicates that average *E. coli* concentrations for two rain events far exceeded the full-body contact recreation single sample *E. coli* limit. *E. coli* concentration averages for the two rain events ranged from 1,116 cfu/100 ml to 70,608 cfu/100 ml. While the averaged *E. coli* concentrations cannot be directly compared to the single sample maximum or geometric mean *E. coli* standards, the high averages obtained during the 2005 wet weather

[35] The CSO-impacted segment of Spy Run Creek extends approximately 0.9 miles to the confluence of the St. Marys River through and along flood control levees and mostly City-owned property. The occasional fishing and kayaking of this Spy Run segment occurs within approximately 1000 feet of the confluence (i.e. the St. Mary's River backwater). Any further recreational uses are effectively precluded by two small flow control dams and an absence of public access points. Use observations were made by FWPD officials most familiar with the City parks and trails along the segment.
[36] See Appendix C-3 for mapping and photographs of all four tributary segments.
[37] The lengths of the CSO-impacted segments are approximately 0.9 mile for Spy Run Creek, 1.1 mile for Baldwin Ditch, 1.5 mile for Natural Drain #4, and 0.5 mile for Harvester Drain.
[38] Use observations for the Baldwin Ditch and Natural Drain #4 were made by FWPD officials most familiar with these segments and their intersections with river greenway trails.

sampling indicate that a significant number of samples contained *E. coli* concentrations exceeding the single sample limit of 235 cfu/100 ml.

4.1.2.2 Evaluation of 1975-2006 Bacteriological Data from the CSO-Impacted Waters.

To more fully evaluate the attainment status of the City's CSO-Impacted Waters, the 2010 UAA approved by IDEM evaluated fecal coliform and *E. coli* data from the period of 1975 through 2006 that were obtained from fixed-station sampling activities conducted on these water bodies. Surface water grab samples from segments of the St. Mary's River, the St. Joseph River, and the Maumee River in and near the City have been analyzed by the IDEM and its predecessor agency for concentrations of indicator bacteria on an approximately monthly or bi-monthly basis from 1975 through the present; the 2010 UAA analyzed these data for the period up through 2006. Bacterial concentration data for the three rivers in and near the City resulting from this stream sampling activity was obtained from the following sources: 1975 through 1990, from the Legacy STORET Database, United States Environmental Protection Agency, *http://www.epa.gov/storpubl/legacy*; 1991 through 2000, from the IDEM's Assessment Information Management System (AIMS) Database; and 2001 through 2006, from the City's river sampling program. The raw data for bacterial indicator organisms collated from each of these sources are provided in Appendices D, E, and F.

The data obtained from the fixed-station sampling events were limited for several reasons. First, because the fixed-station sampling data was not collected with the frequency required to derive monthly geometric means, the data was compared to full-body contact recreation single sample criteria. Samples collected from 1975 through 1988 were analyzed by the agency for fecal coliform and compared to the full-body contact recreation maximum limit of 400 cfu/100 ml. 330 IAC 1-1-6(e) (1988 Ed.). Samples collected from 1988 through 2006 were analyzed for *E. coli* and compared to the full-body contact recreation single sample limit for *E. coli* of 235 cfu/100 ml. Second, data from sampling stations upstream of the City's CSOs were not included in this analysis and presentation. Third, variations in the available data due to conditions such as rainfall events or low river flow volumes could not be addressed because the data did not provide any information regarding the meteorological conditions or river flows during sampling events.[39]

Finally, the locations of sampling stations were not consistent in all cases from 1975 through 2006. Stations were added and removed during this time period for the Maumee River so that precise locational comparison of data from the same sampling points in that river is not possible over the entire period. These limitations, however, do not preclude useful qualitative conclusions from being drawn concerning attainment status of these rivers over the pertinent timeframe, as discussed below.

Due to the limitations of the fixed-station sampling data, the general attainment status of the rivers from 1975 through 2006 was determined through comparison of the number of samples exceeding applicable full-body contact recreation single sample limits to the total number of samples collected from each of five sampling stations on the three principal waters. It would be expected

[39] It may be reasonably inferred that the individual samples with low bacterial content correspond to dry weather conditions while samples with high concentrations of indicator bacteria correspond to wet weather conditions. However, it has not been possible to readily correlate the water quality data with meteorological conditions.

that, if the water quality in the St. Mary's River, St. Joseph River, and Maumee River were increasingly impaired over time, the percentage of samples collected exceeding the applicable full-body contact single sample limit would correspondingly show a trending increase over the time period from 1975 through 2006. Such a hypothetical trending increase is not reflected in the data, however. If anything, the data, particularly the data from 2001 to 2006, show a trending to lower bacterial concentrations. In order to minimize the impact of years with small sample sizes or atypical meteorological conditions, as well as to provide greater assurance that the data for each time segment would contain precipitation-related results, data from each river sampling station was combined into data sets corresponding to decade periods consisting of the latter half of the 1970's, the 1980's, the 1990's, and 2001-2006. The percentages of samples with bacterial content exceeding applicable recreational criteria for each river sampling station are summarized in Table 4.1-4.

Table 4.1-4 Exceedances of Applicable Bacteriological Standards for Full Body Contact Recreation from 1975 to 2006

Percent of Samples Exceeding Applicable Maximum Criterion				
	1975-80 Fecal coliform	1981-1990 Fecal Coliform	1991-2000 *E. coli*	2001-2006 *E. coli*
St. Joseph River @ Tennessee Avenue	32.4% (37)*	38.8% (85)	43.1% (102)	30.0% (183)
St. Marys River @ Spy Run	ND	77.8% (27)	75.5% (102)	65.4% (182)
Maumee River @ Anthony Blvd.	65.4% (55)	71.4% (56)	ND	54.4% (180)
Maumee River @Landin Road	ND	ND	59.7% (77)	59.0% (183)
Maumee River @ State Road 101	62.0% (50)	54.1% (85)	60.2% (108)	ND

ND – no data
*Parenthetical figure states the number of samples in the data set
Fecal coliform exceedances estimated by comparison to a maximum value of 400 cfu/100 ml
E. coli exceedances based on a maximum value of 235 cfu/100 ml

As indicated by Table 4.1-4, all three rivers produced a significant percentage of samples exceeding applicable full-body contact recreation single sample limits for each time interval. In addition, though not discernible from the above table, the data for each sampling station rather consistently showed exceedances of the bacterial criteria from year to year. The river sampling data obtained from 1975 through 2006 indicate that all three rivers (and all sampling stations) have consistently failed to meet the full-body contact recreation criteria in significant numbers of samples. Some variations are shown to have occurred among the three waters in the percentage of bacterial exceedances, as may be expected based on differences in the number of CSOs discharging, and the relative volumes of combined sewage discharged, to each waterway. Based on this information, it can be generally concluded that the water quality in those portions of the St. Marys River, St. Joseph River, and Maumee River routinely impacted by Fort Wayne's CSO discharges has consistently failed to attain bacteriological criteria for full-body contact

recreational use since at least 1975 and that there has been no significant change in water quality related to recreational use from 1975 through 2006, other than slight improvements in this decade.

From the foregoing information, it may be further concluded, as a general matter, that the existing recreational use for these CSO-Impacted Waters during wet weather conditions can be characterized as "rare-to-no full-body (primary) contact recreation occurring in waters that do not attain water quality criteria supporting full-body contact recreational use."

A different conceptual approach for displaying the bacterial quality of the CSO-Impacted Waters over time is illustrated in Figures 4.1-1 through 4.1-5. These figures display the results of a statistical analysis of the data for indicator bacteria concentration for each waterway for each decade since the mid-1970's. These figures provide the 5th, 25th, 50th, 75th, and 95th percentiles and the mean of the data set for indicator bacteria concentrations for each sampling station for each waterway for each decade period.[40] Thus, this method of data depiction, known as a "box and whiskers" format, provides a visual display of the spread, as well as the concentration, of the data set. The raw data set for each graph displayed in these figures are provided in Appendices G through K.

The sampling locations from which the bacterial data are derived are each within the CSO-impacted segments of the waters. One sampling station is located within each of the CSO-impacted segments of the St. Marys River and St. Joseph River. Three sampling stations are located on the Maumee River. It bears mention that the data sets for these figures include bacterial concentrations corresponding to all weather conditions; it was not feasible to attempt to segregate data deriving from wet weather from data associated with dry weather.[41] However, the overall data set for each sampling location will include data from wet weather conditions such that the impacts of CSO discharges on bacterial quality of the waters will be reflected in the full data set. Since each data set displayed in a box and whiskers graph in these figures represents a decade (or a substantial fraction), the data set can be assumed to include representative influences of CSO discharges.

Turning to a consideration of the substance of the figures (which appear on succeeding pages), the following overall observations can be made. As a general matter, the instream bacterial concentrations at each sampling location have remained relatively constant over the entire period of evaluation, spanning the mid-1970's to 2006. This is particularly evident when focusing on the darker box of each graph, representing the 25th through 75th percentiles of the data. The constancy of the data is most pronounced for the St. Joseph River and the State Road 101 sampling station for the Maumee River, but the trend characterizes each sampling location's

[40] For each graphic display for a particular sampling station and time period, the minimum bacterial concentration is indicated by the left endpoint or "tail" of the graph, while the maximum concentration is found at the right endpoint. The left leading edge of the light gray box represents the 5th percentile of the data, the left leading edge of the smaller dark gray box displays the 25th percentile, the line running through the dark gray box indicates the median of the data, the right leading edge of the dark gray box provides the 75th percentile, and finally, the right leading edge of the light grey box is the 95th percentile for the data set.

[41] There were no readily accessible records available to the City of contemporaneous meteorological records from which weather conditions could be correlated to the sampling results for each of the sampling locations on a particular day of water quality sampling.

data. Secondly, the data consistently show, for each sampling location, that the most recent decade is slightly lower in bacterial concentrations than earlier decades. This corroborates that bacterial quality of the CSO-Impacted Waters relating to recreational use has remained relatively consistent since the mid-1970's and appears to have improved slightly, as might be expected, with increasing attention over time to measures intended to produce water quality improvement.

Figure 4.1-1 Box-Whisker Plots for Historical Bacteria Data by Decade – St. Marys River (at Spy Run)

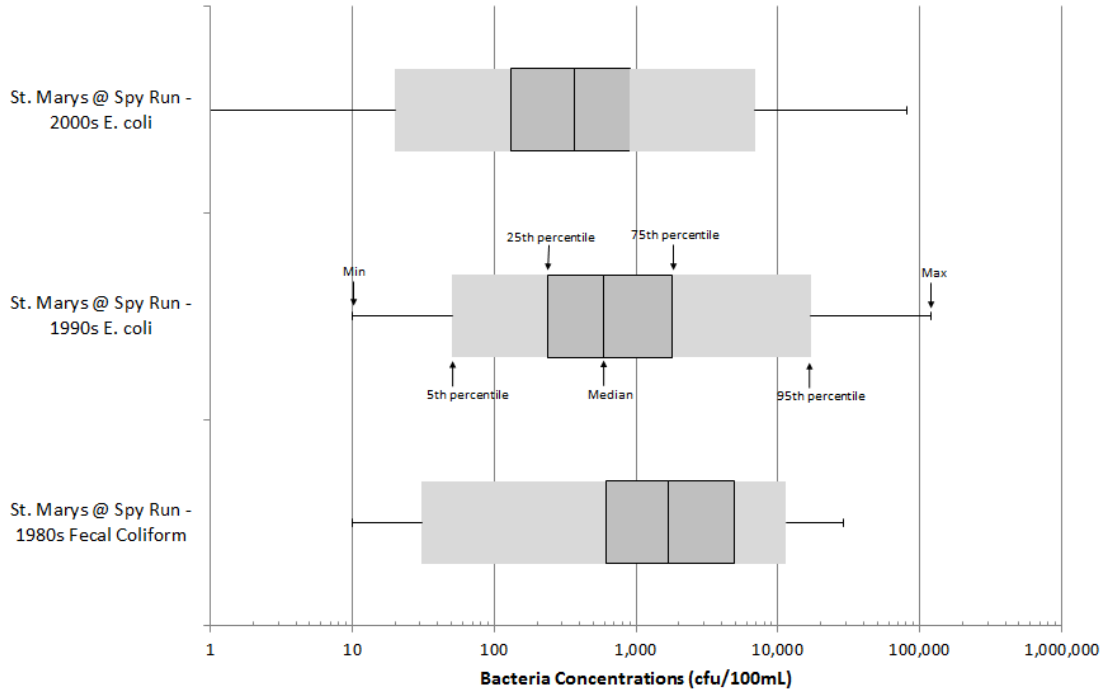


Figure 4.1-2 Box-Whisker Plots for Historical Bacteria Data by Decade – St. Joseph River (at Tennessee Avenue)

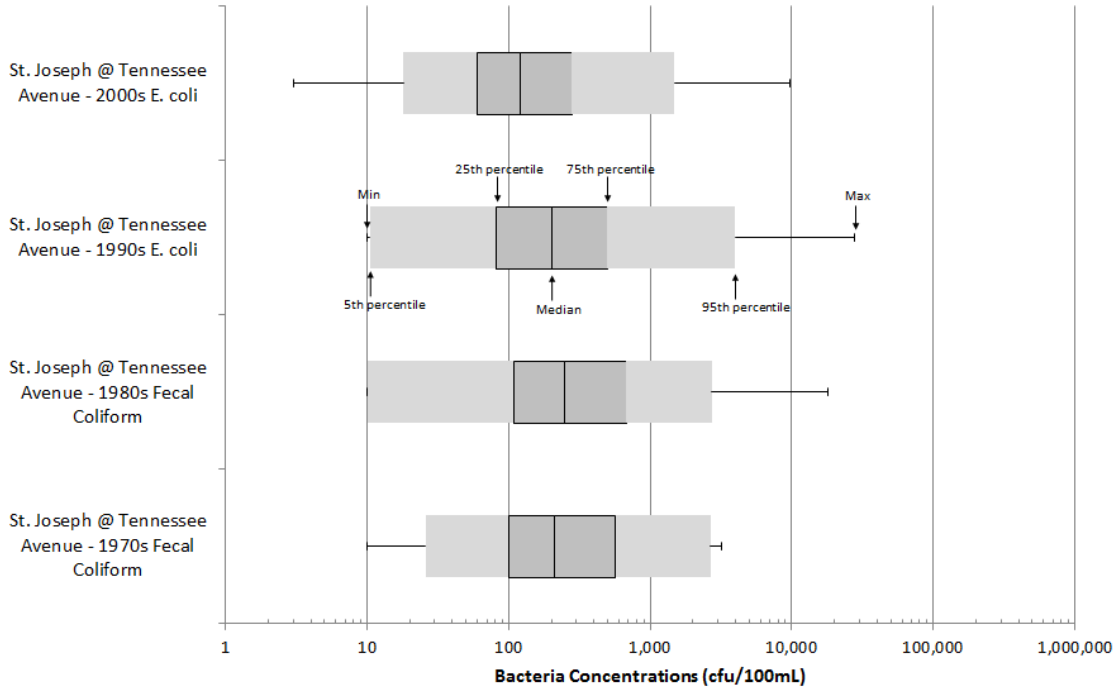


Figure 4.1-3 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at Anthony Boulevard)

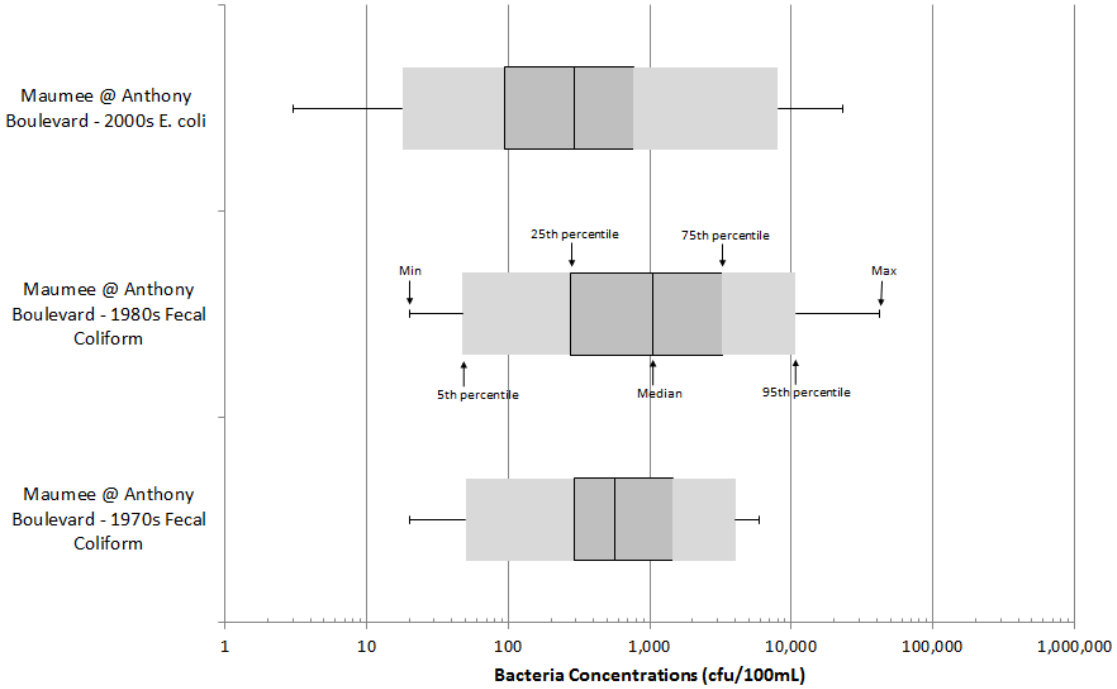


Figure 4.1-4 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at Landin Road)

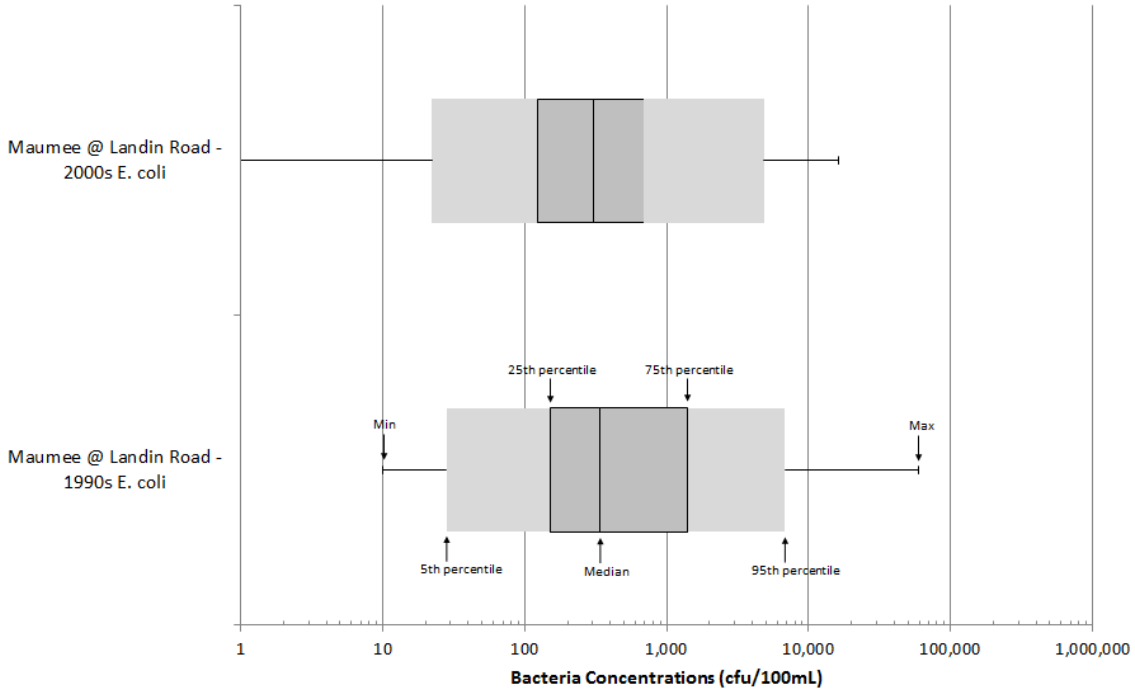
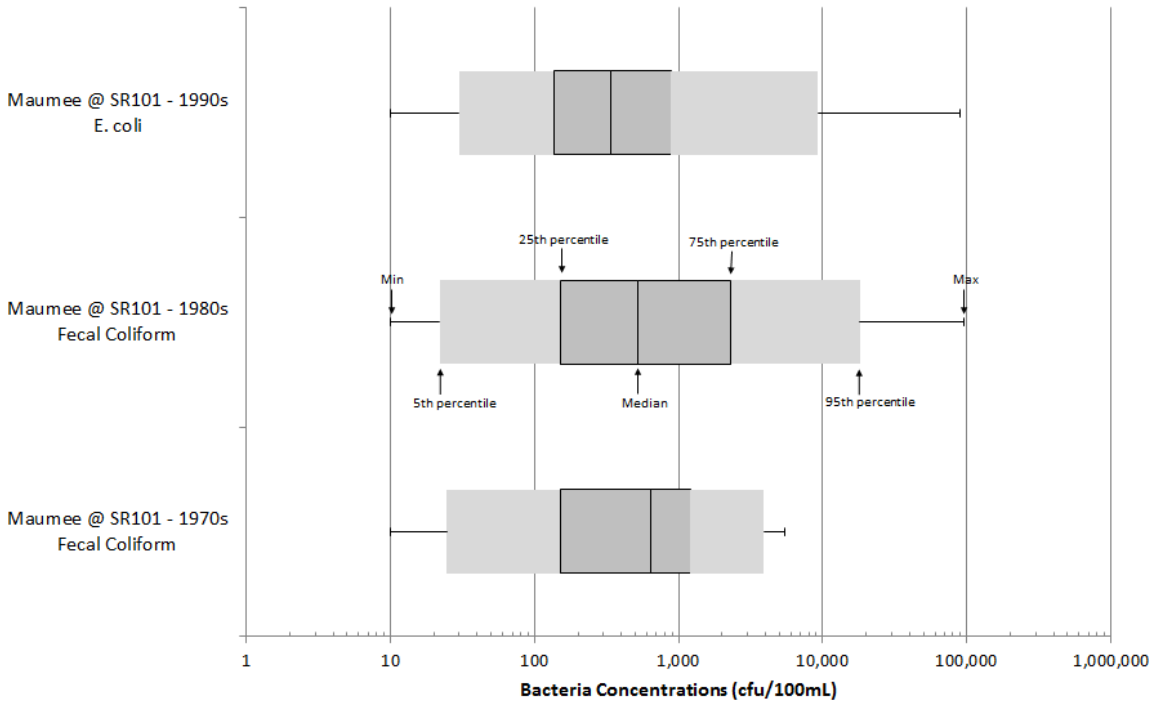


Figure 4.1-5 Box-Whisker Plots for Historical Bacteria Data by Decade – Maumee River (at SR101)



The conclusions drawn from the review of fixed station monitoring data are consistent with what would be expected from the facts relating to the City's combined sewer system. Historical records indicate that the combined sewer system dates to the early part of the 20th century. The service area of the combined sewer system – the central portion of the City – has been built out since long before the 1970s and the basic configuration, sizing and extent of the combined sewer system has been unchanged since well before the 1970s as well. With a stable residential customer base and a stable sewer infrastructure, it would be expected that the frequency and volume of CSO discharges would be consistent over time, taking into account the various factors discussed above which create short term variations. From this, it is reasonable to conclude that the average nature and extent of the impairment of bacteriological water quality would remain rather invariant over time.

4.1.2.3 Evaluation of 2016-2018 Stream Monitoring Data from Upstream of the CSO-Impacted Waters

The St. Joseph River and the St. Marys River are the two largest CSO-Impacted Waters that originate from outside City territory and enter the area served by the City's combined sewer system. Waters of these two rivers, in areas upstream of any potential CSO impacts as well as in areas already identified as CSO-Impacted Waters, regularly exhibit water quality that does not meet the bacterial criteria set by Indiana law for protection of full-body recreational use. This fact has been established through the City's long-term river quality monitoring program that was

initiated in 2001, and is demonstrated quantitatively as follows using the City's most recent three years of data (2016-2018):

- Figure 4.1-6 (St. Marys River) and Figure 4.1-7 (St. Joseph River) show measured *E. coli* levels at two locations on each river, one at the upstream City boundary and one downstream of the local CSO area. As can be seen, measured *E. coli* levels regularly exceed 235 cfu/100ml at the upstream boundary location on each river, before the rivers are impacted by City CSOs.
- The data underlying Figure 4.1-6 also demonstrate that the upstream boundary location for the St. Marys River had higher *E. coli* levels than the downstream location on 38 of the 103 sample days in 2016-2018. (Note that this sampling period precedes implementation of most CSO controls related to the St. Marys River.) For the St. Joseph River, Figure 4.1-7 data demonstrate that the upstream boundary location had higher *E. Coli* levels than the downstream location on 61 of 107 sample days in 2016-2018. (Note that implementation of CSO controls affecting the St. Joseph River were completed in September 2015, prior to this sampling period.)
- Figure 4.1-8 (St. Marys River) and Figure 4.1-9 (St. Joseph River) show the frequency distributions of *E. coli* data from the upstream and downstream sampling sites, based on the full set of samples collected from 2016-2018. On the St. Marys River, the upstream City boundary samples exceed 235 cfu/100ml approximately 43% of the time, while the downstream location samples exceed 235 cfu/100ml approximately 52% of the time. On the St. Joseph River, the upstream City boundary samples exceed 235 cfu/100ml approximately 35% of the time, while the downstream location samples exceed 235 cfu/100ml approximately 40% of the time. The frequency distribution graphs for the upstream and downstream sampling locations on the St. Joseph River track each other so closely as to be nearly congruent, implying that downstream bacterial quality is dominated by the upstream bacterial quality.

Figure 4.1-6 E. coli Sampling Results 2016-2018 – St. Marys River

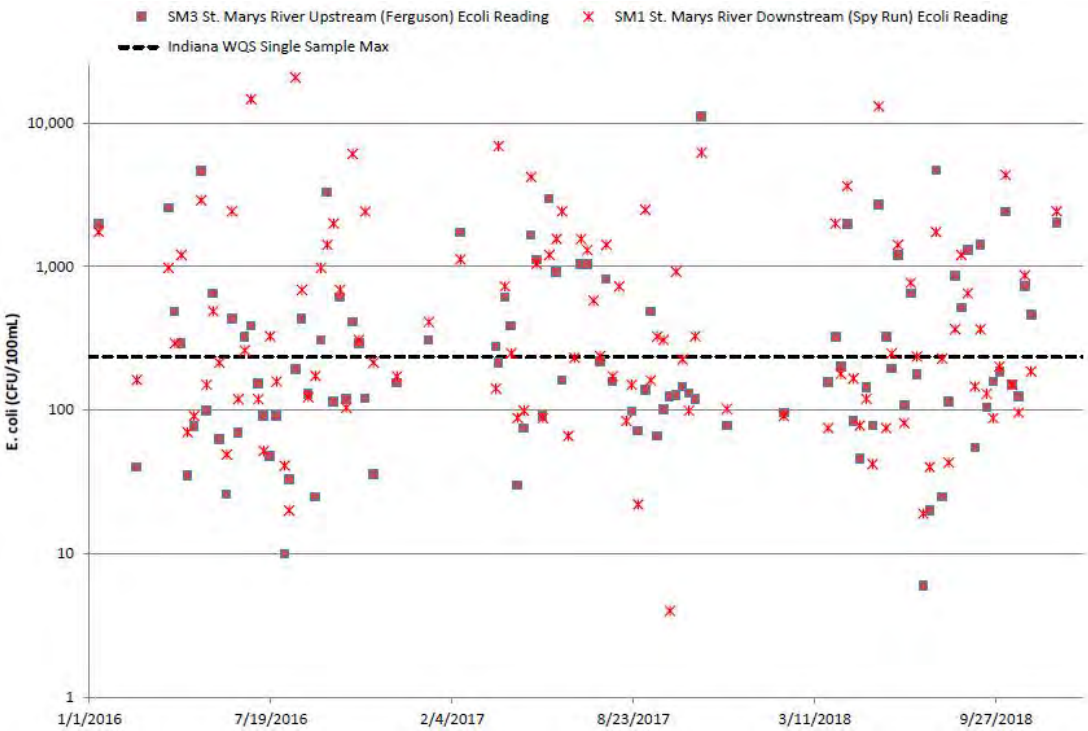


Figure 4.1-7 E. coli Sampling Results 2016-2018 – St. Joseph River

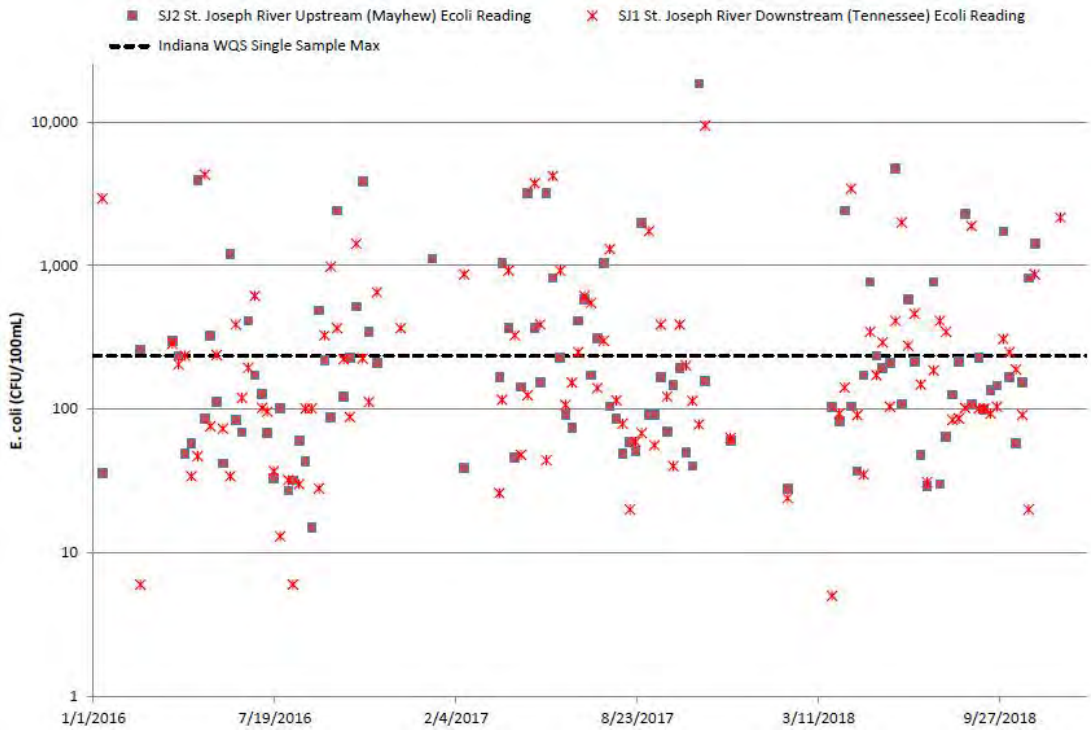


Figure 4.1-8 E. coli Frequency Distributions – St. Marys River

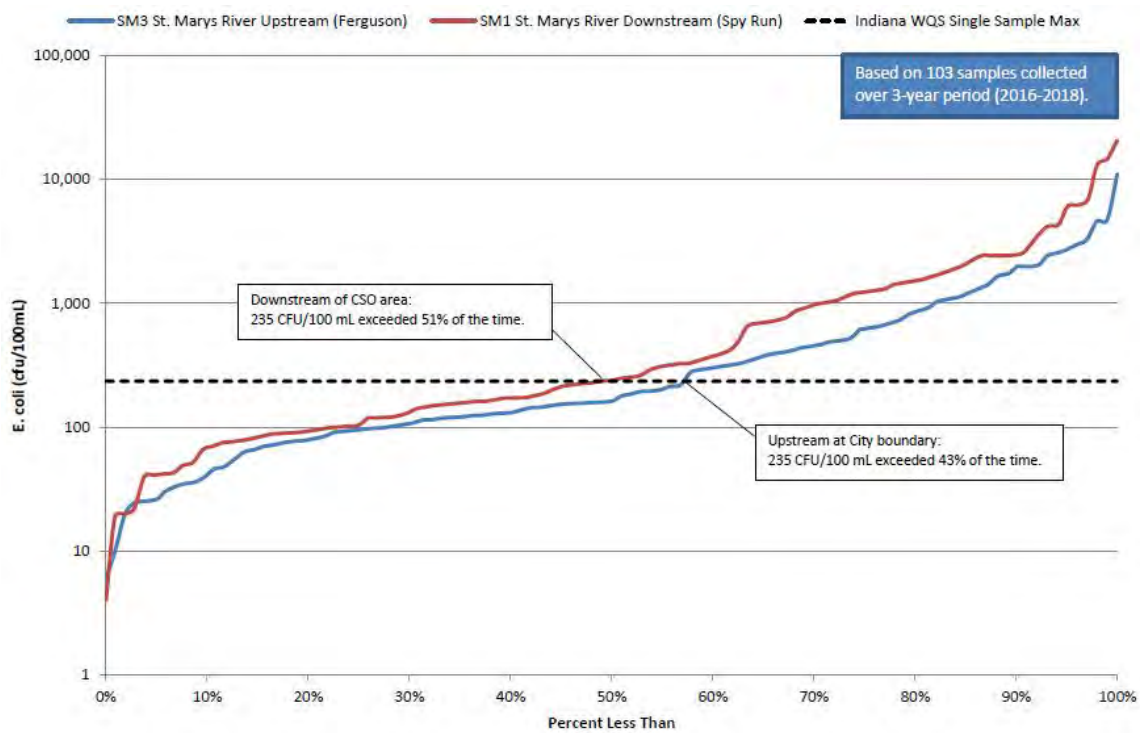
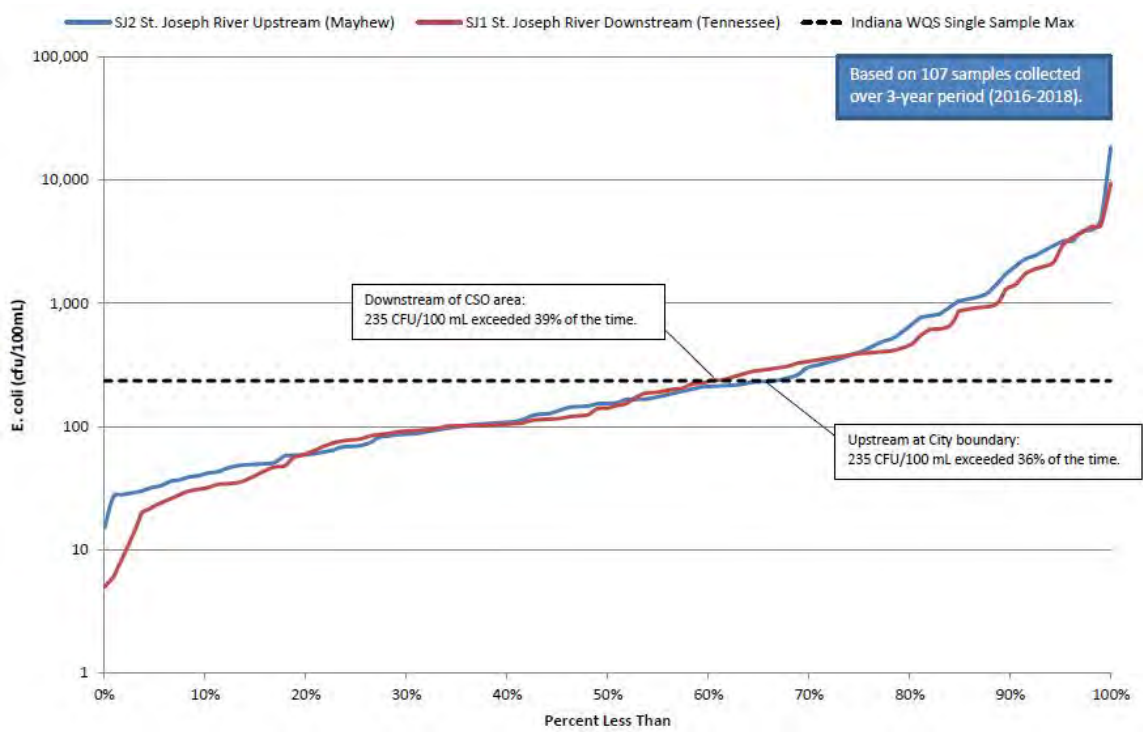


Figure 4.1-9 E. coli Frequency Distributions – St. Joseph River



Clearly, upstream contamination of both the St. Marys and St. Joseph River is regularly present to such a degree that it prevents the water quality of either river from meeting recreational water quality criteria, both upstream of and internal to the CSO-impacted zones.

Additional illustrative river monitoring data for the St. Joseph River is available in the City's St. Joseph River Milestone Report ("*Milestone Report*"), dated August 9, 2017, which was submitted to EPA and IDEM to document post-construction monitoring of the efficacy of CSO controls relating to that waterway.[42] Of particular note is that the *Milestone Report* shows that the St. Joseph River, at its downstream terminus, fails to demonstrate bacterial quality consistent with the State recreational criteria even though the CSO controls installed for CSOs that discharge to that waterbody meet the Performance Criteria required under the federal Consent Decree.[43] Consistent with the results discussed above for the 2016-2018 sampling period, this failure is predominantly attributable to the poor upstream bacterial quality of the river.

4.1.3 Existing Use Conclusions

From the foregoing information, the following overall conclusion is readily apparent. The existing recreational use of the City's CSO-Impacted Waters associated with wet weather conditions involves the following two elements: one, there is an almost total absence of full-body contact recreational activities in the CSO-impacted waters, especially during those wet weather conditions that are associated with the few projected CSO discharge events to occur after full implementation of the LTCP; and, two, to the extent any full-body contact recreation has occurred in these waters, it has occurred in waters whose quality characteristically is impaired for recreational use under such wet weather conditions, with fecal coliform or, more recently, *E. coli* levels substantially exceeding bacteriological criteria for full-body contact recreation.

It should also be recognized that 2016 – 2018 water quality monitoring of the St. Joseph River and the St. Marys River at points immediately upstream of the urban area of the City shows the bacterial quality of waters at these locations to be routinely in excess of the applicable water quality criteria for full-body contact recreation. Further, the frequency distribution graphs for the upstream and downstream sampling locations of the St. Joseph River for the 2016 – 2018 period, Figure 4.1-9, are nearly congruent, indicating that the downstream bacterial quality of this waterbody is dominated by its upstream water quality. For both rivers, it is evident that the poor downstream quality is primarily attributable to substandard quality upstream of the City's urban areas.

In a further extrapolation of this theme, Appendix B-2 provides a discussion of results of the City's recently updated water quality model for the CSO-Impacted Waters. When inputs of all bacteria sources to the St. Joseph River, St. Marys River and Maumee River are set to zero except for upstream inputs, the model indicates that the entire modeled length of the Maumee River (from its upstream end to SR101, see Appendix B-2) would experience *E. coli* levels in excess of the recreational water quality criteria more than 50% of the recreation season during 1995, which is representative of the typical year's precipitation levels.

[42] This Milestone Report is attached to this UAA as Appendix P.
[43] *Milestone Report*, pp. 10-11.

4.2 Revision of the Recreational Use Designation for the City's CSO-Impacted Waters Will Not Remove Existing Uses

As previously referenced, federal water quality regulations do not allow the revision of a designated use through the UAA process to the extent that the revision would remove an existing use.[44]

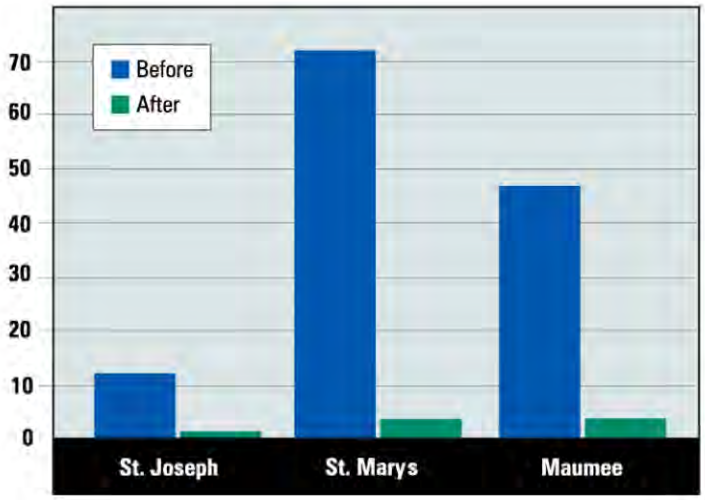
The *IDEM Existing Use Guidance* provides that, for a CSO community in which the existing use of a CSO-impacted waterbody during wet weather is determined to be certain recreational activities that have occurred under impacted, or substandard, water quality conditions (relative to full-body contact recreational use), the reclassification of the waterbody to the CSO wet weather limited use subcategory would not be expected to remove the existing use. This conclusion derives from the following points. One, full-body contact recreational use has not been attained in such waters due to the characteristic substandard water quality, regardless of what limited recreational activity may have occurred under such conditions. Two, the water quality of the impacted waterbodies during the periods in which the CSO wet weather limited use subcategory would apply is that which results from full implementation of the community's LTCP, which will represent some degree of improvement over historical conditions due to a reduction in CSO discharges. The *Guidance's* conclusion is pertinent to Fort Wayne's CSO-Impacted Waters since the existing recreational use of each of these waterbodies has been identified as limited recreational activities occurring under impaired bacteriological water quality.

That the conclusion indicated by the Guidance is valid in Fort Wayne's case is evident from the information provided in this Updated UAA. First, historical water quality data for the City's CSO-Impacted Waters show consistent noncompliance with minimum water quality criteria required to support full-body contact recreation. Second, virtually no recreational activities have been observed in or on the CSO-Impacted Waters during wet weather events. Third, the City's full implementation of the CSO control measures specified in the City's LTCP will markedly reduce historical levels of CSO discharges to the impacted waters and the aggregate time in which these waters will incur CSO impacts. For the 19 CSO regulators with highest activation rates, full implementation of the LTCP will reduce the number of overflow events from a range of 20 to 71 annual events to a maximum of one annual overflow event per typical year for the 6 CSOs discharging to the St. Joseph River and a maximum of 4 annual events per typical year with respect to CSOs discharging to the other impacted waters.[45] The reduction in overflow frequency for each of the three major CSO-Impacted Waters to be realized from LTCP implementation is graphically shown in Figure 4.2-1 below.

[44] 40 CFR 131.10(h)(1).

[45] Determining whether an actual CSO event that occurs after implementation of the LTCP would be expected, consistent with the installed CSO controls, will not be a simple matter. It is problematic to attempt to evaluate individual CSO events in isolation; events must be considered within the context of the typical year to determine whether the event would be among the predicted few annual overflow events. As explained in the Post-Construction Monitoring Plan (Section 4.6.4.1) for the LTCP, the City has developed a model-based method to assess the performance of their control program following implementation of the LTCP. Under this assessment approach, the City will use its hydraulic sewer system model to run a continuous simulation for a representative five-year period agreed to with IDEM and U.S. EPA to determine whether the City has achieved the Performance Criteria for the LTCP. This analytical approach will provide a basis for determining the types of wet-weather conditions that are expected to cause a CSO event after LTCP implementation.

Figure 4.2-1 Annual Overflow Frequency in a Typical Year



Clearly, the existing use corresponding to the impacts of 20 to 71 annual overflow events will not be removed or restricted by a reduction to 4 annual overflow events (or even one) under similar precipitation conditions. Much to the contrary, the existing use will be enhanced given that the volumes of combined sewage discharged and number of annual hours in which the CSO discharges produce substandard bacterial quality under typical year conditions will be markedly reduced through performance of the LTCP. Model projections indicate that the LTCP improvements will reduce hours of CSO discharges from approximately 500 hours per typical year under existing CSS conditions to 30 hours per year (and only 6 hours per year on the St. Joseph River) after LTCP implementation (a reduction in annual CSO discharge hours of 94%). Thus, rather clearly, any existing uses of the City's CSO-Impacted Waters will be improved upon, rather than removed, concurrently with application of the CSO Wet Weather Limited Use subcategory.

In summary, the existing recreational uses of the City's CSO-Impacted Waters during wet weather conditions that produce CSO discharges are seen to be, at most, limited recreational activities occurring in substandard water quality.[46] Moreover, these existing uses will not be removed or adversely affected by the proposed revision of the designated use by which the CSO wet weather limited use subcategory would be applied during four annual periods per typical year of wet weather impact and substandard *E. coli* quality.

Consequently, the existing uses of the City's impacted waters corresponding to wet weather conditions do not pose an obstacle to consideration of this Updated UAA.

[46] Technically, under the definition of "existing use" provided in 40 CFR 131.1, it does not appear that there would be any existing recreational use in the CSO-impacted waters during wet weather conditions that result in CSO discharges in view of the characteristic substandard bacterial quality of these waters under such conditions. The use, including water quality consistent with the applicable water quality criteria, has not been attained.

5 Attaining the Current Recreational Designated Use Is Not Feasible During Wet Weather Conditions

This section explains why attainment of the current designated use of full-body contact recreation is not feasible in the City's CSO-Impacted Waters during certain wet weather conditions. More specifically, this designated use cannot be feasibly attained during those wet weather conditions which exceed the capability of the CSO control measures being installed by the City under its approved LTCP due to ambient river conditions and without causing substantial and widespread economic and social impact. As a consequence, relief from the current designated use and the accompanying *E. coli* water quality criteria is warranted during such wet weather conditions. The City proposes, as a result, that the CSO wet weather limited use subcategory provided under Indiana law be approved under federal and state law for application to the City's CSO-Impacted Waters as the highest attainable use during periods of impact by CSO discharges following full implementation of the approved LTCP.[47]

5.1 Reasons for Infeasibility of Attainment of Full-body Contact Recreation During Wet Weather Conditions

Revision of the recreational use for the City's CSO-Impacted Waters during the referenced wet weather conditions and application of the CSO wet weather limited use subcategory is supported based upon four of the six factors provided in 40 CFR Sec. 131.10(g):

- Naturally-occurring pollutant concentrations prevent the attainment of the use.
- Natural, ephemeral, intermittent, or low-flow conditions or water levels prevent the attainment of the use.
- Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place.
- Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

Each of these factors is discussed in more detail below.

5.2 Factor 1: Naturally Occurring Pollutant Concentrations

There can be no real doubt that naturally-occurring *E. coli* contamination contributes to the prevailing noncompliant bacterial quality in waters of the St. Marys River and St. Joseph River upstream of the City's CSOs as well as in the segments impacted by the CSOs. Mammalian and avian wildlife exist throughout the upstream rural watersheds of both rivers, and increasingly, many wildlife species venture into suburban and even urban areas. This reality is recognized in,

[47] As explained above, Indiana has not established a full time recreational designated use other than full-body contact recreation. The temporary use posited by this Updated UAA represents the highest attainable use during rare wet weather events that result in CSO discharges while otherwise preserving the current designed use. Moreover, there is no alternative lesser full time recreational designated use which Indiana could establish and which could be attained during the rare wet weather conditions at issue herein.

for example, the St. Marys River Total Maximum Daily Load for *E. coli* (*St. Marys TMDL*) document,[48] as follows:

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

The rather ubiquitous presence of wildlife invariably results in their fecal droppings being a source of *E coli* that is mobilized by storm runoff so as to impact area waters throughout their upstream reaches.[49] No reasonable basis exists on which wildlife could be ruled out as a significant source of *E. coli* contamination throughout the lengths of the St. Marys River and the St. Joseph River.

A complicating factor for the assessment of naturally-occurring *E. coli* is that the extensive anthropogenic impacts in upstream watersheds result in overlapping ranges of habitation of wildlife and domesticated animals, making it increasingly difficult to distinguish the *E. coli* impacts of wildlife to waters within the watershed from similar impacts of animals associated with human activity, *i.e.*, livestock and pets. This is true in both the St. Marys and St. Joseph River watersheds, where upstream land use is primarily rural agricultural. However, in both watersheds, there are wildlife corridors providing access to the rivers, and the forested fringe shrouding most of the rivers' lengths provides wildlife habitat until the rivers reach the urbanized areas of the City. While there may be sophisticated scientific investigative methods available to identify and distinguish *E. coli* of wildlife origin from *E. coli* deriving from domesticated animals, such methods would be of little practical import.

While it is not practicable to separate *E. coli* impacts of wildlife to the St. Marys River and St. Joseph River from similar impacts of livestock and pets, it is beyond argument that such natural impacts exist in both watersheds. The practical inseparability of the bacterial impacts of wildlife and domesticated animals should be no bar to the recognition of the wildlife contributions of *E. coli* as a naturally occurring pollutant impact on the bacterial quality of the St. Marys River and St. Joseph River.

5.3 Factor 2: Intermittent High Flow Conditions

Factor 2 posits consideration of "natural, ephemeral, intermittent, or low-flow conditions or water levels [that] prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating State water conservation requirements to enable uses to be met." This factor recognizes that flow conditions can preclude recreational use in a river or stream, independent of water quality conditions. In

[48] "Total Maximum Daily Load For *E. coli* Impairment in the St. Marys River Watershed and Maumee River Adams and Allen Counties," 2006, IDEM Office of Water Quality, p. 9.
[49] Although there are smaller municipalities with combined sewer systems in the St. Joseph and St. Marys River watersheds upstream of the City of Fort Wayne, there are excessive levels of *E. coli* even upstream of the smaller municipalities for which wildlife, as well as domesticated animals, are probable sources. See: *St. Marys TMDL*, Attachment A; and St. Joseph River Watershed TMDLs (Draft), Appendix F, Table F-6.

Fort Wayne's case, the conditions of interest are the intermittently high flow conditions that accompany large storm events exceeding the LTCP level of control contemplated by the LTCP for a typical year. Factor 2 is directly applicable to the City's CSO-Impacted Waters under these high flow conditions, due to flow, depth, and/or velocity making the rivers and streams unsafe for recreational use. This conclusion is supported by a combination of historical evidence and future projections, as follows:

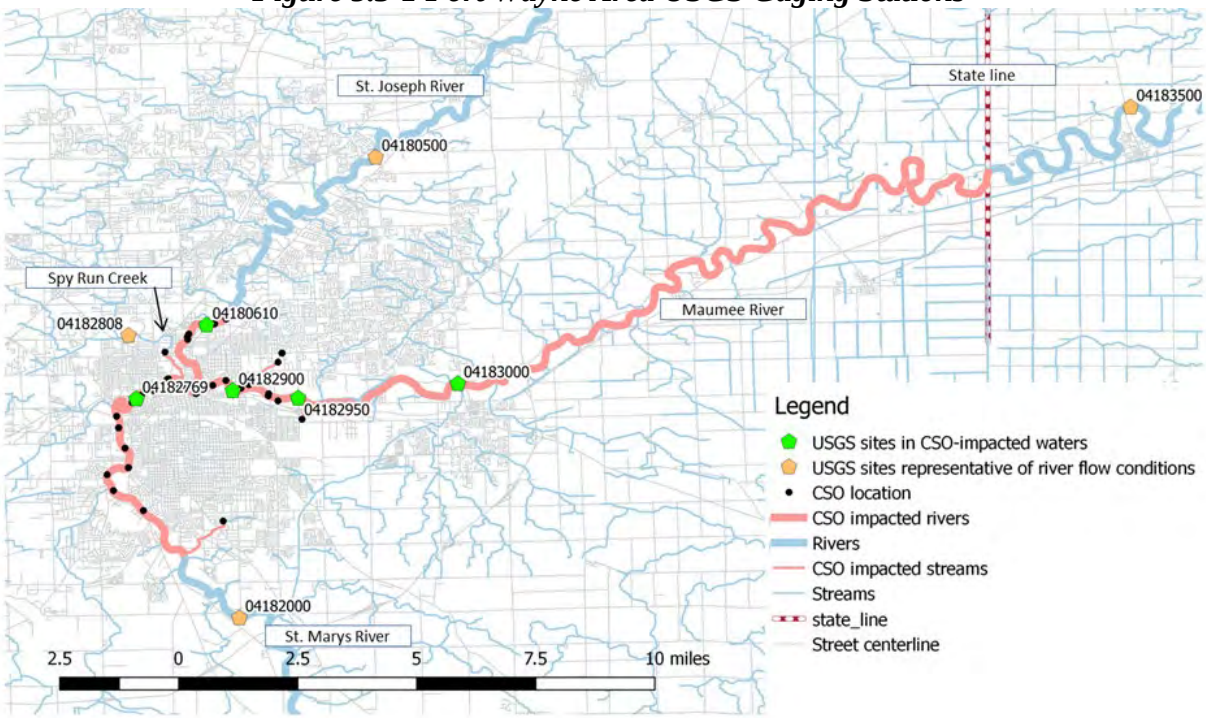
- First, USGS records from the past 5 to 30 years document that field staff have historically chosen not to enter the City's CSO-Impacted Waters under similar high flow conditions, typically for safety reasons.
- Second, projections from the City's calibrated model show that flow conditions during post-LTCP CSO activation events will exceed USGS safety guidelines.

5.3.1 Background on USGS Field Program and Safety Guidelines

The USGS conducts a regular field measurement program in support of their network of river gaging sites. In particular, each site is visited approximately once per month to manually measure and record flow depth and flow velocity in order to maintain calibration of the stage-discharge relationship at the site. As part of each measurement, local staff record whether they collect the data by wading into the river (preferred due to increased accuracy), or collect the data using a non-wading method (typically from a bridge location). The decision to wade versus not wading is typically made based on safety considerations, at least at locations where wading is a regular option.

The USGS maintains 9 active gaging stations in the Fort Wayne area that are within or proximate to the City's CSO-Impacted Waters, as shown in Figure 5.3-1. Five of these sites are within the impacted waters, and four of the sites are in relevant locations upstream or downstream of the impacted waters.

Figure 5.3-1 Fort Wayne Area USGS Gaging Stations



In support of their field programs, the USGS has also developed an objective criterion for determining when wading can be considered safe in a stream. The USGS wading criterion holds that wading is unsafe when a stream's depth multiplied by its velocity meets or exceeds 10 ft^2/s[50]. This metric, known as the safety factor, recognizes that no single measure is an absolute indicator of risk; rather, a combination of depth and velocity (and associated flow) needs to be considered to assess potentially unsafe river conditions.

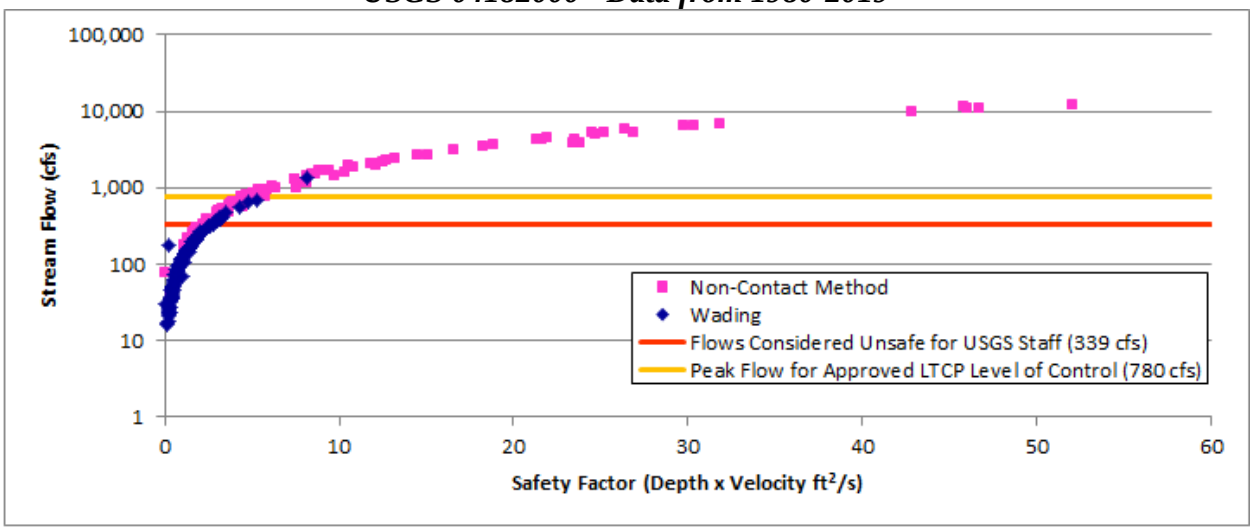
5.3.2 Reviewing Historical Safety Decisions by USGS Field Staff

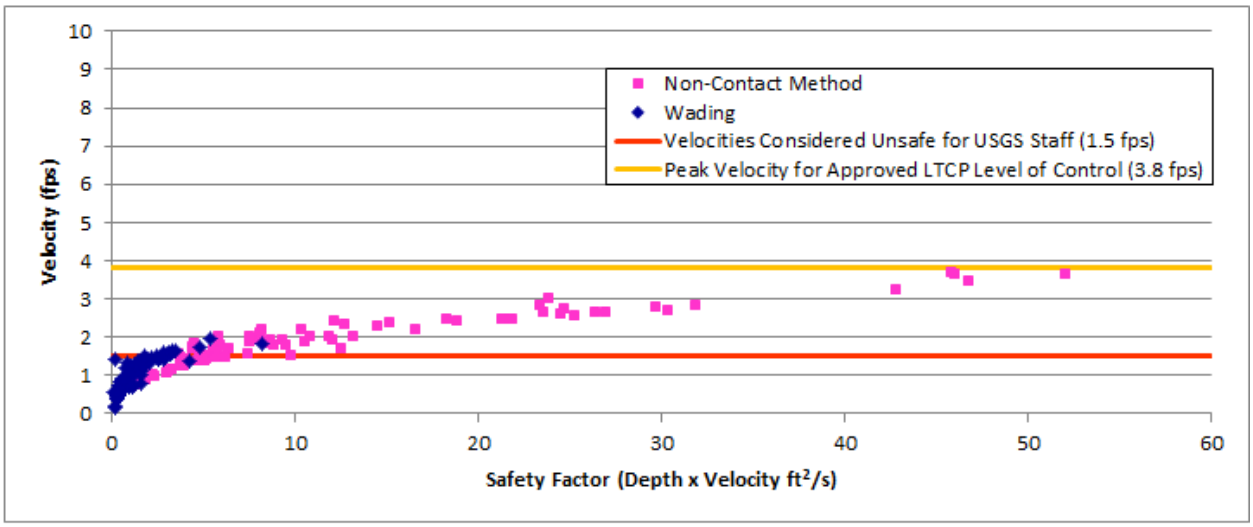
As noted above, every field visit to a USGS site results in a data record representing conditions on a given day that includes documentation of whether the river was accessed via wading or by a non-wading method. These data records were retrieved from the USGS website[51] for every gaging station shown in Figure 5.3-1. Substantial wading data are available for 7 of the 9 USGS gaging stations. This information was used to develop Figures 5.3-2 through 5.3-8 below, which present measured flow, velocity, and depth data at each site, along with the value considered unsafe for USGS staff and the projected peak value during smaller post-LTCP activation events under the approved LTCP. The data are plotted against the USGS safety factor (depth x velocity) in order to provide a consistent comparison across metrics and across sites.

[50] "National Field Manual for the Collection of Water-Quality Data," compiled 2015, United States Geological Survey, Chapter A9 p. 22
[51] https://waterdata.usgs.gov/

Of particular note on these figures is the value considered unsafe for USGS staff. This value has been developed based on the documented decision by USGS staff to wade, or not to wade, on a given data collection day, and can be considered the local threshold deemed unsafe by the USGS for entering the river at each site. As the figures illustrate, these local safety thresholds are always exceeded by projected conditions during post-LTCP activation events, at every USGS site – from upstream of the impacted waters, through the impacted waters, to downstream of the impacted waters. Data and comparisons from these figures are also summarized in Table 5.3-1, following the figures.

Figure 5.3-2 USGS Field Measurements St. Marys at Ferguson Road
USGS 04182000 - Data from 1980-2019





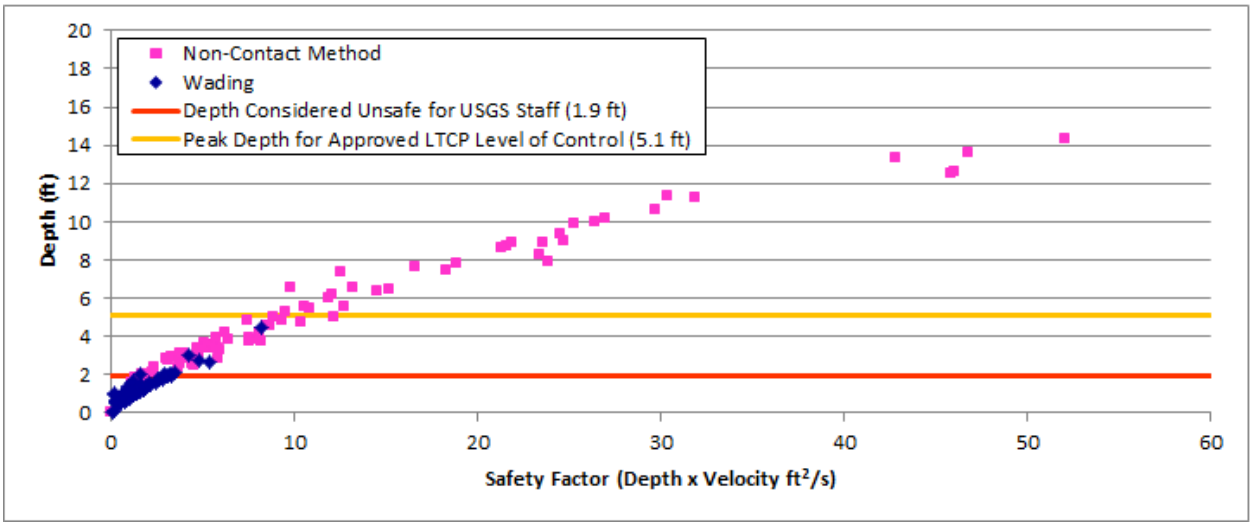
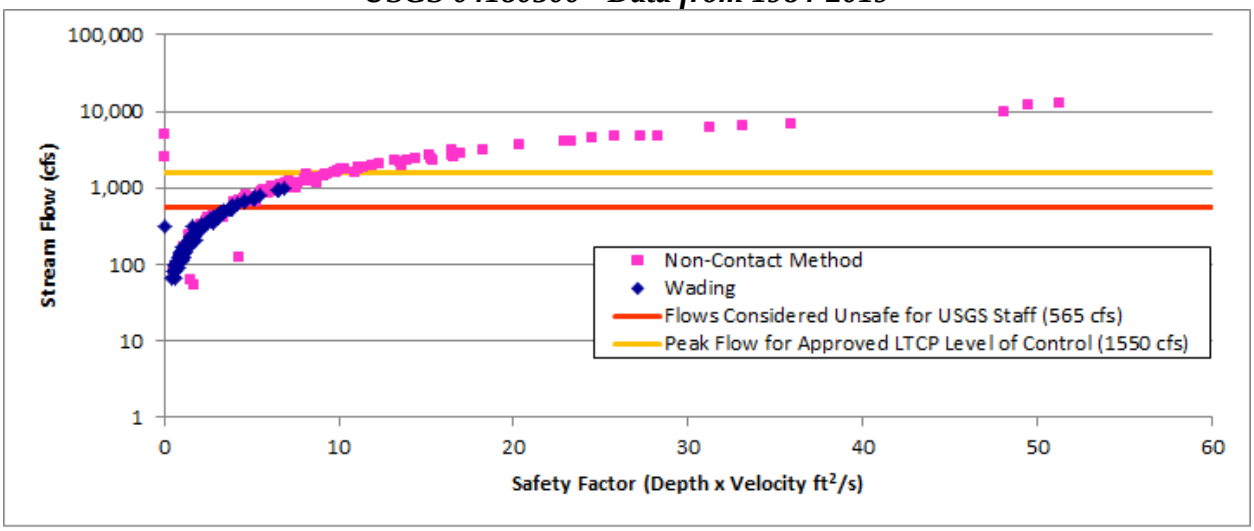
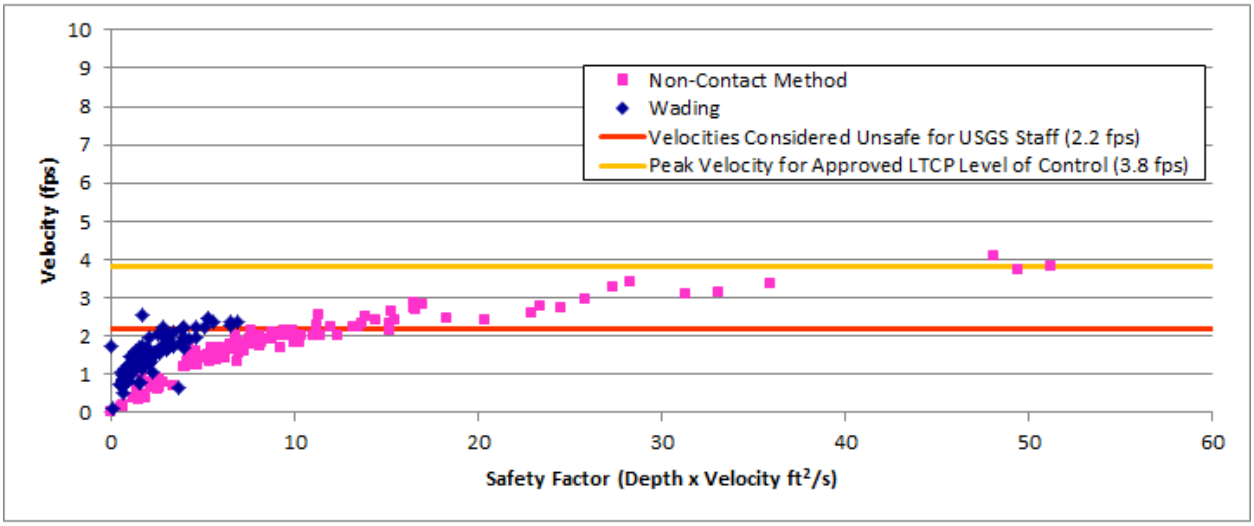


Figure 5.3-3 USGS Field Measurements St. Joe at Mayhew Road
USGS 04180500 - Data from 1984-2019





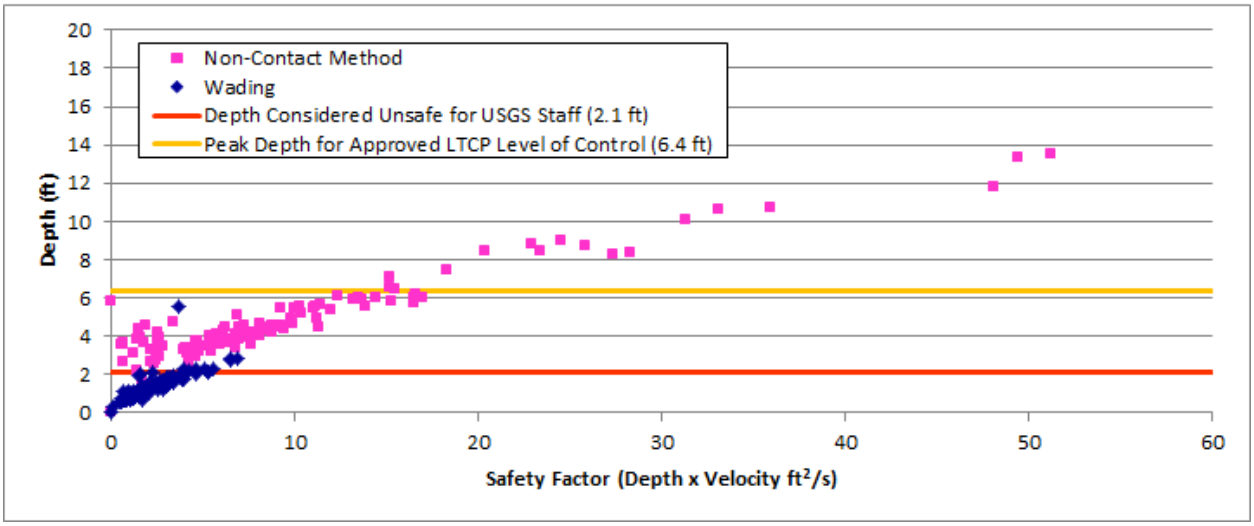
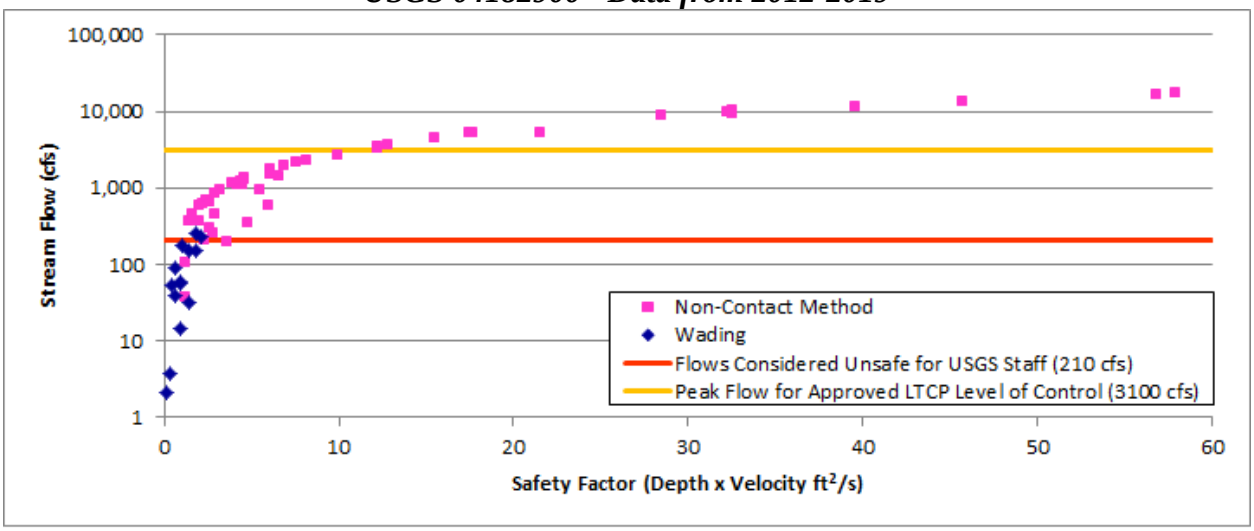
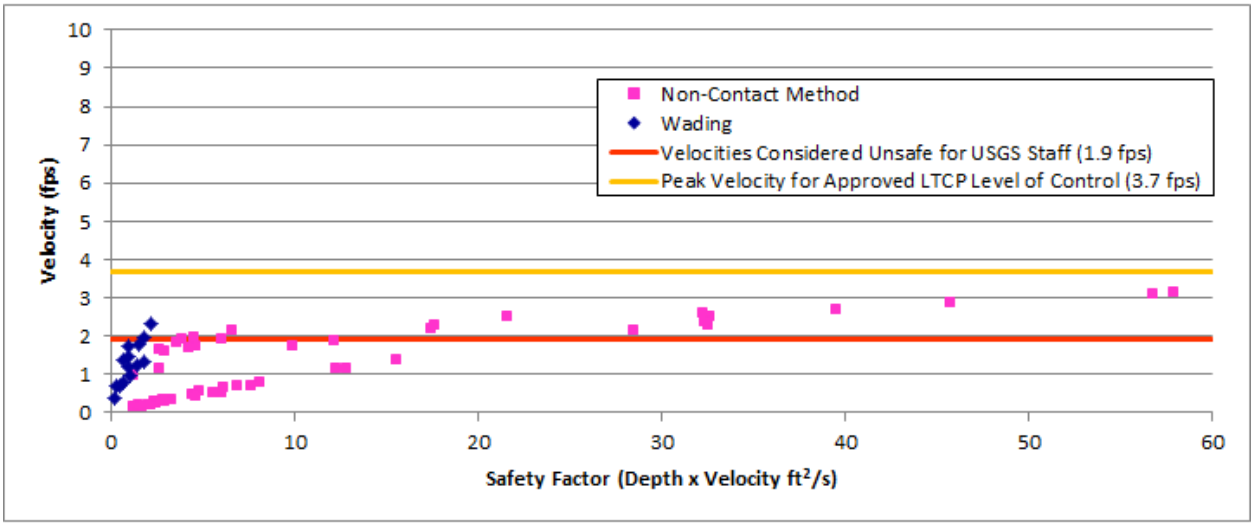


Figure 5.3-4 USGS Field Measurements Maumee at Anthony Boulevard
USGS 04182900 - Data from 2012-2019





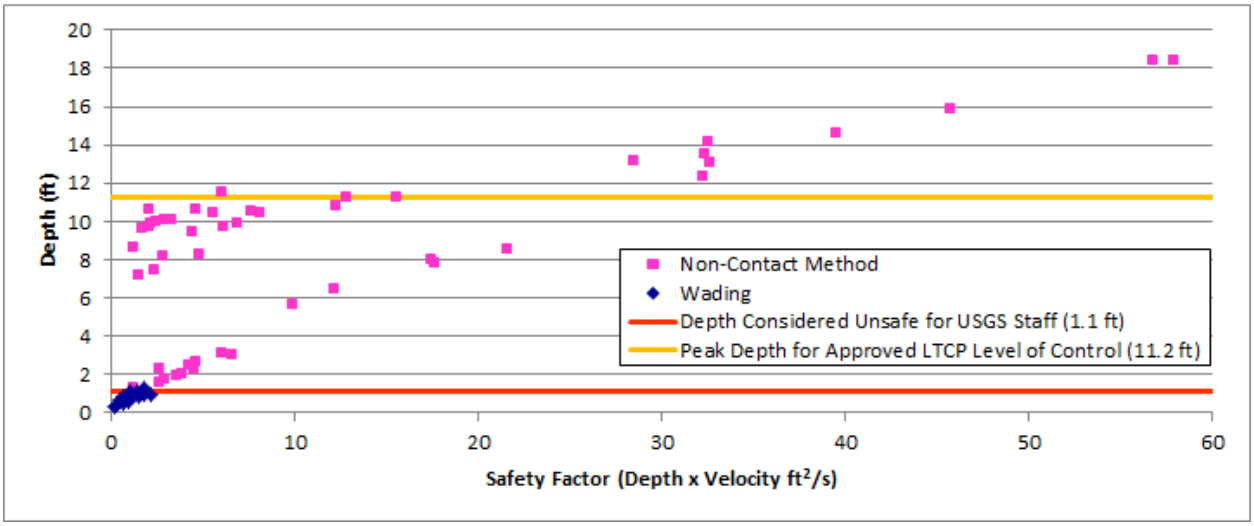
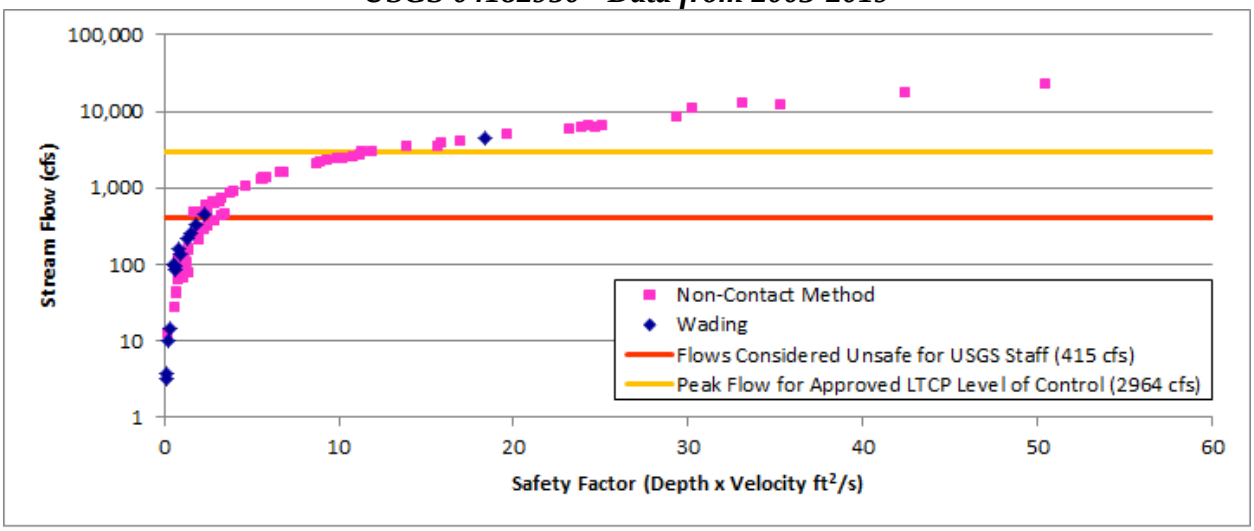
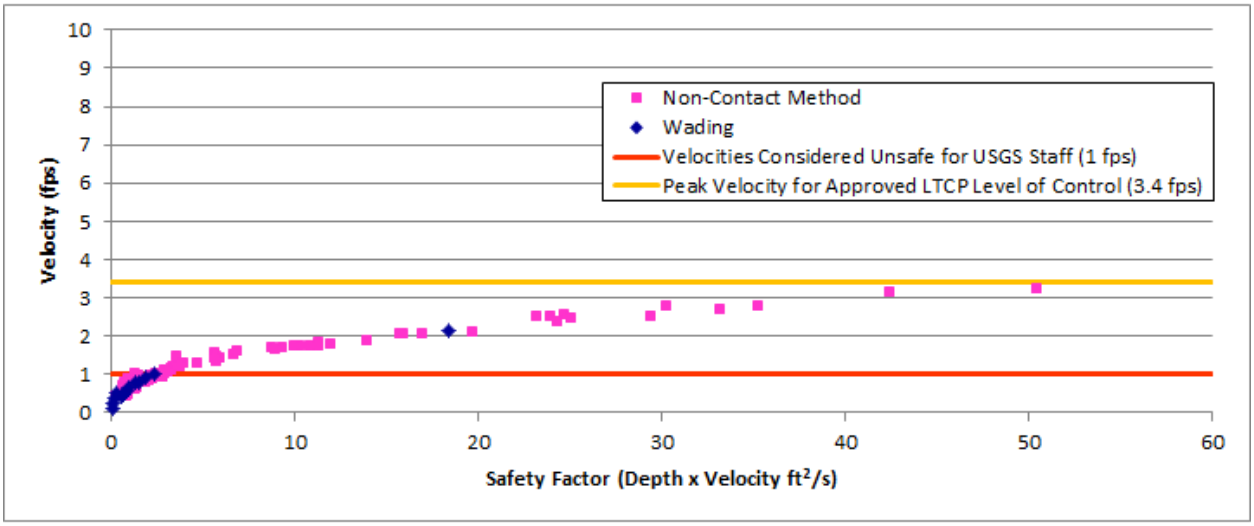


Figure 5.3-5 USGS Field Measurements Maumee at Coliseum Boulevard USGS 04182950 - Data from 2003-2019





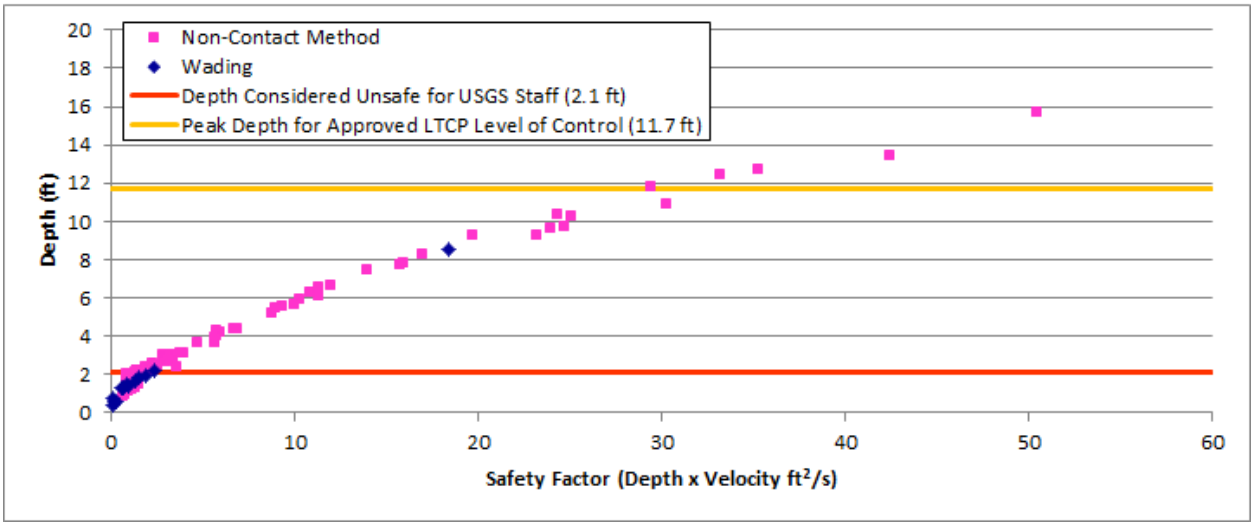
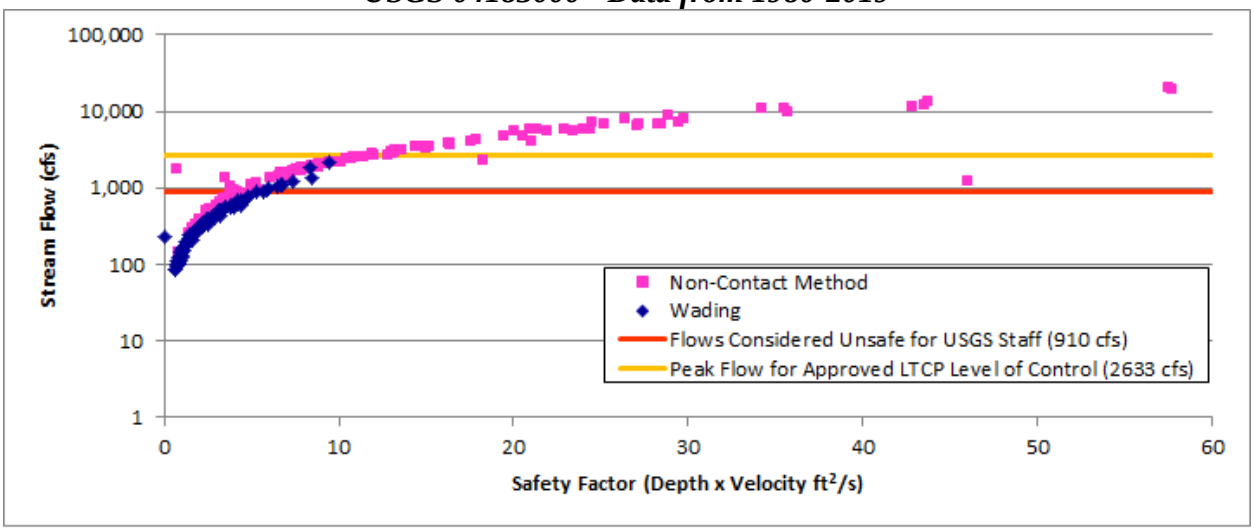
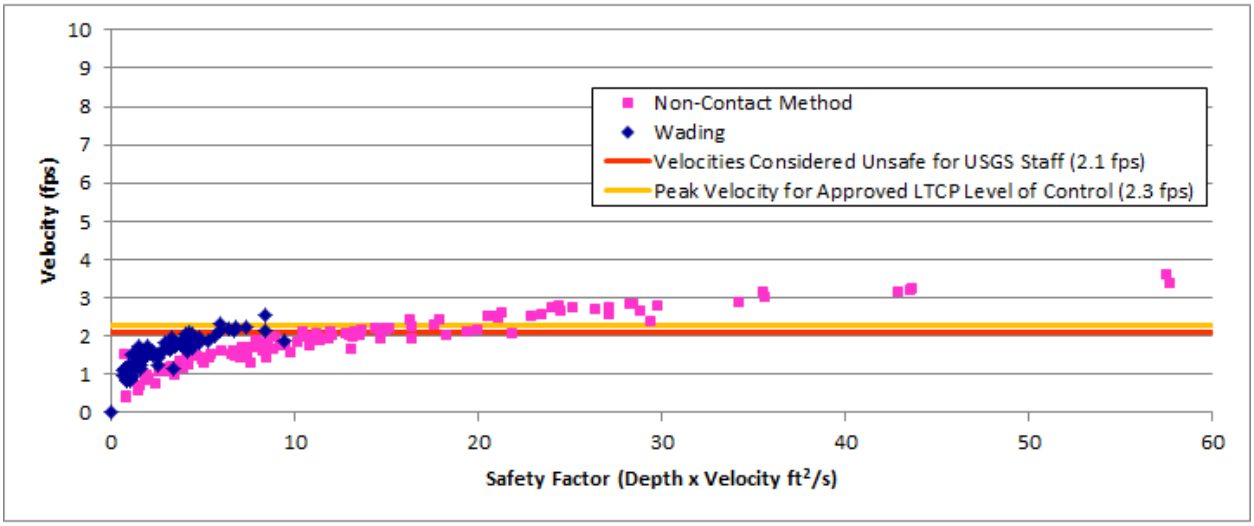


Figure 5.3-6 USGS Field Measurements Maumee at Landin Road
USGS 04183000 - Data from 1980-2019





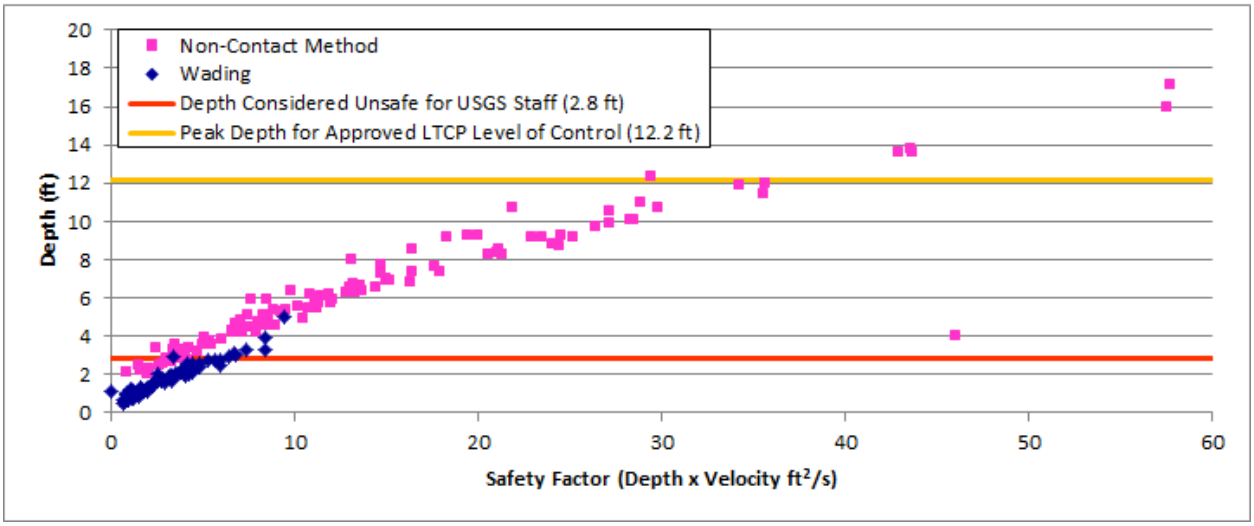
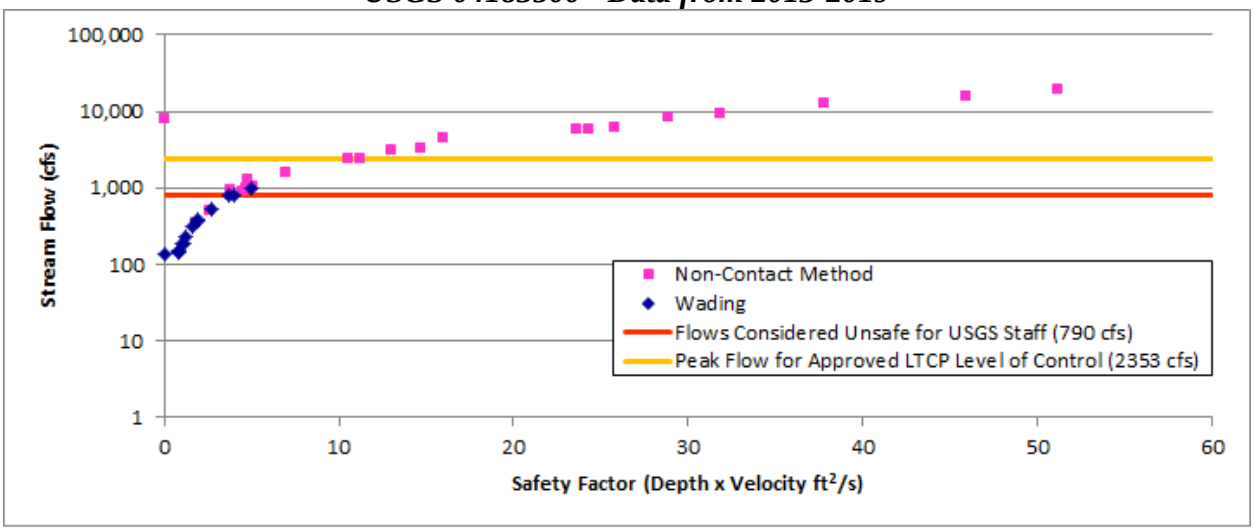
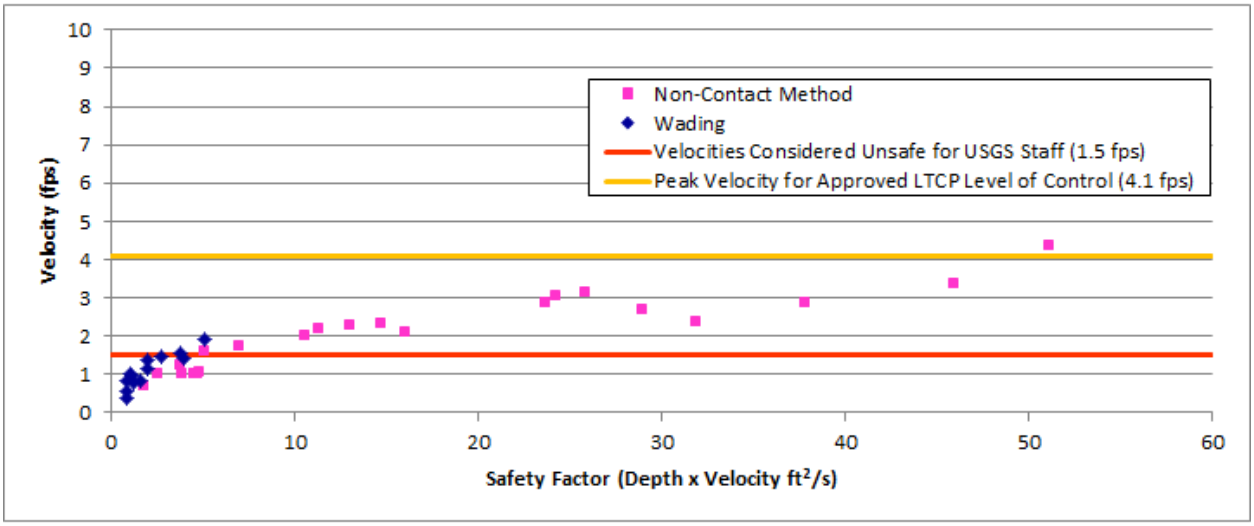


Figure 5.3-7 USGS Field Measurements Maumee at Antwerp Ohio
USGS 04183500 - Data from 2013-2019





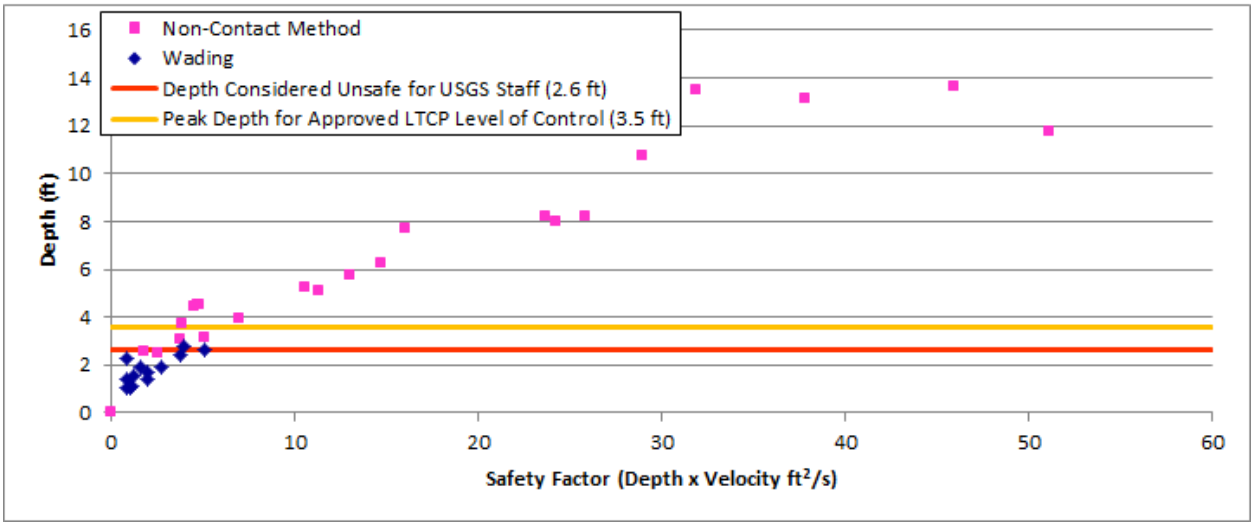
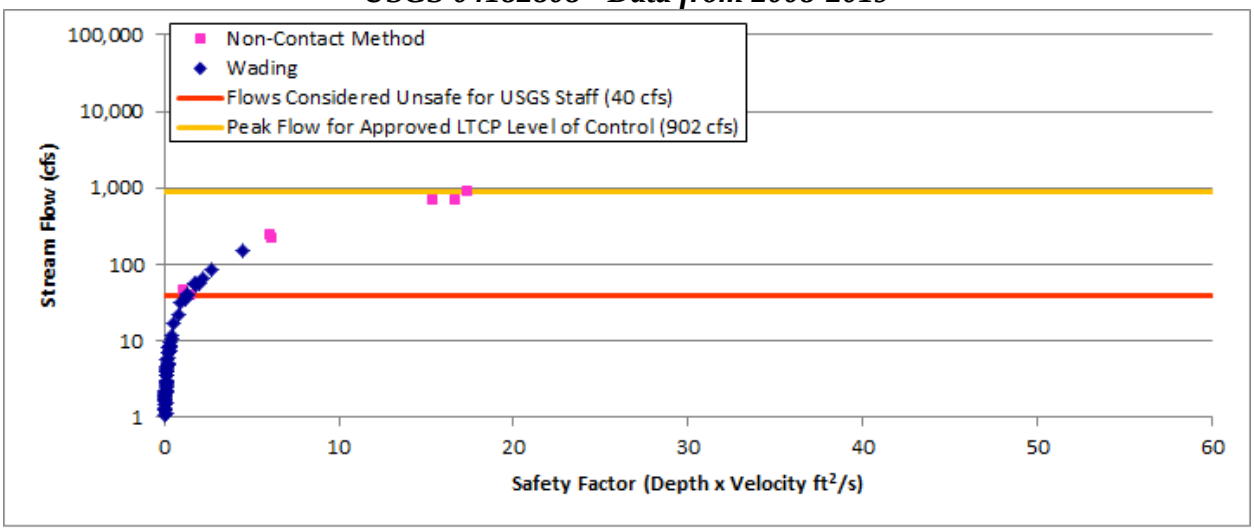
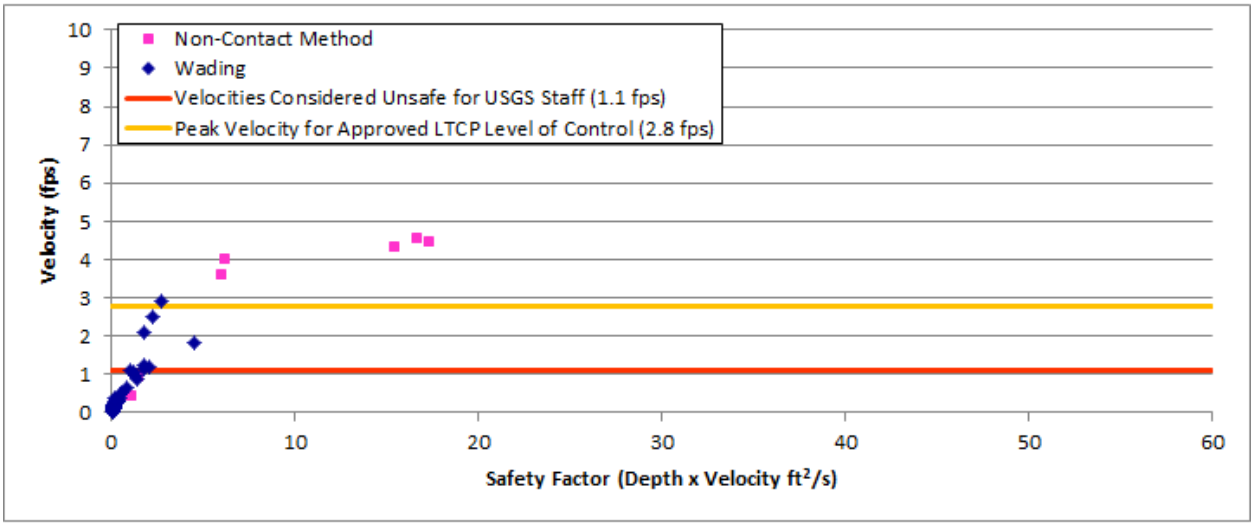


Figure 5.3-8 USGS Field Measurements Spy Run near Park Drive
USGS 04182808 - Data from 2008-2019





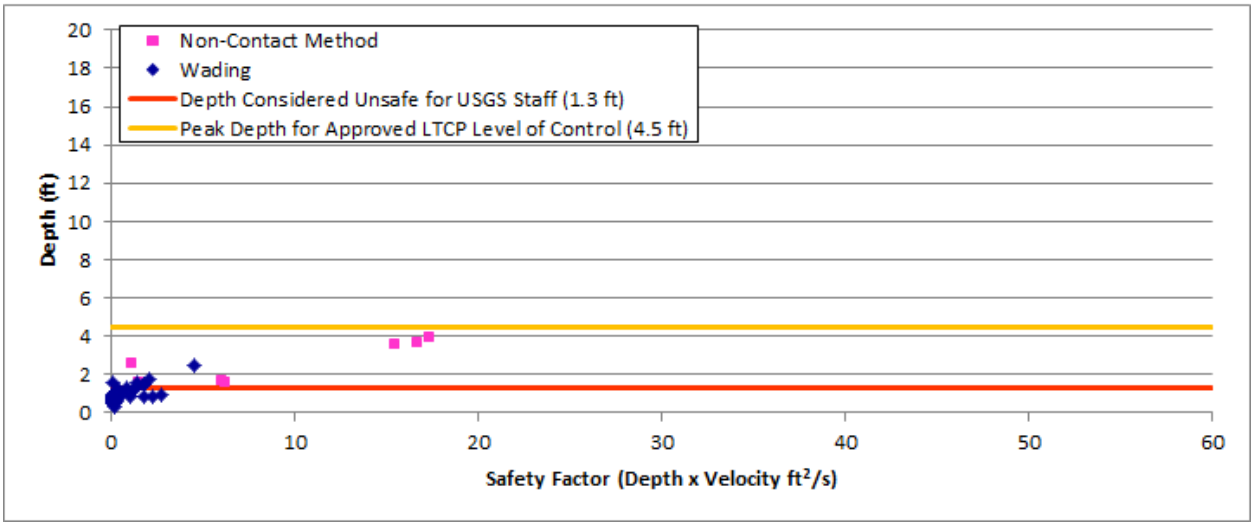


Table 5-3.1 Modeled Instream Peak Flow, Velocity, and Depth During CSO Activations Remaining After LTCP Implementation

Watershed	USGS Site ID	Flows Considered Unsafe for Wading by USGS Staff (cfs)[1]	Peak (Modeled) Stream Flows after LTCP Implementation (cfs)[2]	Velocities Considered Unsafe for Wading by USGS Staff (fps)[1]	Peak (Modeled) Stream Velocities after LTCP Implementation (fps)[3]	Depths Considered Unsafe for Wading by USGS Staff (ft)[1]	Peak (Modeled) Stream Depths after LTCP Implementation (ft)
St. Marys River[4]	04182000	>339	780	>1.5	3.8	>1.9	5.1
St. Joseph River[4]	04180500	>565	1550	>2.2	3.8	>2.1	6.4
Maumee River	04182900	>210	3100	>1.9	3.7	>1.1	11.2
	04182950	>415	2964	>1	3.4	>2.1	11.7
	04183000	>910	2633	>2.1	2.3	>2.8	12.2
	04183500[5]	>790	2353	>1.5	4.1	>2.6	3.5
Spy Run Creek[4]	04182808	>40	902	>1.1	2.8	>1.3	4.5

[1]Flows, velocities, and depths considered unsafe for wading by USGS staff were derived from field measurement data reported by USGS through November 2019 for each gaging station.

[2]Modeled flows, velocities, and depths in this table are based on model predictions of instream conditions during the infrequent CSO activations remaining after LTCP implementation. Specifically, values represent the average of the two lowest instream flow conditions projected during post-LTCP activation events over a 5-year period. Instream conditions during all other activation events will be more severe.

[3]The peak velocity represents the velocity within the stream cross section that will be likely encountered by persons attempting to recreate. The velocity is calculated as the average model-predicted velocity over the cross section multiplied by 2.0 based on natural irregular channel velocity profiles presented in Open Channel Hydraulics (V.T. Chow, 1959). Lower velocities may be found in impoundment areas.

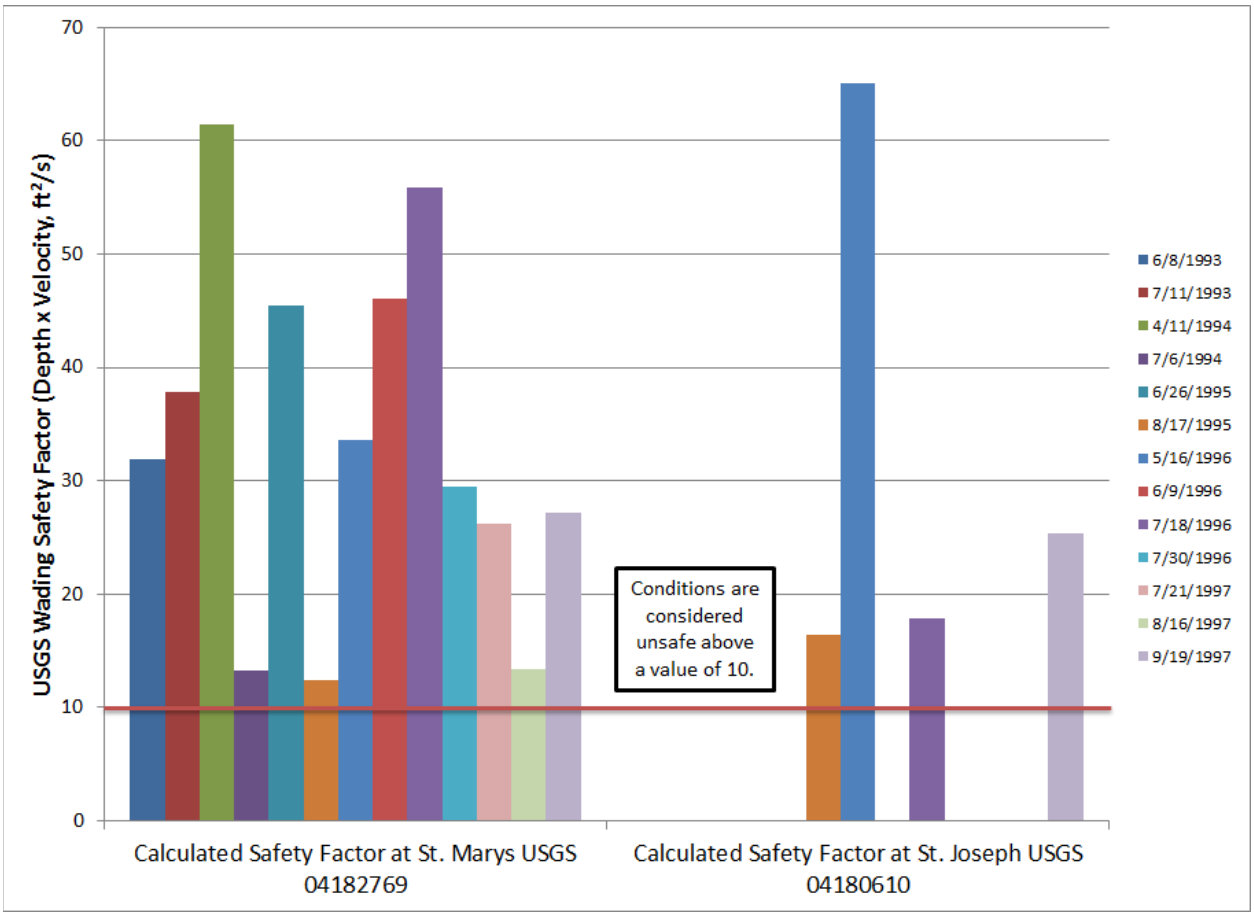
[4]These USGS sites are upstream of the CSO-impacted area on respective rivers/streams; however,they are included as representative of instream flow conditions under extreme events.

[5]This USGS site is downstream of the CSO-impacted area on the Maumee; however,it is included as representative of instream flow conditions under extreme events. This location is particularly important as it confirms that safety concerns will prevent recreational use throughout the CSO-Impacted Waters, i.e. extending to the downstream end at the Ohio border.

5.3.3 Assessing Wading Safety Criterion Using Model Projections

The remaining two USGS gaging stations (04182769, on the lower St. Marys River, and 04180610, on the lower St. Joseph River) are located along river segments with consistently elevated depths and, consequently, entail limited to no USGS wading data. The elevated depths are due to the downstream Hosey Dam on the Maumee River creating a backwater condition (note that the dam is not actively operated, so that while depths are increased, flow rates are not modified). In the absence of USGS wading data, the City used projections from their calibrated model to compare river flow conditions at these two locations during post-LTCP activation events to the USGS wading safety criterion of 10 ft^2/s. As shown in Figure 5.3-9, flows at these two USGS gaging stations also exceed the relevant USGS safety threshold during post-LTCP activation events.

Figure 5.3-9 Projected Safety Factors During Post-LTCP Activation Events at Two USGS Stations Without Wading Data

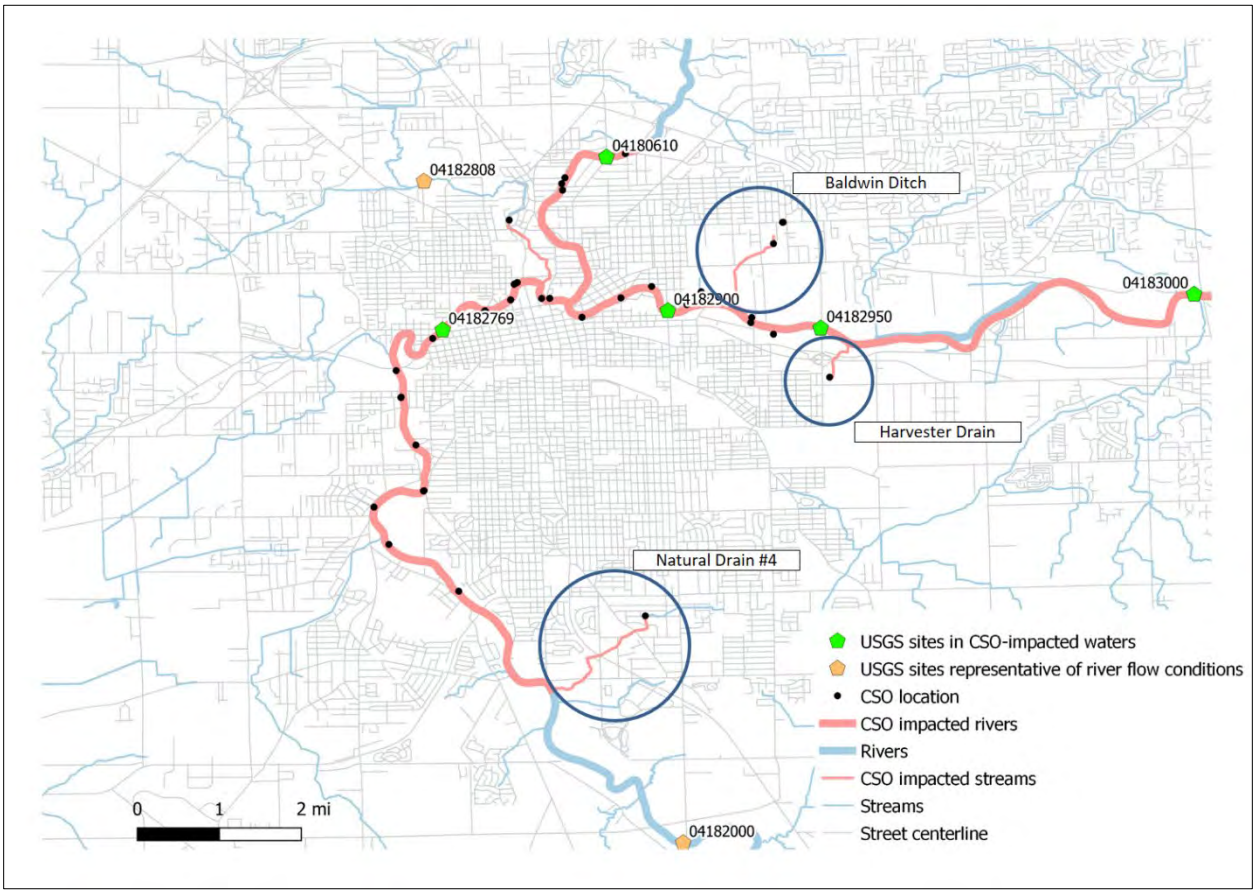


Based on model projections of representative post-LTCP activation events over a 5-year period from 1993-1997. Note that the fewer activations predicted on the St. Joseph River reflect the higher control level for St. Joseph CSOs.

A model-based method can also be used to assess post-LTCP conditions on the three small stream segments included in the City's CSO-Impacted Waters. These stream segments – the

downstream reaches of Natural Drain #4, Baldwin Ditch, and Harvester Drain - are identified on Figure 5.3-10, and as can be seen do not have any USGS gauging stations along their length.

Figure 5.3-10 Location of Three CSO-Impacted Streams



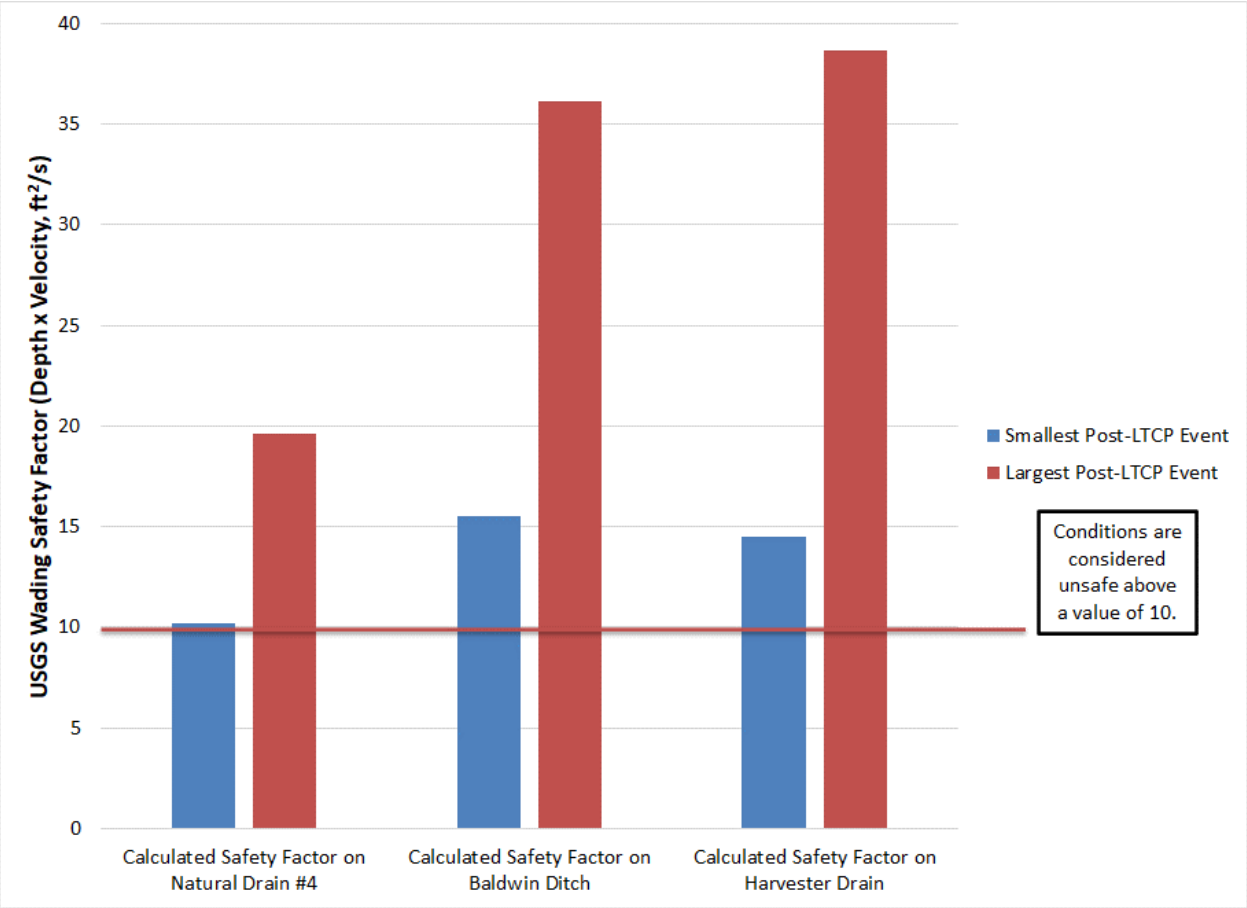
Further, while the flows in these three streams are accounted for in the City's calibrated model as inflow to the rivers, the stream channels themselves are not represented explicitly due to their small size. Therefore, a hybrid approach was used to assess post-LTCP hydraulic conditions on these streams as follows:

- Flow rates for post-LTCP activation events were extracted from the model for each of the three streams.
- A representative cross section and associated channel slope were defined for each stream using a digital elevation model maintained by the City.[52]
- Hydraulic calculations were performed to estimate the depths and velocities associated with the post-LTCP flows.

[52] The City's 2017 digital elevation model was derived from the QL2 (quality level 2) topographic LiDAR dataset under the statewide USGS 3DEP (3D Elevation Program).

The results of these calculations were used to compare flow conditions during post-LTCP activation events to the USGS wading safety criterion of 10 ft^2/s. Specifically, for all three streams, the safety factors for the smallest and largest post-LTCP activation events were estimated to span the range of post-LTCP conditions. As shown in Figure 5.3-11, flows on all three streams also exceed the relevant USGS safety threshold during post-LTCP activation events.

Figure 5.3-11 Projected Safety Factors During Post-LTCP Activation Events on CSO-Impacted Streams



5.4 Factor 3: Human-Caused Conditions or Sources of Pollution

Whether "human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place" is the focus of the third of the 40 CFR §131.10(g) factors. The City posits, as alluded to in the preceding section, that bacterial contamination from the presence of domesticated animals associated with human populations has adversely impacted the quality of the St. Joseph River and the St. Marys River in rural agricultural areas upstream of the City. Further, as discussed below, the City also asserts that the urbanization of Fort Wayne and the immediately surrounding areas constitute such a human-caused condition which leads to increased levels of bacterial

contamination in the CSO-Impacted Waters. Both human-caused conditions are believed to be significant contributing sources of bacterial contamination that routinely exceed applicable standards for full-body recreation, as described above, such that the designated recreational use cannot be attained under wet weather conditions.

5.4.1 Increased Bacterial Pollution from Domesticated Animals Associated with Human Populations.

As discussed in Section 5.2, above, the watersheds of the St. Marys River and St. Joseph River upstream of the City are characterized as consisting, primarily, of rural agricultural land. Notwithstanding the general agricultural character, portions of each watershed, particularly in forested or wooded areas fringing the rivers, serve as habitat for wildlife of various forms. These wildlife are a source of fecal contamination to the river, as described above. But, stemming from the agricultural uses made of the bulk of the watersheds, also present are substantial numbers of livestock, household pets, and other animals that frequent areas of human habitation and activity. Fecal contamination from the presence of these animals is a human-caused condition that contributes to the characteristic inability of the St. Marys River and St. Joseph River to exhibit the quality necessary to support full-body contact recreation. While livestock managed in confined animal feeding operations ("CAFOs") are subject to effluent limitation guidelines under the NPDES program, other livestock, managed in other ways, are not subject to such regulatory control. Grazing livestock and other domesticated animals that wander agricultural land constitute distributed non-point sources of bacterial pollution that, while not practically controllable, do result in contamination of stormwater flowing to the waters of each watershed and ultimately impact both the St. Marys and St. Joseph Rivers.

5.4.2 Increased Bacterial Pollution Caused by Urbanization

Urbanization inherently generates human-caused sources of bacterial pollution which can prevent attainment of water quality necessary for recreational use during significant wet weather events. These human-caused conditions include the density of human population, the presence of numerous pets and other animals associated with human population (including feral cats, geese, pigeons, and other avian species, squirrels, raccoons, mice, and rats), the high percentage of impervious surfaces in the urban landscape, and the draining of storm runoff from the impervious areas with storm sewer or combined sewer systems. As a result of these conditions, a substantially higher fraction of precipitation becomes runoff than is typical for rural areas and a higher percentage of that runoff is conveyed to waters draining the urban area. Not only does a much higher fraction of precipitation run off the urban lands but the runoff occurs with much greater rapidity than occurs in a rural area, resulting in larger short-term volumes of runoff.

As noted in Section 4.1.2.3 above, upstream contamination of both the St. Marys and St. Joseph River is regularly present to such a degree that it prevents the water quality of either river from meeting recreational water quality criteria, both upstream of and internal to the CSO-impacted zones. The contaminant levels shown in Figures 4.1-6 and 4.1-7, which regularly exceed water quality criteria for full-body contact recreational use, most likely reflect bacterial contamination from both natural sources (wildlife) and human-caused sources (livestock and domesticated

animals, among others) from both upstream rural areas and newer urban areas served by separate storm sewers.

5.4.3 Inability to Remedy Human-Caused Bacterial Contamination

Before the City can rely upon the human-caused condition factor of 40 CFR 131.10(g) to support removal of the recreational use designation during periods of CSO impacts that remain after implementation of CSO controls, it must consider a) whether it is feasible to remedy those conditions; or b) if feasible, whether remedying those conditions would cause more environmental damage than exists with those conditions in place. Given the nature of the sources of bacterial contamination as described in previous sections, the City posits that it is infeasible to remedy the human-caused conditions. It is inconceivable that anyone would suggest that farm livestock or family pets will disappear from the watersheds for the St. Joseph River or St. Marys River in the foreseeable future. Nor would anyone seriously suggest that urbanization will be reversed. Consequently, the only potentially feasible approaches to remedying these human-caused sources of bacterial contamination involve the implementation of management practices or actual controls on bacterial contamination that may mitigate the effects of these sources.

Potential management practices to limit the volume and, in particular, mitigate the bacterial content of rural and urban stormwater have significant practical limitations that severely restrict their effectiveness and create obstacles to their widespread implementation.

In rural areas, the use of agricultural Best Management Practices (BMPs) is widely recommended and already an accepted practice for many Midwestern farmers. Specific to bacteria control, agricultural BMPs such as conservation buffers, grazing management, and erosion and sediment control can have a positive effect. However, given the spatial extent of the sources, i.e. throughout the entire watersheds of the St. Marys and St. Joseph Rivers, it is impracticable to adequately control bacterial loads from widely distributed livestock and pets using BMPs. The only guaranteed solution is to change the fundamental land use and remove livestock and pets – which, as noted above, is inconceivable.

For urban areas, the use of certain BMPs, such as periodic street sweeping, provide limited capability for reduction of stormwater contaminants. Also, various green infrastructure technologies, such as those listed below, are emerging as another possible approach for mitigating the negative impacts of urbanization on the quality of area waters from stormwater runoff. These technologies are projected to be helpful in reducing the amount of stormwater runoff (and thus the amount of bacterial contaminants reaching public waters) from urbanized areas.

- Urban trees
- Green roofs
- Green parking lots
- Rain barrels
- Porous pavement
- Rain gardens

While such techniques may make minor reductions in stormwater runoff volumes, industry experience indicates that they do not appear capable of significant reductions in runoff from storms of moderate or more intense rain events. Moreover, their implementation on the broad scale required for appreciable impact would require widespread cooperation by private property owners, which cannot be assumed. Measures like street cleaning or "sweeping" cannot be done with sufficient frequency to make significant removal of animal fecal material prior to all storm events, and, in any event, the streets represent only a small fraction of the urban area on which such contamination may exist.

Modeling by the City indicates that approximately 75% of *E. coli* from fecal contamination of stormwater conveyed by the separate storm sewers within the City would need to be eliminated, in addition to eliminating upstream contamination of the St. Joseph River and St. Marys River in order to have a chance of meeting State bacterial standards for recreational use. The City believes that eliminating upstream contamination is impossible, for the reasons explained above, and that eliminating 75% of *E. coli* from separate storm sewers would require such a level of effort and cost as to make such a goal impossibly lofty and unattainable for the foreseeable future.

Nonetheless, the City will continue to investigate best practices for managing stormwater runoff within the urban area that may be effective in reducing the adverse effects of stormwater on bacterial quality of its waters, including any measures or practices and quantifiable results shared by other cities' stormwater management programs, and will seek to adopt any proven, workable best management practices. Also, the City will continue to encourage voluntary stormwater management practices through education, public information releases and other methods.

In conclusion, the full-body contact recreational use cannot be attained in the CSO-Impacted Waters due to: (i) the upstream bacterial contamination of the St. Joseph River and St. Marys River from livestock and pets; and (ii) the effects of urbanization, specifically, increased flows and increased *E. coli* bacteria pollution from domesticated animals and other urban sources in nonpoint storm runoff or in storm runoff discharged from the City's separate storm sewer system. It is neither feasible nor affordable to remedy or sufficiently mitigate these effects.

5.5 Factor 6: Substantial and Widespread Economic and Social Impact

The sixth factor described by 40 CFR 131.10(g) as a potential basis for the infeasibility of attaining a designated use in a particular waterbody is that:

- Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact.

The City of Fort Wayne posits that, when the application of Indiana's designated use for full-body contact recreation to the City's CSO impacted waters is evaluated under this factor, a conclusion clearly emerges that it is not feasible to attain this designated use under all wet weather conditions which may occur. Furthermore, the analysis demonstrates that the extent of CSO controls specified in the City's LTCP defines the limit of feasible water quality improvements under this factor (i.e., the highest attainable use). As a result, the City proposes that a revision of this full-body contact recreational designated use is warranted to relieve the City from the obligation to

attain the designated use and associated bacterial standards in these waters under those wet weather conditions where attainment is infeasible. The following subsections explain the rationale for this position.

Before moving to a consideration of the specifics of the City's position, a preliminary observation is made concerning the scope of the sixth factor of 40 CFR 131.10(g). The reference to "controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act" has been consistently interpreted to mean controls more stringent than the technology-based requirements of the CWA. Any additional controls beyond the minimum technology-based requirements that would be needed to meet water quality-based requirements under the CWA are subject to evaluation under the sixth factor. The EPA's CSO Control Policy and other guidance identifies the Nine Minimum Controls as the minimum technology-based requirements of the CWA with respect to CSOs.[53]

5.5.1 Substantial Economic and Social Impact

5.5.1.1 Background

The first step in determining whether a revision of Indiana's water quality standards relating to wet weather recreation on the City's CSO-Impacted Waters is warranted under the sixth factor of 40 CFR 131.10(g) is to assess whether implementation of the CSO control measures needed to comply with the existing water quality standards under such conditions would result in a substantial economic and social impact on the City Wastewater Utility's ratepayers. Fort Wayne's demonstration of this threshold fact is presented in section 5.5.1.2.1, below. Before setting out that analysis, however, a brief review of relevant EPA guidance on this topic is provided.

Evaluation of potential substantial economic and social impacts associated with the City's implementation of CSO control measures is informed generally by EPA's guidance for applying the sixth factor of 40 CFR 131.10(g) – the March 1995 Interim Economic Guidance for Water Quality Standards ("*Interim Economic Guidance*").[54] Although this guidance was developed for a much broader purpose of guiding determinations on proposed water quality standard revisions of all types, including standards for aquatic life habitat as well as those for water-based recreation, and for water quality impacts by industrial discharges as well as municipal discharges, the EPA continues to rely upon this document for general guidance in the more narrow context of prospective water quality standard revisions relating to municipal CSO impacts.[55] Much of the discussion of this section will follow the general framework of the *Interim Economic Guidance*.

EPA has also developed guidance for municipalities in preparing financial capability analyses for use in scheduling the implementation of LTCPs. This document is entitled *Combined Sewer Overflows - Guidance for Financial Capability Assessment and Schedule Development*,[56] referred to hereinafter as the EPA's "*Financial Capability Guidance*." Comparison of EPA's *Interim*

[53] See *Coordinating CSO LTCPs and WQS Reviews*, *supra*, p. 9, Sec. II.1.B.
[54] EPA-823-B-95-002, U.S.EPA (March 1995). The basis of regulatory relief is described on Page 3 of this guidance that attaining a designated use would result in substantial and widespread economic and social impacts.
[55] See *Coordinating CSO LTCPs and WQS Reviews*, *supra*, App. IV, p. A-13.
[56] U.S. EPA (February 1997).

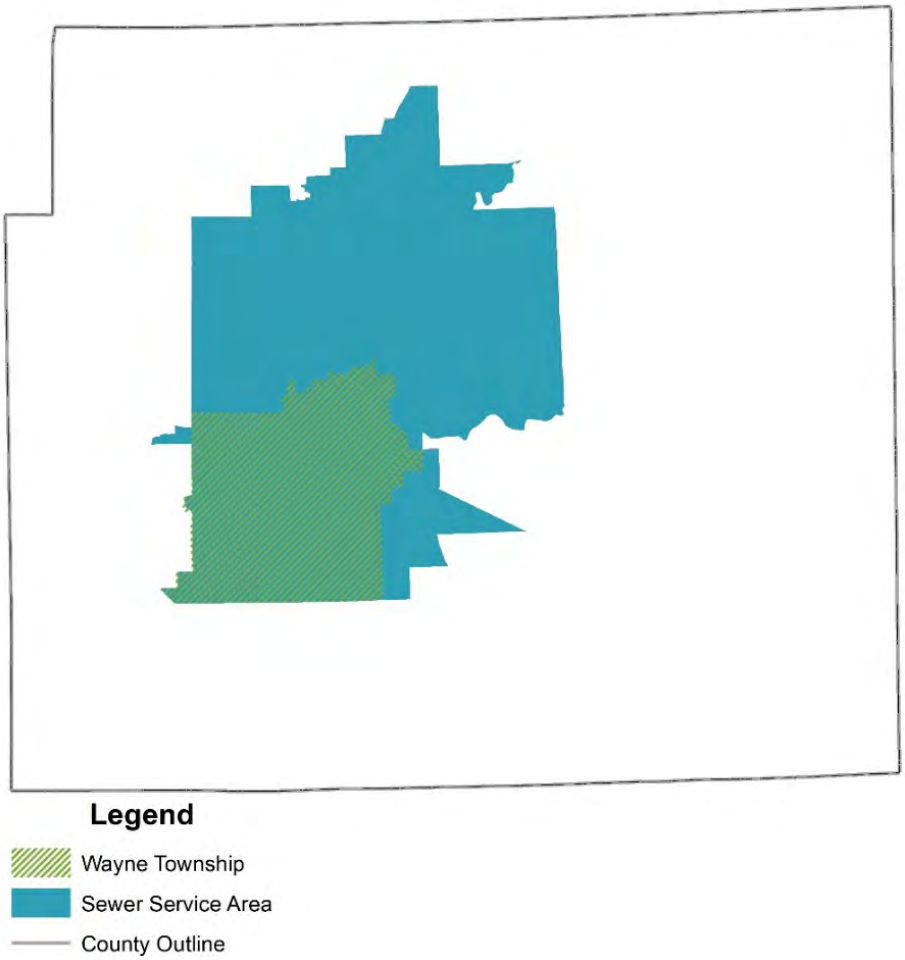
Economic Guidance with the agency's *Financial Capability Guidance* shows that the *Financial Capability Guidance* is essentially equivalent to that portion of the *Interim Economic Guidance* addressing whether attainment of a designated use would cause a "substantial economic and social impact". For this reason, the substantial economic and social impact analysis provided under this Updated UAA will be described following the *Interim Economic Guidance* and be compared to the City's Financial Capability Analysis which was prepared as a part of its LTCP and is generally consistent with EPA's *Financial Capability Guidance*. Section 3.5 of the City's LTCP contains the original financial capability analysis ("FCA") for the LTCP.[57] Comparisons to and updates to the original FCA information are described in Appendix L.

5.5.1.1.1 Median Household Income

An MHI value of $48,039 for the sewer service area, hereafter referred to as the City, is employed in the financial model for this Updated UAA. This sewer service area is shown in Figure 5.5-1, and the associated MHI value is derived from the 2017 American Community Survey (ACS) 5-Year Estimates, which generates such financial data in years other than census years. A second relevant MHI value of $35,881 was used to calculate the MPS for Wayne Township, also shown in Figure 5.5-1. The Wayne Township MHI reflects an economically disadvantaged segment of the Fort Wayne community and comes from the 2017 American Community Survey (ACS) 1-Year Estimates. The financial model currently used by the City does not provide forecasting of MHI values for future years.

[57]The City's financial capability – or affordability – analysis was prepared in collaboration with the Community Research Institute (CRI) at Indiana University – Purdue University, Fort Wayne, Indiana.

Figure 5.5-1 Map Depicting Sewer Service Area and Wayne Township within Allen County



5.5.1.2 Municipal Preliminary Screener

A key indicator in the substantial economic impact analysis, also commonly referred to as the affordability analysis, is the ratio, shown as a percentage, of cost per household of the selected LTCP controls and other wastewater collection and treatment activities to median household income. This indicator is referred to in the *Interim Economic Guidance* as the "Municipal Preliminary Screener" ("MPS").[58]

The MPS is used principally, according to the Interim Economic Guidance, to quickly identify those municipal projects that are clearly not expected to cause a substantial economic impact. Under the Interim Economic Guidance, an MPS value of 1.0 % or less is considered to represent a low or little economic impact and to pose virtually no likelihood of presenting a substantial economic impact. For such projects the analysis is terminated; hence the indicator is referred to as a "screening" indicator since it is used to identify and screen out projects with low economic impact.

[58] In the Financial Capability Guidance, this factor is referred to as the "Residential Indicator".

5.5.1.2.1 Municipal Preliminary Screener Value for CSO Compliance with Existing Water Quality Standards

A threshold question under the analysis of the sixth UAA factor is whether controlling the City's CSO discharges to comply with existing water quality standards for recreational use is feasible, or affordable. As explained earlier in this document, the manner in which Indiana NPDES regulations apply the bacteriological criteria for recreational use directly as end-of-pipe limits so that no mixing zone is allowed[59] results in essentially every untreated CSO discharge triggering an exceedance of the recreation-based water quality criteria for *E. coli.* Therefore, full compliance with existing WQS would be achieved only by a level of control that allowed no CSO discharges to occur without adequate treatment or other control for even the most severe storms. This level of control could be approximated, although its costs are underestimated, by a level of control of zero discharges without adequate treatment in a "typical" five-year period (consistent with the typical period approach described in the City's approved Post-Construction Monitoring Plan). A preliminary estimate of the capital costs of this extreme level of control was developed for the original May 2010 UAA submittal. Stated in 2005 dollars, the capital costs were estimated to be a total of $592.4 million.[60] With this Updated UAA, the capital costs for complete capture have been updated to reflect the modified LTCP control measure configuration and more accurate costing (based on more fully-developed projects, and using current industry cost information), resulting in a current estimate of $703.3 million.

The major impact on cost to go from the LTCP scenario to the zero-discharge scenario is associated with upsizing the 3RPORT system. The largest impact is to the tunnel diameter, which goes from the LTCP-required diameter of 16 feet to an estimated 36 feet in diameter to support full CSO control. Table 5.5-1 provides a breakdown of the capital costs of the major components of the CSO control measures projected for the full control scenario as discussed above.[61]

[59] 327 IAC 5-2-11.4(d)(2).

[60] Another approach for achieving full compliance by CSOs with existing WQS would be to completely separate the existing combined sewer system into separate sanitary and storm sewers. The City has developed preliminary capital costs for a complete separation which, when translated to 2005 dollars, total $544 million. This capital cost projection underestimates, though, the total costs of water quality compliance since it does not take into account the fact that a sewer separation would greatly increase the area of the City which contributes storm water to the separate storm sewer system and would consequently be expected to cause a substantial increase in the costs of the City's stormwater management program over current projections or, alternatively, a substantial increase in pollution, including bacterial pollution, conveyed from the separate stormwater sewer system to the area waters currently impacted by CSOs. For these reasons, the analysis for water quality compliance will focus on the level of control representing zero discharges from CSOs in a typical period.

[61] These capital cost projections, which were derived as part of the overall feasibility analysis of the City's LTCP, are considered preliminary cost estimates that would correspond to Class 4 of the Association for the Advancement of Cost Engineering International (AACE). The most accurate estimates in this Class are expected to range from approximately -15% to +20%, while less accurate estimates in this Class could vary from approximately -30% to +50%. See Appendix M for a more complete description of the AACE Classification System for Cost Estimating.

Table 5.5-1 Capital Costs for CSO Control Measures for Complete Capture and Control of CSOs

Program Element	**Full Control Costs ($ millions, 2005)**
Combined Sewer Capacity Improvements	$33.8
Wet Weather Pond Improvements	51.3
Treatment Plant Improvements	17.4
Remote CSO Relief Sewers, Storage & Floatables	51.8
3RPORT Tunnel & Foster Park Relief Sewers	549.0
Total Cost	**703.3**

(All cost estimates based on 2005 dollar value and Typical Five Year Design Period conditions)

When the capital cost estimate of $703.3 million for the zero overflow level of control is appropriately amortized and its debt service costs combined with estimates of additional O&M costs for the CSO controls, and added to existing wastewater collection and treatment utility costs as well as the amortized capital costs and operating costs for other wastewater and collection system projects that are expected over the years 2008-2025, the total costs of wastewater collection and treatment can be determined.

Considering capital costs alone, the total capital needed by the City of Fort Wayne over the life of the LTCP is estimated at nearly $1.03 billion (2005 dollars) to achieve full control and fulfill other projected wastewater collection and treatment needs. These other needs, collectively referred to as the Wastewater Improvement CIP, include projects from the various master plans that have been prepared for the City, together with other wastewater improvements and maintenance needs. These include unimplemented portions of the various Collection System Master Plans, Plant Facility Master Plans, Asset Management Plans, and other projected capital improvements and maintenance needs at the wastewater treatment plant and in the collection system. Since the costs published in the various master plans were developed at different times, all costs were converted to a common dollar base (2005 dollars). Thus, the total remaining capital need for the Wastewater Improvements CIP is estimated at $326.6.6 million, and the total capital needs projected by the City over the life of the LTCP are summarized in Table 5.5-2.

Table 5.5-2: Total Capital Needed – Full Control

Capital Program	**2005 Dollar Value**
LTCP (0 events/18 years)	$703.3 million
Wastewater Improvements CIP	326.6 million
Total Cost	**$1,029.9 million**

When the total debt service costs for the overall capital improvement program described above, along with total corresponding O&M costs, are allocated to residential users in the manner

described in Appendix L to develop a cost per household figure and the result is divided by the median household income (MHI) of all households within the sewer service area, again determined as described Appendix L, a Municipal Preliminary Screener ("MPS") value corresponding to compliance with existing water quality standards (WQS) for primary (full-body) contact recreation ("MPS_{WQS}") is obtained as follows:[62]

$$\mathbf{MPS_{WQS} = 2.96\%}$$

Thus, the MPS value corresponding to the projected level of controls needed to comply with existing water quality standards for recreation exceeds 2% of MHI by a wide margin. Under the *Interim Economic Guidance*, such a result is considered to be in the "large" economic impact range and is, preliminarily speaking, indicative of an unreasonable financial burden on the residential ratepayers of the City's sewer utility. Full demonstration of a substantial economic impact is confirmed below in the discussion of the substantial impacts matrix, which combines this high MPS value with the secondary scoring phase of the analysis.

5.5.1.2.2 Municipal Preliminary Screener Value for Proposed CSO LTCP

The preceding section has established that a CSO control program to achieve full compliance with existing recreational WQS would be indicative of a substantial economic impact. While the *Interim Economic Guidance* provides that even a MPS in the large impact range needs further evaluation under the second phase of analysis, the City is first presenting an updated summary of its selected LTCP control costs, given the preliminary indication of unreasonable financial burden for full WQS compliance, before moving to that second phase.

As stated previously, the City's LTCP is designed to reduce uncontrolled CSO discharge events to 4 events per typical year for the St. Mary's River and the Maumee River and to 1 annual event in a typical year for the St. Joseph River. From the City's preliminary engineering analysis, its costs to achieve this level of reduction in uncontrolled CSO discharges will require 2008-2025 capital expenditures of $339.9 million in 2005 dollars ($494.5 million in current dollars) for LTCP controls, and another $326.6 million in 2005 dollars ($471.7 million in current dollars) for the Wastewater Improvement CIP described above. In addition to these capital expenditures (and their amortized debt service), there will also be projected increases in operational costs for the new controls as well as a continuation of existing debt service and operational costs.

The following Table 5.5-3 provides a breakdown of the capital costs for the major components of the CSO control measures delineated in the City's LTCP.

[62] It bears reemphasizing that this MPS value represents costs of compliance with water quality standards for the context of a typical five-year period. Costs of fully controlling CSOs for more severe wet weather conditions will obviously be greater.

Table 5.5-3 Capital Costs for LTCP Control Measures

Program Element	**LTCP Costs ($ millions, 2005)**
Combined Sewer Capacity Improvements	$33.82
Wet Weather Pond Improvements	34.03
Treatment Plant Improvements	17.43
Remote CSO Relief Sewers, Storage & Floatables	24.67
3RPORT Tunnel & Foster Park Relief Sewers	229.98
Total Cost	**339.9**

(All cost estimates based on 2005 dollar value and Typical Five Year Design Period conditions)

Considering capital costs alone, the total capital needed by the City of Fort Wayne over the life of the LTCP is estimated at nearly $666.5 million (2005 dollars) to achieve Fort Wayne's current LTCP and fulfill other projected wastewater collection and treatment needs. As described in section 5.5.1.2.1, the total remaining capital need for the Wastewater Improvements CIP is estimated at $326.6.6 million, and the total capital needs projected by the City over the life of the LTCP are summarized in Table 5.5-4.

Table 5.5-4: Total Capital Needed - LTCP

Capital Program	**2005 Dollar Value**
LTCP (4 events/typical year)	$339.9 million
Wastewater Improvements CIP	326.6 million
Total Cost	**$666.5 million**

When the total debt service costs for the overall capital improvement program described above, along with total corresponding O&M costs, are allocated to residential users in the manner described in Appendix L to develop a cost per household figure and the result is divided by the median household income (MHI) of all households within the sewer service area, again determined as described in the Appendix L, a Municipal Preliminary Screener ("MPS") value corresponding to selected LTCP control costs ("MPS_{LTCP}") is obtained as follows:[63]

$$\mathbf{MPS_{LTCP} = 1.87\%}$$

An MPS value of 1.87% is considered a mid-range economic impact under the *Interim Economic Guidance* as it falls between 1% and 2% of MHI. The City's value, though, is 87% of the way through the mid-range segment and is at the threshold of large or substantial impact.

[63] This MPS represents the cost of compliance, as a percentage of MHI, with the Performance Criteria for LTCP implementation in the context of the typical 5-year period.

Under the *Interim Economic Guidance*, a result in the mid-range or substantial impact range is to receive further evaluation with the secondary indicators and the substantial impacts matrix. Before moving to that next phase of evaluation, the City first turns to some additional considerations regarding the MPS value that are believed to be both appropriate and relevant.

5.5.1.2.3 Additional Considerations for Municipal Preliminary Screener Values

Additional Consideration – Wayne Township. A demographic fact that the City considers quite germane to an evaluation of potentially substantial and widespread economic and social impact of proposed CSO controls is the point that 24.9% of the residents in the City's most populous township, Wayne Township, have household incomes below the poverty level[64]. Wayne Township's overall population represents 41% of the City's population[65]. A calculation of the Municipal Preliminary Screener was performed for Wayne Township residents, yielding the following result:

$$\mathbf{MPS_{Wayne\text{-}LTCP} = 2.51\%}$$

$$\mathbf{MPS_{Wayne\text{-}WQS} = 3.97\%}$$

These values exceed the "large," or substantial, impact threshold for this preliminary screening indicator by nearly a 26% margin for $MPS\text{-}_{LTCP}$ and a 99% margin for $MPS\text{-}_{WQS}$. The City believes that special consideration is warranted for the financial impacts to be incurred on residents of this quite sizable, low-income segment of the City's population.

Additional Consideration – Stormwater Regulatory Costs. The central question of the use attainability analysis is, "should the current full-body contact recreation designated use for the CSO-Impacted Waters be removed during times of wet weather impacts since attainment of that designated use is not feasible?" Accordingly, all factors contributing to the unattainability of the use and associated costs of the City must be considered. The waters impacted by the City's CSOs are also receiving bacterial loadings from stormwater discharged from the City's separate storm sewer system as well as from nonpoint sources. Thus, the question of attainability of the designated recreational use is a function of the combined effects of all bacterial loadings, which derive from both CSOs and other sources of urban stormwater. Consequently, in evaluating the applicability of 131.10(g)(6), it is appropriate to include the City's current and projected costs of implementing its separate stormwater management program (under MS4 requirements) along with costs of CSO controls and other sewer and wastewater treatment costs. When these stormwater management costs are added to the cost per household, the Municipal Preliminary Screener for the City of Fort Wayne becomes:

$$\mathbf{MPS_{LTCP\text{-}Storm} = 2.13\%}$$

$$\mathbf{MPS_{WQS\text{-}Storm} = 3.22\%}$$

[64] U.S. Census Bureau, 2017 American Community Survey 1-Year Estimates
[65] U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates

When these stormwater management costs are added to the analysis for Wayne Township residents only, the resulting value for that more focused MPS indicator is:

$$\mathbf{MPS_{WayneLTCP\text{-}Storm} = 2.85\%}$$

$$\mathbf{MPS_{SWayneWQS\text{-}Storm} = 4.31\%}$$

From these MPS values, it can be seen that the economic impact to be incurred by the residents of Wayne Township, the City's most populous and financially stressed, exceeds the high, or substantial, impact threshold by nearly 43% for LTCP-Storm and 116% for WQS-Storm.

The MPS values determined above for the various scenarios are collated in the following table for easy reference**.** Details on the calculation of each MPS value are provided in Appendix L.

Table 5.5-5 Summary of Relevant MPS Values

Scenario	MPS	MPS – Wayne Twp.
WQS Compliance*	2.96%	3.97%
WQS Compliance*/Stormwater	3.22%	4.31%
LTCP Controls	1.87%	2.51%
LTCP/Stormwater	2.13%	2.85%

*The MPS values provided in this analysis understate the economic impacts associated with WQS compliance since the projected costs are based on storm events occurring in a typical 5-year period; but, storm events more severe than those in the analyzed typical period would still trigger CSO activations.

These results preliminarily suggest that the City's implementation of controls required for full WQS compliance,[66] when combined with preexisting debt service for sewer and wastewater treatment projects, additional operational costs for the new controls, and other contemporaneous wastewater/sewer improvements, would clearly place an unreasonable and severe economic burden on the City's residents living within the sewer service area. And, the addition of stormwater management costs (a real cost for ratepayers) only increases that severe burden.

A further preliminary conclusion to be drawn from these results is that the City's implementation of its LTCP, in conjunction with preexisting debt service and other operational costs of its sewer and wastewater treatment system, increased operational costs of the LTCP controls, and other contemporaneous wastewater treatment and local sewer separation projects, will result in a mid-range impact very near the large, or substantial, impact threshold when the City's sewer service area population is considered, and clearly a large or substantial impact for residents of Wayne

[66] It must be kept in mind that the reference to WQS compliance is restricted solely to the impacts from the City's combined sewer system. Even if the CSO control measures needed for WQS compliance were affordable and installed, the CSO Impacted Waters would continue to be impaired due to other sources of bacterial contamination as discussed above.

Township, the most financially distressed and most populous Township within the service area. Finally, when the City's stormwater management costs are included in the analysis, as needed for a full assessment of water quality impacts and associated costs, the effect of the City's LTCP implementation will be above the threshold of a large, or substantial, economic impact, when viewed from the perspective of the City as a whole, and even further into the substantial impact range with respect to its most populous and impoverished township, Wayne Township.

Under EPA's *Interim Economic Guidance*, MPS values indicating either mid-range or large economic impacts require a second phase or layer of analysis. This next phase is addressed in the following section.

5.5.2 Secondary Test

In the *Interim Economic Guidance*, the second phase of the impact analysis is described as involving an assessment of the City's general socioeconomic health through the use of six financial indicators, including two indicators in each of the following three categories: debt indicators, socioeconomic indicators, and financial management indicators. Site specific data are collected for each of the six indicators and "scores" are derived indicating relative economic position of the City vis-à-vis national guideline ranges.

5.5.2.1 Indicators for Secondary Test

The following table summarizes the secondary indicators, the benchmarks from EPA's guidance for three potential ranges of relative strength or weakness for each indicator, the appropriate values from the City's financial data, and finally the corresponding score for each indicator.[67]

[67] More background information on the City's underlying data can be found in the FCA, pp. 18-22.

Table 5.5-6 Summary of Secondary Indicators per U.S. EPA Benchmarks

Indicator	Strong	Mid-Range	Weak	City's Value	Points
Bond Rating	AAA-A or Aaa-A	BBB or Baa	BB-D or Ba-C	Aa2 GO Aa3 Sewer	3
Overall Net Debt	<2%	2%-5%	>5%	5.2%	1
Median Household Income	>25% above National MHI	+/-25% of National MHI of $57,652 (5-year estimate)	More than 25% below National MHI of $60,336 (1-year estimate)	$48,039 (5-year estimate)	2
Property Tax Revenues	<2%	2% - 4%	> 4%	2.19%	2
Unemployment Rate	More than 1% below National Average	+/- 1% of National Average of 3.5%	More than 1% above National Average	3.3%[68]	2
Property Tax Collection Rate	> 98%	94% - 98%	< 94%	97.33%	2

5.5.2.2 Secondary Score

The overall composite scores for the secondary indicator analysis for the City, which are obtained by totaling the values for each of the indicators and dividing by the number of indicators (6), is a mid-range value of approximately 2.0, based on current conditions.

It is important to note the long-term demographic trends that have continued to weaken this score since the City's preparation of its Financial Capability Analysis (FCA) in 2006. The secondary score from the 2006 analysis provided in the City's FCA was a mid-range value of 2.33.

5.5.2.3 Contraindications to the Secondary Scoring Result

There are substantial reasons for skepticism concerning the mid-range secondary score indicated for the City by this analysis. First, it should be observed that the City's MHI value is near the low end of the mid-range for this indicator, which might be reasonably considered as one of the more important indicators of the socioeconomic health of a community.

The City's 5-year estimate of MHI is $48,039, which is 83.3% of the national 5-year Estimate MHI. The City's value falls somewhat above the lower mid-range threshold of 75% of the national MHI, or $43,239. If the MHI value for the City's largest and poorest sector, Wayne Township,

[68] U.S. Bureau of Labor Statistics, City of Fort Wayne 2018 Annual Unemployment. As a snapshot update, June 2019 unemployment for the City of Fort Wayne was 3.2, while the national unemployment rate was 3.8.

were utilized for this indicator, the result would be more than 25% below the national MHI and thus in the weak range for this factor.

From 2005 to 2017, the gap between the City's MHI and the higher national MHI continued to widen,[69] illustrating Fort Wayne's worsening economic position on the national stage.[70] However, this marked worsening of the City's MHI as a percentage of the national MHI value is completely shielded by the broad mid-range span for this indicator in the secondary test analysis.

On the reverse side of the scale, two of the indicators on which the City had relatively strong showings – property tax revenues and property tax collection rates – can effectively be considered obsolete information, given the property tax crisis which has arisen in Indiana in the recent past. Transition to a new property value appraisal methodology has been extremely rocky, leading to a virtual taxpayer revolt in some parts of the state and a call by Indiana's governor for rather radical changes to local revenue generation. As a result, in 2008, the Indiana General Assembly passed, and the Governor signed into law, House Bill 1001, which limited property tax liability to one percent of assessed value for owner-occupied residential property, two percent for agricultural property and residential property, and three percent for commercial property[71]. In 2010, a state constitutional amendment was passed to solidify these property tax caps. As a result, cities have been limited in raising funds for their diverse range of operations; and, most significantly, HB 1001 prevents municipalities from achieving a "high burden," on two of the financial capability indicators. One indicator, Property Tax Revenues as a Percent of Full Market Value of All Real Property, will always be below two percent as a result of this legislation, receiving a "strong" score. Similarly, because Indiana provides cities with no home rule authority and generally limits their ability to raise revenue to a property tax, the indicator, "Overall Net Debt as Percent of Overall Assessed Value," will remain in the mid-range category, or perhaps even fall into the strong category. Therefore, while Fort Wayne has become even more distressed as a result of deteriorating economic conditions and legislative restrictions on its ability to raise revenue, it has become nearly impossible for the City to achieve a weak secondary score.

In sum, the City is weak on one of the more important indicators relating to its economic wellbeing – MHI. Yet this factor weighs evenly in the overall composite secondary score with less significant factors such as property tax collection rate. Moreover, two factors with relatively stronger values relating to property tax revenues and collection rates may prove illusory and obsolete in view of the state's continuing property tax crisis. The underlying point of this discussion is that the City's mid-range composite score from the secondary test should be viewed as suspect and should be significantly discounted.

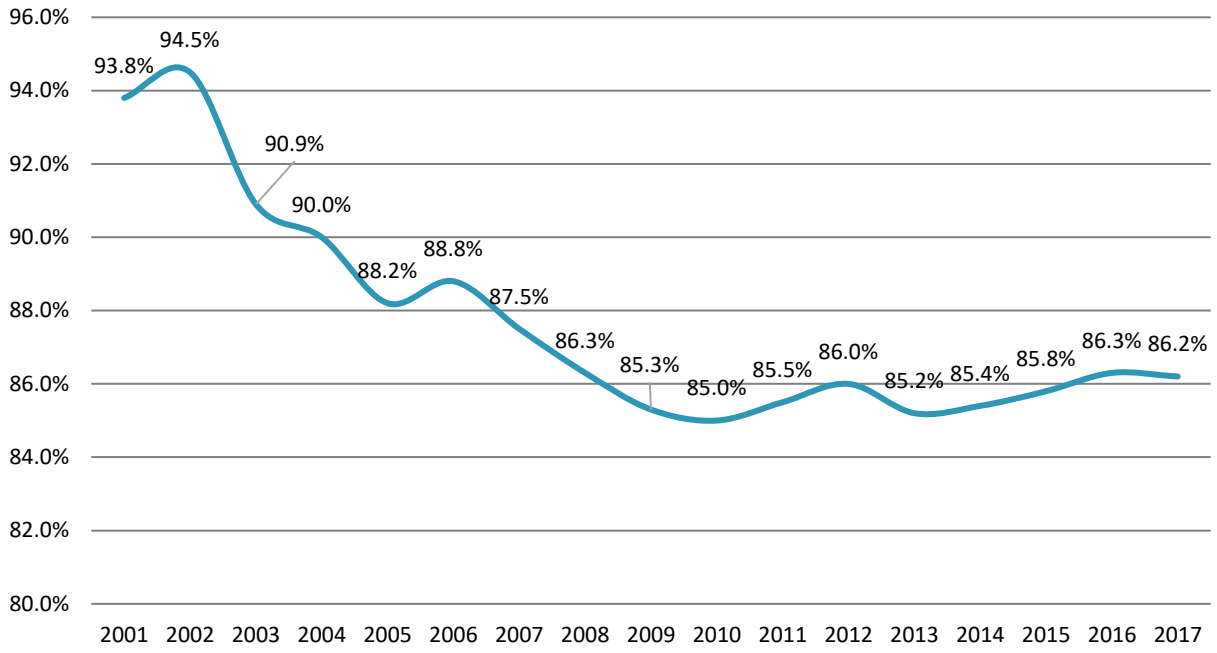
[69] U.S. Census Bureau, 2017 American Community Survey 5-Year Estimates
[70] It is believed, as discussed elsewhere, that this growing disparity from national economic performance is driven by underemployment resulting from the transitioning of the City's economy to service-dominated status.
[71] Indiana House Bill 1001 (2008). Retrieved from: http://www.in.gov/legislative/bills/2008/HE/HE1001.1.html on June 29, 2009.

5.5.2.4 Additional Considerations Beyond the Secondary Test

The following points drawn from the City's FCA and updated in this document illustrate trends at work in Fort Wayne's economy, as well as in the regional economy of which it is a part, which also portend downward slippage in the City's socioeconomic status. These trends may be somewhat reflected in the secondary indicators but they are largely indicative of prospective changes which are not yet incorporated in the specific economic data captured by the secondary indicators.

Those City residents who are employed are generally experiencing a significant degree of underemployment, as the high-paying manufacturing jobs that previously existed have been replaced with lower-paying service jobs. Fort Wayne's economy is in transition, slowly and even belatedly undergoing transformation from an economy based on heavy-manufacturing which lacks resiliency to a more diversified, service-oriented economy. As shown in Chart 5.5.2.4-1, Allen County (Fort Wayne) has experienced a substantial drop in per-capita personal income relative to the national average over the last 15 years or so.

Chart 5.5.2.4-1 Fort Wayne Per Capita Income as a Percentage of National Average



This graph starkly illustrates the impact of a demographic trend impacting Fort Wayne's residents that is discussed further below: chronic underemployment.

While these trends may be generally indicative of many CSO communities, the transformation to lower paying jobs with the decline of the manufacturing sector has been more accentuated in Fort Wayne over the past 25 years as Fort Wayne's economy has failed to keep pace with that of other communities within the nation. As illustrated in Chart 5.5.2.4-2 and consistent with what was described in the FCA, a comparison of 15 similar Midwestern and Southeastern cities shows Fort

Wayne's growth in per-capita personal income from 2001 to 2017 to be among the lowest (in 10th place). Over this same time period, Fort Wayne's per-capita personal income has dropped from 11th to 13th among this set of cities.

Chart 5.5.2.4-2 Comparative Change in Per Capita Income of Similar Cities between 2001 and 2017

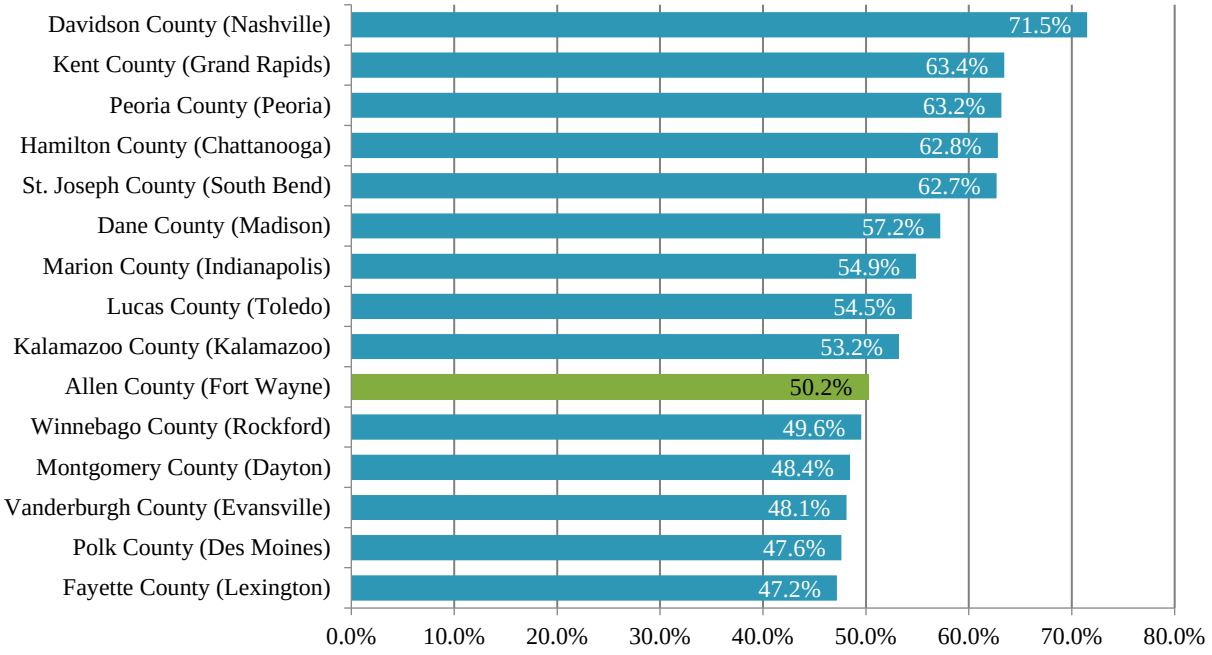
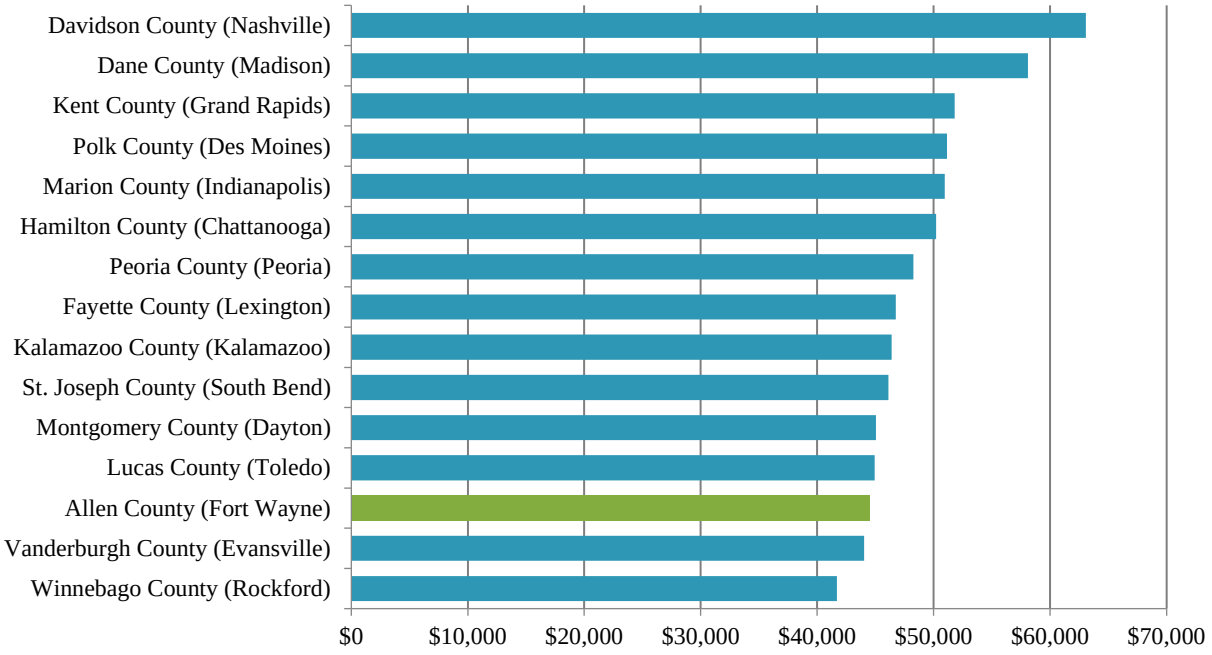
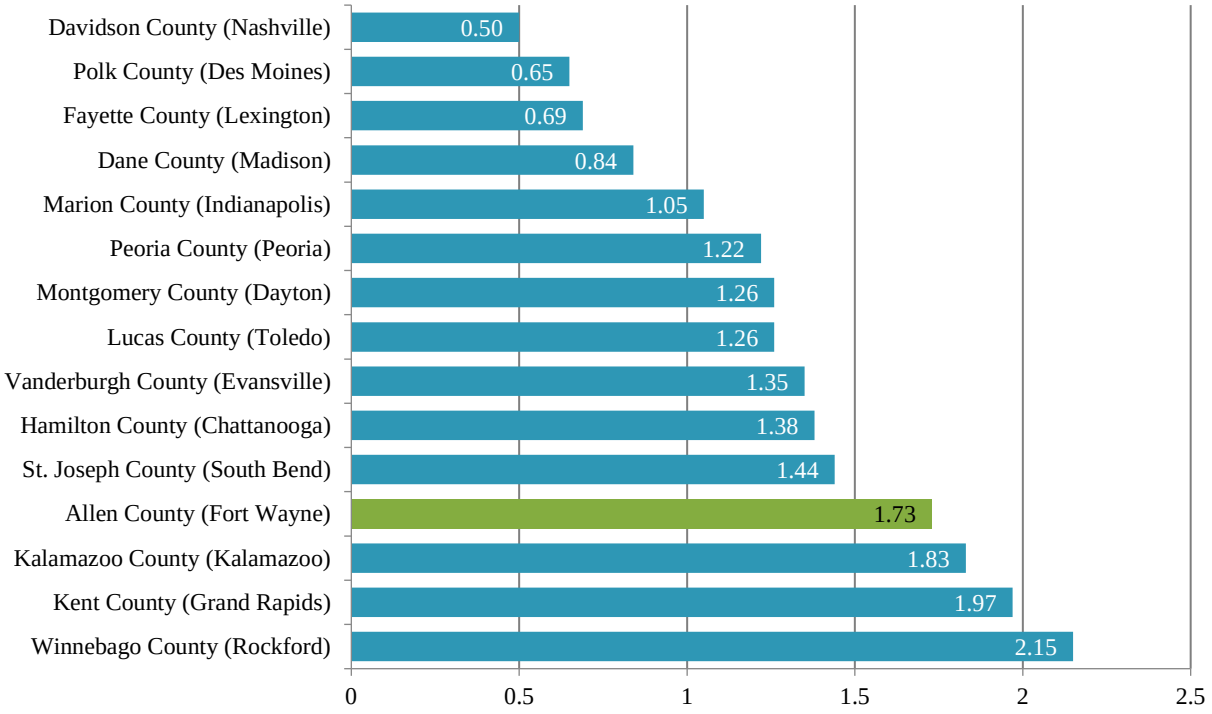


Chart 5.5.2.4-3 Per Capita Personal Income in 2017



Fort Wayne's location quotient for manufacturing of 1.73 helps to explain this phenomenon. A location quotient is an indicator of the concentration of a particular activity in a given area, compared to the rest of the nation. A location quotient greater than one demonstrates that the area's share of that activity is greater than experienced by the country as a whole, while a location quotient of less than one shows that the area has less of a share of the activity than found nationally. Review of the location quotient for each of the 15 cities referenced above shows that Fort Wayne remains among the most dependent on manufacturing employment. This, in turn, makes Fort Wayne's economy extremely sensitive to downturns in the local manufacturing base – because as manufacturing jobs are lost, there is a scarcity of other opportunities for displaced workers to move into.

Chart 5.5.2.4-4 Manufacturing Location Quotient



In July 2006, the Brookings Institution published a report entitled, "Bearing the Brunt: Manufacturing Job Loss in the Great Lakes Region, 1995 - 2005." [72] This report analyzed manufacturing activity in the 25 largest metropolitan statistical areas (MSAs) in the seven-state Great Lakes Region. Of the 25 MSAs, the report identified Fort Wayne as being the seventh-most manufacturing dependent, with 17.2% of its jobs in manufacturing. Even more troubling, the report found that, of these 25 MSAs, Fort Wayne was the only MSA that also lost advanced service jobs from 1995 - 2005. While this study is now 14 years old, the MHI and income data presented

[72] http://www.brookings.edu/~/media/Files/rc/reports/2006/07useconomics_wial/20060727_manufacturing.pdf

above clearly indicate that Fort Wayne's local economy has not recovered and in fact has continued to deteriorate since 2005.

The information summarized here, which is consistent with the City's FCA only accentuates the City's concern that its socioeconomic condition is more problematic than the mid-range score from the secondary indicators.

5.5.3 Substantial Impacts Matrix

The final step under the *Interim Economic Guidance* in assessing whether the City's LTCP will result in a substantial economic impact on City ratepayers is the correlation of the Municipal Preliminary Screener value with the Secondary Score to develop an overall measure of the community's economic health and social/financial capability or strength through the use of the substantial impact matrix. In this case, as a result of the mid-range Secondary Score, the matrix results are essentially a reprise of the Municipal Preliminary Screener results. The table below shows the Substantial Impacts Matrix with the various City MPS values inserted.

Table 5.5-7 Substantial Impacts Matrix

Indicator	**Low MPS** (Below 1%)	**Mid-Range MPS** (1% - 2%)	**High MPS** (Above 2%)
Weak Secondary Score (Below 1.5)	Medium Burden	High Burden	High Burden
Mid-Range Secondary Score (Between 1.5 and 2.5)	Low Burden	Medium Burden 1.87[e]	High Burden 2.13[g] 2.51[f] 2.85[h] 2.96[a] 3.22[c] 3.97[b] 4.31[d]
Strong Secondary Score (Above 2.5)	Low Burden	Low Burden	Medium Burden

[a]MPS_{WQS} 2.96
[b]$MPS_{WayneWQS}$ 3.97
[c]$MPS_{WQS\text{-}Storm}$ 3.22
[d]$MPS_{WayneWQS\text{-}Storm}$ 4.31
[e]MPS_{LTCP} 1.87
[f]$MPS_{WayneLTCP}$ 2.51
[g]$MPS_{LTCP\text{-}Storm}$ 2.13
[h]$MPS_{WayneLTCP\text{-}Storm}$ 2.85

Conclusions on Substantial Economic/Social Impact.

- **CSO Controls to Meet Water Quality Standards under All Wet Weather Conditions Is Clearly Unaffordable**

From this analysis, it can be emphatically stated there is no affordable remedy that will attain the designated use of full-body contact recreation throughout the recreational season each year under all possible wet weather conditions.[73] It is abundantly clear that any approach to achieving full attainment of the currently applicable designated recreational use would cause a substantial economic impact on the City and its citizens.

The high MPS value (2.96) for the CSO control measures needed to produce attainment of full body-contact recreational water quality criteria under all wet weather conditions in a "typical period", when combined with the mid-range Secondary Score, demonstrates that a requirement to implement such control measures would produce a markedly high burden on the City and its residential ratepayers.

- **The Costs of CSO Controls Specified by the LTCP Will Result in Financial Impacts at the Very Threshold of a High Burden**

When fully implemented, the LTCP will reduce the number of overflow events for the City's CSO outfalls from as high as 20 to 71 annual events in the typical year to a maximum of 4 annual overflow events where the capacity of CSO controls will be exceeded. In addition, the six CSOs discharging to the St. Joseph River, the City's highest quality waterway, will see discharges in excess of adequate treatment/control reduced to a single annual overflow event in the typical year. This is an exemplary level of control for wet weather discharges of combined sewage to the City's CSO-Impacted Waters and it comes at a high price.

As has been shown, the costs of implementation of the approved LTCP control measures, when added to the already sizable water quality costs for existing and projected sewer and wastewater treatment infrastructure and O&M, result in MPS values that place the City and its residential ratepayers at the threshold of a substantial economic impact. Moreover, when stormwater management costs are included, or when the evaluation is focused on Wayne Township, the largest and lowest income township within the City's service area, the corresponding MPS values for the LTCP control costs surpass the threshold for a substantial economic impact.

Whether these related MPS values are slightly below or somewhat above the 2.0 threshold for a high financial burden, the City is committed to implementation of the approved LTCP and does not question or challenge this obligation. However, the increased capital and operating costs associated with any more stringent level of control above that prescribed in the LTCP would shift MPS values for the City and its overall service area well over the threshold for substantial economic impact and the City seeks relief from any such potential requirement pursuant to this Updated UAA.

[73] As determined for a "typical" period in the costing and sizing of CSO control alternatives in the LTCP.

5.5.4 Availability of Grants

The City has continually sought sources of outside revenue, such as grants-in-aid, for infrastructure and programmatic needs. However, grant eligibility is generally based upon a community's MHI and applicable user rates. As the largest municipally-owned utility in Indiana, Fort Wayne City Utilities generates economies of scale that place downward pressure on its rates. Many smaller utilities have not sought opportunities to consolidate or regionalize, and thus, experience higher rates. Paradoxically, this places these smaller utilities at a competitive advantage for many grants.

5.5.5 Widespread Economic and Social Impact

The sixth factor of 40 CFR 131.10(g) provides that attainment of a designated use will be deemed infeasible if attainment were to require controls beyond the Clean Water Act's minimum technology-based requirements to the degree that substantial and widespread economic and social impacts would result.

The foregoing discussion has demonstrated, the City believes, that substantial economic and social impacts would result from a requirement to achieve more stringent CSO control measures than those prescribed in the approved LTCP. The *Interim Economic Guidance*, however, suggests that some level of additional analysis may be appropriate to establish the widespread nature of economic and social impact that is already determined to be substantial in magnitude. The guidance states that, "There are no explicit criteria by which to evaluate widespread impacts." Further analysis is recommended to focus on whether the additional CSO control expenditures would produce changes in certain socioeconomic indicators.

Candidly, the City posits that the incurring of substantial economic and social impacts by the residential ratepayers of the second largest municipality in the state of Indiana is *per se* widespread economic and social impact. The City is greatly concerned about the degree of economic and social effects which would befall the community if CSO controls beyond the selected LTCP were required. Median household income within the City is already nearly 20.0% below the national average and the MHI within Wayne Township is markedly lower with 24.9% of its population already below the poverty level. Moreover, as described in Section 5.5.2.4, there are trends at work in Fort Wayne's economy which portend downward slippage in the City's socioeconomic status. The City's economy is in transition, slowly undergoing transformation from an economy based on high-paying heavy-manufacturing employment to one characterized by considerably lower-paying jobs of a service-oriented nature. Thus, many of the City's residents are experiencing a significant degree of underemployment. This provides much of the explanation for the fact that the City's population has experienced a substantial drop in per-capita personal income relative to the national average over the last 16 years or so. These trends may not yet have stabilized.

If the City were compelled to revise its LTCP to provide for full compliance with the bacterial standards specified to support the existing designated use of full-body contact recreation at all times and under all conditions, including severe storm events, the projected average compliance costs per household within the City's sewer system service area would <u>more than double</u> from the

projected costs for implementing the approved LTCP.[74] Such a marked increase in utility costs to Fort Wayne residents and employers beyond the increases currently required to implement the approved CSO control measures (and which will closely approach substantial economic impacts) will correspondingly exacerbate the current economic difficulties linked to lower income status. Such additional CSO control measure costs would provide a disincentive for current employers to expand and future employers to locate within the area, further exacerbating existing community problems.

The imposition of yet more burdensome economic impacts that would accompany a requirement for CSO controls more stringent that the City's LTCP would reduce disposable income of the City's citizenry, which would have a depressing effect on the local economy, and would not only reduce generation of public funds but also divert available public funds from the other critical needs such as housing, education, public safety and health care and detract from the city's ability to retain existing jobs and attract new employers that may provide opportunities for our citizens to improve the quality of life in our community. All sectors of local government are already under increasingly difficult pressures to address greater needs with less funds. Increasing the level of CSO control expenditures beyond those prescribed by the City in its approved LTCP would result in substantial and widespread economic and social impacts. Ironically, the imposition of such a high economic burden upon the City's residents would not fully attain the recreational use due to the documented impact of other sources (primarily upstream sources, along with residual urban stormwater and other nonpoint sources).

Consequently, the substantial and widespread social and economic impacts that would be imposed on the City and its residential ratepayers if required to provide full control or elimination of CSO discharges warrant relief from such a requirement. In other words, the City submits that, consistent with 40 CFR 131.10(g)(6), implementation of CSO controls more stringent than those corresponding to the level of control specified in the approved LTCP is unaffordable and infeasible. Therefore, the requested water quality standard revisions are warranted.

6 Public Outreach

6.1 2010 Public Outreach

The City of Fort Wayne worked with IDEM during the original UAA process in 2010 to develop a public outreach program on the benefits of the City's Long-Term Control Plan and the need for a UAA for revisions to designated recreational use to ensure continued progress in improving water quality.

During the outreach program, the City held two public participation meetings on February 17, 2010. Both meetings involved a presentation describing the City's proposed UAA, followed by open discussion and opportunity for questions and answers. The first meeting was held at the

[74] Once again, it must be recognized that this projection is based on the costs to address wet weather flows from a "typical" period, and there are yet more severe storm events beyond the typical period that would have to be addressed at correspondingly greater costs if the City were to be capable of complying with water quality goals under all circumstances.

Indiana Institute of Technology (Fort Wayne) at 1:00 pm, while the second meeting took place at Woodlan Jr./Sr. High School in Woodburn, IN at 6:30 pm.[75] A representative from IDEM as well as the Allen County Health Department were present at both meetings. Notices for these meetings were published in two local Fort Wayne newspapers as well as in a newspaper in Defiance, OH (a community downstream of the City's CSO impacted waters). A press release was issued and email notices were sent well in advance of the meetings to local citizen groups to advertise the meetings. The email notice was also sent to those who subscribe to the City's CSO overflow notification program. Others made aware of these public meetings include local elected officials in Fort Wayne and Allen County, the Sewer Advisory Committee, community organizations with an expressed interest in water quality issues, local governments from downstream communities, and other potentially interested groups.

The City distributed data discs at each meeting which included the City's UAA draft documents, Consent Decree, Long-Term Control Plan and Frequently Asked Questions and Answers regarding the City's proposed UAA. Hard copies were made available as well. The 30-day public comment period concluded March 17, 2010. The City received one written comment in favor of the proposed UAA. Attached at Appendix N-1 are the following:

1. Summary of minutes from Public Meetings held February 17, 2010.
2. Copy of the press release for the City's Public Meeting held February 17, 2010.
3. Copy of the sign-in sheet for each meeting.
4. Copy of comments received during the 30-day comment period.

The public meetings conducted by the City in conjunction with IDEM provided information on the affected waters, the benefits of the City's LTCP and other water quality improvement programs, the stream reaches affected by the proposed change in recreational use designation and the basis for the 2010 UAA's conclusion that the existing designated use is not attainable during and after large storms.

6.2 2019 Outreach

As part of its development of the Updated UAA, the City conducted additional stakeholder outreach. The City provided an update to its citizen Utility Advisory Group on March 11, 2019. On April 15, 2019 the City held a public meeting and invited all the local watershed board members to attend. The local watershed groups invited were the St Joseph River Watershed Initiative, the Upper Maumee Watershed Partnership, and the Tri-State Watershed Alliance. Attached at Appendix N-2 are the following:

1. Copy of the PowerPoint presentation given at the meetings
2. Copy of the sign-in sheet for the April 15, 2019 meeting.

Based on the information received from public comments, citizenry of the City of Fort Wayne and downstream communities near the CSO-Impacted Waters are accepting of a temporary suspension

[75] Woodburn is located within 3 miles of the Indiana/Ohio border and a similar distance south of the Maumee River.

of the full-body contact recreation standard such as will occur with the application of Indiana's CSO wet weather limited use designation.

7.0 A Revision of the Current Recreational Use Designation for the CSO-Impacted Waters Is Warranted, as Demonstrated by this UAA, With Respect to Wet Weather Conditions

The information provided in preceding sections of this Updated UAA supports approval of the UAA based on Factors 1, 2 and 3, and continued approval under Factor 6 as listed in 40 CFR 131.10(g). Consequently, this Updated UAA provides an adequate basis in fact and law for a revision to the full-body contact recreation use designation currently applied to the City's CSO-Impacted Waters at all times during the recreational season comprising the months of April through October, inclusive, pursuant to 327 IAC 2-1.5-5(a) and 327 IAC 2-1.5-8(e).

In summary:

- Section 4.1.1 reviews a survey of recreational activities observed in or on the CSO-Impacted Waters.
- Overall, Section 4.1.2 presents a summary of bacterial water quality data from the CSO-Impacted Waters from 1975 through 2018 and shows that the bacterial quality of those waters, including periods of dry weather and wet weather, has routinely exceeded water quality criteria specified for full-body contact recreation.
- Section 4.1.2.2 provides a summary of bacterial quality data collected from CSO-Impacted Waters within the City's urban area over the period of 1975 through 2006. Tabular information is provided on the percentage of samples from each of five sampling locations on the three major CSO-Impacted Waters that exceed bacteriological criteria for full-body contact recreation. Also, graphs are provided that summarize statistical analyses of the bacterial quality data for each of the five sampling locations for each decade since the mid-1970s. The overall conclusions drawn from this data are that the bacterial quality of all three rivers has consistently failed, at high percentages of the database, to attain applicable water quality criteria required for full-body contact recreation. In addition, there has been little change in the characteristic bacterial quality of these rivers over the period from 1975 to 2006.
- Section 4.1.2.3 describes a review of bacterial quality data acquired by the City's river sampling program at two sampling locations each for the St. Joseph River and the St. Marys River for the recent period of 2016 through 2018. One sampling location for each river is immediately upstream of the City's urban area (upstream of CSO discharge points) and one is near the downstream confluence of the two rivers (downstream of CSO discharge points). The conclusion drawn from this data review is that upstream bacterial contamination in both rivers is regularly present at levels that prevent the water quality of either river from meeting recreational water quality criteria, both upstream and downstream of CSO discharge points. This point is further reemphasized by the water quality modeling conducted by the City as recounted in Appendix B-2, which demonstrates that upstream bacterial contamination alone in the St. Joseph and St. Marys Rivers, with no bacterial input from the City's CSOs or

stormwater sewer system, will result in nonattainment of recreational water quality criteria in the Maumee River, as well as the St. Joseph and St. Marys Rivers.

- Section 4.1.2.4 describes the existing recreational use in the City's CSO-Impacted Waters: (1) there has been an almost total absence of full-body contact recreational activities in these waters, particularly during those infrequent wet weather conditions that will produce CSO discharges once LTCP implementation is complete; and (2) to the extent that any full-body contact recreation has occurred in these waters since 1975 during such wet weather conditions, it has occurred in waters with water quality that is characteristically impaired for recreational use.
- Section 4.2 explains that there are no existing recreational uses of the CSO-Impacted Waters that would be inconsistent with the requested revisions to the current recreational use designation of these waters since the water quality of these waters, at least since 1975, has not been sufficient to support recreational uses much of the time, and certainly not during wet weather conditions of the severity that will result in CSO discharges from the City's CSS following full implementation of its approved LTCP.
- Section 5.2 discusses the highly probable contribution of naturally-occurring sources of bacterial contamination (i.e., avian and mammalian wildlife) to the instream water quality of the St. Marys River and the St. Joseph River upstream of the City's urban area, and also within the urban area, that routinely exceeds levels supportive of full-body contact recreation. Such naturally-occurring bacterial contamination is conveyed downstream through the CSO-impacted segments of these waters and the Maumee River, which results from their confluence.
- Section 5.3 explains that high flow conditions expected in the CSO-Impacted Waters during and after the infrequent post-LTCP CSO activations will make the waters unsafe for recreational activity, independent of water quality conditions. These conclusions are based on both historical records from USGS field programs and projections from the City's calibrated model.
- Section 5.4 discusses the highly probable contribution of human-caused sources of bacterial contamination (e.g., livestock and domesticated pets) to the instream water quality of the St. Marys River and St. Joseph River upstream of the City's urban area, and also within the urban area, that routinely exceeds levels supportive of full-body contact recreation. This section also explains that urban development as a human-caused condition and in particular increased imperviousness contribute to bacterial contamination, by increasing stormwater runoff rates to the local rivers. As with naturally-occurring bacterial contamination, the bacterial contamination from human-caused sources is conveyed downstream through the CSO-impacted segments of these waters and the Maumee River. It is observed in Sections 5.2 and 5.4 that it is practically infeasible to separate the relative impacts of naturally-occurring sources of bacterial contamination and human-caused sources of bacterial contamination to the St. Marys River, the St. Joseph River, and the Maumee River.
- Section 5.4.2 briefly recounts the human-caused sources of bacterial contamination associated with the City's urbanized area. The infeasibility of sufficiently remediating human-caused sources of bacterial pollution is discussed in Section 5.4.3.

- Section 5.5.1.2 reviews the calculation of the indicator used to assess whether the costs of CSO controls are likely to impose a substantial economic burden on the City pursuant to EPA guidance. This indicator – sometimes referred to as the Municipal Preliminary Screener and elsewhere as the Residential Indicator - when applied to the projected costs of complete elimination of CSO discharges from the City, clearly shows that a markedly substantial economic burden would be incurred by the City's utility ratepayers if such measures were required. Application of this indicator shows that implementation of the City's approved LTCP will result in overall costs that are at the threshold of a substantial economic impact. When focused on the City's most populous township (which also has the highest percentage of households below the federal poverty level) or when LTCP costs are supplemented with costs of implementation of the City's separate stormwater management program, the indicator shows a substantial economic impact.
- Section 5.5.2 addresses the application of the "secondary test" prescribed by EPA guidance to assess the City's general socioeconomic health, given that the Municipal Preliminary Screener indicates that the costs of CSO controls more stringent than those posed by the LTCP would result in a substantial economic burden. The secondary test produces scores in the lower portion of the mid-range level. Sections 5.5.2.3 and 5.5.2.4 review additional financial information concerning the City that strongly suggest that the secondary test scores referenced above are overly optimistic as a general indicator of the City's economic status.
- Section 5.5.3 displays the Substantial Impacts Matrix based on the Municipal Preliminary Screener values for various alternative scenarios considered and the Secondary Test scores. A high, or substantial, economic burden is indicated by the Matrix if the City were required to implement more stringent CSO controls than prescribed by the approved LTCP. Moreover, a high economic burden is indicated when stormwater costs are included in the financial impact analysis for the LTCP or when the financial impacts of the LTCP implementation are considered for the more financially stressed portion of the City (Wayne Township). Section 5.5.5 provides the City's rationale for its substantial economic impact being considered widespread as well. As a result, it is concluded that the imposition of costs of controls more stringent than those required by the LTCP would result in a substantial and widespread economic and social impact. The extent of this burdensome impact would be markedly greater if the City were to be required to eliminate all CSO discharges under all wet weather conditions.

7.1 The Current Recreational Use Designation Cannot Be Attained in the CSO-Impacted Waters during Wet Weather Conditions that Result in CSO Impacts

- Discharges of combined sewage from the City's remaining CSO outfalls, which occur only as a result of wet weather conditions, affect the bacterial quality of the CSO-Impacted Waters.
- After completion of the installation of all CSO control measures prescribed by the City's LTCP, CSO discharges will occur to the St. Joseph River during only one storm event in a "typical year" as defined in the LTCP and will occur to the other CSO-Impacted Waters during no more than four storm events of a "typical year."

- To the extent that the CSO discharges that are projected to occur after full implementation of the City's LTCP will result in short-term bacterial quality in the CSO-Impacted Waters that does not comply with Indiana bacterial water quality criteria required for full-body contact recreation, this Updated UAA demonstrates that:
    - Consistent with UAA Factor 6, any further reduction in the water quality impacts of these CSO discharges is not attainable because the financial impacts of CSO controls more stringent than those provided under the approved LTCP would result in substantial and widespread economic and social impacts for the community of the City. Furthermore, this Updated UAA demonstrates that the markedly higher costs of implementing CSO controls with sufficient capacity to prevent any uncontrolled CSO discharges in a typical year period would clearly pose a high financial burden on the City and its residential ratepayers and, thus, is infeasible under UAA Factor 6.
    - Bacterial contamination considered highly probable of originating from both (i) naturally-occurring sources and (ii) human-caused sources combine to adversely impact the CSO-Impacted Waters to the extent that the water quality of those waters will not be adequate to support full-body contact recreation even if all CSO discharges (and all separate storm sewer discharges) were hypothetically eliminated. Thus, consistent with UAA Factors 1 and 3, bacterial contamination from naturally-occurring and human-caused sources combine to preclude full-body contact recreation in the CSO-Impacted Waters during those wet weather conditions in which CSO discharges occur after full implementation of the City's LTCP; and
    - It is not feasible to separate the impacts of naturally-occurring and human-caused sources of bacterial contamination to the CSO-Impacted Waters, nor is there any reason to separate those impacts. The simple fact is that the combined impact or these contaminant sources renders these waters incapable of supporting full-body contact recreation during the wet weather conditions that give rise to CSO discharges from the City's CSS after full LTCP implementation.
    - Intermittent stream flow conditions during those wet weather events in which CSO discharges occur after full implementation of the City's LTCP present unsafe conditions for fully-body recreational contact, based on documented experience from USGS field programs and projections from the City's calibrated model. The flow conditions expected during the few remaining post-LTCP CSO activations are well above de-facto safety thresholds used locally by USGS field staff, and also above the more general USGS wading safety criterion.

In short, the Updated UAA demonstrates that attainment of full-body contact recreation is not feasible in the CSO-Impacted Waters during those wet weather periods in which those waters are impacted by CSO discharges that occur notwithstanding the CSO controls installed through the full implementation of the City's approved LTCP. The infeasibility of attainment of the full-body contact recreation use during such periods is due to (i) the point that the costs of installing more stringent CSO controls would result in substantial and widespread economic and social impacts as provided by UAA Factor 6, (ii) independently, the fact that attainment of the current recreational use during those periods will be prevented by unsafe flow conditions, as provided by UAA Factor 2, and (ii), independently, the combined impacts of bacterial contamination from (a) naturally-occurring sources and (b) human-caused sources, as provided by UAA Factors 1 and 3.

7.2 Specific Revision Requested to the Full-Body Contact Recreation Use Designation for the City's CSO-Impacted Waters

Based on the information and rationale compiled in this Updated UAA, the City requests approval by IDEM and EPA of the following revision to the current full-body contact recreation use designation for the CSO-Impacted Waters:

- Approval for application of the CSO wet-weather limited use subcategory, as provided in IC 13-18-3-2.5, to the City's CSO-Impacted Waters, in lieu of the current full-body contact recreation use, during and following any and all storm events that trigger CSO discharges from the City's CSS notwithstanding the City's demonstrated capability to comply with the Performance Criteria prescribed in Section 4 of the City's LTCP (and, in particular, Table 4.2.4.1). For any storm event that triggers CSO discharges from the City's CSS under the foregoing conditions, the duration of applicability of the CSO wet-weather limited use designation should last no more than 96 hours after the conclusion of the storm event. The duration of impact supporting the Wet Weather Limited Use subcategory for each CSO-impacted segment is further summarized in Table 7.2-1.
- The CSO wet weather limited use subcategory, if approved, will be applicable to the following water segments under the wet weather conditions described above:
    - St. Marys River, from its junction with Natural Drain #4 near Tillman Road, to its confluence with the St. Joseph River;
    - Natural Drain #4, from CSO Outfall 054 near the intersection of Hollis Lane and Mercer Avenue, to its junction with the St. Marys River;
    - St. Joseph River, from CSO Outfall 052, located immediately south of Coliseum Blvd., near N. Anthony Boulevard, to the confluence with St. Marys River;
    - Spy Run Creek, from CSO Outfall 036, located north of W. State Street along Eastbrook/Westbrook Drive, to its junction with the St. Marys River south of 4th Street near Lawton Park;
    - Baldwin Ditch, from CSO Outfalls 061 and 062 near the intersection of E. State Street and Barnhart Avenue, to its junction with the Maumee River near CSO Ponds 1 and 2;
    - Harvester Drain, from CSO Outfall 064 to its junction with the Maumee River;
    - Maumee River, from its origin at the confluence of the St. Marys River and St. Joseph River in the City to the boundary between the states of Indiana and Ohio.

Table 7.2-1 Summary of UAA Factors and Durations of Impact Supporting Wet Weather Limited Use

Segment	**Factor 1: Naturally Occurring Pollutant Concentrations(1),(3)**	**Factor 2: Natural or Intermittent High Flow Conditions(2),(3)**	**Factor 3: Human-Caused Conditions(1),(3)**	**Factor 6: Substantial and Widespread Economic and Social Impact**
St. Marys River, from its junction with Natural Drain #4 near Tillman Road, to its confluence with the St. Joseph River	96 hours (bacteria)	96 hours (flow, depth, velocity)	96 hours (bacteria)	96 hours/ continuous
Natural Drain #4, from CSO Outfall 054 near the intersection of Hollis Lane and Mercer Avenue, to its junction with the St. Marys River(4)	96 hours (bacteria)	48 hours (flow, depth, velocity)	96 hours (bacteria)	
St. Joseph River, from CSO Outfall 052, located immediately south of Coliseum Blvd., near N. Anthony Boulevard, to the confluence with St. Marys River	96 hours (bacteria)	96 hours (flow, depth, velocity)	96 hours (bacteria)	
Spy Run Creek, from CSO Outfall 036, located north of W. State Street along Eastbrook/Westbrook Drive, to its junction with the St. Marys River south of 4th Street near Lawton Park	96 hours (bacteria)	48 hours (flow, depth, velocity)	96 hours (bacteria)	
Baldwin Ditch, from CSO Outfalls 061 and 062 near the intersection of E. State Street and Barnhart Avenue, to its junction with the Maumee River near CSO Ponds 1 and 2(4)	96 hours (bacteria)	48 hours (flow, depth, velocity)	96 hours (bacteria)	
Harvester Drain, from CSO Outfall 064 to its junction with the Maumee River(4)	96 hours (bacteria)	48 hours (flow, depth, velocity)	96 hours (bacteria)	
Maumee River, from its origin at the confluence of the St. Mary's and St. Joseph Rivers to the boundary between the states of Indiana and Ohio	96 hours (bacteria)	96 hours (flow, depth, velocity)	96 hours (bacteria)	

(1) As explained in Section 5.2, there is no practical means to distinguish between the bacteria impact from natural sources and human-caused sources. However, data and modeling results clearly demonstrate that bacteria durations of impact following post-LTCP activation events are independent of CSO frequency and duration and will be controlled by non-CSO sources.
(2) Factor 2 durations of impact were estimated using calibrated model results, specifically total hours above site-specific USGS safety thresholds (see Table 5-3.1) and/or the USGS wading safety criterion of 10 ft^2/s under the instream conditions expected after post-LTCP activation events. Shorter durations of impact for Spy Run Creek, Natural Drain #4, Baldwin Ditch, and Harvester Drain reflect the faster hydrologic response times associated with their smaller local watersheds (as compared to river watersheds).
(3) Durations of impact are based on model projections for the most severe post-LTCP activation events. It is likely that impacts will be felt for shorter periods of time during some post-LTCP activation events.
(4) Estimates for Natural Dain #4, Baldwin Ditch, and Harvester Drain assume that duration of impact metrics developed for Spy Run Creek apply to other urban streams in Fort Wayne. This is consistent with similarities observed across all five local stream watersheds, specifically a) similar hydrologic response time driven by local precipitation, and b) similar urban non-CSO bacteria sources.

- The water quality-based requirements that are applicable to the City's CSO-Impacted Waters during periods of applicability of the CSO Wet Weather Limited Use subcategory to such waters are determined by the City's approved LTCP as provided by IC 13-18-3-2.5. More specifically, such water quality-based requirements consist, implicitly, of the instream water quality in the CSO-Impacted Waters that results from CSO discharges that occur during wet weather conditions after full implementation of the approved LTCP and demonstrated compliance with the prescribed Performance Criteria. It must be recognized that these water quality-based requirements apply only to bacterial impacts of permitted CSO discharges and therefore assume there is no upstream bacterial contamination of the CSO-Impacted Waters. Since the extant water quality data for upstream reaches of the St. Marys River and the St. Joseph River routinely show the presence of significant bacterial contamination, the referenced water quality-based requirements cannot be assessed by ambient monitoring and can be quantified only through modeling of the CSS and the impacted waters. This statement of the water quality requirements of the CSO wet weather limited use subcategory should be utilized, as appropriate, in revisions to the relevant water quality standards and the City's NPDES permit.

References:

City of Fort Wayne, Indiana, Department of Utilities, 2005, *Recreational Use Report.*

City of Fort Wayne, Indiana, Department of Utilities, 2007, *Financial Capability Assessment for CSO Schedule Development.*

City of Fort Wayne, Indiana, Department of Utilities, 2007, *Long-Term Control Plan.*

IDEM, 2008, Nonrule Policy Document No. Water-014, *Application of Existing Use Concept in Conducting Use Attainability Analyses for Long Term Control Plan Communities for Primary Contact Recreational Uses.*

U.S. EPA, *Legacy STORET Database*, *http://www.epa.gov/storpubl/legacy.*

U.S. EPA, 1994, *Combined Sewer Overflow Control Policy* (59 *Federal Register* 18688, April 19, 1994).

U.S. EPA, 1995, *Interim Economic Guidance for Water Quality Standards*, EPA-823-B-95-002.

U.S. EPA, 1997, *Combined Sewer Overflows - Guidance for Financial Capability Assessment and Schedule Development.*

U.S. EPA, Office of Water, 2001, *Guidance: Coordinating CSO Long Term Control Planning with Water Quality Standards Reviews*, EPA-833-R-01-002.

U.S. EPA, Office of Water, 2002, *Wastewater Technology Fact Sheet: Bacterial Source Tracking*. Washington, D.C. EPA-832-F-02-010.

APPENDIX A: Description of the *Typical Precipitation Year*, as excerpted from Chapter 3 of the City's LTCP.

ATTACHMENT 2

TYPICAL PRECIPITATION YEAR

A typical precipitation year was developed for Fort Wayne using long-term precipitation data. Long-term data was available for the period from 1949 through 1996. The purpose of developing a typical year was to provide a sound basis for annual estimates of CSO activity, including the average annual overflow volume, number of events, and number of overflow hours. The typical year is intended to approximate long-term averages relative to these parameters.

The 48-year hourly precipitation record was analyzed using the RAIN utility of XP-SWMM, which is equivalent to the USEPA SYNOP analysis package. RAIN reads hourly precipitation data, organizes the data into events, and computes statistics for each event, including depth, duration, average, and maximum intensity. RAIN also calculates inter-event time. The RAIN utility requires a definition of the minimum inter-event time as input; the inter-event time is used to identify the separation between two events. For the city of Fort Wayne a 6-hour inter-event time was considered an appropriate interval to separate storm events.

The statistical analysis of the 48-year precipitation data record revealed that a group defined by an annual precipitation of 31–35 inches has the highest probability of occurrence. Probability analyses of storm event volume, maximum intensity, average intensity, and storm duration were also performed for the 48- year data record.

Years 1995, 1989, and 1987 were identified as being the closest candidates for a typical year in terms of total annual rainfall. Event data for these years was subsequently examined in detail and compared with the long-term average event data. Year 1995 was found to be very close to a typical year. To convert 1995 into a true typical year, some storm events were added and removed to closely match the long-term average in terms of distribution of storm event sizes within a year. A summary of these storms are presented in Table A2-1.

For example, based on the long-term average, one storm with a volume greater than 2 inches typically occurs during May to October of each year. However, 1995 did not include any such storm. Therefore, the 1995 precipitation data was modified by adding a storm greater than 2 inches from the Year 1990 precipitation data. Similarly, the 1995 precipitation record had larger than normal number of storm events with depths less than 0.09 inches, so several storm events of less than 0.09 inches were deleted from the 1995 data to bring it into agreement with the long-term average.

The resulting typical year consists of 122 storm events with a total depth of 33.18 inches.

Table A2-1

Modifications to Precipitation Year 1995

Date	Start Hour	Duration (Hours)	Volume (in.)	Avg. Intensity (in/hr)	Max. Intensity (in/hr)	Inter Event Duration (hr)
Events Deleted from 1995 Ranfall Data						
1/13/1995	4	4	0.07	0.02	0.06	32
2/15/1995	2	15	0.07	0	0.02	252
7/5/1995	5	2	0.05	0.03	0.04	14
9/8/1995	4	1	0.01	0.01	0.01	9
9/8/1995	16	1	0.01	0.01	0.01	11
12/11/1995	21	3	0.03	0.01	0.01	66
12/13/1995	1	3	0.07	0.02	0.03	25
Events Replaced in 1995 Rainfall Data						
8/17/1995	10	14	1.82	0.13	1.48	44
Replaced with						
5/4/1990	5	14	1.44	0.1	0.33	7
Events Added to 1995 Precipitation Data						
6/18/1995						
Added with						
8/17/1990	17	16	2.2	0.14	0.34	107

APPENDIX B-1: Screening-level Spreadsheet Analysis of the Potential Impact of CSO Wet-weather Bacteria Loads on the Maumee River Downstream of Fort Wayne

Objective

The objective of this analysis was to determine the potential impact of Combined Sewer Overflow (CSO) discharges on the Maumee River downstream of Fort Wayne. The approach used for the analysis was presented to the US EPA and their technical consultant (SAIC) on August 24, 2004; no comments or concerns were voiced by the regulatory reviewers, and the original analysis was included as part of the City's original 2010 Use Attainability Analysis (UAA). This current presentation is an updated version of the original analysis, benefitting from the City's refinements to their water quality model (including extending the model further downstream) and additional water quality data collected since 2010.

This updated version of the original analysis examines the impacts of CSO sources only, under both existing conditions and LTCP conditions. In reality and as described in Sections 4 and 5 of the UAA report, wet-weather bacteria loads result from a number of sources, and the impacts of all sources are unavoidably intermingled in the river. This intermingling makes it difficult if not impossible to separate the impacts of individual sources in a real river using data analysis methods; however, the City's water quality model can be used to predict the impacts specific to CSOs.

The analysis uses predicted *E. coli* concentrations at State Road 101 (the downstream end of the City's detailed water quality model) as its starting point, and projects those concentrations further downstream along the Maumee River, to estimate where the City's CSOs no longer affect the Maumee River's ability to meet the *E. coli* recreational standard of 235 cfu/100ml. State Road 101 is approximately 19 miles downstream of the last CSO in the City's system.

Approach

The modeling of bacteria fate and transport in river systems is a well-established process. Given the nature and characteristics of bacteria dynamics, it is also a simple process relative to many other water quality parameters. The typical bacteria modeling approach is provided in a standard USEPA reference, *"Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling"* (EPA/600/3-85/040). As explained in this document,

> *"Traditionally, coliform modeling has only taken into account disappearance, and a simple first-order kinetics approach has been used."* p. 434.

and

> *"Modeling coliforms usually involves the use of a simple first-order decay expression to describe disappearance."* p. 449.

The governing equations for the "simple first order decay expression," again from the USEPA document, are as follows:

$$\frac{dC}{dt} = -kC \qquad (8\text{-}1)$$

or

$$C_t = C_o e^{-kt} \qquad (8\text{-}2)$$

where C = coliform concentration, MPN or count/100 ml
C_o = initial coliform concentration, MPN or count/100 ml
C_t = coliform concentration at time t, MPN or count/100 ml
k = disappearance rate constant, day^{-1} or hr^{-1}
t = exposure time, days or hours.

The approach used in this analysis was to perform the calculation shown in recommended Equation 8-2 in a spreadsheet template, using the assumptions presented in the next section.

Assumptions

In order to implement the desired calculation using Equation 8-2, several assumptions are required.

- *Bacteria loading rate at State Road 101 (SR101)*: This represents the C_0 value in Equation 8-2. The starting point for the analysis is the SR101 bridge, located downstream of the Fort Wayne urban area, and downstream of all City CSOs. This location represents the downstream boundary of the City's refined water quality model, and also a joint City/IDEM sampling location. As explained above, two loading rates were examined, as follows:

  – 15,500 cfu/100 ml for "Existing Conditions, CSO sources only" – based on peak wet-weather E. coli levels predicted at SR101 during calendar year 1995 (representative of the City's typical year) under the existing condition, CSO sources only scenario. Specifically, this value represents the predicted peak hourly *E. coli* concentration during a large event that occurred on August 17, 1995.
  – 4,900 cfu/100 ml for "LTCP Conditions, CSO sources only" – developed using the same approach as above, but under LTCP conditions, CSO sources only.

  Note that the August 17, 1995, event was chosen intentionally as a conservative indicator of potential *E. coli* impact from CSOs; as a predominantly local rainfall event, it exhibits high overflow rates relative to river flow rates. Most other post-LTCP activation events will result in a lesser *E. coli* impact.

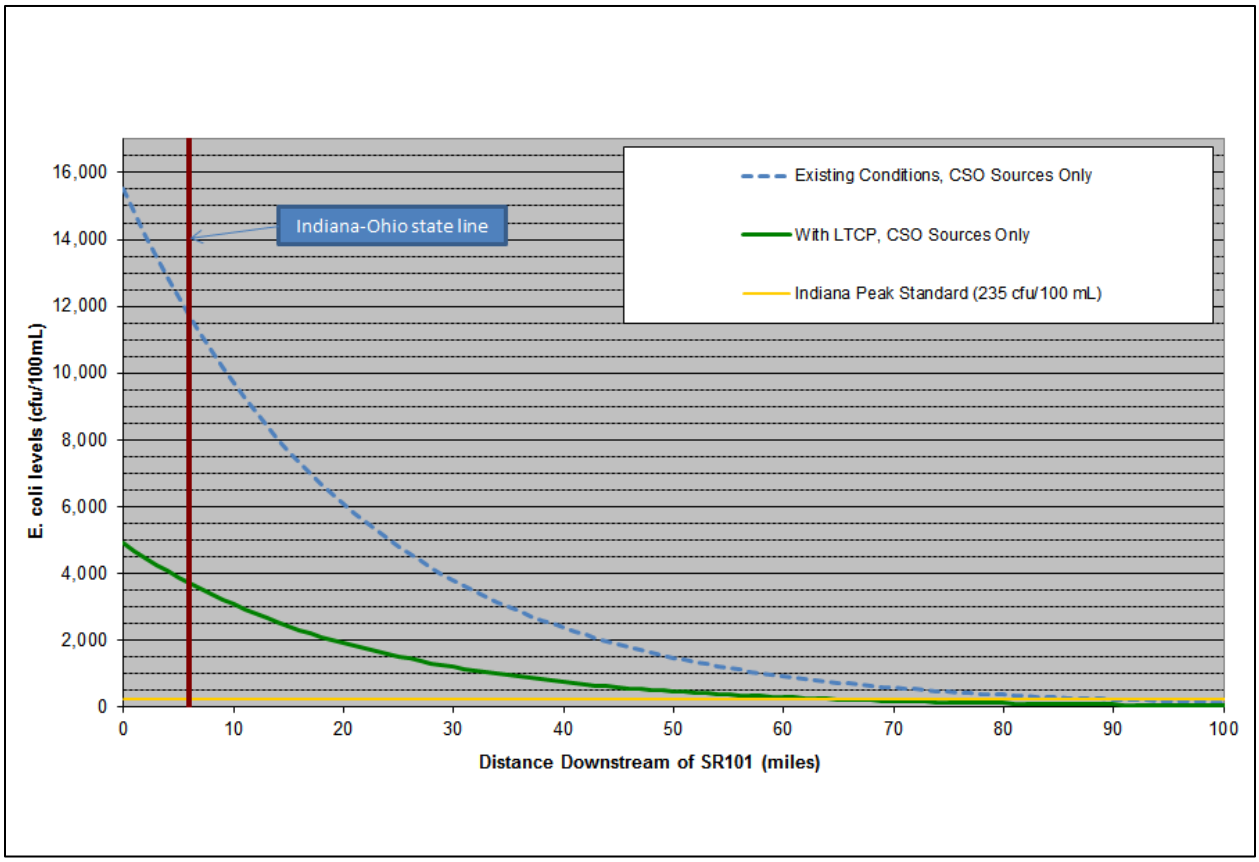
- *Decay rate (k)*: Assumed at 1 day^{-1}. This is a typical value used in bacteria analyses; for example, in 30 studies cited in Table 8-2 of *"Rates, Constants, and Kinetics Formulations in Surface Water Quality Modeling,"* the median rate *k* was 0.04 $hour^{-1}$, or 0.96 day^{-1}.

- *River velocity*: In a river setting, exposure time *t* in Equation 8-2 represents travel time moving downstream from the loading point (SR101). Therefore, for increasing time *t*, the distance travelled downstream from SR101 is controlled by river velocity. River velocity was assumed at 1.25 ft/s, representative of predicted river velocity at SR101 during the final stages of a wet-weather event.

Results

The results of applying Equation 8-2 with the above assumptions, in terms of predicted instream bacteria levels as a function of distance travelled downstream of SR101, are shown in the figure below. Given that SR101 is approximately 19 miles downstream of the City's CSO area, *E. coli* levels in the Maumee River due to CSO discharges are conservatively projected to remain above 235 cfu/100ml for approximately 83 miles under post-LTCP activation conditions.

Figure 1 Screening-Level Analysis of Bacteria Levels Remaining as Function of Distance Downstream of SR101



APPENDIX B-2: Model-Based Assessment of the Impact of Upstream Bacteria Sources on River Reaches in Fort Wayne

Objective

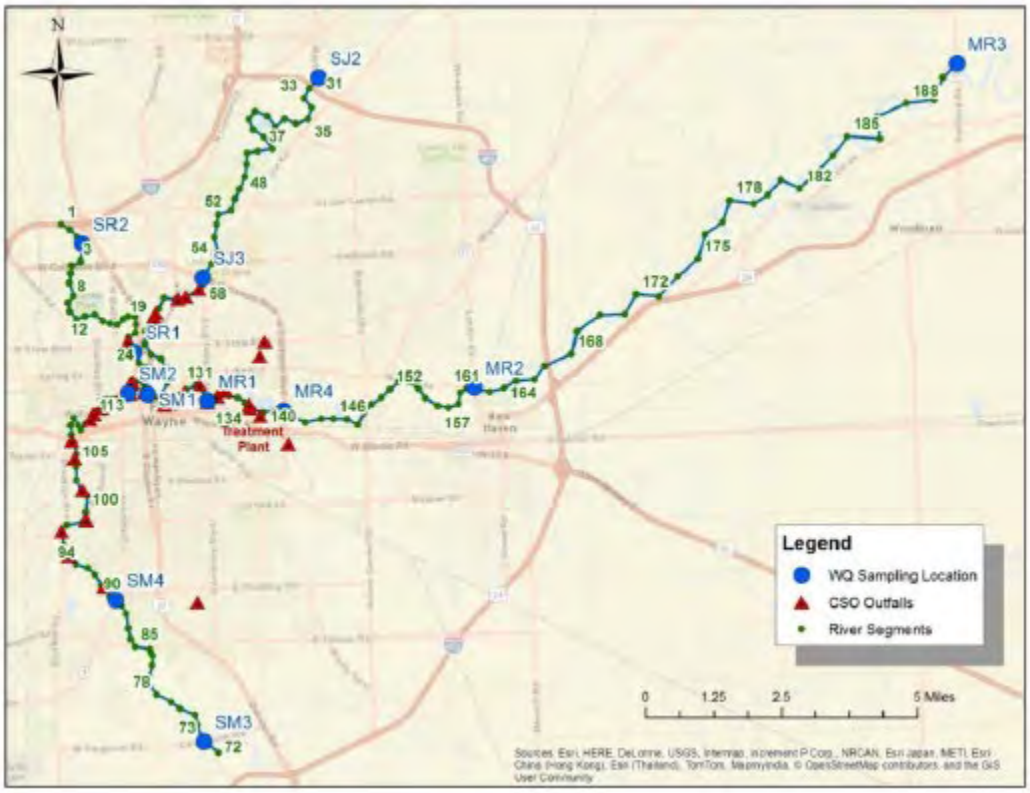
The objective of this analysis was to assess the bacteria impact of upstream sources on the rivers in Fort Wayne. Section 1 of the Use Attainability Analysis (UAA) explicitly identifies the "CSO-Impacted Waters" relevant to the City's submittal – these river reaches are, by definition, impacted by the bacteria in the few CSO discharges remaining after implementation of the LTCP. However, it is important to recognize that all of these reaches are also regularly impacted by non-CSO bacteria sources. In particular, upstream sources have been identified as a dominant contributor to bacteria in the City's rivers, including the CSO-Impacted Waters. The relative impact of these upstream sources can be further examined with the City's water quality model.

The City's water quality model underwent a significant update, expansion, and recalibration effort in 2014-2016, and now serves as an important tool in the City's decision-making process. Relevant background and full details on the water quality model can be found in project documentation[76]. The water quality model starts upstream of the City's CSOs on the St. Marys River and St. Joseph River, and extends well beyond the City's CSOs on the Maumee River (to State Road 101, approximately 19 miles downstream of the last CSO). The extent of the City's model is shown in Figure 1.

[*The remainder of this page is intentionally left blank.*]

[76] "Water Quality Modeling of the St. Joseph, St. Marys, and Maumee Rivers," HDR February 2017.

Figure 1 – Extent of Water Quality Model



Approach

The City's calibrated water quality model explicitly represents different bacteria sources as follows:

- Upstream sources (i.e. inputs at the upstream model boundaries)
- CSO sources
- Stormwater point sources
- Non-point sources
- The City's Water Pollution Control Plant (WPCP), as treated effluent

Each source is assigned unique bacteria concentrations in the model, based on a combination of collected water quality data and calibration of the model to observed in-river concentrations during sampled events.

Given that each source is represented individually, the water quality model provides the City with a tool to examine the relative impact of each of these bacteria source. For the analysis presented in this Appendix, all sources other than upstream sources were assumed to be "clean" – in other words, CSOs, stormwater point sources, non-point sources, and the City's WPCP effluent flowed into the river, but with zero bacteria concentrations. The only bacteria load in

this model run was from upstream sources. In effect, this represents a scenario where the City does not exist as a bacteria source.

The model was run for calendar year 1995, which is representative of the City's typical year, with the Long-Term Control Plan in place (but again, with zero bacteria concentrations for all sources other than upstream sources). Model results were processed to obtain hourly predictions of in-stream bacteria concentrations in all modeled river segments (193 segments).

Results

The hourly bacteria time series were used to calculate "sliding window" 30-day geometric mean (geomean) and 30-day maximum values for in-stream *E.Coli*. In other words, starting on Day 30 of the year, the past (30 x 24) = 720 "samples" were used to calculate a geomean and identify the maximum value from that period. The calculation then slid ahead one hour, and repeated – this process was continued for the full year. The resulting time series of 30-day geomeans and maximum values can then be plotted and compared to Indiana *E. coli* standards.
The results are shown in Figures 2 and 3, for the geomean and maximum values respectively. Four key river reaches are plotted:

- Segment 72, at the upstream model boundary on the St. Marys River (upstream of all CSOs).
- Segment 31, at the upstream model boundary on the St. Joseph River (upstream of all CSOs).
- Segment 127, at the upstream end of the Maumee River (just downstream of the confluence of the St. Marys and St. Joseph Rivers).
- Segment 190, at the downstream model boundary at SR101 (approximately 19 miles downstream of the last CSO).

As can be seen, both the geomean and single sample maximum *E. coli* standards are predicted to be regularly exceeded in all four river reaches due solely to upstream sources. Moreover, these exceedances occur much more frequently than will CSO discharges occur after full LTCP implementation. And, while only the four key reaches are plotted for simplicity, this result is repeated in every river reach, from the upstream model boundaries on the St. Marys and St. Joseph Rivers to the downstream model boundary on the Maumee River.

Figure 2 – Predicted E. coli 30-day geomean for calendar year 1995

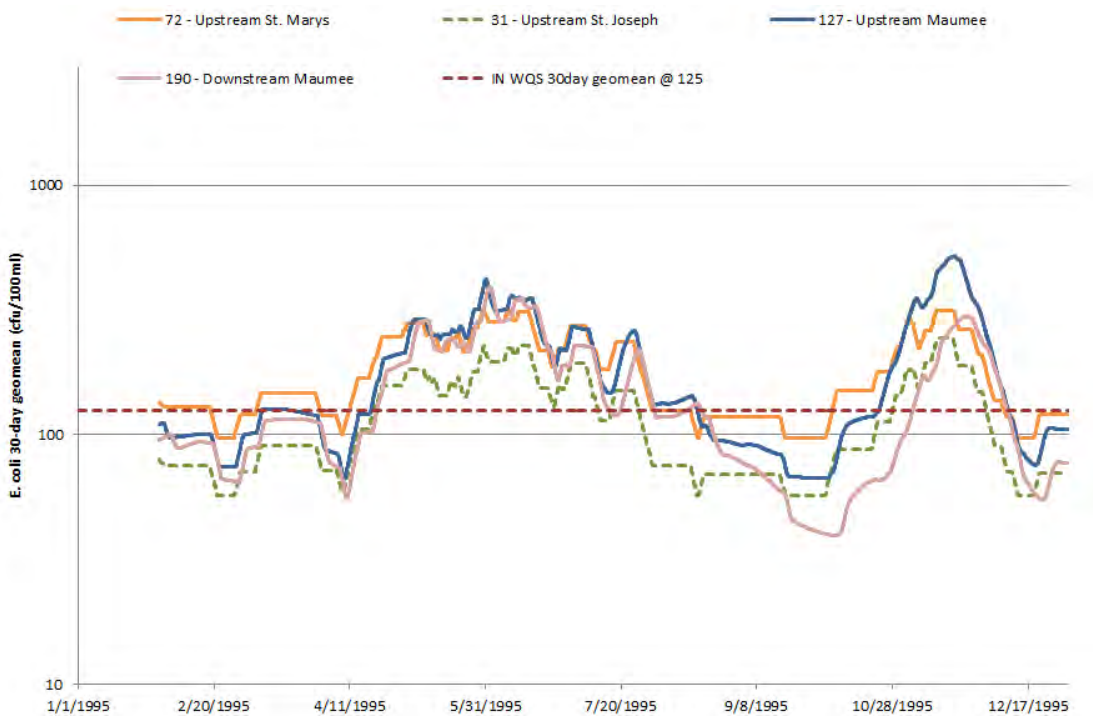
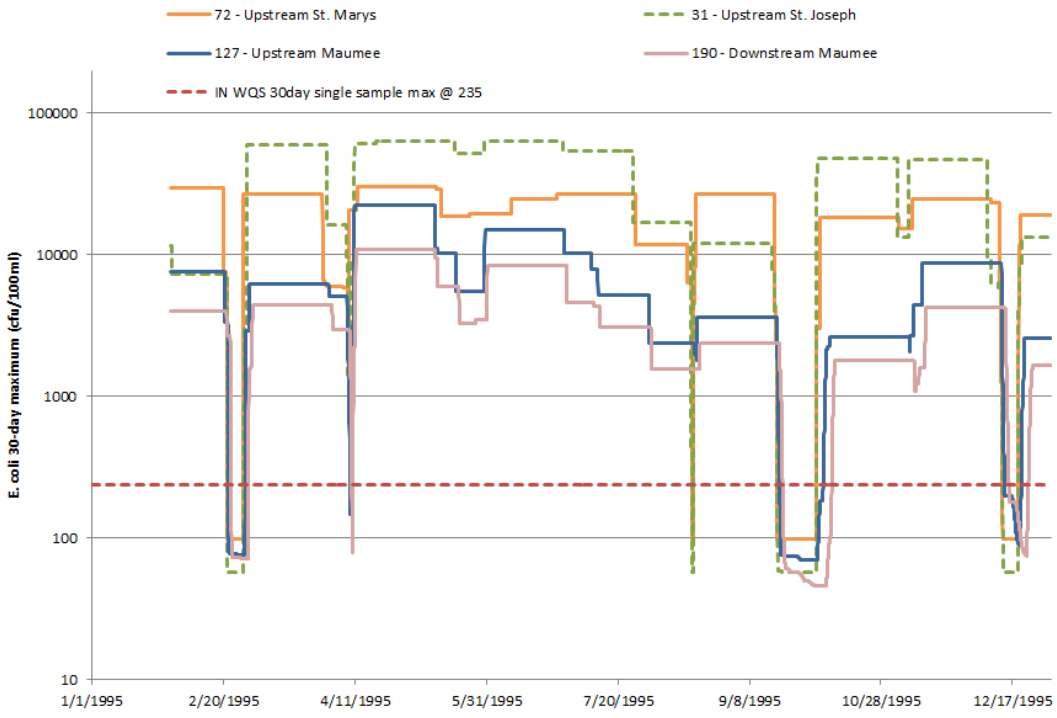


Figure 3 – Predicted E. coli 30-day maximum value for calendar year 1995, Upstream boundary loads only



APPENDIX C-1: Recreational Use Report

Recreational Waterbody Uses in Fort Wayne's Combined Sewer Area

This document is intended to provide an analysis of the recreational uses of rivers and streams in Fort Wayne, Indiana in areas that are affected by combined sewer overflows (CSOs) based on available information sources, including though not limited to surveys, interviews and workshops conducted by City Utilities staff.

OVERVIEW

A variety of methods were used to acquire information on the public's recreational uses of rivers and streams in the Fort Wayne urban area, particularly those portions of the waterways affected by CSO discharges. The collected information indicates that the prevalent recreational activities are those with only incidental water contact, such as walking along river greenways, fishing, and boating, and that a substantial majority of persons surveyed do not use area waterways for any recreational purpose. Full-body contact recreation, such as swimming and water skiing, does not occur, practically speaking, in CSO-impacted waterways. Wading in these waterways is reported only rarely. Downstream uses of the Maumee as it traverses northwestern Ohio were also surveyed and found to be similar to those occurring in the Fort Wayne area. Ohio EPA considers the main stem of the Maumee to be in attainment of its primary contact recreational use designation. Based on the findings of this report, the City of Fort Wayne concludes that there are no sensitive areas associated with primary contact recreation, as defined in the federal CSO Control Policy, located in waterways impacted by the City's CSO discharges.

DISCUSSION

PRIMARY CONTACT RECREATION

- **Swimming**

A literature review of public information sources performed by City Utilities staff did not discover any source that documents or promotes the use of Fort Wayne's rivers for full-body contact recreation. Neither the City nor its Parks and Recreation Department designates any portion of area waterways subject to CSO impacts for public swimming, wading (other than boat ramps), waterskiing or jetskiing. To the contrary, as described later, such activities are discouraged where contact with CSO discharges might occur.

A survey of recreational uses of Fort Wayne area rivers and streams was conducted by City Utilities staff as described in Appendix A. Seventy-three percent (73%) of the survey respondents indicated that, for a variety of reasons, they did not use Fort Wayne area rivers for recreational purposes. Of the twenty-seven percent (27%) of respondents who indicated some recreational use of area waterways, none reported that they or their immediate family members swim in Fort Wayne's rivers. When asked whether they have observed other people swimming in area rivers, only one person reported seeing any such occurrences of swimming.

Anecdotal information indicates that on January 1 of each year, a group known as the Polar Bear Club conducts a Polar Bear Swim in the St. Joseph River at Johnny Appleseed Park. The swim consists of a number of people taking one plunge into the icy water. This activity is, of course, outside the recreational season protected by state water quality standards.

Not only is there a dearth of swimming in area waters, the survey also indicates that there is a relatively high public awareness of the lack of adequate water quality for such recreational activities.

Although Fort Wayne does not have ordinances that prohibit full body contact recreation in CSO-impacted streams, the City discourages such activities through various measures, including the posting of signs at all CSO outfalls and in parks and at other public access points to area streams downstream of CSO outfalls advising that the streams are affected by CSOs and that contact with the water can cause illness. The City also provides other public notification of CSO discharges consistent with an IDEM-approved public notification plan and the Nine Minimum Controls as required by the City's NPDES permit.

An editorial article published in the Fort Wayne Reader, an on-line newspaper (www.fortwaynereadre.com) on September 27, 2004 observes that "there's probably a limit on how much time, energy and money Fort Wayne wants to expend to make sure E.coli levels in the St. Joseph River stay below the EPA's recreational water standards. *After all, no one swims in the St. Joseph River (not on purpose, anyway)."* (Emphasis added)

Another article from the same source, "There's Something in the Water", appeared on September 27, 2004. This and similar articles and items on television and radio, in addition to the City's CSO notification program, help to make citizens aware of concerns about water quality. This article focuses primarily on pesticides in the St. Joseph River but also discusses the presence of E.coli and its adverse health effects.

Fort Wayne's Department of Parks and Recreation operates public swimming pools in four neighborhood parks. In addition, at Headwaters Park, a water feature is provided for children to play in the clean water. It is hoped that, by providing a clean and controlled water recreation venue that is accessible and inviting, playing in the river within the park boundaries can be effectively discouraged.

- **Waterskiing and Jetskiing**

These recreational activities typically involve considerable water contact. The only information available on the occurrence of these activities in the Fort Wayne area arises from the recreational use survey conducted by City Utilities staff. Of the survey respondents who indicated some recreational use of area waterways, only one respondent stated that he or she participated in waterskiing. No location was provided for this activity. None acknowledged jetskiing on the rivers. For those survey respondents reporting observation of others engaging in waterskiing or jetskiing, a very high preponderance of the observations (13 of 15) related to the St. Joseph River upstream of the CSO-impacted area or other waterways with no

CSO impacts. Two respondents reported having seen waterskiing or jetskiing on the St. Joseph River or the Maumee River without specifying a particular area.

- **Wading**

Only two respondents to the recreational use survey (of 115 total) stated that they or family members had waded in area rivers. The St. Joseph River and Foster Park were mentioned as wading locations. A few respondents reported seeing other people wading in the rivers. However, only swimming and sailing/windsurfing were reported less often than wading. During the Johnny Appleseed Festival in 2004, the level of the St. Joseph River was very low as a result of a dry summer. During the two-day event, festival organizers noticed "a handful" of children and adults wading and playing in the river.

- **Conclusions on Primary Contact Recreation**

Recreational activities involving or approaching full-body contact with area rivers within CSO-impacted reaches are virtually non-existent. Survey respondents reported that they do not swim or jetski in waterways affected by CSO discharges and had only rare involvement in waterskiing (one respondent who did not specify a location) or wading (only two respondents). Furthermore, survey respondents reported similarly rare observations of others engaging in primary contact recreation in Fort Wayne's waterways. Also, there is no information indicating any occurrence of such activities during or soon after storm events.

In view of the collected information, the City posits that there are no recreational sensitive areas in the waterways affected by CSO discharges. No primary contact recreation is found in these waterways aside from rare, isolated occurrences or observations, and none has been reported during or immediately following rainfall. Analogizing to the principles of IDEM's LTCP/UAA guidance, such occasional or incidental instances of recreational use do not establish recreational sensitive areas.

RECREATIONAL ACTIVITIES WITH POTENTIAL INCIDENTAL CONTACT

The City's Recreational Use Survey indicates that walking along river greenways, fishing, and boating are the overwhelmingly predominant recreational activities associated with rivers and streams located in the Fort Wayne urban area. These activities generally involve, at most, incidental or secondary contact with waters of area rivers.

- **Boating/Sailing/Canoeing**

The Fort Wayne Department of Parks and Recreation identifies a number of park sites on CSO affected waters where launching areas are available for boating or sailing:

- Johnny Appleseed Park on the St. Joseph River has a boat launch. The launch are itself is located upstream of the City's first upstream CSO. However, because of the boat launch location just downstream of the St. Joseph River dam, most boaters will take a downstream course into CSO affected waters.

- St. Marys River at Guilden Park – boat ramp operated by DNR
- Maumee River boat launch near Maumee Park. This launch site is located between Fort Wayne and New Haven.

The Indiana Department of Natural Resources (DNR) web site contains an Indiana Canoeing Guide that describes a canoe trail on the St. Joseph River. The trail guide focuses on the river upstream of the St. Joseph River Dam and upstream of the CSO affected area. This site does not encourage canoeing downstream of the dam nor does it suggest canoe trails on the St. Marys or Maumee rivers in the Fort Wayne area.

The DNR's recommendations are mirrored by respondents to the City's recreational use survey. Canoeing and kayaking activities were stated as occurring predominantly on the St. Joseph River north of the CSO-impacted area. Limited use of the St. Joseph River within the area of CSO impacts is apparently indicated as well by survey respondents.

In the September/October 2004 edition of Fort Wayne magazine, an article entitled "Three Rivers Run Through It" highlighted canoeing and kayaking opportunities in downtown Fort Wayne, within the CSO area. The article focused on the "peace, quiet and sightseeing" available on the rivers.

The Fort Wayne Kayak Club in cooperation with a local outdoor outfitter sponsors evening canoe trips on Fort Wayne's rivers during the recreational season from April through the end of August. These trips reportedly take place two times per month.

There is no information available which indicates that any of the above-referenced recreational activities occur during wet weather events. To the contrary, those respondents to the recreational use survey who reported some use of area waterways for recreation voiced their avoidance of such activities during rain events or during high water conditions. More than half of such respondents stated that they would not boat or canoe on the rivers either when it is raining or when the river levels are high. Odors were also mentioned as a factor that would keep people from using the rivers, but it was not mentioned as often as rain or high water.

- **Fishing**

In 1989, the Division of Fish and Wildlife of the DNR undertook a project to locate and describe existing fishing waters and to document then-current access facilities in Fort Wayne. As a result of that study a paper was prepared in 1990 entitled: "Current Fish Resources and Fishing Opportunities in Fort Wayne, Indiana." The study identified the following fishing locations in Fort Wayne that are on CSO affected waters.

- St. Joseph River at Johnny Appleseed Park just downstream of the St. Joseph River Dam
- Spy Run Creek at Lawton Park
- St. Marys River at Foster Park
- St. Marys River at the Bluffton Road Bridge

- Pond in Swinney Park. The pond is located in the St. Mary's River flood plain and is subject to frequent flooding by the river.
- St. Marys River at Guilden Park
- Maumee River at Hosey Dam
- Several other sites were identified in this study. However, those sites are not on waters that are impacted by CSOs.

Currently the DNR lists the following locations within the City of Fort Wayne on its website under "Fishing: Where to Fish in Indiana":

- St. Joseph River from Coliseum Boulevard to the confluence of the Maumee River for smallmouth bass, crappie and walleye
- St. Marys River at Guilden Park for carp, catfish and walleye
- Maumee river off US 24 east of Webster Road for catfish and walleye

The Fort Wayne Parks and Recreation Department lists on its website several locations within Fort Wayne City Parks where fishing is available. Several of these are on CSO affected rivers or streams and some of them duplicate the fishing locations identified in the 1990 report by the DNR:

- St. Joseph River at Johnny Appleseed Park just downstream of the St. Joseph River Dam
- Spy Run Creek at Lawton Park
- St. Marys River at Foster Park
- St. Marys River and pond in Swinney Park
- St. Marys River at Guilden Park
- St. Marys River at Bloomingdale Park East and West

In conducting a foot survey of the Maumee River, Fort Wayne City Utilities staff identified two other well-used, but informal fishing areas:

- North side of the river near the large stormwater outfall at Niagara and Pemberton Avenues
- North side of the river where the Water Pollution Control Plant's Pond #2 discharges into the relief channel.

In 2004, a number of fish consumption advisories issued by the Indiana State Board of Health were in effect for various fish types found in Fort Wayne's rivers. In addition to the Statewide advisory for carp based on PCBs, other advisories are in effect in Allen County at various levels for the following species:

- St. Marys: bigmouth buffalo, black redhorse, carp, channel catfish, largemouth bass, quillback, silver redhorse, white sucker. All advisories are based on PCBs. In addition, the advisory for largemouth bass is based on mercury as well.

- Maumee River: bigmouth buffalo, carp, channel catfish, largemouth bass, river redhorse, rock bass, sauger, shorthead redhorse and walleye. The advisory on all of these species is based on PCBs.
- St. Joseph River: black crappie, black redhorse, channel catfish, golden redhorse, rock bass. All advisories on the St. Joseph are based on PCBs.

Observations by City staff and anecdotal information suggest that the majority of fishing in Fort Wayne's rivers is done from the bank. Most survey respondents who reported that they fish in the rivers did not indicate use of the rivers for boating. Conversely, most who reported canoeing did not report fishing. The data therefore suggest that most fishing is bank fishing. This coincides with observed behavior.

- **Walking along River Greenway Trails**

Fort Wayne operates more than 15 miles of greenway trail connecting the parks that are adjacent to the City's rivers and streams. Public use of these greenway trails for exercise and relaxation is the primary water-related recreation occurring in the urban area.

The Fort Wayne Parks and Recreation Department website identifies a number of locations in parks affording public access to the river greenway.

St. Joseph River at Johnny Appleseed Park
St. Joseph River at Hanna's Ford
St. Marys River at the Historic Old Fort
St. Marys River at Bloomingdale Park E & W
St. Marys River at Swinney Park
St. Mary's River at Foster Park
St. Marys River at Griswold Avenue Playlot
St. Marys River at Guildin Park
St. Marys River at Indian Village/Sears Park
St. Marys River at Roosevelt Park
St. Marys River at Traders Point
St. Marys River at Headwaters Park
St. Marys River at Orff Park
Maumee River at Lakeside Park
Spy Run Creek at Lawton Park
Wayne ND #4 at Tillman Park

Most of these public access points, especially those within close proximity to a combined sewer overflow outfall, are marked with signage stating that the water is affected by CSOs during wet weather and that contact with the water can cause illness.

During the fall of 2004, City Utilities staff did an on-foot survey of the riverbanks along the Maumee River. The purpose of the survey was to examine the riverbanks for areas that might be conducive to public access to the river and to identify areas with evidence that access had

been occurring. The bank survey found that such public access points are already identified on the City's Combined Sewer Overflow Outfall Location map.

City Utilities staff are currently conducting a more intensive riverbank survey of waterways affected by CSO discharges to identify those areas where physical characteristics of the riverbanks, such as steep slopes or dense vegetation, discourage or preclude access to waterways and, conversely, those areas whose characteristics are conducive to public access. GIS coordinates of significant features will be recorded.

- **Golf Courses**

Several public and private golf courses abut the rivers.

- One publicly owned golf course is located in Foster Park on St. Mary's River within the CSO affected area.
- Fairview Golf Course is privately owned and is bisected by the Wayne Natural Drain #4 downstream of a CSO.
- Lakeside Golf Course is located on the Maumee River, just downstream of the Coliseum Boulevard Bridge.
- Maumee Valley Golf Club is located within the City of New Haven adjacent to the Maumee River.

As with the greenways, the City's waterways contribute to the ambience at the golf courses but are not directly involved in the recreational activity, except, perhaps, for luckless individuals seeking to retrieve errant shots.

Use of area rivers as a backdrop for walking along their greenways is the primary water-related recreation in the Fort Wayne urban area. Fishing and, to a lesser extent, boating are also among the predominant water-based recreational activities in the area. For all these activities, contact with river waters is an incidental or secondary aspect, usually of an accidental or unintended nature. As previously mentioned, there is a high level of public recognition of the incidence of CSO discharges during wet weather and, by all indications, the public shuns these recreational activities during wet weather events.

COMMUNITY EFFORTS TOWARD IDENTIFICATION OF WATER QUALITY GOALS

In 1997, Fort Wayne City Utilities initiated the development of a "Total Quality Watershed Management" (TQWM) approach to help coordinate various water quality related efforts in Fort Wayne and the Upper Maumee River Basin. An early element of the TQWM program was the establishment of community-based water quality goals.

As a part of this process, the City solicited information about community attitudes and ideas about watershed management using two methods: stakeholder interviews and a series of three community involvement workshops.

Approximately 75 community stakeholders were interviewed between April 18 and 20, 1997. They were asked to identify water quality concerns, water quality goals, visions for use of the rivers and willingness to pay to implement the visions. Some of these same stakeholders participated in the public involvement workshops that included certain city and county elected officials and staff, the citizen advisory group that had been working with the City on water quality issues, representatives of the St. Joseph River Watershed Initiative, soil conservation and environmental groups, the Chamber of Commerce, and the agricultural industry, members of the media and private citizens.

A majority of those interviewed said that drinking water protection was the most important objective to be achieved through better management of the local watersheds. A secondary concern was public health, with issues related to agricultural runoff, industrial discharges and CSO discharges being the foremost public health concerns. When asked about their desire to have the local rivers be fishable and swimable, the majority of stakeholders did not think of this goal as practical. However, nearly half of those interviewed said that this it an appropriate goal, even though it may never be achieved.

The majority of interviewees also indicated that they, their friends and neighbors use the rivers in and around Fort Wayne for various activities, with the most popular activities being walking on the river greenway, fishing and boating. This collective description of waterway uses is consistent with the results of the City Utilities' recent recreational use survey. Stakeholders expressed a desire for improvement in overall recreation, including better access to the greenway. A large number of those interviewed wanted improved boating, boat accessibility and more docks and ramps. When asked about their visions for the rivers, most stakeholders mentioned better river water quality, more opportunities for contact and non-contact recreations and a better appearance of the rivers.

During the third workshop, participants prioritized the identified water quality goals by deciding how they would allocate a limited number of "greenbucks" to achieving each goal.

Based on the allocation of greenbucks, the participants voted their top priorities to be:

1. drinking water protection
2. habitat
3. E.coli
4. odor
5. litter and debris

DOWNSTREAM USE SURVEY – Maumee River

As part of the City's Long-Term Control Plan, a screening-level water quality analysis was conducted to estimate downstream bacteria levels in the Maumee River during and after wet-weather events. This analysis indicated that instream E. Coli levels due to wet-weather bacteria sources in and upstream of Fort Wayne have the potential to remain above the Indiana and Ohio Primary Contact Recreation standard for approximately 72 miles downstream of the City, a distance that would extend three miles into western Henry County, Ohio. These projections are based on a number of conservative assumptions, and include all

wet-weather sources in and upstream of the City, and so represent the maximum potential bacteria effect of Fort Wayne's CSOs.

Although these conservative projections identify the potential for elevated bacteria levels to extend into Ohio, the Ohio Environmental Protection Agency (Ohio EPA) considers the main stem of the Maumee River to be in attainment of its recreational use designation, i.e., Primary Contact Recreation. Ohio EPA's current 303(d) list of impaired waterbodies is included in the *Ohio 2004 Integrated Water Quality Monitoring and Assessment Report*, and was approved by U.S. EPA on May 5, 2004. This listing shows the main stem of the river from the Indiana state line to Lake Erie as impaired for Aquatic Life Use but NOT impaired for Recreation Use – Primary Contact. The Ohio EPA recreational use assessment was based on analysis of 881 fecal coliform samples, collected from 8 sampling sites on the Maumee from 1998 to 2003. Details on the Ohio EPA evaluation methods are contained in Section 6 of the *Ohio 2004 Integrated Water Quality Monitoring and Assessment Report*

Because the Ohio EPA considers the main stem of the Maumee River to be in attainment of its recreational use designation, the presence of primary contact recreation areas in Ohio would have no ramifications on CSO control decisions in Fort Wayne. However, as part of developing a thorough understanding of downstream conditions and impacts, City Utilities staff prepared and transmitted written survey instruments in May, 2005, to downstream county health departments, park departments, emergency management agencies and soil and water conservation districts in Paulding, Defiance and Henry Counties of the State of Ohio and city or town officials in Antwerp and Defiance in Ohio. A survey was also sent to the Independence Dam State Park in Defiance County. Of the fourteen surveys mailed, six were completed and returned.

The survey results indicate recreational activities comparable to those identified in the City's survey of its residents. Fishing and boating tend to predominate and a substantial majority of users are adults. Some wading and playing along riverbanks are also reported during the recreational season. In Defiance, Ohio, water skiing and jetskiing are also reported in city parks located along the Maumee. Swimming is not mentioned by respondents; it appears that the public looks to off-river facilities such as public swimming pools rather than the river to engage in this activity.

It should be noted that between Fort Wayne and Henry County, the City of New Haven in Indiana and 11 communities in Ohio also have combined sewer overflows that release into the Maumee River. The City of Defiance is the largest CSO community in this area of Ohio, with a total of 44 local CSOs.

Overall Conclusions

In view of the information contained in this report and summarized below, the City posits that there are no recreational sensitive areas in the waterways affected by CSO discharges. Aside from rare, isolated occurrences or observations, no primary contact recreation is found in these waterways and none has been reported during or immediately following rainfall. Analogizing to the principles of IDEM's LTCP/UAA guidance, such occasional or incidental instances of recreational use do not establish recreational sensitive areas.

Recreational uses of CSO-affected waterways in the Fort Wayne urban area are not carried out on an organized basis and are intermittent to incidental. The primary public use of the rivers is as a landscape feature or backdrop to other activities, including, most prominently, walking or running along Fort Wayne's River Greenway. The other predominant recreational uses are fishing, canoeing, and boating. For all these activities, contact with river waters is an incidental or secondary aspect, usually of an accidental or unintended nature.

Recreational activities involving or approaching full-body contact with area rivers within CSO-impacted reaches are virtually non-existent. Survey respondents reported that they do not swim or jetski in waterways affected by CSO discharges and had only rare involvement in waterskiing (one respondent) or wading (two respondents). Similarly rare observations of others engaging in primary contact recreation in Fort Wayne's waterways were reported by survey respondents. Also, there is no information indicating any occurrence of such activities during or soon after storm events.

There is no adverse impact by the City's CSO discharges on downstream recreational uses. Although worst-case conservative projections identify the potential for elevated bacteria levels to extend into Ohio, the Ohio EPA considers the main stem of the Maumee River to be in attainment of its recreational use designation, i.e., Primary Contact Recreation. Ohio EPA's current 303(d) list of impaired waterbodies does not show the Maumee River as impaired for Recreation Use – Primary Contact.

The reasons cited most often by people who say they do not use Fort Wayne's rivers for recreational purposes are the appearance (turbidity), color, and odor of the waters and the perception that the rivers are polluted. Although not stated by those surveyed, steep river banks and other factors limiting available access points to the waterways are likely contributors to the lack of primary contact recreational activities.

There is a high level of public recognition of the incidence of CSO discharges during wet weather and, by all indications, the public shuns these recreational activities during wet weather events. Fort Wayne's combined sewer overflow notification program is intended to provide information to the public about river water quality and to make them aware of the risks of full-body contact with CSO affected rivers and streams.

APPENDIX A – Information Sources

Literature Search

City Utilities staff conducted a review of newspaper and magazine articles, published reports, and websites concerning documented recreational usage of Fort Wayne area waterways.

Surveys of Recreational Uses

- **Web Survey**

The recreational uses survey was posted on the City of Fort Wayne website (www.cityoffortwayne.org) from February 1, 2005 – March 15, 2005. It was posted as a NEW! item on the City's homepage. **No responses were received.**

- **Survey of Potential River Users**

The Johnny Appleseed Festival takes place in Fort Wayne on the west bank of the St. Joseph River in Johnny Appleseed Park. It is held annually during the third weekend in October. During the Festival in 2004, random intercept surveys were conducted concerning uses of Fort Wayne's rivers.

Recreational use surveys were also distributed to three local bait stores in Fort Wayne during November 2004. The surveys were left with the owner or manager who was asked to distribute the surveys to customers and collect the responses. Surveys were collected by City staff every two weeks. The same survey instrument was used as was used for the random intercept surveys at the Johnny Appleseed Festival.

- **Survey of Fort Wayne Neighborhoods**

The same survey instrument was distributed to Fort Wayne neighborhoods using two methods. The availability of the web survey was announced to Fort Wayne's Sewer Advisory Group. Most members of the Advisory Group are active members of their neighborhood associations. SAG members were also provided with copies of the survey to be distributed.

The overall results of these surveys are shown in Appendix B.

Anecdotal Information

Anecdotal information on observed an actual river uses has been solicited from a number of sources including:
Sewer Advisory Group
Dan Wire – an avid river user
Jack Stark with the Fort Wayne River Greenway Consortium
Fort Wayne Parks Department
The Director of Headwaters Park
The Fort Wayne Kayak Club

APPENDIX B

Results of Surveys of Recreational Use of Fort Wayne Area Waterways

Recreational Waterbody Uses in Fort Wayne's Combined Sewer Area Supplemental Data Analysis

At the request of U.S. EPA and IDEM the City of Fort Wayne (the "City) collected additional information to supplement the draft Recreational Waterbody Uses in Fort Wayne's Combined Sewer Area report submitted to said agencies on July 7, 2005. This memorandum presents the requested additional information. As is explained below, the additional information well supports the conclusion of the City's July 7, 2005 submission that there are no sensitive areas associated with primary contact recreation, as defined in the Federal CSO Control Policy, located in waterways impacted by the City's CSO discharges.

Random intercept surveys, neighborhood surveys and anecdotal information collected in late 2005 and early 2006 from a variety of creditable sources indicated, as previously reported, that full-body contact recreational uses of the three rivers is minimal. The original surveys included only one report of an observed occurrence of swimming in Fort Wayne's rivers and only two respondents who reported that they or some member of their family had used Fort Wayne's rivers for wading. Based on the original survey work, Fort Wayne concluded that recreational uses of the rivers in the CSO affected area is not carried out on an organized basis but is intermittent to incidental. The primary use of the rivers is as a landscape feature or background for other activities, particularly walking or running along the Greenways. The other predominant recreational uses are canoeing, boating and fishing – all activities that do not involve full-body contact or the risk of ingesting river water.

In order to provide additional verification of the findings and conclusions of the City's original recreational use surveys, the City used two additional methods to corroborate this data in the fall of 2005. During Labor Day weekend, City Utilities staff members walked and biked along the City's rivers in order to observe river uses. A three-day holiday weekend with sunny skies and temperatures in the 80's provided a prime opportunity to observe human interactions with river water – if there were any. Four City employees spent approximately 16 hours making observations along the rivers throughout the Labor Day weekend.

The City also asked its corps of volunteer Greenway Rangers to provide information about recreational uses of the rivers that they may have observed during the 2005 recreational season. The Greenway Rangers patrol Fort Wayne River Greenway system looking for safety or other concerns related to the City's 17.5 miles of greenway trails. Because many of the trails are adjacent to the rivers, the Greenway Rangers may have observed people interacting with the rivers. Surveys were returned from eleven Rangers. Some of them reported activity that they had observed over the course of the summer. These may appear in the attached spreadsheet without specific dates or as activities that they may have observed "occasionally." Other Rangers provided new observations with specific dates and times during the month of September 2005.

The City staff that made observations during Labor Day weekend 2005 and the Greenway Rangers used the same data observation forms to record information. Both groups were provided with definitions for various kinds of activities that they might observe. The data sheets and definitions are attached. In this set of data collection, our observers were not asked to report on numbers of people who were walking along the river banks or using the greenway trails. They were asked to specifically observe for activities that might bring people into direct contact with the water

The new observational data, as summarized in the following bullets, is consistent with the survey information previously collected and reported.

- No swimming, wading or water skiing was observed on the days when staff or volunteers reported seeing activity on the rivers. This provides additional documentation for the original conclusion that there is no primary contact recreation.
- One instance of jet skiing was reported. In reviewing the data, City staff were somewhat surprised by this observation because jet skiing at this location had not been reported in the past. The information supports the assertion that any recreational use is not organized but is intermittent to incidental.
- Of the 24 observations reported in the fall of 2005, 18 involve fishing from the bank or bridge, fishing from a boat, boating or canoeing. These activities do not involve full body contact and have no inherent risk of ingesting river water.
- The reports of a man letting his dog play in the river and playing at the stream bank -- although not wading -- suggest that any contact with the water is incidental to other activity and that full body recreation is not the intent of those interacting with the rivers.

Observational data collected in the late summer of 2005 provide further support for the conclusion that primary contact recreational activity on Fort Wayne's CSO affected waters is rare and isolated. Our conclusions remain that the primary use of the rivers is as a landscape or backdrop for other activities. Actual recreational activities directly involving the rivers consist of non-full body contact recreational activities such as fishing and boating.

Observed River Uses

	Location	Activity	Dates	Frequency	No of people	Weather
St. Joe						
	Johnny Appleseed park @ dam	fishing from dam wall	9-Sep-05	once	5	warm
	Johnny Appleseed Park	fishing from overlook	11-Sep-05	once	2	warm/evening
	St. Joe Dam boardwalk	fishing	4-Sep-05	once	4	sunny/85
	2 miles n. of confluence	playing at streambank on Stevic's island	4-Sep-05	once	3	sunny/85
	Near Elizabeth St./Griswold and Lafayette	Jetskiing	4-Sep-05	once	2	sunny/85
St Mary's						
	Under Harrison St. Bridge	Boys playing at bank	June, July, Aug	weekly	4	
	Sherman St. bridge	Boys playing at bank	June, July, Aug	weekly	4	
	Main Street railroad bridge	Boys throwing rocks from bridge	June, July, Aug	weekly	2 -- 4	Various weather conditions:
	West of Sherman St. bridge -- bench by Greenway	people sitting in chairs by bank/fishing	June, early AM	weekly	2 -- 4	sunny/pt. Sunny/ misty
	Confluence	boating in small motor boat	July -- evening		2	sunny
	Guldlin Park boat launch	people w/boat	Aug, Sept	Sundays	2+	
	Near Old Fort Bridge	canoeing	3-Sep-05	once	1	sunny
	E. of Sherman St. bridge on north bank	Fishing	17-Sep-05	once	2	partly cloudy
	Foster Park near Rudisill Ave	Fishing	3-Sep-05	once	2	sunny/80
	NFS railroad bridge	man letting dog play in water	Sept. 3, 2005	once	1	sunny/80
	South of Foster Park	Fishing from boat	Early May - AM	once	2	sunny
	North shore just east of skate park	fishing	9/26/2005 @5:30 PM	once	1	Partly cloudy/70
	Clearing between Taylor St. and Jefferson Blvd.	Fishing from bank	10/1/05 @10:30 AM	once	2	Pt. Cloudy

Maumee

north bank at Pemberton	Fishing	May, June, July	Occasional	2 -- 4	
Lake Ave bridge	Fishing from bridge	evenings	Occasional	1 -- 2	
Between Kreager Park and Landin Road	Boating	11-Sep-05	once	2	warm/sunny
Around Kreager Park	People riding in air boat	late June or early July	once	2	sunny/evening
East of Anthony Bridge	Fishing from bank	Mid June - afternoon	once	4	sunny/hot
WPCP outfall	Fishing from bank	all summer	daily	1 -- 10	warm/dry

APPENDIX C

Downstream Use Survey – Maumee River

In May 2005, Fort Wayne sent written survey instruments to downstream county health departments, park departments, emergency management agencies and soil and water conservation districts in Paulding, Defiance and Henry Counties and city or town officials in Antwerp and Defiance in Ohio. A survey was also sent to the Independence Dam State Park in Defiance County. These areas were chosen for surveying based on a screening-level water quality analysis that indicated instream E. Coli levels due to wet-weather bacteria sources in and upstream of Fort Wayne have the potential to remain above the Indiana and Ohio Primary Contact Recreation standard for approximately 72 miles downstream of the City. Therefore, the limits of Fort Wayne's maximum potential bacteria effect on downstream communities would be three miles into Henry County. It should be noted that despite these projections, the Ohio EPA considers the main stem of the Maumee River to be in attainment of its recreational use designation, i.e., Primary Contact Recreation.

Fourteen surveys were mailed; five were returned.

Antwerp, Ohio – Riverside Park

Fishing	weekly during recreation season, never during off-season	75% adults/25% children
Canoeing	monthly during recreation season, never during off-season	100% adults
Wading	monthly during recreation season, never during off-season	50% adults/50% children
Wading during duck race annually in August		100% adults
Fishing tournament annually in June		50% adults/50% children

Defiance, Ohio – Kingsbury Park

Fishing	fishing daily throughout the year	80% adults/20 % children
Boating	daily during recreation season, never during off-season	75% adults/25% children
Playing@ bank	daily during recreation season, weekly during off-season	55% adults/45% children
Wading	daily during recreation season, never during off-season	40% adults/60% children
Water/Jet skiing	daily during recreation season, never during off-season	50% adults/50% children

Defiance, Ohio – Independence Park

Fishing	daily throughout the year	75% adults/25% children
Boating	daily during recreation season, never during off-season	75% adults/25% children
Playing @bank	daily throughout the year	70% adults/25% children
Wading	daily during recreation season, never during off season	50% adults/50% children
Water/Jet skiing	weekly during recreation season, never during off-season	55% adults/45% children

Defiance, Ohio – Pontiac Park

Boating	daily during recreation season, weekly during off-season			80% adults/20% children
Canoeing	"	"	"	"
Kayaking	"	"	"	"
Water/Jet skiing	"	"	"	"

Independence Dam State Park – Defiance County, Ohio

Among the amenities noted on the Independence Dam State Park website are a three mile hiking trail along the bank of the Maumee River, a boat ramp, canoe/kayak portage and a fishing pier.

Boating	daily during recreation season, weekly during off-season			75% adults/25% children
Fishing	"	"	"	"
Playing @ bank	"	"	"	"
Wading	"	"	"	"

APPENDIX C-2: 2019 River Use Observation Survey Form

2019 River Use Observation Survey

Observation Period - Recreational Season (April to October 2019)

Fort Wayne City Utilities

12/1/2019

Name of Group/Organization Taking Survey: _____

Please check the box below for each river and activity that is CLOSEST to your OBSERVATION for Each Water Body and Activity
Please also briefly explain/indicate on line provided how frequently you TYPICALLY would VIEW/VISIT each Water Body listed

Date Completed: _____

Water Body / River Activity	Activities Observed During DRY WEATHER OR LOW RIVER CONDITIONS (NOT within 48 hours after a large rain)					Activities Observed During WET WEATHER OR HIGH RIVER CONDITIONS (or within 48 hours after a large rain)				
	Observed Activity Almost Every Day during Season	Observed Activity Multiple Times a Month in Season	Observed Activity a Few Times a Month in Season	Observed Activity Only a Few Times in Entire Season	Activity Not Observed at All	Observed Activity Almost Every Day during Season	Observed Activity Multiple Times a Month in Season	Observed Activity a Few Times a Month in Season	Observed Activity Only a Few Times in Entire Season	Activity Not Observed at All
St Joseph River (St Joe Dam to Maumee River confluence)										
Frequency of view/visit of this Water Body (i.e. hours a day, daily, weekly, monthly, do not observe at all, etc.) _____										
Fishing										
Boating (motor boat, canoe, kayak)										
Water/Jet Skiing, Paddle Boarding										
Wading										
Swimming										
St Mary's River (Tillman Road to Maumee River confluence)										
Frequency of view/visit of this Water Body (i.e. hours a day, daily, weekly, monthly, do not observe at all, etc.) _____										
Fishing										
Boating (motor boat, canoe, kayak)										
Water/Jet Skiing, Paddle Boarding										
Wading										
Swimming										
Maumee River (St Joseph River confluence to Anthony Blvd / Hosey Dam)										
Frequency of view/visit of this Water Body (i.e. hours a day, daily, weekly, monthly, do not observe at all, etc.) _____										
Fishing										
Boating (motor boat, canoe, kayak)										
Water/Jet Skiing, Paddle Boarding										
Wading										
Swimming										
Maumee River (Anthony Blvd/Hosey Dam to eastern edge of Allen County)										
Frequency of view/visit of this Water Body (i.e. hours a day, daily, weekly, monthly, do not observe at all, etc.) _____										
Fishing										
Boating (motor boat, canoe, kayak)										
Water/Jet Skiing, Paddle Boarding										
Wading										
Swimming										

APPENDIX C-3: Four Tributary Segments – Maps and Photographs

Spy Run Creek

May 5, 2020

This map is intended for general reference purposes only. The information displayed herein is not guaranteed to be completely accurate or all inclusive.

© 2015 City of Fort Wayne

Spy Run Creek

Looking Downstream from Elizabeth Street – Dry Weather

Looking Downstream from Elizabeth Street – Wet Weather

Baldwin Ditch

May 5, 2020

This map is intended for general reference purposes only. The information displayed herein is not guaranteed to be completely accurate or all inclusive.

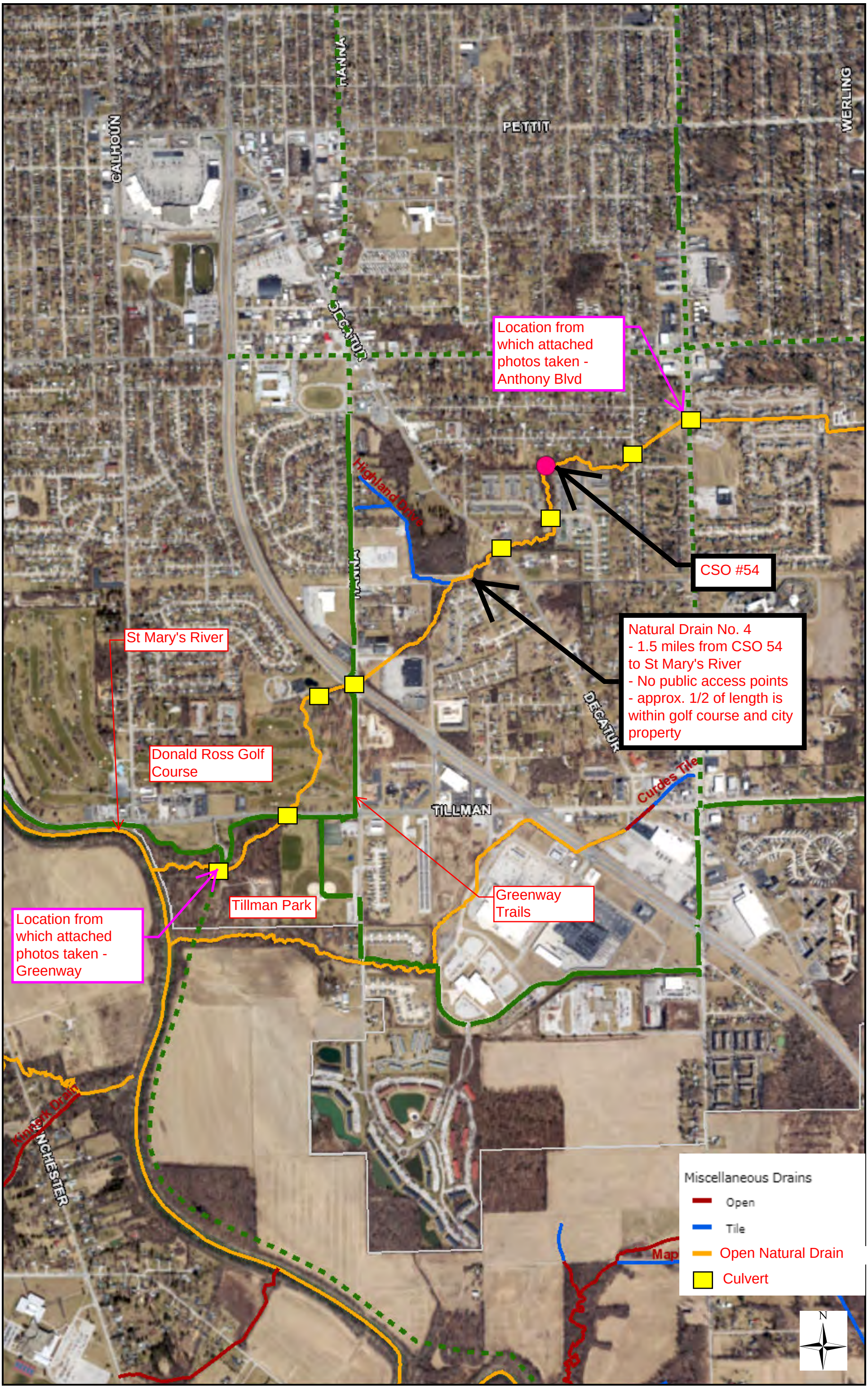
© 2015 City of Fort Wayne

Baldwin Ditch

Looking Downstream from Lake Avenue – Dry Weather

Looking Downstream from Lake Avenue – Wet Weather

Natural Drain No.4



May 5, 2020

This map is intended for general reference purposes only. The information displayed herein is not guaranteed to be completely accurate or all inclusive.

© 2015 City of Fort Wayne

Natural Drain No. 4

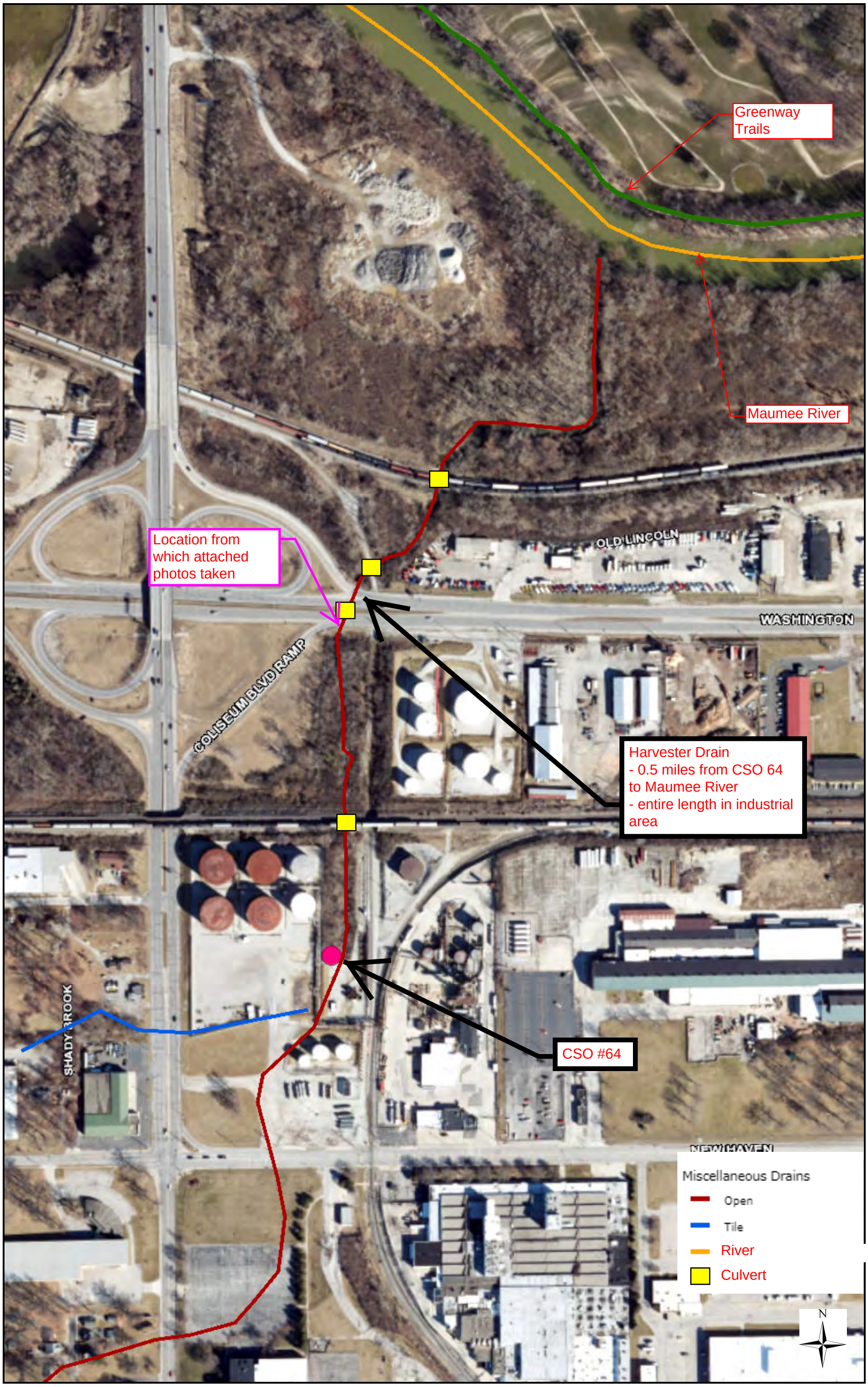
Looking Upstream from River Greenway – Dry Weather

Looking Upstream from River Greenway – Wet Weather

Looking Upstream from South Anthony Boulevard – Dry Weather

Looking Upstream from South Anthony Boulevard – Wet Weather

Harvester Drain



May 5, 2020

This map is intended for general reference purposes only. The information displayed herein is not guaranteed to be completely accurate or all inclusive.

© 2015 City of Fort Wayne

Harvester Drain

Looking Upstream from East Washington Blvd – Dry Weather

Looking Upstream from East Washington Blvd – Wet Weather

APPENDIX D: Stream Data, Legacy STORET Database

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	03-10-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	5400.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	280.00		A

Start Date:	04-14-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	3400.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	170.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	05-12-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	900.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	30.00		A

Start Date:	06-10-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	2400.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	320.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	07-14-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	160.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	100.00		A

Start Date:	08-12-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	30.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	120.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Orgenization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	09-21-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	12000.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1200.00		A

Start Date:	10-19-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31501	COLIFORM,TOT,MEMBRANE FILTER,IMMED.M-ENDO M	5600.00		A
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	710.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	11-17-1976	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	220.00		A

Start Date:	03-15-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	220.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	04-12-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	10.00		A

Start Date:	05-10-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	150.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENY MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	06-14-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	100.00		A

Start Date:	07-06-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	760.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	08-09-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1000.00		A

Start Date:	09-08-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	100.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	10-12-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	360.00		A

Start Date:	11-15-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	130.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	12-21-1977	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	2900.00		A

Start Date:	04-11-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	210.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	05-09-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	120.00		A

Start Date:	06-06-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	10.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	08-01-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	70.00		A

Start Date:	08-29-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	610.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	10-04-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	70.00		A

Start Date:	10-31-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	30.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	12-05-1978	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	2600.00		A

Start Date:	03-07-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	400.00		A

STORET LDC - Detailed Data Report

Organization Code:	211ND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	04-03-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	570.00		A

Start Date:	05-01-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	80.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	06-06-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	150.00		A

Start Date:	07-11-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	420.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	08-16-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	3200.00		A

Start Date:	09-06-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	150.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	10-18-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	870.00		A

Start Date:	11-08-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	40.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	12-06-1979	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	290.00		A

Start Date:	01-10-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	180.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	02-06-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	140.00		A

Start Date:	03-05-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	290.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	04-10-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1200.00		A

Start Date:	05-07-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	10.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana	County: Allen		
Latitude: 41deg. 5min. 22sec. N	Longitude: 85deg. 7min. 42sec. W		
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	06-05-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1600.00		A

Start Date:	07-10-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	440.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	08-07-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	2000.00		A

Start Date:	09-04-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	2900.00		A

STORET LDC - Detailed Data Report

Organization Code:	211ND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	09-30-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	2000.00		A

Start Date:	11-05-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	40.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	12-03-1980	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	240.00		A

Start Date:	01-14-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	350.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44		
	LAKE ERIE		
	MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	03-04-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	210.00		A

Start Date:	05-06-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	72.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State: Indiana		County: Allen	
Latitude: 41deg. 5min. 22sec. N		Longitude: 85deg. 7min. 42sec. W	
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	06-10-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	4400.00		A

Start Date:	07-08-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1800.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indinna	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	09-02-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	130.00		A

Start Date:	12-16-1981	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	30.00		A

STORET LDC - Detailed Data Report

Organization Code:	21IND	Organization Name:	INDIANA DEPT. ENV MNGT
Station ID:	171400	Station Alias:	STJ 0 STJ .5
Station Name:	ST JOSEPH R AT FT WAYNE AT MILE POINT 0.44 LAKE ERIE MAUMEE RIVER		
State:	Indiana	County:	Allen
Latitude:	41deg. 5min. 22sec. N	Longitude:	85deg. 7min. 42sec. W
Hydrologic Unit Code (HUC):	04100003		
Station Type Indicator Description:	Surface Water		
Legacy STORET Station Type:	/TYPA/AMBNT/STREAM		

Start Date:	01-06-1982	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	1900.00		A

Start Date:	04-07-1982	Start Time:	
End Date:		End Time:	
Sample Depth:	feet	Effluent Monitoring Code:	
UMK:		Replicate Number:	
Composite Method Code:		Pipe ID:	
Composite/Grab Number:			
Primary/Secondary Activity Category:			

Parameter Code	Parameter Long Name	Result Value	Remark Code	Composite Statistic Code
31616	FECAL COLIFORM,MEMBR FILTER,M-FC BROTH,44.5 C	660.00		A