CSO Long-Term Control Plan Amendment No. 2

prepared for the

CITY OF
WEST LAFAYETTE

December 30, 2011

WESSLER
ENGINEERING

More than a Project™

TABLE OF CONTENTS

1.0 Background 1

1.1 Combined Sewer Overflow Policy Documents 1

1.2 CSO Long Term Control Plan History 2

1.3 Location 2

1.4 Demographic Information 2

1.5 Previous Studies and Reports 2

1.6 Collection System Characterization 3

1.6.1 Overflow Structures 3

1.6.2 Service Areas and Composition 4

1.7 Wastewater Treatment Facilities Characterization 4

1.7.1 WWTP Description 4

1.7.2 Wet-Weather Treatment Facility 4

1.7.3 NPDES Permit Requirements 5

2.0 Public Participation 6

2.1 Public Involvement 6

2.2 Sensitive Areas Determination 6

2.2.1 SRCER Findings 7

2.2.2 Public Input 7

2.2.3 Additional Criteria 7

3.0 System Modeling 8

3.1 Model Development 8

3.2 Calibration 8

3.3 Model Results 9

4.0 Alternative Selection Process 10

4.1 Sensitive Areas Consideration 10

4.2 Maximization of Wet Weather Flows at the WWTP 10

4.3 Presumptive Approach 10

4.3.1 Use Attainability Analysis 11

4.3.2 Substantial and Widespread Economic and Social Impacts 12

4.3.3 Implementation and Performance 14

4.4 Design Storm Approach 15

4.4.1 Alternative 1 – Transport and Treat *16*
4.4.2 Alternative 2 – Sewer Separation *17*
4.4.3 Alternative 3 – Interceptor and Separation *18*
4.4.4 Alternative 4 – Deep Tunnel Storage *19*
4.5 Green Infrastructure and Low Impact Design Considerations 19
4.6 Cost Analysis 19
5.0 Selected Plan 21
5.1 Selected Approach 21
5.2 Selected Projects 21
5.2.1 WWF Minor Improvements *21*
5.2.2 New Interceptor *22*
5.2.3 Wet Weather Facility Expansion *22*
5.3 Implementation Schedule 23
6.0 Post-Construction Monitoring Program 25

LIST OF TABLES

Table 3.3 Existing System Model Results

Table 4.3 Approved CSO LTCP Project Implementation

Table 4.4.1 Alternative 1 Wet Weather Treatment Options

Table 4.4.2 Alternative 2 Sewer Separation and Wet Weather Treatment Options

Table 4.4.3 Alternative 3 Wet Weather Treatment Options

Table 4.6 Cost Summary

Table 5.2 LTCP Implementation Cost Opinion

Table 5.3 Proposed LTCP Implementation Schedule

LIST OF APPENDICES

Appendix A Figures

Appendix B NPDES Permit

Appendix C IDEM State Agreed Judgment and Correspondence

Appendix D Financial Information

Appendix E Flow Monitoring Report

Appendix F Modeling Calibration Comparisons

Appendix G Public Participation Information

Appendix H Opinions of Probable Costs

Appendix I Wet Weather Facility Expansion Layout Options and Cost Opinions

Appendix A - Table Of Contents

Figure A-1 Combined Sewer Area

Figure A-2 Alternative 1: Transport and Treat

Figure A-3 Alternative 2: Sewer Separation

Figure A-4 Alternative 3: Interceptor & Separation

Figure A-5 Alternative 4: Deep Tunnel

Figure A-6 Selected Plan

Appendix B - Table Of Contents

NPDES Permit

IDEM Non-Rule Policy #Water-016

Appendix C - Table Of Contents

IDEM State Judicial Agreement & Correspondence

Appendix D - Table Of Contents

City of West Lafayette Financial Information

CSO LTCP Alternatives Rate Projections

Appendix E - Table Of Contents

"West Lafayette, Indiana: Temporary Flow Monitoring Study" ADS Environmental Services, April 7, 2011

Appendix F - Table Of Contents

Model Calibration Comparison Graphs

Appendix G - Table Of Contents

Citizens Advisory Committee May 10, 2011 Meeting Notes

Citizens Advisory Committee May 10, 2011 Meeting Sign-In

December 19, 2011 Public Hearing Public Notification Proof of Publication

December 19, 2011 Public Hearing Meeting Minutes

December 19, 2011 Public Hearing Handout

Appendix H - Table Of Contents

Opinions of Probable Project Costs

H-1 Summary of Alternatives

H-2 Alternative 1a – Full Transport and Treat – WWF Storage for 1yr Storm

H-3 Alternative 1b – Full Transport and Treat – WWF Storage for 10yr Storm

H-4 Alternative 2a – Partial Sewer Separation – WWF Storage for 1yr Storm

H-5 Alternative 2b – Partial Sewer Separation – WWF Storage for 10yr Storm

H-6 Alternative 2c – Complete Sewer Separation WWF Storage for 1yr Storm

H-7 Alternative 2d – Complete Sewer Separation WWF Storage for 10yr Storm

H-8 Alternative 3a – Interceptor and Partial Sewer Separation – WWF Storage for 1yr Storm

H-9 Alternative 3b – Interceptor and Partial Sewer Separation – WWF Storage for 10yr Storm

H-10 Alternative 4 – Deep Tunnel Storage – Full Storage and Pumping

H-11 Alternative 5a – Green Infrastructure (10% Combined Service Area) – WWF Storage for 1yr Storm

H-12 Alternative 5b – Green Infrastructure (25% Combined Service Area) – WWF Storage for 1yr Storm

H-13 Summary of Alternatives Not Included in Report (WWTP Expanded to 38 MGD Peak)

H-14 Alternative 1a-2 – Full Transport and Treat – WWF Storage for 1yr Storm

H-15 Alternative 1b-2 – Full Transport and Treat – WWF Storage for 10yr Storm

H-16 Alternative 2a-2 – Partial Sewer Separation – WWF Storage for 1yr Storm

H-17 Alternative 2b-2 – Partial Sewer Separation – WWF Storage for 10yr Storm

H-18 Alternative 3-2 – Interceptor and Partial Sewer Separation – WWF Storage for 1yr Storm

Appendix I - Table Of Contents

Wet Weather Treatment Facility Expansion Layout Options & Cost Opinions

1.0 BACKGROUND

The City of West Lafayette's Combined Sewer Overflow (CSO) Long-Term Control Plan (LTCP) was developed prior to the finalization of the current federal and state CSO policy. The City entered into a State Judicial Agreement (SJA) with IDEM in 2007, which called for the implementation of the CSO LTCP over 20 years, and revised CSO language was added to the City's National Pollutant Discharge Elimination System (NPDES) Permit. A copy of the Permit and SJA are included in **Appendix B** and **Appendix C**, respectively.

In 2010 the Indiana Department of Environmental Management (IDEM) requested the City evaluate the "Design Storm Approach" found in IDEM's current CSO Policy as the installed wet-weather treatment facility (WWF) was not consistently meeting E. coli limits established in the NPDES permit. This Amendment No. 2 evaluates the current situation with a structured analysis of the combined sewer system, includes a process for the selection of alternative CSO control projects and their beneficial impacts, and recommends a cost-effective plan to meet the current CSO Policy.

1.1 Combined Sewer Overflow Policy Documents

The U.S. EPA and State of Indiana developed a CSO policy which is divided into two phases. Phase I focuses on the technology-based "nine-minimum controls" that maximize the use of the existing infrastructure, and includes the Combined Sewer Overflow Operational Plan (CSOOP) and the Stream Reach Characterization and Evaluation Report (SRCER). Phase II requires greater capital expenditures to meet water quality standards if Phase I projects prove to be inadequate, and consists of the CSO LTCP finalization and implementation.

The Indiana Department of Environmental Management (IDEM) published the Combined Sewer Overflow (CSO) Long-Term Control Plan and Use Attainability Analysis (UAA) Guidance Document (Guidance Document) in September 2001 to assist communities in preparing their LTCPs. The Presumptive Approach found in this report is based on this document. The Guidance Document states:

> *All waters in the State of Indiana are designated for full-body recreational contact use and for support of a well-balanced aquatic community. Discharges from CSO's cannot cause or contribute to violations of water quality standards, including criteria adopted to protect these uses. Senate Enrollment Act (SEA) 431 provides a mechanism whereby CSO communities may apply for targeted relief from this requirement, provided the criteria set forth in the statute are met.*

Communities that cannot totally eliminate water quality impacts caused by CSO's without incurring substantial and widespread economic and social hardship (as defined in the IDEM Guidance Document) will be able to take advantage of the relief provided by SEA 431 by temporarily suspending the designated use of the receiving stream during CSO events via an approved UAA.

In addition to the Guidance Document, IDEM subsequently published the CSO Treatment Facility Guideline Non-Rule Policy (NRP) Document, Policy Number Water-016 (included in **Appendix B**). This NRP Document states that IDEM is willing to accept, for additional evaluation as part of a community's alternatives analysis, a treatment basin alternative based on the Design Storm Approach as described by that NRP Document. A CSO treatment facility designed and operated according to that NRP Document provides a high level of CSO treatment that precludes the need for a UAA.

1.2 CSO Long Term Control Plan History

The City of West Lafayette utilized its 1996 *Wastewater Treatment Plant and Collection System Facilities Plan Amendment No. 1* as the basis of its CSO LTCP. The plan was updated in September 2001 with the *CSO Long-Term Control Plan Wet Weather Treatment Facility Update No. 1* design document. The updated plan was approved on August 28, 2007 within the State Judicial Agreement (SJA). A copy of the SJA is included in **Appendix C**. On September 1, 2008, the City of West Lafayette's NPDES Permit was revised to authorize discharge of treated combined sewage from Outfall 007 at the WWF subject to limits on E. coli. The NPDES permit also included a 36-month compliance schedule for E. coli for Outfall 007.

1.3 Location

West Lafayette is located in Tippecanoe County. The overall wastewater collection service area comprises the City of West Lafayette, Purdue University, and unincorporated areas to the north and west of the city. The service area is generally bounded by the Wabash River on the east and south, County Road 600 North and County Road 500 West to the north and west respectively.

1.4 Demographic Information

The City of West Lafayette 2010 Census population is 29,596, up 2.8% from the 2000 Census population of 28,778. The median household income is $31,885. Purdue University strongly influences the demographic makeup of the community. Over 50% of the population is between 20 and 29 years old and 60% of housing units are found in multi-unit structures.

1.5 Previous Studies and Reports

1993 *Wastewater Treatment Plant and Collection System Facilities Plan*, Greeley and Hansen – identified deficiencies in the combined sewer collection system, implemented the foundation drain disconnection program, and recommended improvements at the wastewater treatment plant (WWTP) that resulted in the 1997 plant upgrades, which increased the design average capacity by 15 percent from 7.8 MGD to 9.0 MGD.

1996 *Wastewater Treatment Plant and Collection System Facilities Plan Amendment No. 1*, Greeley and Hansen – the document that became the CSO Long-Term Control Plan focused on surcharging in the Happy Hollow interceptor and CSO reduction. It recommended improvements to the North River Road Lift Station, the River Road Relief Interceptor, and installation of a wet-weather treatment facility.

1996 (revised 2001) *Combined Sewer Operational Plan* - description and inventory of the combined sewer collection system and WWTP that recommended low-cost CSO controls including routine maintenance and administrative controls and pollution prevention programs.

2000 *Stream Reach Characterization and Evaluation Report*, Commonwealth Biomonitoring – a study of the Wabash River to determine whether CSO's contribute to the water quality impairment of the river.

2001 *Selection of Rectangular Basin over Vortex Separators: CSO Treatment Alternatives for West Lafayette, Indiana*, Malcom Pirnie – technical report comparing the performance of rectangular CSO treatment basins to vortex separators.

2001 *CSO Long-Term Control Plan Wet Weather Treatment Facility Update No. 1*, Malcom Pirnie – revision of the CSO LTCP proposing a rectangular wet-weather treatment basin and establishing the basis of design.

1.6 Collection System Characterization

West Lafayette's wastewater collection system includes both separate sanitary sewers and combined sewers. The combined sewer area is shown on **Figure A-1** (all Figures are located in **Appendix A**). There are ten lift stations in the system. Parallel interceptor sewers run along River Road. A new Western Interceptor is in the final stages of construction. The River Road interceptors transport combined sewage, and the Western Interceptor will transport separate sanitary sewage directly to the WWTP and divert it around all CSOs. The Western Interceptor, when complete, will eliminate three lift stations.

There are three permitted CSO's in the collection system along River Road: 003 at Dehart Street, 004 and 006 (considered one CSO for permitting purposes) at Quincy Street, and 005 at Wood Street. Permitted CSO 007 is located at the treatment plant at the WWF. Previous overflow points at Robinson Street and State Street have been eliminated. Each of the CSO Structures was reconstructed when the River Road parallel interceptor was constructed in 1998.

Additional details of the collection system can be found in the City's Combined Sewer Operational Plan.

Although Purdue University owns and operates its own sewer system, its flows are conveyed through the City's sewers to the WWTP and do affect CSO discharges. Its sewer system includes both separate and combined sewers, although the extent of each is not known. Eliminating combined sewers and reducing wet-weather flows in the University's sewer system could have an appreciable impact on reducing discharge frequency and volumes from the City's CSOs. It is recommended the City work with Purdue University to determine the extent of the University's combined sewers to better quantify the wet-weather flow contribution and possible means or plans to reduce it.

1.6.1 Overflow Structures

CSO 003 is located in Dehart Street approximately 50 feet west of the intersection of River Road. A 54-inch combined sewer enters the structure. A 36-inch throttle pipe directs flow to the newer 48-inch River Road interceptor and a 15-inch pipe is connected to the original 36-inch interceptor. The 54-inch overflow pipe runs from the structure to the Wabash River under an apartment complex driveway and parking lot.

CSO 004 and 006 (sometimes referred to as 004A) are located directly adjacent to one another 200 feet west of River Road along Quincy Street. CSO 004 is just south of Quincy Street contained within an 8-foot diameter precast concrete manhole. CSO 006 is located in a 9-foot diameter manhole under the Quincy Street pavement sixteen feet from CSO 004. The two structures are interconnected by a 36-inch pipe. Each structure has a 42-inch combined sewer leading to it and a 42-inch overflow pipe. The twin overflow pipes run from the structures to the river, similar to the CSO 003 pipe, under an apartment complex driveway and parking lot.

CSO 005 as it previously existed has been eliminated. However, an emergency overflow located just east of River Road in Wood Street at the intersection of the 72-inch River Road interceptor and the 54-inch Wood Street combined sewer was installed with the new River Road Interceptor. Just downstream of the structure, the River Road interceptor increases to 78 inches in diameter. The overflow weir is set 12 feet above the invert of the interceptor and only 18 inches below the top of the structure. No discharges from the structure are known to have happened since its installation. It serves to prevent flooding of River Road (State Road 43) during the most extreme wet-weather events.

1.6.2 Service Areas and Composition

The service area of the West Lafayette WWTP includes the City, Purdue University, and unincorporated areas to the west and north. The sewers within the city limits are owned and operated by the City of West Lafayette. Purdue University owns and operates its own sewers. There are combined sewers in both systems.

The sewers in the unincorporated areas west and north of the City are owned and maintained by private utilities. They are reported to be separate sanitary sewers.

1.7 Wastewater Treatment Facilities Characterization

1.7.1 WWTP Description

The existing wastewater treatment plant is a Class IV, 9.0 MGD conventional activated sludge plant with nitrification and chlorine disinfection. The plant was last expanded in 1997 to increase the flow capacities from 7.8 MGD design average flow and 10.0 MGD design hydraulic peak flow to 9.0 MGD and 22.5 MGD, respectively. This expansion kept the major processes basically the same but added new tankage and equipment to significantly increase peak treatment capacity. The expansion significantly increased the design peak capacity which has allowed more wet-weather flow to receive treatment and helped to reduce CSO discharges. The major items included a new screening building with influent bar screens, additions to grit removal process, a new raw sewage and primary effluent pump station, extension of the primary clarifiers, conversion of the aeration tanks to fine bubble with provisions for alternate feed storm mode operations, new blower building, new final clarifiers, and new office building. The plant has been well-maintained and is in good overall condition.

A major upgrade to the anaerobic digesters with co-generation and miscellaneous improvements was completed in 2008, but did not affect the flow capacities of the plant. Digested sludge is stored in a lagoon, and final disposal is by liquid land application.

Based on a review of the record information for the previous WWTP expansion, the plant is theoretically designed to handle a peak hydraulic flow of 22.5 MGD, and plant personnel are successful at achieving and often-times exceeding this peak flow capacity during wet-weather. It is believed that the first flush is successfully captured at the beginning of storm events as plant personnel routinely accept as much flow as possible up to, and sometimes beyond, the plant's design peak capacity. Flows of up to 28 MGD can be sustained on occasion for a short period of time, but then have to be throttled down to approximately 22.5 MGD due primarily to solids carry-over in the clarifiers along with other operational limitations. The plant can successfully treat flows close to 22.5 MGD for an extended period of time.

1.7.2 Wet-Weather Treatment Facility

The wet-weather treatment facility (WWF) was completed in 2003 to treat CSO discharges from Outfall 007, which previously discharged directly to the river. Flows in excess of the WWTP peak hydraulic capacity (22.5 MGD) are diverted to the WWF, which is designed for an average flow of 43 MGD and peak hydraulic flow of 113.5 MGD and has a storage capacity of 585,000 gallons. Treatment consists of settling and disinfection utilizing sodium hypochlorite and sodium bisulfate prior to discharge. Both influent and effluent flow metering is provided. Stored flows are pumped back to the WWTP for treatment after the wet-weather event.

Flows to the WWF often times exceed the design average and sometimes exceed the design peak flow capacities, and the facility has not been able to reliably and consistently meet E. coli limits which became effective September 1, 2011.

1.7.3 NPDES Permit Requirements

The City is authorized to discharge from its WWTP and WWF in accordance with NPDES Permit No. IN0024821. This permit became effective February 1, 2011 and expires January 31, 2016. A copy of the Permit and effluent limitations can be found in **Appendix B**. The City has had recent violations of its NPDES permit due to E. coli exceedances at the WWF.

2.0 PUBLIC PARTICIPATION

Establishing and maintaining public input during the development of the LTCP is an important part of the process and is required by the IDEM Guidance Document. The public participation process includes activities and tasks such as the following:

- Formation of a Citizen's Advisory Committee
- Public meetings and hearings
- Public Education
- Community notification program

2.1 Public Involvement

As a part of the Amendment No. 2 process, a Citizen's Advisory Committee (CAC) was formed. At the suggestion of the mayor, the West Lafayette Go Greener Committee was approached. The Go Greener Committee members agreed to serve as the CSO LTCP CAC. The CAC met on one occasion prior to the LTCP submittal. The meeting on May 10, 2011 was an introduction and educational presentation on combined sewers, addressing such issues as what they are, why they exist, why they need to be addressed, and what will be done. The second part of that initial meeting focused on the LTCP Amendment, why it was being done and what is was to accomplish. Finally, preliminary control alternatives were discussed. The committee stressed the need to investigate low-impact design, sustainability, and green infrastructure in the LTCP. Meeting Notes are included in **Appendix G**.

A public hearing was conducted on December 19, 2011 to present the results of the LTCP and the CAC meeting. No public input was received following the hearing and the information included in this report is the same as that presented at the hearing. A copy of the public hearing handout is included in **Appendix G**.

The City has a public education brochure available at the wastewater treatment plant. CSO information is also available on the City's website www.westlafayette.in.gov and periodic newspaper articles are planned to keep the public informed of the LTCP status and progress. The City has developed a CSO notification program for residents. A record of CSO events is available on the website and citizens can sign up to receive notices of events through West Lafayette's eNotify system. After registering with eNotify, residents will receive emails notifying them of CSO activity.

2.2 Sensitive Areas Determination

Per the IDEM Guidance Document, sensitive areas are defined as "Waters impacted by CSO discharges which must be given the highest priority for CSO discharge elimination, relocation, or control". Examples of sensitive areas include:

1. Habitat for threatened or endangered species,
2. Primary Contact Recreational Areas such as beaches and other swimming areas,
3. Drinking Water Source Waters,
4. Outstanding State Resource Waters and Outstanding National Resources Waters.

The LTCP process relied upon the Stream Reach Characterization and Evaluation Report (SRCER), public input, and additional research criteria (endangered species, outstanding resource designation, etc.) for determining sensitive areas in the CSO receiving stream.

2.2.1 SRCER Findings

The SRCER was prepared in May 2000 by Commonwealth Biomonitoring, Inc. The SRCER noted no sensitive areas along the Wabash River near West Lafayette. While the river supports aquatic life, it is unsuitable for recreational uses due to E. coli bacterial contamination. However, contamination is widespread in the river. The City of West Lafayette was noted as not being a significant contributor of E. coli.

2.2.2 Public Input

The Citizen's Advisory Committee (CAC) formed during the LTCP process determined that while there were some recreational uses of the Wabash River such as rowing, boating, and fishing, these activities do not occur during wet weather and there are no areas of the river near West Lafayette that are more sensitive than others.

2.2.3 Additional Criteria

A review of 327 IAC 2-1-2 revealed that the Wabash River is not listed as an outstanding state resource water (OSRW), and 327 IAC 2-1-11 does not list it as a designated exceptional or limited use water. The Wabash River is also not listed as an outstanding national resource water.

3.0 SYSTEM MODELING

One step listed as part of the Phase II CSO Controls is the "characterization, monitoring, and modeling as the basis for knee-of-the-curve or presumptive approach in selection of CSO control alternatives." Modeling of the sewer system simulates how the system reacts during various storm events and to determine how the system will react when changes are made or different alternative CSO controls are implemented. Modeling is a valuable tool in determining the effectiveness of CSO controls.

The West Lafayette combined sewer system was modeled using XP-SWMM. XP-SWMM was developed by XP Software and is based on Version 4.2 of the freeware EPA SWMM with proprietary and public domain enhancements. SWMM (Storm Water Management Model) is a dynamic hydrologic and hydraulic model, which characterizes storm water runoff from the onset of precipitation to discharge to the receiving stream. While it is capable of modeling both the quantity and quality of storm water runoff, no water quality modeling was completed for this particular study. It was assumed for this study that any CSO discharge would be a water quality violation due primarily to high bacteria counts.

3.1 Model Development

The West Lafayette system model was developed by Greeley and Hansen for the 1996 *Wastewater Treatment Plant and Collection System Facilities Plan*. It was updated by Malcolm Pirnie in 2001 as a part of the Wet Weather Treatment Facility design and again in 2003 to predict overflow volumes resulting from 1-year and 10-year design storms. In 2010 Wessler Engineering was provided a copy of the model in order to prepare this amendment.

The system model is primarily a model of the River Road Interceptors, with the rest of the system skeletonized into the main conveyances entering the interceptors. Wessler reviewed the record drawings for the 1998 interceptor plans and revised the model hydraulics accordingly. Wastewater Treatment Utility staff also took measurements in the CSO structures to verify weir heights and elevations. Model hydrology was adjusted during the calibration phase.

3.2 Calibration

In order for a model to accurately depict system behavior, it must be calibrated using actual field measurements. Eleven (11) temporary flow meters were installed by ADS Environmental Services upstream and downstream of each of the three regulated CSOs in the collection system and in the River Road Interceptor. Two (2) rain gauges were also installed. Flow information was also obtained from existing influent and effluent flow meters at the WWF (CSO Outfall 007) as well as the WWTP effluent. Flow rate, flow level, velocity and precipitation data was collected from the temporary flow meters from November 10, 2010 through February 16, 2011. The ADS flow monitoring report can be found in **Appendix E**. Parameters in the XP-SWMM model were adjusted to replicate actual measured flows as closely as possible based upon the measured precipitation data.

Model calibration was done in two parts: (1) dry-weather calibration to determine baseline sewage flow rates and (2) wet-weather calibration to develop rainfall/runoff relationships. The baseline flow was established by looking at days without wet-weather influence.

After the base dry-weather flow was calibrated, the flow monitoring data from rainfall events was compared to the model data for the same event. The rainfall data collected in the field was compiled and input into the model. Graphs of flow data (rate, level, and velocity) from field-collected data were compared to graphs

generated by XP-SWMM corresponding to the same pipes and/or overflows. When significant differences occurred between the recorded data and modeled output, the percentage of impervious area tributary to that conduit was changed. The greater the percentage of impervious area in a drainage basin, the greater the amount of runoff generated.

Once the volumes in the model were similar to the actual volumes measured, the slope and width of each subcatchment was adjusted to produce model hydrographs similar in shape to the flow monitoring hydrographs. The slope and width both affect the time of concentration. It was found through a sensitivity analysis that width made a greater impact on hydrograph shape than slope. So for the sake of continuity and ease, slope was based on average slope over the subcatchment and not changed. The width was set to equal the area of the subcatchment divided by the longest travel path for a drop of water then adjusted to generate a hydrograph with similar shape to the hydrographs measured. Increasing the width increases the flow peak and decreases time to peak. **Appendix F** includes comparisons of flow monitoring results to the calibrated model results for two selected storm events.

3.3 Model Results

Since the knee-of-the-curve analysis was performed previously in the original LTCP, the focus of the new modeling effort was system performance during the 1-year/1-hour (1.24" rainfall) and 10-year/1-hour (2.10" rainfall) design storms as described in the CSO Long-Term Control Plan and CSO Treatment Facility Non-rule Policy Document developed by IDEM. The Design Storm Approach criterion is described in more detail in Section 4.4.

The calibrated existing system model showed overflows occurring at the Dehart and Quincy CSOs, and flow discharged from the WWF in excess of its design average flow capacity (42 MGD).

Table 3.3: Existing System Model Results

CSO Location	*1yr Storm CSO Discharge Flow (MGD)*	*10yr Storm CSO Discharge Flow (MGD)*
Dehart St. (003)	7.5	72.4
Quincy St. North (006)	41.7	50.0[1]
Quincy St. South (004)	41.1	48.6[1]
Wet Weather Treatment Facility (007)[2]	65.3	93.6

1 Flow is limited by pipe capacity
2 CSO discharges at 007 receive partial treatment

4.0 ALTERNATIVE SELECTION PROCESS

Alternatives for CSO controls were initially selected based on four criteria: sensitive areas consideration, maximizing wet weather flow transport to the WWTP, maximizing treatment at the WWTP, and estimated cost-vs-benefit (i.e. effectiveness in reducing CSO's) based on two Approaches: (1) the Presumptive Approach and (2) the Design Storm Approach. The preliminary alternatives were then evaluated, compared with other options when applicable, and sized using the calibrated XP-SWMM system model.

4.1 Sensitive Areas Consideration

As discussed in Chapter 2, the Wabash River in does not support full-body contact along its entirety, with no one area being more sensitive than another. Therefore, no special considerations were required for this criterion.

4.2 Maximization of Wet Weather Flows at the WWTP

WWTP personnel have developed a successful wet-weather operations scheme that allows them to treat peak flows that often times exceed the peak hydraulic flow rating of 22.5 MGD. However, much more flow is transported to the plant than can be treated. A control chamber constructed at the WWTP during the River Road Interceptor project directs flows in excess of 22.5 MGD to the WWF.

The WWF has a design average flow of 42 MGD and a design hydraulic capacity of 113.5 MGD. Alternatives utilizing the existing WWF will need to improve disinfection efficiency for flows in excess of 42 MGD in order to meet NPDES permit limits for E. coli.

4.3 Presumptive Approach

The Presumptive Approach has been selected as of one of the two approaches for the basis of this Plan. The requirements for a Presumptive Approach are described in the CSO Long-Term Control Plan and Use Attainability Analysis Guidance Document developed by IDEM as Criterion 1. The Criteria reads as follows in the Guidance Document:

> *Under the presumptive approach, controls adopted in the LTCP should be required to meet one of the following criteria:*
>
> 1. *No more than an average of four overflow events per year, provided that the permitting authority may allow up to two additional overflow events per year. For the purpose of this criterion, an overflow event is one or more overflows from a Combined Sewer System as the result of a precipitation event that does not receive minimum treatment specified… This refers to untreated or inadequately treated overflow, overflows not receiving the minimum treatment of primary clarification, solids and floatable disposal, and disinfection, if necessary. Outfalls may overflow more frequently if they receive the minimum specified treatment as discussed above; or*
> 2. *The elimination or the capture for treatment of no less than 85% by volume of the combined sewage collected in the Combined Sewer System during precipitation events on a system-wide annual average basis. Under Criterion 2, the "85 percent by volume of the combined sewage" refers to 85 percent of the total volume of flow collected in the CSS during precipitation events on a system-wide, annual average basis (not 85 percent of the volume being discharged)….*

The minimum level of treatment applicable to above Criteria 1 is defined in EPA's CSO Control Policy as follows:

- *Primary clarification; removal of floatable and settleable solids may be achieved by any combination of treatment technologies or methods that are shown to be equivalent to primary clarification of 30% removal;*
- *Solids and floatable disposal; and*
- *Disinfection of effluent, if necessary, to meet water quality standards, protect designated uses and protect human health, including removal of harmful disinfection residuals, where necessary."*

Full implementation of West Lafayette's current CSO LTCP is intended to meet the performance criteria of the Presumptive Approach by effectively capturing or treating 97% of wet weather volume (West Lafayette *CSO Long-Term Control Plan Wet Weather Treatment Facility Update No. 1*, p. 5-1).

Neither the City's current NPDES Permit nor its State Judicial Agreement mandate a Use Attainability Analysis. However, the approved plan stated CSO 003, 004 and 006 were "not expected to discharge except under extreme rainfall events", and all flow discharged at the WWF (CSO 007) would receive screening, solids settling and disinfection. If CSO discharges continue after full implementation of the original LTCP, a Use Attainability Analysis will likely be required.

4.3.1 Use Attainability Analysis

Rivers, lakes and streams are used for a variety of purposes. For the purpose of the LTCP, uses are categorized into two types, "existing use" and "designated use". These terms are defined in IDEM's CSO LTCP Guidance Document. "Existing use means a use actually attained in the water body…whether or not it is included in the water quality standards". A body of water within a community may have several existing uses. Commercial, industrial, recreational, preservation and/or municipal are some possible existing uses.

Per the Guidance Document, "Designated uses are those uses specified in water quality standards for each water body or segment whether or not they are being attained." **All waters are designated by the State of Indiana for full-body contact recreational use.**

All CSOs within the City of West Lafayette discharge to the Wabash River. Existing uses for the river include limited fishing and boating. During significant wet-weather events, full-body contact (i.e., swimming) and fishing is discouraged and likely unattainable due to associated increases in flow and river levels, dangerous conditions due to current and debris, and E. coli bacterial contamination by sources other than CSOs.

According the IDEM's CSO LTCP Guidance Document a designated use cannot be removed, but through a Use Attainability Analysis (UAA), the use may be temporarily suspended. To utilize a UAA a CSO community must demonstrate the following (per the Guidance Document):

1. The designated use is not an existing use;
2. Attaining the designated use is not feasible due to one of the following six factors;
   (1) High pollutant concentrations are naturally occurring and not attributed to CSO events;
   (2) Low water levels or intermittent low flow conditions do not allow for the designated use;

(3) A human-caused condition or pollution source can either not be remedied or would cause additional environmental damage if remedied;

(4) CSO management structures or the operation of such structures will prevent the designated use;

(5) With regards to protecting aquatic life, the proper physical conditions are not present to support the designated use; or

(6) The implementation of the CSO LTCP will result in a substantial and widespread economic and social impact.

3. The use cannot be attained by implementing effluent limits required under section 301(b) and 306 of the Clean Water Act and cost-effective and reasonable best management practices for non-point source control; and

4. The suspension will not affect the attainment and maintenance of the water quality standards of downstream waters.

As noted above, the Wabash River in West Lafayette does not appear to be routinely used for full-body contact recreational purposes during significant wet weather and therefore does not possess an existing recreational use during such periods. Through the SRCER, it was determined that water quality is impaired prior to reaching the City. Due to the large drainage basin of the Wabash River upstream of West Lafayette and the vast and numerous non-point sources that are outside the jurisdiction and control of the City, best management practices for non-point source controls would not be a reasonable or cost-effective option to attain the use of the river. Due to these upstream conditions and non-point sources being the dominant factor affecting water quality of the river, the designated use suspension and subsequent CSO discharges alone will not affect the attainment and maintenance of the water quality standards of downstream waters.

While the Wabash River does possess background levels of E. coli pollution that would preclude recreational use, factor 3, "A human-caused condition or pollution source can either not be remedied or would cause additional environmental damage if remedied," has not previously been allowed on its own as justification for temporary suspension of a designated use. It is the belief of IDEM that man-made sources can always be limited through the implementation of Best Management Practices (BMPs). Therefore, demonstrating factor 6, "The implementation of the CSO LTCP will result in a substantial and widespread economic and social impact," is the most prevalent justification used in a UAA.

4.3.2 Substantial and Widespread Economic and Social Impacts

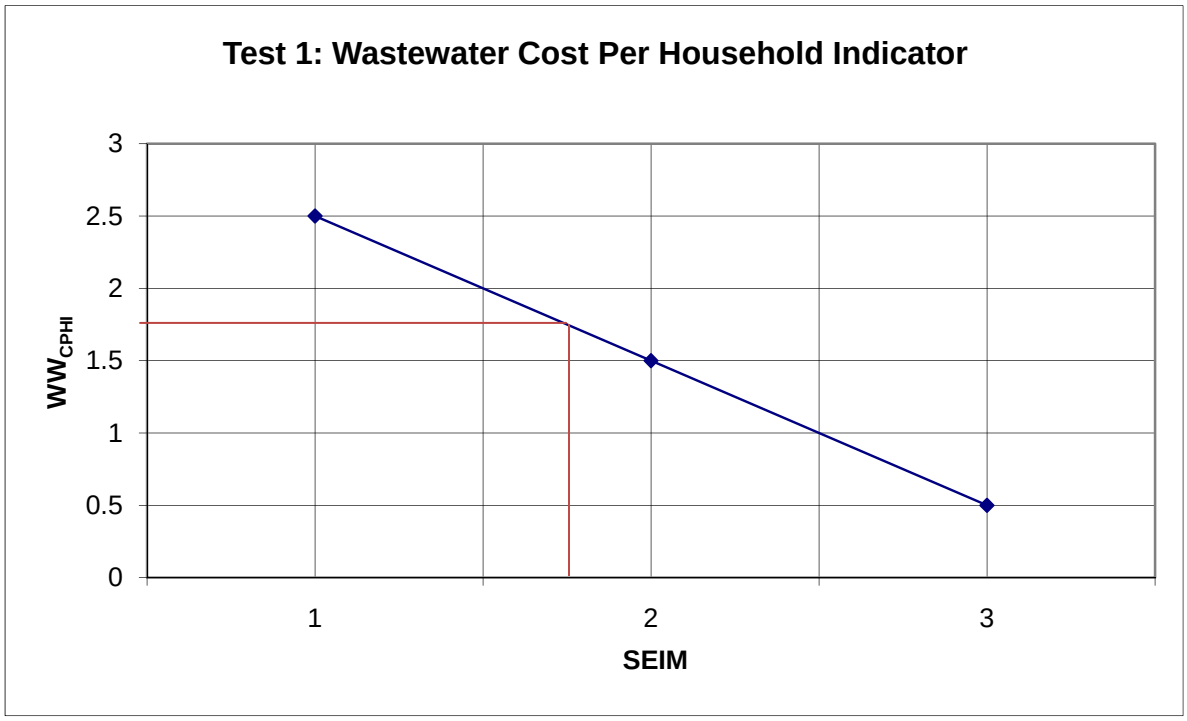
According to IDEM's Guidance Document, CSO municipalities may use a series of three tests to demonstrate a Substantial and Widespread Economic and Social Impact (SWESI) has been met. If the municipality does not meet the first test, the next test is conducted.

Test 1 is the Wastewater Cost Per Household Indicator (WW_{CPHI}). WW_{CPHI} represents sewer bills as a percentage of the median household income (MHI) for the community. **Appendix D** contains West Lafayette's financial data, rate analysis, and WW_{CPHI} analysis.

The WW_{CPHI} is compared to the Socio-Economic Indicator Matrix (SEIM) score, which is also calculated in **Appendix D**.

West Lafayette's Socio-Economic Indicator Matrix (SEIM) Total = 1.7

The WW_{CPHI} and SEIM values are compared on the following chart provided by IDEM:



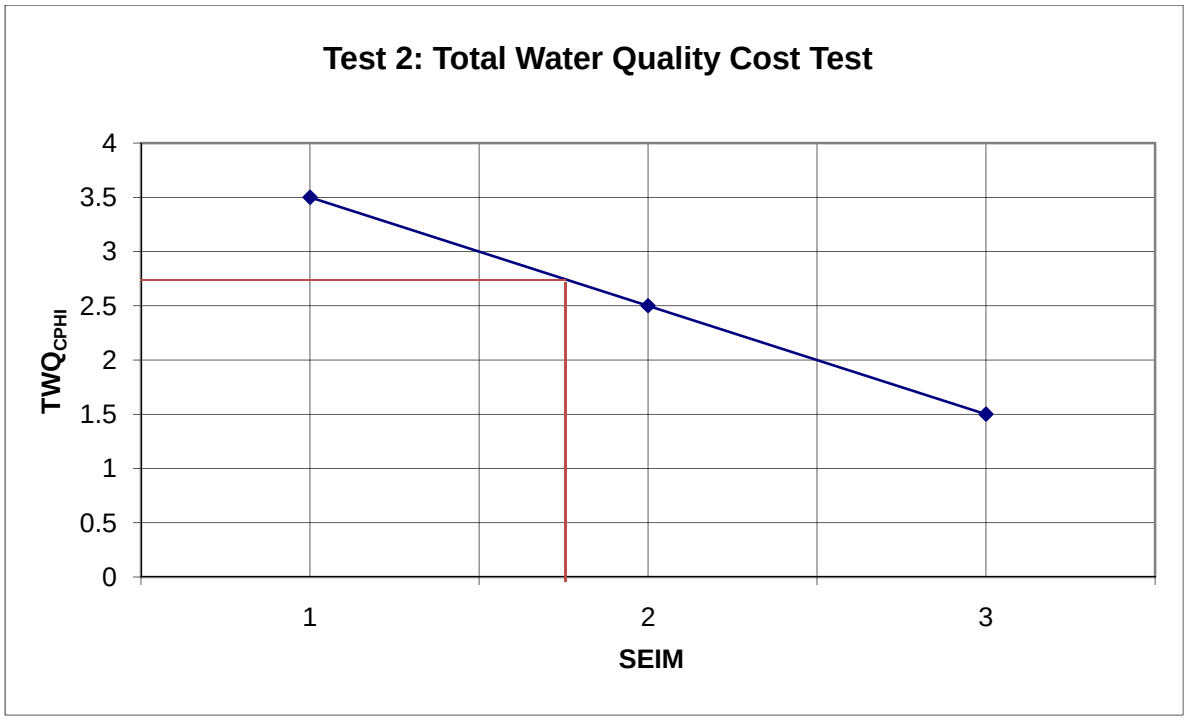
If the point at which the WW_{CPHI} and SEIM values meet is positioned on or above the diagonal line shown, then a SWESI has been demonstrated. With a SEIM of 1.7, the corresponding minimum WW_{CPHI} is 1.8.

When factoring in the City's MHI and number of sewer customers, the WW_{CPHI} of 1.8 roughly equates to a residential sewer rate of $580/year, or $48/month. Therefore, in order to meet the SWEI criterion for UAA, the resulting CSO LTCP cost would be approximately $50,000,000. Financial information, calculations, and rate projections are located in **Appendix D**.

Test 2 utilizes the Total Water Quality (TWQ) cost as compared to SEIM. TWQ cost includes:

- Existing and anticipated wastewater costs
- Wastewater Long Term Control Plan Implementation costs
- Existing and anticipated storm water control costs
- Existing and anticipated nonpoint source control costs
- Existing and anticipated drinking water costs

TWQ_{CPHI} is compared to SEIM on the following chart:



If a plot of TWQ_{CPHI} versus SEIM lands above the graphed line, then a SWESI has been demonstrated.

Test 3 - Finally, IDEM may consider additional change in socioeconomic factors in determining SWESI. It is not anticipated that this third test would apply to West Lafayette.

4.3.3 Implementation and Performance

West Lafayette's approved original LTCP, based upon the Presumptive Approach, is nearing full implementation. Table 4.3 lists the original LTCP projects and their completion dates.

The main line of the Western Interceptor (Divisions I through IV) is installed. Division V is currently being constructed with completion anticipated for February 2012 and includes connection of the existing sewers to the new interceptor, abandoning lift stations, and re-directing sanitary flow to the new interceptor. Upon completion of Division V, the original LTCP will be fully implemented.

Bringing the Western Interceptor online will reduce sanitary flows in the combined sewer system and should reduce CSO discharges from 003, 004 and 006. However, it is not certain that overflows will be reduced to the level required in the Presumptive Approach by the Guidance Document. Furthermore, the WWF is not consistently and reliably meeting the NPDES Permit limit of 235 colonies/100mL daily maximum for E. coli during storm events. While the CSO LTCP states that the WWF will provide full treatment for flows up to 42 MGD and partial treatment of flows up to 113.5 MGD, flow-based limits are not included in the current NPDES permit.

In order to meet the requirements of the Presumptive Approach, West Lafayette would either (1) need to make the improvements required to no longer have untreated discharges, thereby making suspension of the designated use through UAA unnecessary, or (2) complete a UAA and implement CSO reduction measures to a point where the cost of implementation creates Substantial and Widespread Economic and Social Impact (estimated total LTCP cost of $50,000,000).

Table 4.3: Approved CSO LTCP Project Implementation

LTCP Project	*Year Completed*
Wastewater Treatment Plant (WWTP) Upgrades	1997
North River Road Lift Station	1999
River Road Parallel Interceptor	2001
Happy Hollow Interceptor Rehabilitation	2002
Wet Weather Treatment Facility	2003
WWTP Anaerobic Digester Improvements	2007
Western Interceptor (Division I)	2007
Western Interceptor (Division II)	2008
Western Interceptor (Division III)	2009
Western Interceptor (Division IV)	2011
Western Interceptor (Division V)	February 2012 (anticipated)

4.4 Design Storm Approach

The Design Storm Approach has been selected as the second approach for the basis of this LTCP. It is believed that the City can meet the requirements described in the CSO Long-Term Control Plan and CSO Treatment Facility Non-Rule Policy Document developed by IDEM as outlined under the CSO Treatment Facility Design Criteria. The Criteria reads as follows in Non-Rule Policy Document Water-016:

6.A. CSO Treatment Facility Design Criteria

In developing information concerning CSO Treatment Facilities, CSO Communities should evaluate facilities designed to meet the following general criteria:

1. *Retention, for transportation to and treatment at the wastewater treatment plant ("WWTP"), of flows generated during storms no smaller than the "One Year, One Hour Storm." These alternatives should also provide for the transport of this entire volume to the WWTP and the full treatment of that same entire volume within 48 hours.*
2. *Treatment of combined sewage flows generated during storms no smaller than the "Ten Year, One Hour Storm," which includes, at a minimum, the following:*
    a. *The detention of flows for settling that achieves the Total Suspended Solids ("TSS") control described in 6.B.10 with the ten year one hour peak hourly flow retained for no less than 30 minutes.*

b. Skimming of the detained flows to remove solids and floatables.
c. Disposal of the solids and floatables in accordance with any applicable solid waste disposal laws and regulations.
d. Disinfection of all detained flows, to the effluent level set forth in 6.B.9.
e. Dechloriniation, if necessary, so that the effluent from the CSO Treatment Facility does not exceed the Total Residual Chlorine ("TRC") level set forth in 6.B.9.

3. Combined sewage flows in excess of the "Ten Year One Hour" (or higher) designed storm used for sizing of the CSO Treatment Facility should receive whatever treatment is feasible given capacity limitations at the CSO Treatment Facility and the WWTP.

6.B. Other Assumptions and Criteria to Use in Evaluating a CSO Treatment Facility

The following assumptions and design criteria should be applied when considering inclusion of a CSO Treatment Facility in the alternatives analysis in accordance with this non-rule policy document:

9. Disinfection should be controlled to achieve the daily maximum E. Coli concentration of 235/100 ml. If disinfection is carried out using chlorine or hypochlorite, dechlorination must be employed to meet a maximum TRC of 0.06 mg/l.

10. Combined sewage facilities should be designed and operated to meet an appropriate level of TSS control to ensure effective disinfection.

Therefore, the goal of the Design Storm Approach for the LTCP is to provide CSO controls during the design storms as described by the criteria above. This will enable the City to "provide a high level of CSO treatment that precludes the need for a use attainability analysis" according to IDEM's Non-Rule Policy. In order to attain this goal, alternatives must be evaluated for each overflow and its tributary sub-area. The 10-year/1-hour storm (2.10 inches of rain in 1 hour) was used for the modeling analysis of overflows at each outfall. The 1-year/1-hour storm (1.24 inches of rain in 1 hour) was used to determine the storage requirement at the wet weather treatment facility. Additional wet weather flows in excess of the 1-year/1-hour (1/1) and up to the 10-year/1-hour (10/1) storm were used to determine the primary treatment and disinfection treatment rate necessary as described in the Non-Rule Policy referenced above.

4.4.1 Alternative 1 – Transport and Treat

The original LTCP employs a "transport and treat" CSO control strategy, meaning that the emphasis is on capture of combined sewage flows rather than elimination through source control. Following the Design Storm Approach criteria, conveyances must be sized to allow the 10/1 storm to reach the wet-weather treatment facility without discharge at the collection system CSO's. The existing River Road Interceptors do not possess sufficient capacity for the estimated 10/1 storm flows.

The option of remote (at or near the CSO discharges) storage and/or treatment of CSO discharges was considered, but due to the densely developed areas surrounding the CSO structures and outfall lines, lack of available space, and very close proximity to residential and commercial areas, this option was discarded. The City's original LTCP also considered these options and reached the same conclusion.

Alternative 1 includes the installation of a third interceptor located upstream of CSO's 003, 004 and 006. For conceptual planning and estimating purposes the interceptor is assumed to begin at the intersection of Rose St. and Dehart St., follow Rose St. south to Stadium Ave, travel west along Stadium to Salisbury St., then south to the end of Salisbury St. The final leg of the interceptor runs east along Williams St. to River Road

and south along River Road to the headworks of the treatment plant. The interceptor route is illustrated in **Figure A-2**. Note that the route shown is conceptual at this time and is subject to change upon future study.

With the additional flows from the proposed interceptor, an expansion and improvements will be required at the WWF in order to meet the Non-rule Policy Document Water-016 criteria. The existing WWF has a storage capacity of 585,000 gallons and design peak hydraulic flow of 113.5 MGD. Two main options were evaluated for expansion of the WWF. **Option A** provides additional storage capacity of the 1/1 storm volume and treatment/disinfection of flows from storms greater than 1/1 up to 10/1. Flows in excess of those seen during the 10/1 will receive treatment to the fullest extent possible but likely will not meet the minimum level of treatment, including E. coli levels. The stored volume is sent back to the WWTP headworks for full treatment. **Option B** is to store the 10/1 storm such that no additional treatment is required. All flow would be sent to the WWTP for treatment after the storm event; flows exceeding the 10/1 storm flows will receive treatment to the fullest extent possible but likely will not meet the minimum level of treatment, including E. coli levels. **Table 4.4.1** summarizes Alternative 1 WWF capacities.

Table 4.4.1 Alternative 1 Wet Weather Treatment Options

Alternative 1 Option	*WWF Storage Volume*	*WWF Peak Treatment Rate*
a – Store 1/1, Treat up to 10/1	2.5 million gallons	150 MGD
b – Store 10/1	5.8 million gallons	N/A*

** Storms up to 10/1 are fully stored, then sent to the WWTP for treatment*

Opinions of Probable Project Cost for Alternatives 1a and 1b can be found in **Appendix H**. Cost opinions for WWF expansion options included within these Alternatives are included in **Appendix I**.

4.4.2 Alternative 2 – Sewer Separation

The second method of CSO reduction investigated was source control through sewer separation. It was assumed that new sanitary sewers would be installed in areas ultimately selected for separation. The existing combined sewers would remain as storm sewers and the CSO structures would be reconfigured. A number of options were analyzed under Alternative 2. They are listed in **Table 4.4.2** and illustrated in **Figure A-3**. Note that the areas shown for separation are conceptual and meant to show the magnitude of the area estimated to be separated, and not meant to indicate the exact area. Should sewer separation be pursued, the exact areas deemed most suitable would be determined in future studies.

Table 4.4.2 Alternative 2 Sewer Separation and Wet Weather Treatment Options

Alternative 2 Option	*Sewer Separation Description*	*WWF Storage and Treatment*
a – Partial Separation, Store 1/1, Treat up to 10/1	Separate 262 acres of service area upstream of CSO's 003, 004 and 006. No CSO's for rainfall events up to 10/1.	1.1 million gallons storage 104 MGD treatment rate
b - Partial Separation, Store 10/1	Separate 262 acres of service area upstream of CSO's 003, 004 and 006. No CSO's for rainfall events up to 10/1.	2.9 million gallons storage No treatment rate required
c - Full Separation, Store 1/1, Treat up to 10/1	Separate the entire 003, 004 and 006 service areas (497 acres) and abandon the CSO structures. The 007 area would remain combined.	206,000 gallons of storage (less than existing capacity) 60 MGD treatment rate
d - Full Separation, Store 10/1	Separate the entire 003, 004 and 006 service areas (497 acres) and abandon the CSO structures. The 007 area would remain combined.	1.3 million gallons storage No treatment rate required

Opinions of Probable Project Cost for Alternatives 2a through 2d can be found in **Appendix H**. Cost opinions for WWF expansion options included within these Alternatives are included in **Appendix I**.

4.4.3 Alternative 3 – Interceptor and Separation

Alternative 3 investigated a hybrid approach of Alternatives 1 and 2: provide partial sewer separation in the CSO 003 service area and install a smaller interceptor sewer from the WWTP to the Quincy Street CSO's (004 and 006). Again, options were developed for WWF performance to compare storage and treatment requirements. Those options are summarized in **Table 4.4.3**.

95 acres upstream of CSO 003 were assumed to be separated through the installation of new sanitary sewers. In the separated area, the existing combined sewers would be utilized as storm sewers. The remaining combined sewers would be routed to the existing River Road Interceptor and there would be no CSO discharges for storms up to the 10/1. All of the 004, 006 and 007 area combined sewers would remain, but a new interceptor (See **Figure A-4**) would route flows from storms up to the 10/1 directly to the WWTP.

Table 4.4.3 Alternative 3 Wet Weather Treatment Options

Alternative 3 Option	*WWF Storage Volume*	*WWF Peak Treatment Rate*
a - Store 1/1, Treat up to 10/1	2.2 million gallons	130 MGD
b – Store 10/1	5.1 million gallons	N/A

Opinions of Probable Project Cost for Alternatives 3a and 3b can be found in **Appendix H**. Cost opinions for WWF expansion options included within these Alternatives are included in **Appendix I**.

4.4.4 Alternative 4 – Deep Tunnel Storage

The fourth and final alternative is construction of a deep tunnel. The tunnel would provide storage of wet weather flows in excess of WWTP capacity (22.5 MGD) for storm events up to the 10/1. The preliminary tunnel location is based upon the Alternative 1 interceptor route as shown in **Figure A-5**. An approximate 5,000-foot long, 15-foot diameter tunnel providing over 6 million gallons of storage capacity was assumed in the modeling. New connecting sewers and a deep tunnel pump station are also required in this Alternate. Expansion of the WWF would not be required. The Opinion of Probable Project Cost for Alternative 4 can be found in **Appendix H**.

4.5 Green Infrastructure and Low Impact Design Considerations

CSO communities throughout the country are implementing green infrastructure (GI) and low-impact design (LID) features as source control in order to reduce CSO impacts. IDEM has encouraged CSO communities to implement GI/LID, and the West Lafayette Citizens Advisory Committee was favorable to investigating and implementing these features as well.

The City of West Lafayette is currently investigating GI improvements as a part of its Wet Weather Program. A $2.5 million project has been proposed under a separate study for "The Island", an urban area within the city limits that is surrounded by Purdue University, which involves installing rain gardens and rain barrels. This project and similar GI/LID projects would reduce the amount of stormwater runoff entering the combined sewer, but they cannot cost-effectively achieve the level of performance required by the CSO Guidance Document. Retrofitting urbanized areas with GI can cost over $1.50/square foot of contributing drainage area. With 730 acres of combined sewer area, a solution relying solely on GI would exceed $48,000,000 in construction costs and would not achieve the 10-year control required in the Design Storm Approach. Alternative 5 was developed to incorporate GI features within Alternative 1a as an example of a LTCP alternative with GI features and to evaluate its impact on reducing interceptor and WWF expansion requirements. The Opinion of Probable Project Cost for Alternative 5 can be found in **Appendix H**. Cost opinions for the WWF expansion options included with these Alternatives are included in **Appendix I**.

It is recommended that the City continue to evaluate and encourage GI/LID in new developments, redevelopment, and in targeted locations. As GI is implemented, its impacts can be assessed and the proposed CSO LTCP improvements can be re-evaluated in the future and re-sized where appropriate.

4.6 Cost Analysis

The opinions of probable project cost for each alternative are summarized in **Table 4.6**.

Table 4.6 Cost Opinion Summary

Alternative	***Description***	***Opinion of Total Cost***
Presumptive Approach	Improvements to existing WWF and collection system to the extent that Substantial and Widespread Economic and Social Impact level is attained.	$50,000,000
Design Storm Approach		
Alternative 1a	Transport and treat. New interceptor sewer, WWF storage for 1/1, WWF treatment up to 10/1	$24,500,000
Alternative 1b	Transport and treat. New interceptor sewer, WWF storage for 10/1	$34,400,000
Alternative 2a	Partial sewer separation in areas 003, 004 & 006, WWF storage for 1/1, WWF treatment up to 10/1	$35,100,000
Alternative 2b	Partial sewer separation in areas 003, 004 & 006, WWF storage for 10/1	$43,700,000
Alternative 2c	Complete sewer separation of areas 003, 004 & 006, WWF storage for 1/1, WWF treatment up to 10/1	$54,700,000
Alternative 2d	Complete sewer separation of areas 003, 004 & 006, WWF storage for 10/1	$59,500,000
Alternative 3a	Interceptor to CSO 004/006, partial sewer separation in area 003, WWF storage for 1/1, WWF treatment up to 10/1	$28,400,000
Alternative 3b	Interceptor to CSO 004/006, partial sewer separation in area 003, WWF storage for 10/1	$44,300,000
Alternative 4	Deep tunnel storage – 10/1 control	$47,500,000
Alternative 5a	Green Infrastructure (10% of combined service area), new interceptor sewer, WWF storage for 1/1, WWF treatment up to 10/1	$33,300,000
Alternative 5b	Green Infrastructure (25% of combined service area), new interceptor sewer, WWF storage for 1/1, WWF treatment up to 10/1	$42,800,000

5.0 SELECTED PLAN

The recommended Plan, Alternative 1a, is anticipated to provide the City of West Lafayette with CSO control consistent with IDEM's Combined Sewer Overflow Long-Term Control Plan and Use Attainability Analysis Guidance Document at the least financial impact to rate payers. **Figure A-6** illustrates the selected plan.

5.1 Selected Approach

The two alternate approaches evaluated in this LTCP are the Presumptive Approach (4 CSO's per year on an annual basis) and the Design Storm Approach (no untreated CSO events for storms up to the 10-year/1-hour rainfall event). The City of West Lafayette has elected to follow the recommended Design Storm Approach compliant with Non-Rule Policy Number Water-016.

As noted in **Table 4.6**, there is no cost advantage to pursuing the Presumptive Approach. Regardless of performance, the Presumptive Approach and Use Attainability Analysis (UAA) require spending to a limit which raises sewer bills to a defined level of substantial and widespread economic and social impact in order to attain a temporary suspension of water quality standards under the Limited Wet Weather Use subcategory as defined by Senate Enrollment Act (SEA) 620. Furthermore, the UAA would have to be updated every five years, creating a moving target for compliance that will likely increase the LTCP costs over time. The design storm approach is based upon meeting water quality requirements without the need for a UAA.

5.2 Selected Projects

For the City of West Lafayette to meet the Phase II requirements of the Indiana CSO Strategy, the following projects are included within Alternative 1a:

1) WWF Minor Improvements
2) New Interceptor – Phase 1
3) New Interceptor – Phase 2
4) WWF Expansion

Table 5.2 LTCP Implementation Cost Opinion

Item	*Opinion of Project Cost*
WWF Minor Improvements	TBD – to be separated out of WWF Expansion Cost listed below once scope is determined
New Interceptor – Phase 1	$8,000,000
New Interceptor – Phase 2	$5,500,000
WWF Expansion	$11,000,000

5.2.1 WWF Minor Improvements

While a full WWF expansion is included as the final CSO LTCP project (see **Table 5.3**), improvements are proposed that could be made sooner to improve treatment and operations. Such improvements have not yet been fully evaluated and determined, but could include chlorine mixing improvements, a new effluent flow meter in the outfall pipe to function under higher river levels and submerged conditions, possibly raising the interior walls to operate at a higher river level without short circuiting, and CSO screen improvements. Many

of these potential improvements are included in the proposed WWF Expansion described below and included in its cost opinion, and would be separated out if included in the WWF Minor Improvements project. The cost opinion for these improvements will be developed once the scope of the project has been determined.

5.2.2 New Interceptor

The construction of a new combined sewer interceptor is to be implemented in two phases. For planning and estimating purposes, it is assumed that Phase 1 will consist of 84 and 78-inch pipe between the Quincy Street CSO's (004 and 006) and the WWTP. Phase 2 would include 60 and 54-inch pipe between Quincy Street and Dehart Street and modifications to the existing CSO diversion structures.

Although this option is based on a new interceptor to the WWTP sized for the anticipated 10/1 design storm flows, the City reserves the right to evaluate and pursue other potential options in the future which can store, transport, reduce design flows, or reduce the sizing of a new interceptor or conveyance facilities, such as a deep tunnel alternative, in-line storage, GI/LID projects (e.g., rain gardens), and other potential solutions should those options achieve the end-goals and prove cost-effective.

5.2.3 Wet Weather Facility Expansion

Under the selected Alternative 1a, the proposed WWF Expansion would provide 2.5 to 2.8 MG of storage for the 1/1 storm event and a treatment rate of 150 MGD for up to the 10/1 storm event, and includes the following general items:

- Raise CSO screens 2 feet
- Raise interior walls 2 feet
- Expand the structure by adding 9 passes to the existing 3 passes (total of 12) (Layout Option 8)
- Chlorine mixing improvements
- New effluent flow meter
- New flush gates for the additional passes
- Expansion of the disinfection system equipment
- New dewatering pumps and piping
- Associated electrical and I&C

An itemized breakdown of the cost opinion for the WWF Expansion and WWF basic layout options are included under Alternative 1a in **Appendix I**.

Although this option is based on expansion of the WWF consistent with the existing structure and process equipment, the City reserves the right to evaluate and pursue other potential options in the future, such as high-rate sedimentation, high rate treatment/disinfection (e.g., swirl concentrators), UV disinfection, and other potential solutions should those options achieve the end-goals and prove cost-effective.

Currently, the performance of the WWF is compromised when the Wabash River level reaches approximately 13 feet due to submergence of the tank walls and short-circuiting. The proposed improvement of raising the walls by 2 feet will allow the WWF to avoid submergence and short-circuiting up to a river level of approximately 15 feet, which occurs infrequently. It should be noted that during flood conditions when the river level exceeds approximately 13 feet for the interim, and approximately 15 feet after the walls and screens are raised, that the WWF performance will continue to be compromised, and it is unrealistic to expect the City to meet E. coli limits under these extreme and rare occurrences. In addition, it is also unrealistic to

expect the WWF to consistently and reliably meet E. coli limits until all proposed LTCP projects are completed and the LTCP is fully implemented.

5.3 Implementation Schedule

The proposed LTCP implementation schedule is listed in **Table 5.3** based on the projects included in Alternative 1a. An initial period of 12 months is included for post-construction monitoring to evaluate and quantify the impact of the Western Interceptor on reducing CSOs and improving performance of the WWF. Should the initial post-construction monitoring indicate results that are better or worse than anticipated in the sewer modeling performed for this study, the proposed LTCP projects may need to be revisited or adjusted to compensate for the varying results.

TABLE 5.3: Proposed LTCP Implementation Schedule

TASK	***DURATION****	***COMPLETION DATE***
Post-Construction Monitoring		
Upon completion of the Western Interceptor – Division V	12 months	March 2012 thru February 2013
Project 1: WWF Minor Improvements		
Study/PER	4 months	July 2013
Design	5 months	December 2013
Permitting	4 months	April 2014
Bidding/Bonds/Financial	5 months	September 2014
Construction	10 months	July 2015
Post-Construction Monitoring	12 months	June 2016
Project 2: New Interceptor – Phase 1		
- Study/PER	6 months	December 2016
- SRF Review/approval*	4 months	April 2017
- Design	8 months	December 2017
- Permitting	4 months	April 2018
- Bidding/Bonds/Financial	5 months	September 2018
- Construction	14 months	November 2019
Project 3: New Interceptor – Phase 2		
- Study/PER update	4 months	April 2020
- SRF Review/approval*	4 months	August 2020
- Design	8 months	April 2021
- Permitting	4 months	August 2021
- Bidding/Bonds/Financial	5 months	January 2022
- Construction	14 months	March 2023
- Post-Construction Monitoring	12 months	February 2024
Project 4: WWF Expansion		
- Study/PER	5 months	July 2024
- SRF Review/approval*	4 months	November 2024
- Design	8 months	July 2025
- Permitting	4 months	November 2025
- Bidding/Bonds/Financial	5 months	April 2026
- Construction	15 months	July 2027
- Post-Construction Monitoring	12 months	June 2028

- Overall schedule assumes IDEM approval of LTCP by July 2012
- *Assumes project funding through State Revolving Fund (SRF) Loan Program
- All project timelines dependent upon timeliness of reviews and schedule limitations of funding agencies
- Per 2007 SJA, LTCP implementation must be complete by September 1, 2027

6.0 POST-CONSTRUCTION MONITORING PROGRAM

The post-construction compliance monitoring program will consist of the following:

1) Record rainfall using a depth/duration data logging rain gauge;
2) Conduct a flow study prior to expansion of the WWF and recalibrate the hydraulic model to replace assumed performance of selected projects with measured data;
3) Meter flows discharged from the WWF;
4) Sample WWF discharges for E. coli and total residual chlorine;
5) Meter overflows for duration and volume at selected CSO's with the City's current metering equipment;
6) Record the above information and keep on file.

Collected rainfall data will be used to confirm there are no CSO discharges from the collection system overflows due to rain events smaller than a 10-year/1-hour storm and that releases from the WWF are occurring only from storms greater than the 1-year/1-hour storm.

The hydraulic model will be used to determine design flow rates and storage volume for the WWF expansion. Flow monitoring in the system and at the WWTP will be conducted as part of the Post-Construction Monitoring phase of Project 3 – New Interceptor-Phase 2, as listed in **Table 5.3**. The flow study results will be used to recalibrate the model in order to more accurately estimate the design flow and volume required for the design storm rainfall amounts. In this way flow data can also be used to validate performance. For example, if a 1-year/2-hour storm results in a higher flow rate than a 1-year/1-hour storm, having a treated release at the WWF will be acceptable.

Due to background conditions and non-point sources which contribute to the degraded water quality upstream of the City, it would not be productive to conduct bio-assessments and sediment sampling of the river, as these would show influences from the background conditions and not accurately reflect the impact from the CSO's. The above listed program would be much more useful in monitoring and quantifying the CSO impacts. The City will review the information collected above on an annual basis. An annual review will provide a periodic evaluation of the effectiveness of each control project throughout the implementation schedule, and also provide a comparison of the monitoring results with the predicted project results determined by the system modeling. An annual review of this information will allow for short durational fluctuations in weather patterns to average out over time. Necessary system modeling updates and control project modifications can be made between review periods in an effort to obtain the projected results of the overall Plan.

In addition, in accordance with the Guidance Document and SEA 431, the City will review the feasibility of implementing additional or new control alternatives to attain water quality standards if they are not being met. The City will conduct a periodic review five (5) years after approval of the LTCP for the following:

1) Document to IDEM that the LTCP has been reviewed;
2) Update the LTCP as necessary to document the results of the post-construction monitoring of the implemented projects;
3) Submit amendments to the LTCP to IDEM for approval (if deemed necessary);
4) Implement control alternatives determined to be cost-effective.

APPENDIX A

Figures

Figure A-1 Combined Sewer Area

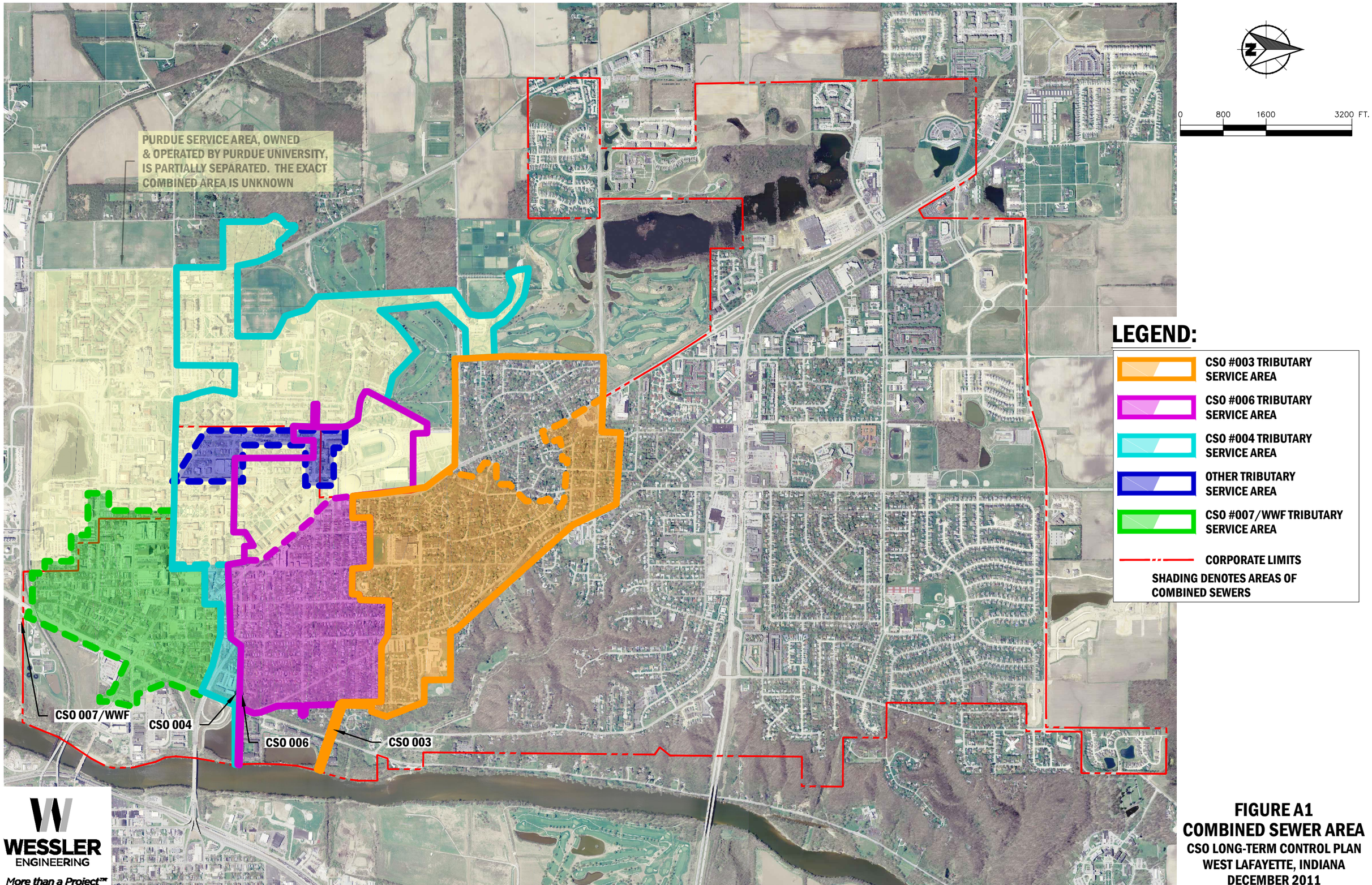
Figure A-2 Alternative 1: Transport and Treat

Figure A-3 Alternative 2: Sewer Separation

Figure A-4 Alternative 3: Interceptor & Separation

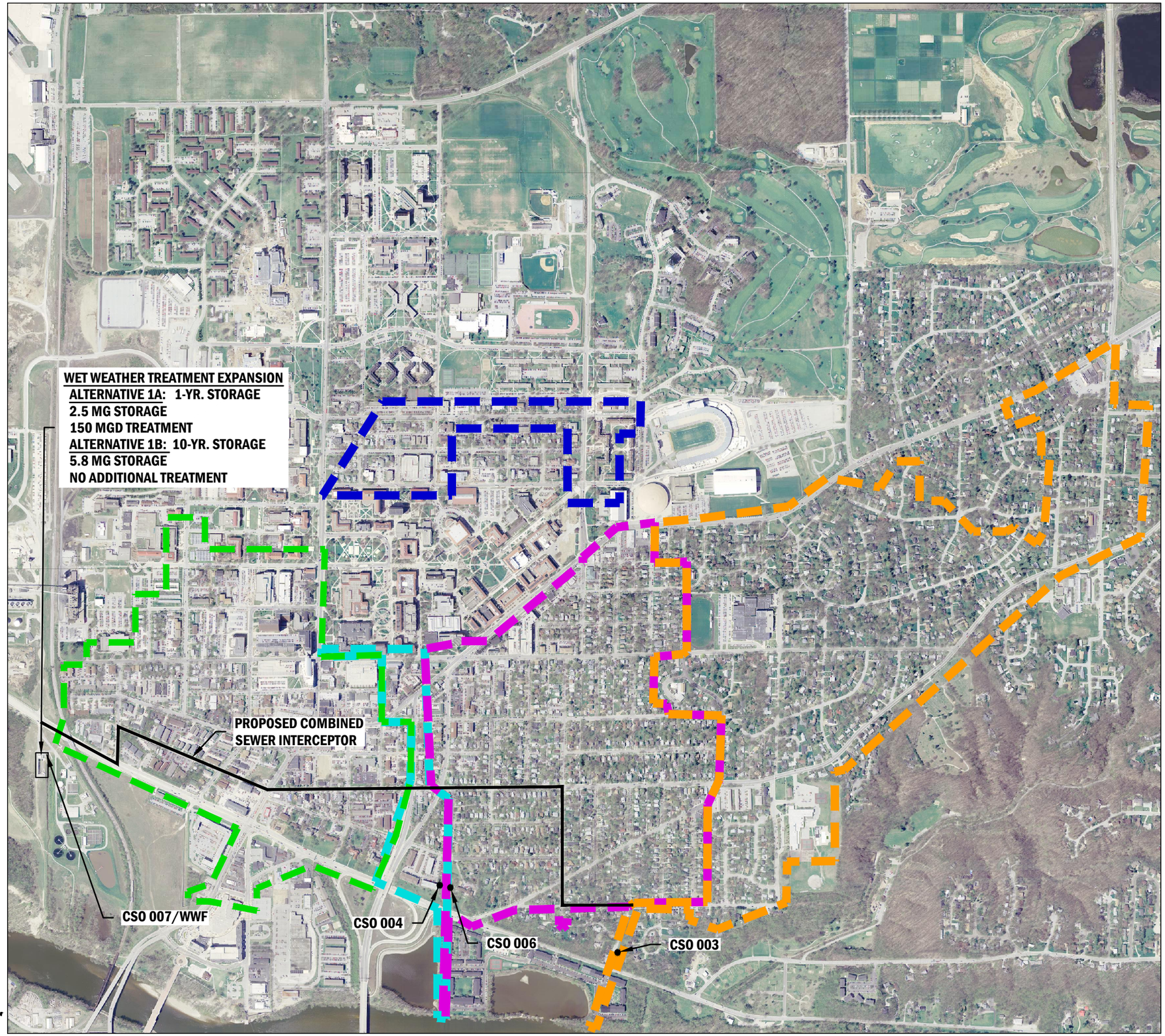
Figure A-5 Alternative 4: Deep Tunnel

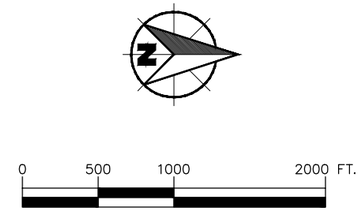
Figure A-6 Selected Plan



WESSLER ENGINEERING
More than a Project™

FIGURE A1
COMBINED SEWER AREA
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011



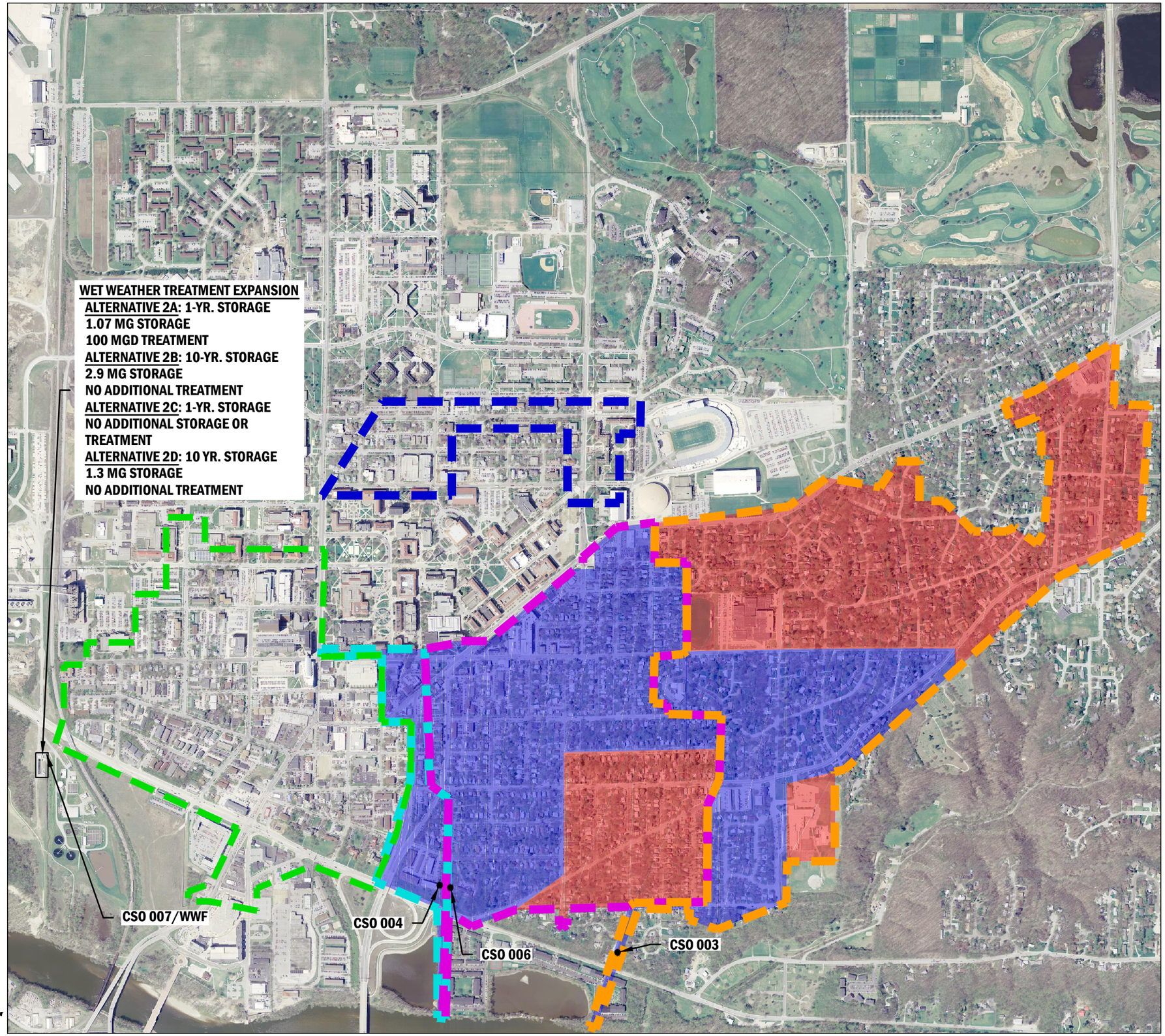


LEGEND:

- CSO #003 COMBINED SEWER AREA
- CSO #006 COMBINED SEWER AREA
- CSO #004 COMBINED SEWER AREA
- OTHER COMBINED SEWER AREA
- CSO #007/WWF COMBINED SEWER AREA

WESSLER ENGINEERING
More than a Project™

FIGURE A2
ALTERNATIVE 1
TRANSPORT & TREAT
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011



0 500 1000 2000 FT.

LEGEND:

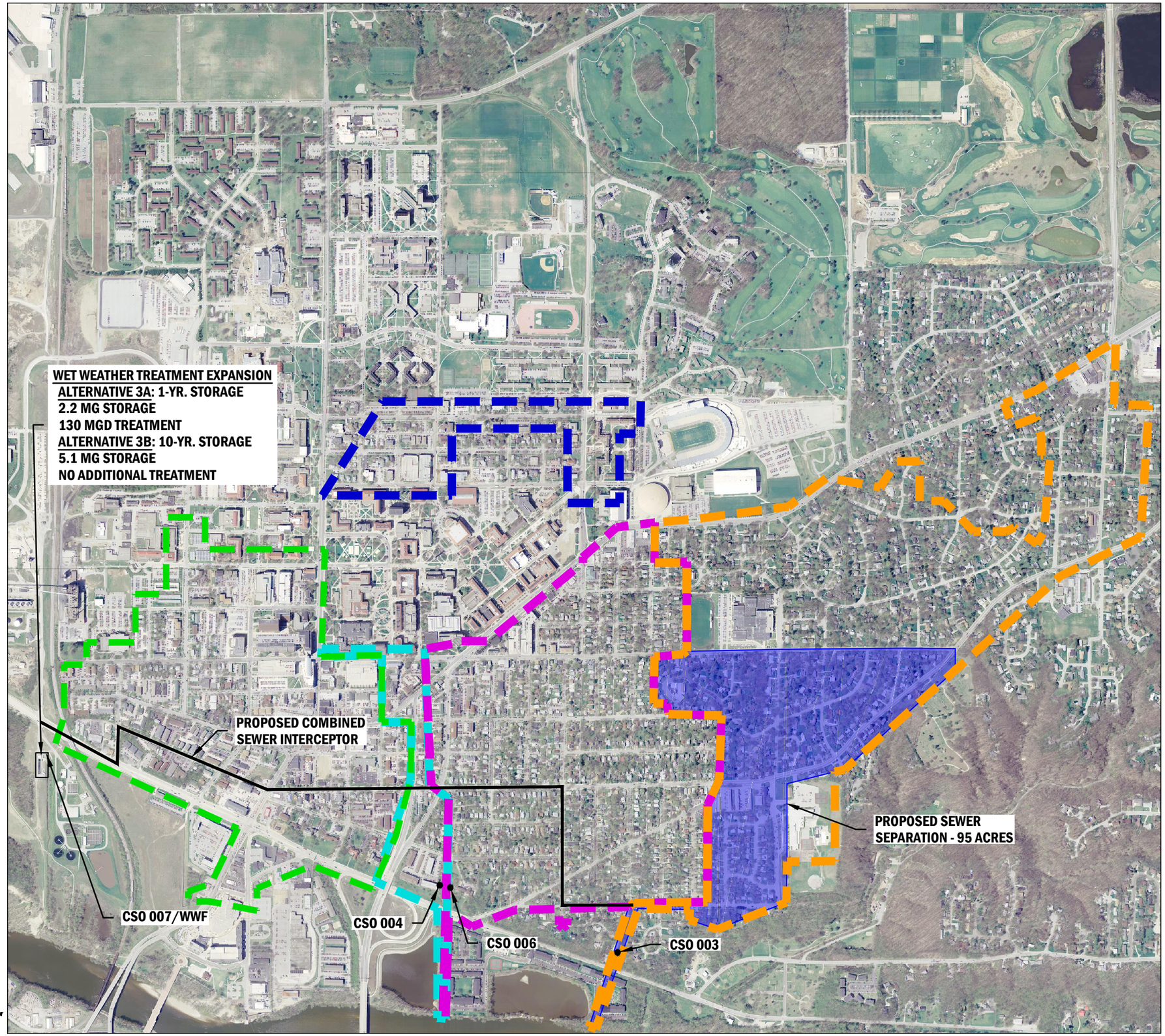
- SEWER SEPARATION ALTERNATIVES 2A, 2B, 2C, 2D
- SEWER SEPARATION ALTERNATIVES 2A & 2B
- CSO #003 COMBINED SEWER AREA
- CSO #006 COMBINED SEWER AREA
- CSO #004 COMBINED SEWER AREA
- OTHER COMBINED SEWER AREA
- CSO #007/WWF COMBINED SEWER AREA

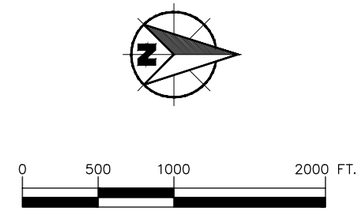
SEWER SEPARATION TOTALS:

- ALTERNATIVES 2A & 2B 262 ACRES
- ALTERNATIVES 2C & 2D 497 ACRES

WESSLER ENGINEERING
More than a Project™

FIGURE A3
ALTERNATIVE 2
SEWER SEPARATION
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011



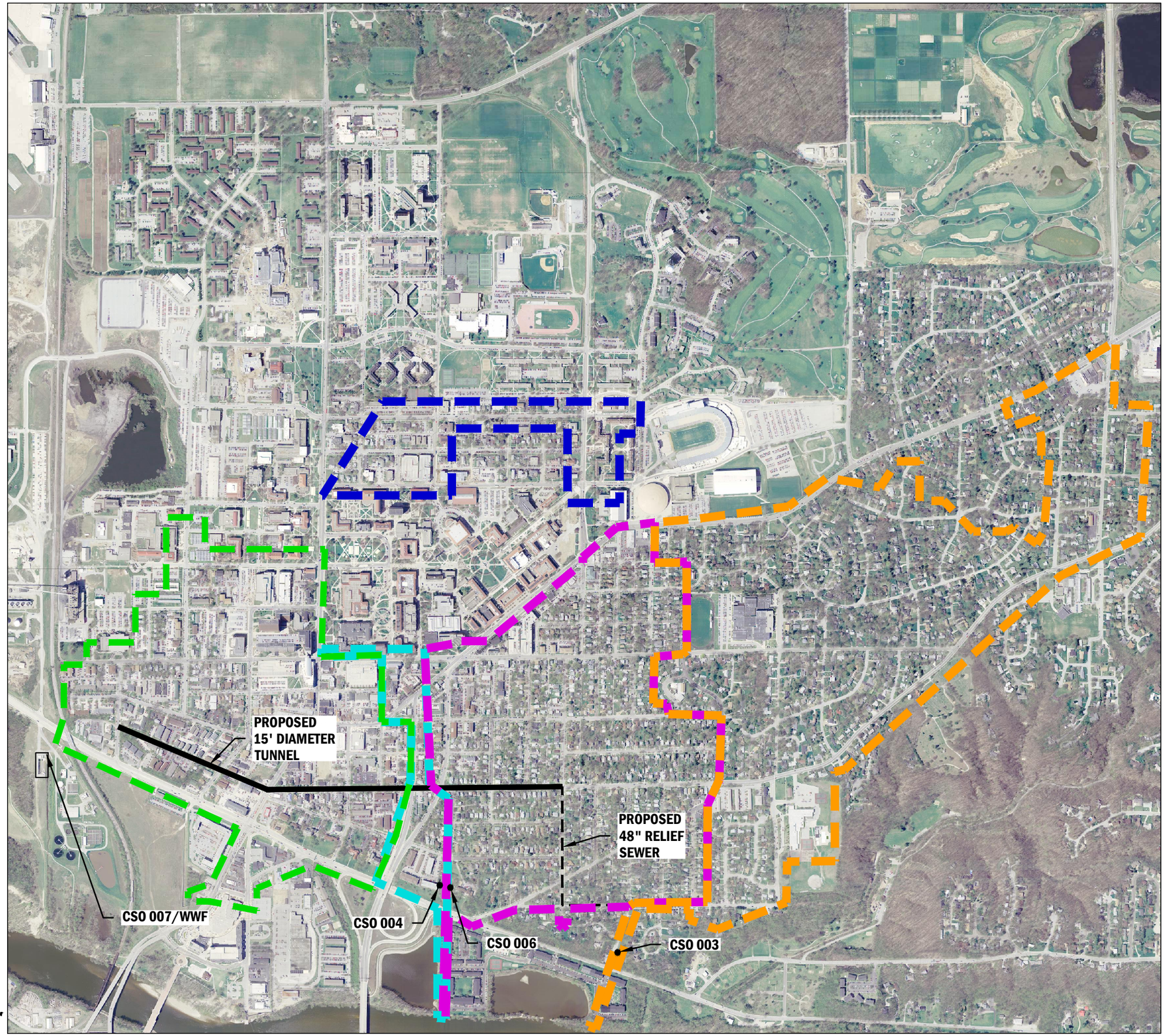


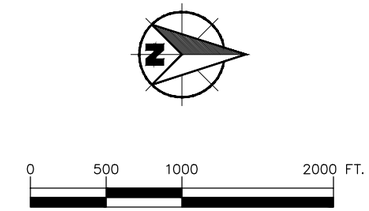
LEGEND:

- CSO #003 COMBINED SEWER AREA
- CSO #006 COMBINED SEWER AREA
- CSO #004 COMBINED SEWER AREA
- OTHER COMBINED SEWER AREA
- CSO #007/WWF COMBINED SEWER AREA

WESSLER ENGINEERING
More than a Project™

FIGURE A4
ALTERNATIVE 3
INTERCEPTOR & SEWER SEPARATION
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011



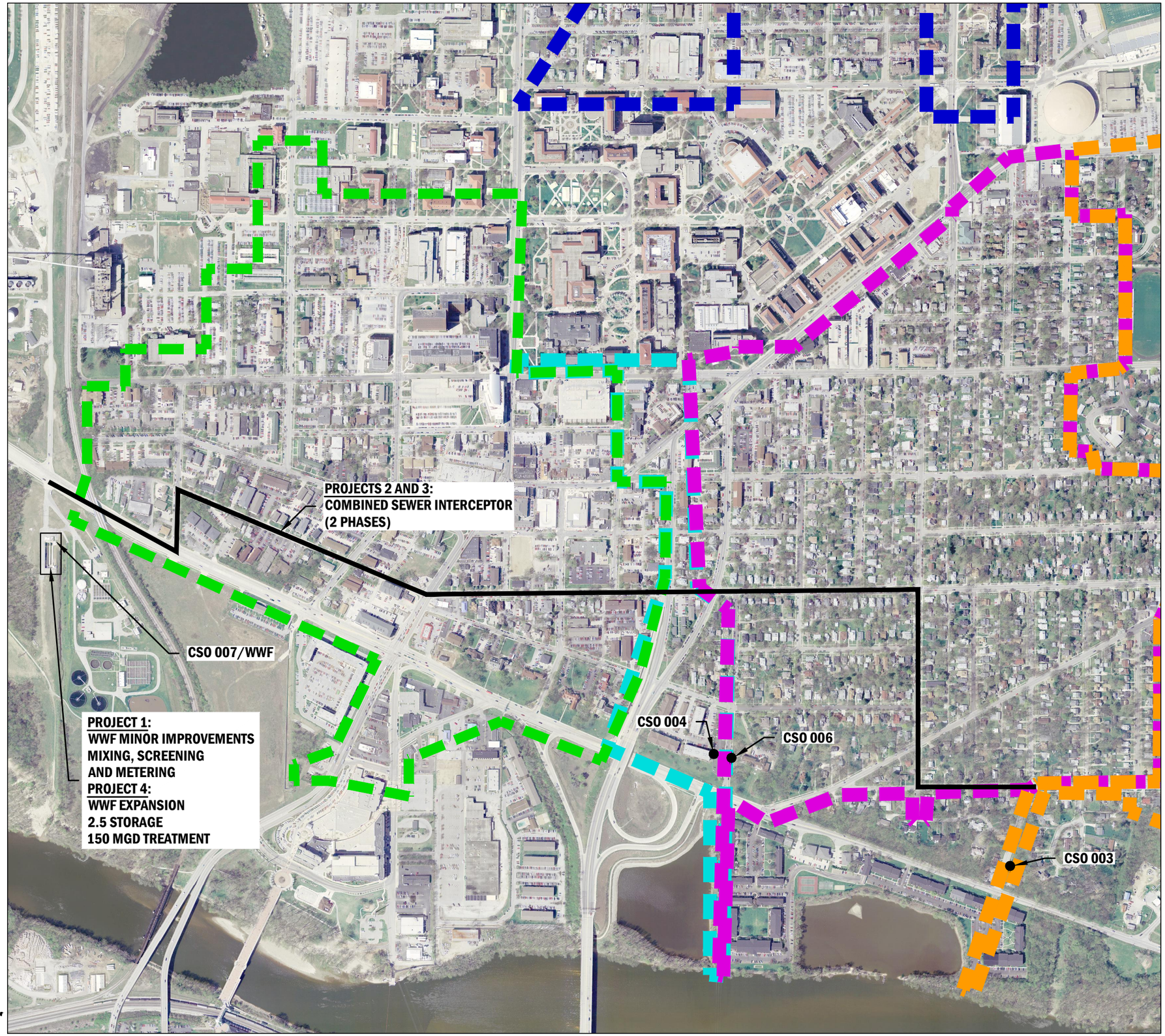


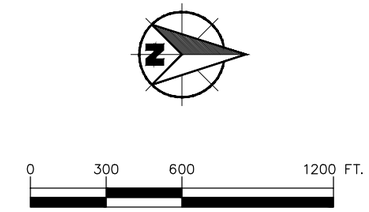
LEGEND:

- CSO #003 COMBINED SEWER AREA
- CSO #006 COMBINED SEWER AREA
- CSO #004 COMBINED SEWER AREA
- OTHER COMBINED SEWER AREA
- CSO #007/WWF COMBINED SEWER AREA

WESSLER ENGINEERING
More than a Project™

FIGURE A5
ALTERNATIVE 4
DEEP TUNNEL
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011





LEGEND:

- CSO #003 COMBINED SEWER AREA
- CSO #006 COMBINED SEWER AREA
- CSO #004 COMBINED SEWER AREA
- OTHER COMBINED SEWER AREA
- CSO #007/WWF COMBINED SEWER AREA

WESSLER ENGINEERING
More than a Project™

FIGURE A6
SELECTED PLAN
CSO LONG-TERM CONTROL PLAN
WEST LAFAYETTE, INDIANA
DECEMBER 2011

APPENDIX B

NPDES Permit

IDEM Non-Rule Policy #Water-016

IDEM

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels, Jr.
Governor

Thomas W. Easterly
Commissioner

100 North Senate Avenue
Indianapolis, Indiana 46204
(317) 232-8603
Toll Free (800) 451-6027
www.idem.IN.gov

ELECTRONIC MAIL

October 25, 2010

The Honorable John R. Dennis, Mayor
City of West Lafayette
609 West Navajo Street
West Lafayette, Indiana 47906

Dear Mayor Dennis:

Re: Final NPDES Permit No. IN0024821
City of West Lafayette Wastewater Treatment Plant
Tippecanoe County

Your application for a National Pollutant Discharge Elimination System (NPDES) permit has been processed in accordance with Sections 402 and 405 of the Federal Water Pollution Control Act as amended, (33 U.S.C. 1251, et seq.), and IDEM's permitting authority under IC 13-15. The enclosed NPDES permit covers your discharges to the Wabash River. All discharges from this facility shall be consistent with the terms and conditions of this permit.

One condition of your permit requires monthly reporting of several effluent parameters. Reporting is to be done on the Monthly Report of Operation (MRO) form. This form is available on the internet at the following web site:

http://www.in.gov/idem/5104.htm

You should duplicate this form as needed for future reporting.

Another condition which needs to be clearly understood concerns violation of the effluent limitations in the permit. Exceeding the limitations constitutes a violation of the permit and may bring criminal or civil penalties upon the permittee. (See Part II.A.1 and II.A.11 of this permit). It is very important that your office and treatment operator understand this part of the permit.

Please note that this permit issuance can be appealed. An appeal must be filed under procedures outlined in IC 13-15-6, IC 4-21.5, and the enclosed public notice. The appeal must be initiated by you within 18 days from the date this letter is postmarked, by filing a request for an adjudicatory hearing with the Office of Environmental Adjudication (OEA), at the following address:

Office of Environmental Adjudication
Indiana Government Center North
100 North Senate Avenue, Room 501
Indianapolis, IN 46204

Please send a copy of any such appeal to me at IDEM, Office of Water Quality-Mail Code 65-42, 100 North Senate Avenue, Indianapolis, Indiana 46204-2251.

Please reference the Post Public Notice Addendum, on the final pages of the Fact Sheet, for this Office's response to comments submitted during the public notice period.

The permit should be read and studied. It requires certain action at specific times by you, the discharger, or your authorized representative. One copy of this permit is also being sent to your operator to be kept at the treatment facility. You may wish to call this permit to the attention of your consulting engineer and/or attorney.

If you have any questions concerning your NPDES permit, please contact Julie Morris at 317/232-8739. Questions concerning appeal procedures should be directed to the Office of Environmental Adjudication, at 317/232-8591.

Sincerely,

Paul Higginbotham, Chief
Permits Branch
Office of Water Quality

Enclosures
cc: Tippecanoe County Health Department
David Henderson, Certified Operator
U.S. EPA, Region 5

STATE OF INDIANA

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

AUTHORIZATION TO DISCHARGE UNDER THE

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Federal Water Pollution Control Act, as amended, (33 U.S.C. 1251 et seq., the "Act"), Title 13 of the Indiana Code, and regulations adopted by the Water Pollution Control Board, the Indiana Department of Environmental Management (IDEM) is issuing this permit to the

CITY OF WEST LAFAYETTE

hereinafter referred to as "the permittee." The permittee owns and/or operates the **City of West Lafayette Wastewater Treatment Plant**, a major municipal wastewater treatment plant located at 500 South River Road, West Lafayette, Indiana, Tippecanoe County. The permittee is hereby authorized to discharge from the outfalls identified in Part I of this permit to receiving waters named the Wabash River in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in the permit. The permittee is also authorized to discharge from combined sewer overflow outfalls listed in Attachment A of this permit, to receiving waters named the Wabash River in accordance with the effluent limitations, monitoring requirements, and other conditions set forth in this permit. This permit may be revoked for the nonpayment of applicable fees in accordance with IC 13-18-20.

Effective Date: February 1, 2011.

Expiration Date: January 31, 2016.

In order to receive authorization to discharge beyond the date of expiration, the permittee shall submit such information and application forms as are required by the Indiana Department of Environmental Management. The application shall be submitted to IDEM at least 180 days prior to the expiration date of this permit, unless a later date is allowed by the Commissioner in accordance with 327 IAC 5-3-2 and Part II.A.4 of this permit.

Issued on October 25, 2010, for the Indiana Department of Environmental Management.

Paul Higginbotham, Chief
Permits Branch
Office of Water Quality

TREATMENT FACILITY DESCRIPTION

The permittee currently operates a Class IV, 9.0 MGD wastewater treatment plant consisting of influent flow measurement, screening, grit removal, six primary clarifiers, four aeration tanks, three final clarifiers, chlorination and dechlorination facilities and an effluent flow meter. Final sludge is handled utilizing a gravity belt sludge thickener, two anaerobic digesters, and is land applied.

The City of West Lafayette's collection system receives varying inflow rates depending on the presence or absence of students at Purdue University. Due to this inflow fluctuation, bypass of individual treatment units, not entire treatment processes, does not constitute as a bypass as noted in Part II.B.2 of the permit, provided that the permittee is at all times maintaining in good working order and efficiently operating all facilities and systems; providing the best quality effluent; and achieving compliance with the terms and conditions of the permit.

The collection system is comprised of combined sanitary and storm sewers with four (4) Combined Sewer Overflow (CSO) locations. The CSO locations have been identified and permitted with provisions in Attachment A of the permit.

The mass limits for $CBOD_5$, TSS and ammonia-nitrogen have been calculated utilizing the peak design flow of 18 MGD. This is to facilitate the maximization of flow through the treatment facility in accordance with this Office's CSO policy.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

The permittee is authorized to discharge from the outfall listed below in accordance with the terms and conditions of this permit. The permittee shall take samples and measurements at a location representative of each discharge to determine whether the effluent limitations have been met. Refer to Part I.B of this permit for additional monitoring and reporting requirements.

1. Beginning on the effective date of this permit, the permittee is authorized to discharge from Outfall 001, which is located at Latitude: 40° 25' 03" N, Longitude: 86° 53' 59" W. The discharge is subject to the following requirements:

TABLE 1

	Quantity or Loading			**Quality or Concentration**			**Monitoring Requirements**	
Parameter	Monthly Average	Weekly Average	Units	Monthly Average	Weekly Average	Units	Measurement Frequency	Sample Type
Flow [1]	Report	----	MGD	----	----	----	Daily	24-Hr. Total
$CBOD_5$	3,755	6,008	lbs/day	25	40	mg/l	Daily	24-Hr. Composite
TSS	4,506	6,759	lbs/day	30	45	mg/l	Daily	24-Hr. Composite
Ammonia-nitrogen								
Summer [2]	451	676	lbs/day	3.0	4.5	mg/l	Daily	24-Hr. Composite
Winter [3]	901	1,352	lbs/day	6.0	9.0	mg/l	Daily	24-Hr. Composite
Phosphorus	Report	----	----	Report	----	mg/l	Monthly	24-Hr. Composite

TABLE 2

Parameter	Quality or Concentration: Daily Minimum	Monthly Average	Daily Maximum	Units	Monitoring Requirements: Measurement Frequency	Sample Type
pH [4]	6.0	----	9.0	s.u.	Daily	Grab
Total Residual Chlorine [5]						
Final Effluent [6]	----	0.02	0.04	mg/l	Daily	Grab
E. coli [7]	----	125 [8]	235 [9]	colonies/100 ml	Daily	Grab
Influent Mercury [10]	----	----	Report	ng/l	6 X Annually	Grab
Effluent Mercury						
Interim [10] [11]	----	----	Report	ng/l	6 X Annually	Grab
Final [10] [11]	----	12	20	ng/l	6 X Annually	Grab

[1] Effluent flow measurement is required per 327 IAC 5-2-13. The flow meter(s) shall be calibrated at least once annually.

[2] Summer limitations apply from May 1 through November 30 of each year.

[3] Winter limitations apply from December 1 through April 30 of each year.

[4] If the permittee collects more than one grab sample on a given day for pH, the values shall not be averaged for reporting daily maximums or daily minimums. The permittee must report the minimum or maximum pH value of any individual sample during the month on the Discharge Monitoring Report forms.

[5] The effluent shall be disinfected on a continuous basis such that violations of the applicable bacteriological limitations (fecal coliform or *E. coli*) do not occur from April 1 through October 31, annually. If the permittee uses chlorine for any reason, at any time including the period from November 1 through March 31, then the limits and monitoring requirements in Table 3 for total residual chlorine shall be in effect whenever chlorine is used.

[6] In accordance with 327 IAC 5-2-11.1(f), compliance with this permit will be demonstrated if the measured effluent concentrations are less than the limit of quantitation (0.06 mg/l). If the measured effluent concentrations are above the water quality-based permit limitations and above the limit of detection (LOD) specified by the permit in any of three (3) consecutive analyses or any five (5) out of nine (9) analyses, the permittee is required to reevaluate its chlorination/dechlorination practices to make any necessary changes to assure compliance with the permit limitation for TRC. These records must be retained in accordance with the record retention requirements of Part I.B.8 of this permit.

Effluent concentrations greater than or equal to the LOD but less than the limit of quantitation (LOQ), shall be reported on the discharge monitoring report forms as the measured value. A note must be included with the DMR indicating that the value is not quantifiable. Effluent concentrations less than the limit of detection shall be reported on the discharge monitoring report forms as less than the value of the limit

of detection. For example, if a substance is not detected at a concentration of 0.01 mg/l, report the value as < 0.01 mg/l. At present, two methods are considered to be acceptable to IDEM, amperometric and DPD colorimetric methods, for chlorine concentrations at the level of 0.06 mg/l.

Parameter	LOD	LOQ
Chlorine	0.02 mg/l	0.06 mg/l

Case-Specific MDL

The permittee may determine a case-specific method detection level (MDL) using one of the analytical methods specified above, or any other test method which is approved by IDEM prior to use. The MDL shall be derived by the procedure specified for MDLs contained in 40 CFR Part 136, Appendix B, and the limit of quantitation shall be set equal to 3.18 times the MDL. Other methods may be used if first approved by the U.S. EPA and IDEM.

[7] The *E. coli* limitations and monitoring requirements apply from April 1 through October 31 annually. The monthly average *E. coli* value shall be calculated as a geometric mean.

IDEM has specified the following methods as allowable for the detection and enumeration of *Escherichia coli (E. coli)*:

1. Coliscan MF® Method
2. EPA Method 1103.1 using original m-TEC agar.
3. EPA revised Method 1103.1 using modified m-TEC agar.
4. *Standard Methods* 20th Edition Method 9223 B using Colilert®

[8] The monthly average *E. coli* value shall be calculated as a geometric mean. Per 327 IAC 5-10-6, the concentration of *E. coli* shall not exceed one hundred twenty-five (125) cfu or mpn per 100 milliliters as a geometric mean of the effluent samples taken in a calendar month. No samples may be excluded when calculating the monthly geometric mean.

[9] If less than ten samples are taken and analyzed for *E. coli* in a calendar month, no samples may exceed two hundred thirty-five (235) cfu or mpn as a daily maximum. However, when ten (10) or more samples are taken and analyzed for *E. coli* in a calendar month, not more than ten percent (10%) of those samples may exceed two hundred thirty-five (235) cfu or mpn as a daily maximum. When calculating ten percent, the result must not be rounded up. In reporting for compliance purposes on the Discharge Monitoring Report (DMR) form, the permittee shall record the highest non-excluded value for the daily maximum.

[10]Mercury monitoring shall be conducted six times annually (i.e. every other month) for the term of the permit. Monitoring shall be conducted in the months of February, April, June, August, October, and December of each year. Mercury monitoring and analysis will be performed using EPA Test Method 1631, Revision E. If Method 1631, Revision E is further revised during the term of this permit, the permittee

and/or its contract laboratory is required to utilize the most current version of the method immediately after approval by EPA.The permittee shall measure and report this parameter as total recoverable metal.

[11]See the Schedule of Compliance in part I.D. of the permit.

2. Minimum Narrative Limitations

At all times the discharge from any and all point sources specified within this permit shall not cause receiving waters:

a. including the mixing zone, to contain substances, materials, floating debris, oil, scum or other pollutants:

(1) that will settle to form putrescent or otherwise objectionable deposits;

(2) that are in amounts sufficient to be unsightly or deleterious;

(3) that produce color, visible oil sheen, odor, or other conditions in such degree as to create a nuisance;

(4) which are in amounts sufficient to be acutely toxic to, or to otherwise severely injure or kill aquatic life, other animals, plants, or humans;

(5) which are in concentrations or combinations that will cause or contribute to the growth of aquatic plants or algae to such a degree as to create a nuisance, be unsightly, or otherwise impair the designated uses.

b. outside the mixing zone, to contain substances in concentrations which on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants.

B. MONITORING AND REPORTING

1. Representative Sampling

Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge flow and shall be taken at times which reflect the full range and concentration of effluent parameters normally expected to be present. Samples shall not be taken at times to avoid showing elevated levels of any parameters.

2. Data on Plant Operation

The raw influent and the wastewater from intermediate unit treatment processes, as well as the final effluent shall be sampled and analyzed for the pollutants and operational parameters specified by the applicable Monthly Report of Operation Form, as

appropriate, in accordance with 327 IAC 5-2-13. Except where the permit specifically states otherwise, the sample frequency for the raw influent and intermediate unit treatment process shall be at a minimum the same frequency as that for the final effluent. The measurement frequencies specified in each of the tables in Part I.A. are the minimum frequencies required by this permit.

3. Monthly Reporting

The permittee shall submit monitoring reports to the Indiana Department of Environmental Management containing results obtained during the previous month and shall be postmarked no later than the 28th day of the month following each completed monitoring period. The first report shall be submitted by the 28th day of the month following the month in which the permit becomes effective. These reports shall include, but not necessarily be limited to, the Discharge Monitoring Report (DMR) and the Monthly Report of Operation (MRO). Permittees with combined sewer overflow discharges must also submit the CSO Discharge Monitoring Report to IDEM by the 28th day of the month following each completed monitoring period. All reports shall be mailed to IDEM, Office of Water Quality – Mail Code 65-42, Compliance Data Section, 100 North Senate Ave., Indianapolis, Indiana 46204-2251. The Regional Administrator may request the permittee to submit monitoring reports to the Environmental Protection Agency if it is deemed necessary to assure compliance with the permit.

A calendar week will begin on Sunday and end on Saturday. Partial weeks consisting of four or more days at the end of any month will include the remaining days of the week, which occur in the following month in order to calculate a consecutive seven-day average. This value will be reported as a weekly average or seven-day average on the MRO for the month containing the partial week of four or more days. Partial calendar weeks consisting of less than four days at the end of any month will be carried forward to the succeeding month and reported as a weekly average or a seven-day average for the calendar week that ends with the first Saturday of that month.

4. Definitions

a. Calculation of Averages

Pursuant to 327 IAC 5-2-11(a)(5), the calculation of the average of discharge data shall be determined as follows: For all parameters except fecal coliform and *E. coli*, calculations that require averaging of sample analyses or measurements of daily discharges shall use an arithmetic mean unless otherwise specified in this permit. For fecal coliform, the monthly average discharge and weekly average discharge, as concentrations, shall be calculated as a geometric mean. For *E. coli*, the monthly average discharge, as a concentration, shall be calculated as a geometric mean.

b. Terms

(1) "Monthly Average" -The monthly average discharge means the total mass or flow-weighted concentration of all daily discharges during a calendar month on

which daily discharges are sampled or measured, divided by the number of daily discharges sampled and/or measured during such calendar month. The monthly average discharge limitation is the highest allowable average monthly discharge for any calendar month.

(2) "Weekly Average" - The weekly average discharge means the total mass or flow weighted concentration of all daily discharges during any calendar week for which daily discharges are sampled or measured, divided by the number of daily discharges sampled and/or measured during such calendar week. The average weekly discharge limitation is the maximum allowable average weekly discharge for any calendar week.

(3) "Daily Maximum" - The daily maximum discharge limitation is the maximum allowable daily discharge for any calendar day. The "daily discharge" means the total mass of a pollutant discharged during the calendar day or, in the case of a pollutant limited in terms other than mass pursuant to 327 IAC 5-2-11(e), the average concentration or other measurement of the pollutant specified over the calendar day or any twenty-four hour period that represents the calendar day for purposes of sampling.

(4) "24-hour Composite" - A 24-hour composite sample consists of at least eight (8) individual flow-proportioned samples of wastewater, taken by the grab sample method over equal time intervals during the period of operator attendance or by an automatic sampler, which are taken at approximately equally spaced time intervals for the duration of the discharge within a 24-hour period and which are combined prior to analysis. A flow proportioned composite sample shall be obtained by:

(a) recording the discharge flow rate at the time each individual sample is taken,

(b) adding together the discharge flow rates recorded from each individual sampling time to formulate the "total flow value,"

(c) dividing the discharge flow rate of each individual sampling time by the total flow value to determine its percentage of the total flow value, and

(d) multiplying the volume of the total composite sample by each individual sample's percentage to determine the volume of that individual sample which will be included in the total composite sample.

(5) $CBOD_5$: Five-day Carbonaceous Biochemical Oxygen Demand

(6) TSS: Total Suspended Solids

(7) *E. coli*: Escherichia coli bacteria

(8) The "Regional Administrator" is defined as the Region V Administrator, U.S. EPA, located at 77 West Jackson Boulevard, Chicago, Illinois 60604.

(9) The "Commissioner" is defined as the Commissioner of the Indiana Department of Environmental Management, located at the following address: 100 North Senate Avenue, Indianapolis, Indiana 46204-2251.

(10) Limit of Detection or LOD is defined as a measurement of the concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero (0) for a particular analytical method and sample matrix. The LOD is equivalent to the method detection level or MDL.

(11) Limit of Quantitation or LOQ is defined as a measurement of the concentration of a contaminant obtained by using a specified laboratory procedure calibrated at a specified concentration about the method detection level. It is considered the lowest concentration at which a particular contaminant can be quantitatively measured using a specified laboratory procedure for monitoring of the contaminant. This term is also called the limit of quantification or quantification level.

(12) Method Detection Level or MDL is defined as the minimum concentration of an analyte (substance) that can be measured and reported with a ninety-nine percent (99%) confidence that the analyte concentration is greater than zero (0) as determined by the procedure set forth in 40 CFR Part 136, Appendix B. The method detection level or MDL is equivalent to the LOD.

5. Test Procedures

The analytical and sampling methods used shall conform to the current version of 40 CFR, Part 136, unless otherwise specified within this permit. Multiple editions of Standard Methods for the Examination of Water and Wastewater are currently approved for most methods, however, 40 CFR Part 136 should be checked to ascertain if a particular method is approved for a particular analyte. The approved methods may be included in the texts listed below. However, different but equivalent methods are allowable if they receive the prior written approval of the State agency and the U.S. Environmental Protection Agency.

a. Standard Methods for the Examination of Water and Wastewater
18th, 19th, or 20th Editions, 1992, 1995 or 1998 American Public Health Association, Washington, D.C. 20005.

b. A.S.T.M. Standards, Part 23, Water; Atmospheric Analysis
1972 American Society for Testing and Materials, Philadelphia, PA 19103.

c. Methods for Chemical Analysis of Water and Wastes
June 1974, Revised, March 1983, Environmental Protection Agency, Water Quality Office, Analytical Quality Control Laboratory, 1014 Broadway, Cincinnati, OH 45202.

6. Recording of Results

For each measurement or sample taken pursuant to the requirements of this permit, the permittee shall record and maintain records of all monitoring information and monitoring activities under this permit, including the following information:

a. The exact place, date, and time of sampling or measurements;

b. The person(s) who performed the sampling or measurements;

c. The dates and times the analyses were performed;

d. The person(s) who performed the analyses;

e. The analytical techniques or methods used; and

f. The results of all required analyses and measurements.

7. Additional Monitoring by Permittee

If the permittee monitors any pollutant at the location(s) designated herein more frequently than required by this permit, using approved analytical methods as specified above, the results of such monitoring shall be included in the calculation and reporting of the values required in the Monthly Discharge Monitoring Report and on the Monthly Report of Operation form. Such increased frequency shall also be indicated on these forms. Any such additional monitoring data which indicates a violation of a permit limitation shall be followed up by the permittee, whenever feasible, with a monitoring sample obtained and analyzed pursuant to approved analytical methods. The results of the follow-up sample shall be reported to the Commissioner in the Monthly Discharge Monitoring Report.

8. Records Retention

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed and calibration and maintenance of instrumentation and recording from continuous monitoring instrumentation, shall be retained for a minimum of three (3) years. In cases where the original records are kept at another location, a copy of all such records shall be kept at the permitted facility. The three-year period shall be extended:

a. automatically during the course of any unresolved litigation regarding the discharge of pollutants by the permittee or regarding promulgated effluent guidelines applicable to the permittee; or

b. as requested by the Regional Administrator or the Indiana Department of Environmental Management.

C. REOPENING CLAUSES

In addition to the reopening clause provisions cited at 327 IAC 5-2-16, the following reopening clauses are incorporated into this permit:

1. This permit may be modified or, alternately, revoked and reissued after public notice and opportunity for hearing to incorporate effluent limitations reflecting the results of a wasteload allocation if the Department of Environmental Management determines that such effluent limitations are needed to assure that State Water Quality Standards are met in the receiving stream.

2. This permit may be modified due to a change in sludge disposal standards pursuant to Section 405(d) of the Clean Water Act, if the standards when promulgated contain different conditions, are otherwise more stringent, or control pollutants not addressed by this permit.

3. This permit may be modified, or, alternately, revoked and reissued, to comply with any applicable effluent limitation or standard issued or approved under section 301(b)(2)(C), (D) and (E), 304(b)(2), and 307(a)(2) of the Clean Water Act, if the effluent limitation or standard so issued or approved:

   a. contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or

   b. controls any pollutant not limited in the permit.

4. This permit may be modified, or alternately, revoked and reissued, after public notice and opportunity for hearing, to include a case-specific Method Detection Level (MDL). The permittee must demonstrate that such action is warranted in accordance with the procedure specified under Appendix B, 40 CFR Part 136, or approved by the Indiana Department of Environmental Management.

D. SCHEDULE OF COMPLIANCE FOR MERCURY

1. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality (OWQ) nine (9) months from the effective date of the permit. The progress report shall include, among other items, a description of the method(s) selected for meeting the final requirements for mercury. The final effluent limitations for mercury are deferred for the term of this compliance schedule, however the permittee must take steps to attempt to meet the final limitations as soon as reasonably possible. If

the permittee determines prior to the conclusion of this compliance schedule that it can meet any of the final limitations, the permittee shall provide written notification to the Compliance Data Section of the Office of Water Quality. Monitoring and reporting of effluent mercury is required during the interim period in accordance with Part I.A. Table 2 of the permit.

2. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality not later than the eighteen (18) months from the effective date of the permit.

3. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality not later than the twenty-seven (27) months from the effective date of the permit.

4. The permittee shall comply with all final requirements no later than the thirty-six (36) months from the effective date of the permit. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality at this time.

5. If the permittee fails to comply with any deadline contained in the foregoing schedule, the permittee shall, within fourteen (14) days following the missed deadline, submit a written notice of noncompliance to the Compliance Data Section of the Office of Water Quality stating the cause of noncompliance, any remedial action taken or planned, and the probability of meeting the date fixed for compliance with final effluent limitations.

PART II

STANDARD CONDITIONS FOR NPDES PERMITS

A. GENERAL CONDITIONS

1. Duty to Comply

The permittee shall comply with all terms and conditions of this permit in accordance with 327 IAC 5-2-8(1) and all other requirements of 327 IAC 5-2-8. Any permit noncompliance constitutes a violation of the Clean Water Act and IC 13 and is grounds for enforcement action or permit termination, revocation and reissuance, modification, or denial of a permit renewal application.

It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of the permit.

2. Duty to Mitigate

In accordance with 327 IAC 5-2-8(3), the permittee shall take all reasonable steps to minimize or correct any adverse impact to the environment resulting from noncompliance with this permit. During periods of noncompliance, the permittee shall conduct such accelerated or additional monitoring for the affected parameters, as appropriate or as requested by IDEM, to determine the nature and impact of the noncompliance.

3. Duty to Provide Information

The permittee shall submit any information that the permittee knows or has reason to believe would constitute cause for modification or revocation and reissuance of the permit at the earliest time such information becomes available, such as plans for physical alterations or additions to the facility that:

a. could significantly change the nature of, or increase the quantity of, pollutants discharged; or

b. the Commissioner may request to evaluate whether such cause exists.

In accordance with 327 IAC 5-1-3(a)(5), the permittee must also provide any information reasonably requested by the Commissioner.

4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must obtain and submit a renewal of this permit in accordance with 327 IAC 5-3-2(a)(2). It is the permittee's responsibility to obtain and submit the application. In accordance with 327 IAC 5-2-3(c), the owner of the facility or

operation from which a discharge of pollutants occurs is responsible for applying for and obtaining the NPDES permit, except where the facility or operation is operated by a person other than an employee of the owner in which case it is the operator's responsibility to apply for and obtain the permit. The application must be submitted at least 180 days before the expiration date of this permit. This deadline may be extended if:

a. permission is requested in writing before such deadline;

b. IDEM grants permission to submit the application after the deadline; and

c. the application is received no later than the permit expiration date.

As required under 327 IAC 5-2-3(g)(1) and (2), POTWs with design influent flows equal to or greater than one million (1,000,000) gallons per day and POTWs with an approved pretreatment program or that are required to develop a pretreatment program, will be required to provide the results of whole effluent toxicity testing as part of their NPDES renewal application.

5. Transfers

In accordance with 327 IAC 5-2-8(4)(D), this permit is nontransferable to any person except in accordance with 327 IAC 5-2-6(c). This permit may be transferred to another person by the permittee, without modification or revocation and reissuance being required under 327 IAC 5-2-16(c)(1) or 16(e)(4), if the following occurs:

a. the current permittee notified the Commissioner at least thirty (30) days in advance of the proposed transfer date.

b. a written agreement containing a specific date of transfer of permit responsibility and coverage between the current permittee and the transferee (including acknowledgment that the existing permittee is liable for violations up to that date, and the transferee is liable for violations from that date on) is submitted to the Commissioner.

c. the transferee certifies in writing to the Commissioner their intent to operate the facility without making such material and substantial alterations or additions to the facility as would significantly change the nature or quantities of pollutants discharged and thus constitute cause for permit modification under 327 IAC 5-2-16(d). However, the Commissioner may allow a temporary transfer of the permit without permit modification for good cause, e.g., to enable the transferee to purge and empty the facility's treatment system prior to making alterations, despite the transferee's intent to make such material and substantial alterations or additions to the facility.

d. the Commissioner, within thirty (30) days, does not notify the current permittee and the transferee of the intent to modify, revoke and reissue, or terminate the permit and to require that a new application be filed rather than agreeing to the transfer of the permit.

The Commissioner may require modification or revocation and reissuance of the permit to identify the new permittee and incorporate such other requirements as may be necessary under the Clean Water Act or state law.

6. Permit Actions

In accordance with 327 IAC 5-2-16(b) and 327 IAC 5-2-8(4), this permit may be modified, revoked and reissued, or terminated for cause, including, but not limited to, the following:

a. Violation of any terms or conditions of this permit;

b. Failure of the permittee to disclose fully all relevant facts or misrepresentation of any relevant facts in the application, or during the permit issuance process; or

c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge controlled by the permittee (e.g., plant closure, termination of the discharge by connecting to a POTW, a change in state law or information indicating the discharge poses a substantial threat to human health or welfare).

Filing of either of the following items does not stay or suspend any permit condition: (1) a request by the permittee for a permit modification, revocation and reissuance, or termination, or (2) submittal of information specified in Part II.A.3 of the permit including planned changes or anticipated noncompliance.

The permittee shall submit any information that the permittee knows or has reason to believe would constitute cause for modification or revocation and reissuance of the permit at the earliest time such information becomes available, such as plans for physical alterations or additions to the permitted facility that:

1. could significantly change the nature of, or increase the quantity of, pollutants discharged; or

2. the commissioner may request to evaluate whether such cause exists.

7. Property Rights

Pursuant to 327 IAC 5-2-8(6) and 327 IAC 5-2-5(b), the issuance of this permit does not convey any property rights of any sort or any exclusive privileges, nor does it authorize any injury to persons or private property or an invasion of rights, any infringement of federal, state, or local laws or regulations. The issuance of the permit also does not

preempt any duty to obtain any other state, or local assent required by law for the discharge or for the construction or operation of the facility from which a discharge is made.

8. Severability

In accordance with 327 IAC 1-1-3, the provisions of this permit are severable and, if any provision of this permit or the application of any provision of this permit to any person or circumstance is held invalid, the invalidity shall not affect any other provisions or applications of the permit which can be given effect without the invalid provision or application.

9. Oil and Hazardous Substance Liability

Nothing in this permit shall be construed to relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject to under Section 311 of the Clean Water Act.

10. State Laws

Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable state law or regulation under authority preserved by Section 510 of the Clean Water Act or state law.

11. Penalties for Violation of Permit Conditions

Pursuant to IC 13-30-4, a person who violates any provision of this permit, the water pollution control laws; environmental management laws; or a rule or standard adopted by the Water Pollution Control Board is liable for a civil penalty not to exceed twenty-five thousand dollars ($25,000) per day of any violation. Pursuant to IC 13-30-5, a person who obstructs, delays, resists, prevents, or interferes with (1) the department; or (2) the department's personnel or designated agent in the performance of an inspection or investigation commits a class C infraction.

Pursuant to IC 13-30-10, a person who intentionally, knowingly, or recklessly violates any provision of this permit, the water pollution control laws or a rule or standard adopted by the Water Pollution Control Board commits a class D felony punishable by the term of imprisonment established under IC 35-50-2-7(a) (up to one year), and/or by a fine of not less than five thousand dollars ($5,000) and not more than fifty thousand dollars ($50,000) per day of violation. A person convicted for a violation committed after a first conviction of such person under this provision is subject to a fine of not more than one hundred thousand dollars ($100,000) per day of violation, or by imprisonment for not more than two (2) years, or both.

12. Penalties for Tampering or Falsification

In accordance with 327 IAC 5-2-8(9), the permittee shall comply with monitoring, recording, and reporting requirements of this permit. The Clean Water Act, as well as IC 13-30-10, provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under a permit shall, upon conviction, be punished by a fine of not more than ten thousand dollars ($10,000) per violation, or by imprisonment for not more than one hundred eighty (180) days per violation, or by both.

13. Toxic Pollutants

If any applicable effluent standard or prohibition (including any schedule of compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the Clean Water Act for a toxic pollutant injurious to human health, and that standard or prohibition is more stringent than any limitation for such pollutant in this permit, this permit shall be modified or revoked and reissued to conform to the toxic effluent standard or prohibition in accordance with 327 IAC 5-2-8(5). Effluent standards or prohibitions established under Section 307(a) of the Clean Water Act for toxic pollutants injurious to human health are effective and must be complied with, if applicable to the permittee, within the time provided in the implementing regulations, even absent permit modification.

14. Operator Certification

The permittee shall have the wastewater treatment facilities under the responsible charge of an operator certified by the Commissioner in a classification corresponding to the classification of the wastewater treatment plant as required by IC 13-18-11-11 and 327 IAC 5-22. In order to operate a wastewater treatment plant the operator shall have qualifications as established in 327 IAC 5-22-7. The permittee shall designate one (1) person as the certified operator with complete responsibility for the proper operations of the wastewater facility.

327 IAC 5-22-10.5(a) provides that a certified operator may be designated as being in responsible charge of more than one (1) wastewater treatment plant, if it can be shown that he will give adequate supervision to all units involved. Adequate supervision means that sufficient time is spent at the plant on a regular basis to assure that the certified operator is knowledgeable of the actual operations and that test reports and results are representative of the actual operations conditions. In accordance with 327 IAC 5-22-3(11), "responsible charge" means the person responsible for the overall daily operation, supervision, or management of a wastewater facility.

Pursuant to 327 IAC 5-22-10(4), the permittee shall notify IDEM when there is a change of the person serving as the certified operator in responsible charge of the wastewater treatment facility. The notification shall be made no later than thirty (30) days after a change in the operator.

15. Construction Permit

Except in accordance with 327 IAC 3, the permittee shall not construct, install, or modify any water pollution treatment/control facility as defined in 327 IAC 3-1-2(24). Upon completion of any construction, the permittee must notify the Compliance Data Section of the Office of Water Quality in writing.

16. Inspection and Entry

In accordance with 327 IAC 5-2-8(7), the permittee shall allow the Commissioner, or an authorized representative, (including an authorized contractor acting as a representative of the Commissioner) upon the presentation of credentials and other documents as may be required by law, to:

a. Enter upon the permittee's premises where a point source, regulated facility, or activity is located or conducted, or where records must be kept pursuant to the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the terms and conditions of this permit;

c. Inspect at reasonable times any facilities, equipment or methods (including monitoring and control equipment), practices, or operations regulated or required pursuant to this permit; and

d. Sample or monitor at reasonable times, any discharge of pollutants or internal wastestreams for the purposes of evaluating compliance with the permit or as otherwise authorized.

B. MANAGEMENT REQUIREMENTS

1. Facility Operation, Maintenance and Quality Control

a. In accordance with 327 IAC 5-2-8(8), the permittee shall at all times maintain in good working order and efficiently operate all facilities and systems (and related appurtenances) for collection and treatment that are:

(1) installed or used by the permittee; and

(2) necessary for achieving compliance with the terms and conditions of the permit.

Neither 327 IAC 5-2-8(8), nor this provision, shall be construed to require the operation of installed treatment facilities that are unnecessary for achieving compliance with the terms and conditions of the permit.

b. The permittee shall operate the permitted facility in a manner which will minimize upsets and discharges of excessive pollutants. The permittee shall properly remove and dispose of excessive solids and sludges.

c. The permittee shall provide an adequate operating staff which is duly qualified to carry out the operation, maintenance, and testing functions required to ensure compliance with the conditions of this permit.

d. Maintenance of all waste collection, control, treatment, and disposal facilities shall be conducted in a manner that complies with the bypass provisions set forth below.

e. Any extensions to the sewer system must continue to be constructed on a separated basis. Plans and specifications, when required, for extension of the sanitary system must be submitted to the Facility Construction Section, Office of Water Quality in accordance with 327 IAC 3-2-1. There shall also be an ongoing preventative maintenance program for the sanitary sewer system.

2. Bypass of Treatment Facilities

Pursuant to 327 IAC 5-2-8(11):

a. Terms as defined in 327 IAC 5-2-8(11)(A):

(1) "Bypass" means the intentional diversion of a waste stream from any portion of a treatment facility.

(2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which would cause them to become inoperable, or substantial and permanent loss of natural resources which can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Bypasses, as defined above, are prohibited, and the Commissioner may take enforcement action against a permittee for bypass, unless:

(1) The bypass was unavoidable to prevent loss of life, personal injury, or severe property damage, as defined above;

(2) There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance; and

(3) The permittee submitted notices as required under Part II.B.2.d; or

(4) The condition under Part II.B.2.f below is met.

c. Bypasses that result in death or acute injury or illness to animals or humans must be reported in accordance with the "Spill Response and Reporting Requirements" in 327 IAC 2-6.1, including calling 888/233-7745 as soon as possible, but within two (2) hours of discovery.

d. The permittee must provide the Commissioner with the following notice:

(1) If the permittee knows or should have known in advance of the need for a bypass (anticipated bypass), it shall submit prior written notice. If possible, such notice shall be provided at least ten (10) days before the date of the bypass for approval by the Commissioner.

(2) The permittee shall orally report or fax a report of an unanticipated bypass within 24 hours of becoming aware of the bypass event. The permittee must also provide a written report within five (5) days of the time the permittee becomes aware of the bypass event. The written report must contain a description of the noncompliance (i.e. the bypass) and its cause; the period of noncompliance, including exact dates and times; if the cause of noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent recurrence of the bypass event.

e. The Commissioner may approve an anticipated bypass, after considering its adverse effects, if the Commissioner determines that it will meet the conditions listed above in Part II.B.2.b. The Commissioner may impose any conditions determined to be necessary to minimize any adverse effects.

f. The permittee may allow any bypass to occur that does not cause a violation of the effluent limitations in the permit, but only if it also is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of Part II.B.2.b.,d and e of this permit.

Note: Bypass of treatment units, not entire treatment processes, does not constitute a bypass as noted in Part II.B.2 of the permit, provided that the permittee is at all times: maintaining in good working order and efficiently operating all facilities and systems; providing the best quality effluent; and achieving compliance with the terms and conditions of the permit.

g. Any overflow or release of sanitary wastewater from the wastewater treatment facilities or collection system into the environment which is not specifically authorized by this permit is expressly prohibited (pursuant to IC 13-30-2-1, IC 13-18-4-5 and 327 IAC 5-2-2). This prohibition applies to sanitary sewer overflows, regardless of cause, including releases from outfall points, cracked or broken pipes, manholes, basement backups or any other source or reason. This prohibition does not apply to back ups of wastewater into private properties that are due solely to a failure or blockage of private laterals that are not the responsibility of the permittee.

3. Upset Conditions

Pursuant to 327 IAC 5-2-8(12):

a. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation.

b. An upset shall constitute an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of Paragraph c of this subsection, are met.

c. A permittee who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence, that:

(1) An upset occurred and the permittee has identified the specific cause(s) of the upset, if possible;

(2) The permitted facility was at the time being operated in compliance with proper operation and maintenance procedures;

(3) The permittee complied with any remedial measures required under "Duty to Mitigate", Part II.A.2; and

(4) The permittee submitted notice of the upset as required in the "Twenty-Four Hour Reporting Requirements," Part II.C.3, or 327 IAC 2-6.1, whichever is applicable.

4. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed from or resulting from treatment or control of wastewaters shall be disposed of in a manner such as to prevent any pollutant from such materials from entering waters of the State and to be in compliance with all Indiana statutes and regulations relative to liquid and/or solid waste disposal.

a. Collected screenings, slurries, sludges, and other such pollutants shall be disposed of in accordance with provisions set forth in 329 IAC 10, 327 IAC 6.1, or another method approved by the Commissioner.

b. The permittee shall comply with existing federal regulations governing solids disposal, and with applicable provisions of 40 CFR Part 503, the federal sludge disposal regulation standards.

c. The permittee shall notify the Commissioner prior to any changes in sludge use or disposal practices.

d. The permittee shall maintain records to demonstrate its compliance with the above disposal requirements.

5. Power Failures

In accordance with 327 IAC 5-2-10 and 327 IAC 5-2-8(13) in order to maintain compliance with the effluent limitations and prohibitions of this permit, the permittee shall either:

a. provide an alternative power source sufficient to operate facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit, or

b. shall halt, reduce or otherwise control all discharge in order to maintain compliance with the effluent limitations and conditions of this permit upon the reduction, loss, or failure of one or more of the primary sources of power to facilities utilized by the permittee to maintain compliance with the effluent limitations and conditions of this permit.

C. REPORTING REQUIREMENTS

1. Planned Changes in Facility or Discharge

Pursuant to 327 IAC 5-2-8(10)(F) and 5-2-16(d), the permittee shall give notice to the Commissioner as soon as possible of any planned alterations or additions to the facility (which includes any point source) that could significantly change the nature of, or increase the quantity of, pollutants discharged. Following such notice, the permit may be modified to revise existing pollutant limitations and/or to specify and limit any pollutants not previously limited. Material and substantial alterations or additions to the permittee's operation that were not covered in the permit (e.g., production changes, relocation or combination of discharge points, changes in the nature or mix of products produced) are also cause for modification of the permit. However those alterations which constitute total replacement of the process or the production equipment causing the discharge converts it into a new source, which requires the submittal of a new NPDES application.

2. Monitoring Reports

Pursuant to 327 IAC 5-2-8(9), 327 IAC 5-2-13, and 327 IAC 5-2-15, monitoring results shall be reported at the intervals and in the form specified in "Data On Plant Operation", Part I.B.2.

3. Twenty-Four Hour Reporting Requirements

Pursuant to 327 IAC 5-2-8(10), the permittee shall orally report to the Commissioner information on the following types of noncompliance within 24 hours from the time permittee becomes aware of such noncompliance. If the noncompliance meets the requirements of item b (Part II.C.3.b) or 327 IAC 2-6.1, then the report shall be made within those prescribed time frames.

a. Any unanticipated bypass which exceeds any effluent limitation in the permit;

b. Any noncompliance which may pose a significant danger to human health or the environment. Reports under this item shall be made as soon as the permittee becomes aware of the noncomplying circumstances by calling 317/233-7745 (888/233-7745 toll free in Indiana);

c. Any upset (as defined in Part II.B.3 above) that exceeds any technology-based effluent limitations in the permit; or

d. Any discharge from the sanitary sewer system.

e. Any dry weather discharge from a combined sewer overflow which is identified in this permit; or

f. Violation of a maximum daily discharge limitation for any of the following toxic pollutants: mercury.

The permittee can make the oral reports by calling 317/232-8670 during regular business hours or by calling 317/233-7745 (888/233-7745 toll free in Indiana) during non-business hours. A written submission shall also be provided within five (5) days of the time the permittee becomes aware of the circumstances. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce and eliminate the noncompliance and prevent its recurrence. The Commissioner may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. Alternatively the permittee may submit a "Bypass Overflow/Incident Report" or a "Noncompliance Notification Report", whichever is applicable, to IDEM at 317/232-8637 or 317/232-8406 or to wwreports@idem.IN.gov. If a complete fax or email submittal is sent within 24 hours of the time that the permittee became aware of the occurrence, then that report will satisfy both the oral and written reporting requirements.

4. Other Noncompliance

Pursuant to 327 IAC 5-2-8(10)(D), the permittee shall report any instance of noncompliance not reported under the "Twenty-Four Hour Reporting Requirements" in Part II.C.3, not related to the failure to report planned changes in the permitted facility, or not relating to any compliance schedules at the time the pertinent Discharge Monitoring

Report is submitted. The written submission shall contain: a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent the noncompliance.

5. Other Information

Pursuant to 327 IAC 5-2-8(10)(E), where the permittee becomes aware that it failed to submit any relevant facts or submitted incorrect information in a permit application or in any report to the Commissioner, the permittee shall promptly submit such facts or corrected information to the Commissioner.

6. Signatory Requirements

Pursuant to 327 IAC 5-2-22 and 327 IAC 5-2-8(14):

a. All reports required by the permit and other information requested by the Commissioner shall be signed and certified by a person described below or by a duly authorized representative of that person:

(1) For a corporation: by a principal executive defined as a president, secretary, treasurer, any vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy-making functions for the corporation or the manager of one or more manufacturing, production, or operating facilities employing more than two hundred fifty (250) persons or having gross annual sales or expenditures exceeding twenty-five million dollars ($25,000,000) (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

(2) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

(3) For a federal, state, or local governmental body or any agency or political subdivision thereof: by either a principal executive officer or ranking elected official.

b. A person is a duly authorized representative only if:

(1) The authorization is made in writing by a person described above.

(2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.); and

(3) The authorization is submitted to the Commissioner.

c. Certification. Any person signing a document identified under paragraphs a and b of this section, shall make the following certification:

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

7. Availability of Reports

Except for data determined to be confidential under 327 IAC 12.1, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Indiana Department of Environmental Management and the Regional Administrator. As required by the Clean Water Act, permit applications, permits, and effluent data shall not be considered confidential.

8. Penalties for Falsification of Reports

IC 13-30 and 327 IAC 5-2-8(14) provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than 180 days per violation, or by both.

9. Progress Reports

In accordance with 327 IAC 5-2-8(10)(A), reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than fourteen (14) days following each schedule date.

10. Advance Notice for Planned Changes

In accordance with 327 IAC 5-2-8(10)(B), the permittee shall give advance notice to IDEM of any planned changes in the permitted facility, any activity, or other circumstances that the permittee has reason to believe may result in noncompliance with permit requirements.

11. Additional Requirements for POTWs and/or Treatment Works Treating Domestic Sewage

a. All POTWs shall identify, in terms of character and volume of pollutants, any significant indirect discharges into the POTW which are subject to pretreatment standards under section 307(b) and 307 (c) of the CWA.

b. All POTWs must provide adequate notice to the Commissioner of the following:

(1) Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to section 301 or 306 of the CWA if it were directly discharging those pollutants.

(2) Any substantial change in the volume or character of pollutants being introduced into that POTW by any source where such change would render the source subject to pretreatment standards under section 307(b) or 307(c) of the CWA or would result in a modified application of such standards.

As used in this clause, "adequate notice" includes information on the quality and quantity of effluent introduced into the POTW, and any anticipated impact of the change on the quantity or quality of the effluent to be discharged from the POTW.

c. This permit incorporates any conditions imposed in grants made by the U.S. EPA and/or IDEM to a POTW pursuant to Sections 201 and 204 of the Clean Water Act, that are reasonably necessary for the achievement of effluent limitations required by Section 301 of the Clean Water Act.

d. This permit incorporates any requirements of Section 405 of the Clean Water Act governing the disposal of sewage sludge from POTWs or any other treatment works treating domestic sewage for any use for which rules have been established in accordance with any applicable rules.

e. POTWs must develop and submit to the Commissioner a POTW pretreatment program when required by 40 CFR 403 and 327 IAC 5-19-1, in order to assure compliance by industrial users of the POTW with applicable pretreatment standards established under Sections 307(b) and 307(c) of the Clean Water Act. The pretreatment program shall meet the criteria of 327 IAC 5-19-3 and, once approved, shall be incorporated into the POTW's NPDES permit.

D. ADDRESSES

1. Cashiers Office

Indiana Department of Environmental Management
Cashiers Office – Mail Code 50-10C
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Cashiers Office:

a. NPDES permit applications (new, renewal or modifications) with fee

b. Construction permit applications with fee

2. Municipal NPDES Permits Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Municipal NPDES Permits Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251
The following correspondence shall be sent to the Municipal NPDES Permits Section:

a. Preliminary Effluent Limits request letters

b. Comment letters pertaining to draft NPDES permits

c. NPDES permit transfer of ownership requests

d. NPDES permit termination requests

e. Notifications of substantial changes to a treatment facility, including new industrial sources

f. Combined Sewer Overflow (CSO) Operational Plans

g. CSO Long Term Control Plans (LTCP)

h. Stream Reach Characterization and Evaluation Reports (SRCER)

3. Compliance Data Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Compliance Data Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Compliance Data Section:

a. Discharge Monitoring Reports (DMRs)

b. Monthly Reports of Operation (MROs)

c. Monthly Monitoring Reports (MMRs)

d. CSO DMRs

e. Gauging station and flow meter calibration documentation

f. Compliance schedule progress reports

g. Completion of Construction notifications

h. Whole Effluent Toxicity Testing reports

i. Toxicity Reduction Evaluation (TRE) plans and progress reports

4. Pretreatment Group

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Compliance Data Section – Pretreatment Group
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

The following correspondence shall be sent to the Pretreatment Group:

a. Organic Pollutant Monitoring Reports

b. Significant Industrial User (SIU) Quarterly Noncompliance Reports

c. Pretreatment Program Annual Reports

d. Sewer Use Ordinances

e. Enforcement Response Plans (ERP)

f. Sludge analytical results

5. Enforcement Section

Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-40
Enforcement Section
100 N. Senate Avenue
Indianapolis, Indiana 46204-2251

a. Bypass/Overflow Reports

b. Anticipated Bypass/Overflow Reports

ATTACHMENT A

Precipitation Related Combined Sewer Overflow Discharge Authorization Requirements

I. Discharge Authorization

A.

Outfall	Location	Receiving Water
003	Dehart Street & North River Rd. 40° 25' 54" N 86° 53' 49" W	Wabash River
004	Quincy Street & North River Rd. 40° 25' 38" N 86° 53' 50" W	Wabash River
006	Quincy Street & North River Rd. 40° 25' 39" N 86° 53' 50" W	Wabash River
007	Overflow at the WWTP 40° 24' 58" N 86° 54' 01" W	Wabash River

1. Once the Long Term Control Plan (LTCP) is implemented, the following CSOs in the collection system will remain active: 003, 004, & 006. These CSOs will discharge only under conditions described in Part V of this Attachment A.

2. The permittee is authorized to discharge treated combined sewage from Outfall 007 when influent flows exceed the wastewater treatment plant peak hydraulic capacity. Any discharge from 007 is subject to the requirements and provisions of this permit including the following requirements:

TABLE 1

	Quantity or Loading			**Quality or Concentration**			**Monitoring Requirements**	
Parameter [7]	Daily Maximum	Monthly Average	Units	Monthly Average	Daily Maximum	Units	Measurement Frequency	Sample Type
Flow [1]	Report	Report	MGD	----	----	----	Daily	24-Hr. Total
$CBOD_5$	----	----	----	Report	Report	mg/l	Daily	Composite [6]
TSS	----	----	----	Report	Report	mg/l	Daily	Composite [6]
Ammonia-nitrogen	----	----	----	Report	Report	mg/l	Daily	Composite [6]

TABLE 2

Parameter	Quality or Concentration: Daily Minimum	Daily Maximum	Monthly Average	Units	Monitoring Requirements: Measurement Frequency	Sample Type
pH [8]	Report	Report	----	s.u.	Daily	Grab
Dissolved Oxygen [9]	Report	----	----	mg/l	Daily	Grab
E. coli [2] [4] [5]	----	235	125	colonies/100 ml	Daily	Grab
TRC [2] [3]	----	0.04	0.02	mg/l	Daily	Grab

[1] Effluent flow measurement is required per 327 IAC 5-2-13. The flow meter(s) shall be calibrated at least once annually.

[2] The effluent shall be disinfected on a continuous basis during any discharge such that violations of the applicable bacteriological limitations do not occur from April 1 through October 31, annually.

[3] In accordance with 327 IAC 5-2-11.1 (f), compliance with this permit will be demonstrated if the measured effluent concentrations are less than the limit of quantitation (0.06 mg/l). If the measured effluent concentrations are above the water quality-based permit limitations and above the limit of detection (LOD) specified by the permit in any of three (3) consecutive analyses or any five (5) out of nine (9) analyses, the permittee is required to reevaluate its chlorination/dechlorination practices to make any necessary changes to assure compliance with the permit limitation for TRC. These records must be retained in accordance with the record retention requirements of Part I.B.8 of this permit.

Effluent concentrations greater than or equal to the LOD but less than the limit of quantitation (LOQ), shall be reported on the discharge monitoring report forms as the measured value. A note must be included with the DMR indicating that the value is not quantifiable. Effluent concentrations less than the limit of detection shall be reported on the discharge monitoring report forms as less than the value of the limit of detection. For example, if a substance is not detected at a concentration of 0.01 mg/l, report the value as < 0.01 mg/l. At present, two methods are considered to be acceptable to IDEM, amperometric and DPD colorimetric methods, for chlorine concentrations at the level of 0.06 mg/l.

Parameter	LOD	LOQ
Chlorine	0.02 mg/l	0.06 mg/l

Case-Specific MDL

The permittee may determine a case-specific method detection level (MDL) using one of the analytical methods specified above, or any other test method which is approved by IDEM prior to use. The MDL shall be derived by the

procedure specified for MDLs contained in 40 CFR Part 136, Appendix B, and the limit of quantitation shall be set equal to 3.18 times the MDL. Other methods may be used if first approved by the U.S. EPA and IDEM.

[4] The *E. coli* limitations and monitoring requirements apply from April 1 through October 31 annually. The monthly average *E. coli* value shall be calculated as a geometric mean. IDEM has specified the following methods as allowable for the detection and enumeration of *Escherichia coli (E. coli)*:

1. Coliscan MF® Method
2. EPA Method 1103.1 using original m-TEC agar.
3. EPA revised Method 1103.1 using modified m-TEC agar.
4. *Standard Methods* 20th Edition Method 9223 B using Colilert®

[5] For *E. coli*, the daily maximum shall be the geometric mean of all grab samples on any discharge day, provided that three (3) or more grab samples are collected. The *E. coli* monthly average shall be the geometric mean of all grab samples collected during the month, provided that five (5) or more grab samples are collected. The goal of the effluent monitoring program is to collect at least three (3) grab samples during each discharge event, and the samples shall be collected at shorter intervals at the onset of the event, if the permittee estimates that the event duration may be less than 6 hours.

If there are less than five (5) discharges in a calendar month, then the monthly average does not need to be reported on the Discharge Monitoring Report (DMR). If Outfall 007 discharges five (5) times or more during a calendar month, then the monthly average *E. coli* value shall be calculated as a geometric mean and reported on the DMR.

[6] Effluent composite sampling, either by automatic sampler collecting samples at set intervals or by grab samples collected during discharges from the wet weather treatment component, shall be representative of the discharge and of sufficient quantity to ensure that the parameters of Table 1 of Attachment A can be measured; shall be initiated within 30 minutes from the beginning of a discharge event; and shall continue at intervals determined by the permittee, but no less than every 2 hours during the duration of the event. If an event lasts for more than 24 hours a new sampling period shall be initiated. Analysis for the parameters identified in Table 1 of Attachment A shall be from the composite sample collected as described above.

[7] For purposes of reporting on a discharge event which lasts less than 24 hours, but occurs during two calendar days, the pollutant concentrations for the event shall be reported as daily values on the day when the majority of the discharge occurred.

[8] If the permittee collects more than one grab sample on a given day for pH, the values shall not be averaged for reporting daily maximums or daily minimums. The permittee must report the minimum or maximum pH value of any individual sample during the month on the Discharge Monitoring Report forms.

[9] The daily minimum concentration of dissolved oxygen in the effluent shall be reported as the arithmetic mean determined by summation of daily grab sample results divided by the number of daily grab samples. These samples are to be collected over equal time intervals.

B. Combined Sewer Overflows are point sources subject to both technology-based and water quality-based requirements of the Clean Water Act and state law.

C. At all times the discharge from any and all CSO outfalls herein shall not cause receiving waters:

1. including the mixing zone, to contain substances, materials, floating debris, oil, scum, or other pollutants:

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

2. outside the mixing zone, to contain substances in concentrations which on the basis of available scientific data are believed to be sufficient to injure, be chronically toxic to, or be carcinogenic, mutagenic, or teratogenic to humans, animals, aquatic life, or plants.

D. Dry weather discharges from any portion of the sewer collection system, including the outfalls listed in Part I.A of this Attachment A, are prohibited. If a dry weather discharge occurs, the permittee shall notify the Office of Water Quality, Enforcement Section, by phone within 24 hours and in writing within five days of the occurrence. The correspondence shall include the duration and cause of the discharge as well as the remedial action taken to end the discharge.

II. <u>Schedule of Compliance for *E. coli* at CSO 007</u>

A. The final effluent limitations for *E. coli* are deferred until September 1, 2011, unless the final effluent limitations can be met at an earlier date. The permittee shall notify the Compliance Data Section of OWQ as soon as the final effluent limitations for *E. coli* can be met. Upon receipt of such notification by OWQ, the final limitations for *E. coli* will become effective, but no later than September 1,

2011. Monitoring and reporting of *E. coli* in the effluent is required during the interim period.

B. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality by May 1, 2011.

C. Construction shall be completed by August 1, 2011. The permittee shall submit a written progress report to the Compliance Data Section, Office of Water Quality when construction has been completed.

D. The permittee shall comply with all final requirements no later September 1, 2011.

E. If the permittee fails to comply with any deadline contained in the foregoing schedule, the permittee shall, within fourteen (14) days following the missed deadline, submit a written notice of noncompliance to the Compliance Evaluation Section of the Office of Water Quality stating the cause of noncompliance, any remedial action taken or planned, and the probability of meeting the date fixed for compliance with final effluent limitations.

III. Monitoring Report Requirements

A. The permittee is required to monitor the flow from each CSO outfall. This monitoring of each CSO outfall shall include:

1. measurement of the flow volume,
2. the time that the CSO discharge began,
3. the flow duration, and
4. rainfall amount and duration.

The requirement for the measurement of flow volume may be accomplished by installing a flow measurement device or by utilizing a reliable method of estimating the flow volume. Within 120 days from the effective date of this permit modification, the permittee shall submit to IDEM their monitoring plan which describes the permittee's method of accomplishing this permit requirement. The permittee shall also update its CSO Operational Plan to incorporate the flow monitoring plan.

The permittee shall also report the amount of precipitation for each day of the month. A rain gauge must be used that measures amount (depth) and duration. If multiple rain gauges are used, the information from each rain gauge shall be reported.

All of the information described in this subsection shall be reported on the CSO Discharge Monitoring Report (CSO DMR) form provided by IDEM and submitted to IDEM prior to the 28th day of the following month. All submittals under this provision shall be subject to the reporting requirements of this permit, including, but not limited to, Part II, Section C.6 ("Signatory Requirements"), C.7 ("Availability of Reports"), and C.8 ("Penalties for Falsification of Reports") of this permit.

B. The permittee shall monitor and report discharges from Outfall 007 in accordance with Part I.A.2., of Attachment A of this permit.

IV. CSO Operational Plan

A. The permittee shall comply with the following minimum technology-based controls, in accordance with the federal CSO Control Policy:

1. The permittee shall implement proper operation and regular maintenance programs for the sewer system and the CSOs. The purpose of the operation and maintenance programs is to reduce the magnitude, frequency and duration of CSOs. The program shall consider regular sewer inspections; sewer, catch basin, and regulator cleaning; equipment and sewer collection system repair or replacement, where necessary; and disconnection of illegal connections.
2. The permittee shall implement procedures that will maximize the use of the collection system for wastewater storage that can be accommodated by the storage capacity of the collection system in order to reduce the magnitude, frequency and duration of CSOs.
3. The permittee shall review and modify, as appropriate, its existing pretreatment program to minimize CSO impacts from non-domestic users. The permittee shall identify all industrial users that discharge to the collection system upstream of any CSO outfalls; this identification shall also include the pollutants in the industrial user's wastewater and the specific CSO outfall(s) that are likely to discharge the wastewater.
4. The permittee shall operate the POTW at the maximum treatable flow during all wet weather flow conditions to reduce the magnitude, frequency and duration of CSOs. The permittee shall deliver all flows to the treatment plant within the constraints of the treatment capacity of the POTW.
5. Dry weather overflows from CSO outfalls are prohibited. Each dry weather overflow must be reported to IDEM as soon as the permittee becomes aware of the overflow. When the permittee detects a dry weather overflow, it shall begin corrective action immediately. The permittee shall inspect the dry weather overflow each subsequent day until the overflow has been eliminated.
6. The permittee shall implement measures to control solid and floatable materials in CSO discharges.
7. The permittee shall implement a pollution prevention program focused on reducing the impact of CSOs on receiving waters.
8. The permittee shall implement a public notification process to inform citizens of when and where CSO discharges occur and their impacts. This notification must also be done in accordance with 327 IAC 5-2.1.
9. The permittee shall monitor to effectively characterize CSO impacts and the efficacy of CSO controls.

B. The permittee's implementation of each of the minimum controls in Part III.A of this Attachment A shall be documented in its CSO Operational Plan (CSOOP), which was approved July 30, 1993. The permittee shall update the CSOOP to reflect changes in its operation or maintenance practices; measures taken to implement the above

minimum requirements; and changes to the treatment plant or collection system, including changes in collection system flow characteristics, collection system or WWTP capacity or discharge characteristics (including volume, duration, frequency and pollutant concentration). Beginning twelve (12) months from the effective date of this permit renewal, the permittee shall annually evaluate its CSOOP and update it, as necessary. The permittee shall submit the CSOOP updates to IDEM, Office of Water Quality, Municipal NPDES Permits Section.

The CSOOP update(s) shall include a summary of the proposed revisions to the CSOOP as well as a reference to the page(s) that have been modified. Any CSOOP updates shall not result in:

1. a lower amount of flow being sent to and through the plant for treatment, or
2. more discharges (measured either by volume, duration, frequency, or pollutant concentration) occurring from the CSO outfalls.

The permittee shall maintain a current CSO Operational Plan, including all approved updates, on file at the POTW.

V. CSO Long-Term Control Plan

The Indiana Department of Environmental Management (IDEM) has conducted a substantive review of the City of West Lafayette Long-Term Control Plan (LTCP).

West Lafayette has two components of its CSO LTCP remaining. Continuation of the Western Interceptor project (Division II) commenced in December 2007. Division III of the Western Interceptor project is scheduled to begin in September 2021. Division III is dependent upon an INDOT project and will be completed as soon as possible depending on the US 231 extension.

The serpentine flow CSO treatment facility, combined with chlorine disinfection facilities, must provide primary treatment, disinfection and dechlorination of flow up to and including the 10 year, 1 hour design storm prior to discharge from CSO Outfall 007.

The City of West Lafayette's approved CSOOP, LTCP and NPDES permit outline the wet weather operating procedures and design capabilities of the WWTP and CSO Treatment Facility. All CSO Treatment Facility wet weather discharges shall receive the specified treatment to the extent possible. In conditions where wet weather discharges from the CSO Treatment Facility result from a storm event, rainfall amount, or intensity which exceed the design capacity of the facility, the permittee shall provide documentation that all conditions and requirements expressed in their NPDES permit, including Attachment A, were achieved. All documentation regarding performance of the WWTP and the CSO Treatment Facility during storm events identified above, would be reviewable by IDEM with exercise of enforcement discretion for discharges from CSOs 003, 004, 006 and 007 accorded to it under IC 13 – 30 for these storm events.

Based on this information, IDEM has determined that the City's LTCP is acceptable and therefore formally approves the City of West Lafayette's LTCP. The LTCP is incorporated herein.

The City of West Lafayette must implement their approved LTCP consistent with the approved implementation schedule and consistent with the terms and conditions of Agreed Judgment Cause No. 79C01-0710-CC-00105. A detailed scope of projects may be found in the West Lafayette's LTCP, which is incorporated as an enforceable part of Agreed Judgment Cause No. 79C01-0710-CC-00105.

In accordance with IC 13-18-3-2.6, this NPDES permit recognizes that the schedule of compliance in Agreed Judgment Cause No. 79C01-0710-CC-00105 exceeds the term of this permit. IC 13-18-3-2.6 establishes that when a schedule of compliance exceeds the term of a permit, implementation of the schedule of compliance shall continue before and during successive permit terms, and in accordance with the community's approved LTCP.

VI. Sewer Use Ordinance Review/Revision and Enforcement

The permittee's Sewer Use Ordinance must contain provisions which: (1) prohibit introduction of inflow sources to any sanitary sewer; (2) prohibit construction of new combined sewers outside of the existing combined sewer service area; and (3) provide that for any new building the inflow/clear water connection to a combined sewer shall be made separate and distinct from sanitary waste connection to facilitate disconnection of the former if a separate storm sewer subsequently becomes available. The permittee shall continuously enforce these provisions.

VII. Reopening Clauses

A. After LTCP implementation, if IDEM has evidence that a CSO discharge is causing or contributing to exceedances of water quality standards, then additional control measures, effluent limitations, and/or monitoring requirements may be imposed on the CSO through a modification of this permit, after public notice and opportunity for hearing.
B. This permit may be reopened to address changes in the EPA National CSO Policy or state or federal law.
C. The permit may be reopened, after public notice and opportunity for hearing, to incorporate elements of an approved LTCP.
D. The permit may be reopened, after public notice and opportunity for hearing, to incorporate applicable provisions of IC 13-18.

Fact Sheet
August 18, 2010
Updated: September 28, 2010

City of West Lafayette Wastewater Treatment Plant
located at 500 South River Road,
West Lafayette, Indiana, Tippecanoe County

Outfall Location	Latitude:	40° 25' 03" N
	Longitude:	86° 53' 59" W

NPDES Permit No. IN0024821

Background

This is the proposed renewal of the NPDES permit for the City of West Lafayette Wastewater Treatment Plant which was issued on January 12, 2006 and has an expiration date of January 31, 2011. The permittee submitted an application for renewal which was received on July 30, 2010. The permittee currently operates a Class IV, 9.0 MGD wastewater treatment plant consisting of influent flow measurement, screening, grit removal, six primary clarifiers, four aeration tanks, three final clarifiers, chlorination and dechlorination facilities and an effluent flow meter. Final sludge is handled utilizing a gravity belt sludge thickener, two anaerobic digesters, and is land applied.

The City of West Lafayette's collection system receives varying inflow rates depending on the presence or absence of students at Purdue University. Due to this inflow fluctuatioin, bypass of individual treatment units, not entire treatment processes, does not constitute as a bypass as noted in Part II.B.2 of the permit, provided that the permittee is at all times maintaining in good working order and efficiently operating all facilities and systems; providing the best quality effluent; and achieving compliance with the terms and conditions of the permit.

Collection System

The collection system is comprised of combined sanitary and storm sewers with four (4) Combined Sewer Overflow (CSO) locations. The CSO locations have been identified and permitted with provisions in Attachment A of the permit.

CSO Statutory or Regulatory Basis for Permit Provisions

CSOs are point sources subject to NPDES permit requirements, including both technology-based and water quality-based requirements of the CWA and state law. Thus the permit contains provisions IDEM deems necessary to meet water quality standards, as well as technology-based treatment requirements, operation and maintenance requirements, and best management practices. This permit is based on various provisions of state and federal law, including (1) Title

13 of the Indiana Code; (2) the water quality standards set forth in 327 IAC 2-1; (3) the NPDES rules set forth in 327 IAC 2 and 327 IAC 5, including 327 IAC 5-2-8 and 327 IAC 5-2-10; and (4) section 402(q) of the CWA (33 USC § 1342), which requires all permits or orders issued for discharges from municipal CSOs to conform with the provisions of EPA's National CSO Control Policy (58 Fed. Reg. 18688, April 19, 1994). EPA's CSO Policy contains provisions that, among other things, require permittees to develop and implement minimum technological and operational controls and long term control plans to meet state water quality standards. The permit's penalty provisions are based in large part on IC 13-30. In addition to the regulatory provisions previously cited, the data collection and reporting requirements are based in part on 327 IAC 5-1-3, 327 IAC 5-2-13 and section 402(q) of the CWA. The long term control plan provisions were included to ensure compliance with water quality standards.

This permit renewal shows the portions remaining to be completed in the approved LTCP and includes the implementation schedule.

Explanation of Effluent Limitations and Conditions

The effluent limitations set forth in Part I of Attachment A are derived in part from the narrative water quality standards set forth in 327 IAC 2-1-6. The narrative standards are minimum standards that apply to all waters at all times, and therefore are applicable to all discharges of pollutants. Because EPA has not issued national effluent limitation guidelines for this category of discharges, the technology-based BAT/BCT provisions are based on best professional judgment (BPJ) in addition to section 402(q) of the CWA. (CSO discharges are not subject to the secondary treatment requirements applicable to publicly owned treatment works because overflow points have been determined to not be part of the treatment plant. Montgomery Environmental Coalition v. Costle, 646 F.2d 568 (D.C. Cir. 1980).)

Spill Reporting Requirements

Reporting requirements associated with the Spill Reporting, Containment, and Response requirements of 327 IAC 2-6.1 are included in Part II.B.2.c. and Part II.C.3. of the NPDES permit. Spills from the permitted facility meeting the definition of a spill under 327 IAC 2-6.1-4(15), the applicability requirements of 327 IAC 2-6.1-1, and the Reportable Spills requirements of 327 IAC 2-6.1-5 (other than those meeting an exclusion under 327 IAC 2-6.1-3 or the criteria outlined below) are subject to the Reporting Responsibilities of 327 IAC 2-6.1-7.

It should be noted that the reporting requirements of 327 IAC 2-6.1 do not apply to those discharges or exceedences that are under the jurisdiction of an applicable permit when the substance in question is covered by the permit and death or acute injury or illness to animals or humans does not occur. In order for a discharge or exceedence to be under the jurisdiction of this NPDES permit, the substance in question (a) must have been discharged in the normal course of operation from an outfall listed in this permit, and (b) must have been discharged from an outfall for which the permittee has authorization to discharge that substance.

Solids Disposal

The permittee is required to dispose of its sludge in accordance with 329 IAC 10, 327 IAC 6.1, or 40 CFR Part 503. The permittee maintains a land application permit (INLA000123) for the disposal of solids.

Receiving Stream

The facility discharges to the Wabash River via Outfall 001. The receiving stream has a seven day, ten year low flow ($Q_{7,10}$) of 868 cubic feet per second (561 MGD) at the outfall location. This provides a dilution ratio of receiving stream flow to treated effluent of 62:1.

The receiving stream is designated for full body contact recreational use and shall be capable of supporting a well-balanced warm water aquatic community in accordance with 327 IAC 2-1.

Industrial Contributions

There is no industrial flow to the wastewater treatment plant. This NPDES permit does not authorize the facility to accept industrial contributions until the permittee has provided the Indiana Department of Environmental Management with a characterization of the waste, including volume amounts, and this Office has determined whether effluent limitations are needed to ensure the State water quality standards are met in the receiving stream.

Effluent Limitations and Rationale

The effluent limitations proposed herein are based on Indiana Water Quality Standards, NPDES regulations, and two Wasteload Allocation (WLA) analyses performed by this Office's Permits Technical Support Section staff on December 10, 1998, May 1, 2002, and August 9, 2010. These limits are in accordance with antibacksliding regulations specified in 327 IAC 5-2-10(11). Monitoring frequencies are based upon facility size and type.

The final effluent limitations to be limited and/or monitored include: Flow, Carbonaceous Biochemical Oxygen Demand ($CBOD_5$), Total Suspended Solids (TSS), Ammonia-nitrogen (NH_3-N), phosphorus, pH, Total Residual Chlorine (TRC), *Escherichia coli* (*E. coli)*, and mercury.

Dissolved Oxygen (DO) limitations have not been included in the permit due to the high dilution afforded by the receiving stream.

Final Effluent Limitations

The summer monitoring period runs from May 1 through November 30 of each year and the winter monitoring period runs from December 1 through April 30 of each year. The disinfection season runs from April 1 through October 31 of each year.

The mass limits for $CBOD_5$, TSS and ammonia-nitrogen have been calculated utilizing the peak design flow of 18 MGD. This is to facilitate the maximization of flow through the treatment facility in accordance with this Office's CSO policy.

Flow

Flow is to be measured daily as a 24-hour total. Reporting of flow is required by 327 IAC 5-2-13.

$CBOD_5$

$CBOD_5$ is limited to 25 mg/l (3,755 lbs/day) as a monthly and 40 mg/l (6,008 lbs/day) as a weekly average. Monitoring is to be conducted daily by 24-hour composite sampling. The $CBOD_5$ concentration limitations included in this permit are set in accordance with the Wasteload Allocation (WLA) analysis performed by this Office's Permits Technical Support Section staff on December 10, 1998 and are the same as the concentration limitations found in the facility's previous permit.

TSS

TSS is limited to 30 mg/l (4,506 lbs/day) as a monthly average and 45 mg/l (6,759 lbs/day) as a weekly average. Monitoring is to be conducted daily by 24-hour composite sampling. The TSS concentration limitations included in this permit are set in accordance with the Wasteload Allocation (WLA) analysis performed by this Office's Permits Technical Support Section staff on December 10, 1998 and are the same as the concentration limitations found in the facility's previous permit.

Phosphorus

The Wabash River Total Maximum Daily Load (TMDL) for Nutrients and Pathogens, dated September 18, 2006, includes recommendations for the institution of phosphorus monitoring for the City of West Lafayette WWTP. In accordance with these recommendations of the TMDL, the permit renewal contains monitoring requirements for phosphorus. This monitoring is to be conducted once monthly for the term of the permit. This is a new requirement for the facility.

Ammonia-nitrogen

Ammonia-nitrogen is limited to 3.0 mg/l (451 lbs/day) as a monthly average and 4.5 mg/l (676 lbs/day) as a weekly average during the summer monitoring period. During the winter monitoring period, ammonia-nitrogen is limited to 6.0 mg/l (901 lbs/day) as a monthly average and 9.0 mg/l (1,352 lbs/day) as a weekly average.

Monitoring is to be conducted daily by 24-hour composite sampling. The ammonia-nitrogen concentration limitations included in this permit are set in accordance with antibacksliding regulations specified in 327 IAC 5-2-10(11) and are the same as the concentration limitations found in the facility's previous permit.

pH

The pH limitations have been based on 40 CFR 133.102 which is cross-referenced in 327 IAC 5-5-3. To ensure conditions necessary for the maintenance of a well-balanced aquatic community, the pH of the final effluent must be between 6.0 and 9.0 standard units in accordance with provisions in 327 IAC 2-1-6(b)(2).

pH must be measured daily by grab sampling. These pH limitations are the same as the limitations found in the facility's previous permit.

Total Residual Chlorine

Disinfection of the effluent is required from April 1 through October 31, annually. Effluent dechlorination will be required in order to protect aquatic life. In accordance with Indiana Water Quality Standards, the final effluent limits (end-of-pipe) for TRC are 0.02 mg/l monthly average and 0.04 mg/l daily maximum. Compliance will be demonstrated if the observed effluent concentrations are less than the limit of quantitation (0.06 mg/l). Disinfection requirements are established in 327 IAC 5-10-6. This monitoring is to be conducted daily by grab sampling.

E. coli

The *E. coli* limitations and monitoring requirements apply from April 1 through October 31, annually. *E. coli* is limited to 125 count/100 ml as a monthly average, and 235 count/100 ml as a daily maximum. The monthly average *E. coli* value shall be calculated as a geometric mean. This monitoring is to be conducted daily by grab sampling. These *E. coli* limitations are set in accordance with regulations specified in 327 IAC 5-10-6.

Mercury

The RPE performed by this Office's Permits Branch staff on August 9, 2010 revealed that the projected effluent quality (PEQ) for mercury was greater than the projected effluent limitations (PELs). Therefore, effluent limitations for mercury are being included in this permit. Mercury is limited to 12 ng/l as a monthly average and 20 ng/l as a daily maximum. This monitoring is to be conducted six times annually by grab sampling. The mercury WQBELs are based on the surface water quality criteria of 327 IAC 2-1-6(a)(3), Table 6-1. In accordance with 327 IAC 5-2-11.1(b)(6), the criteria for mercury are applied to the undiluted discharge.

As the final effluent limitations for mercury are new limitations and as the permittee has provided sufficient justification for a compliance schedule, a 36-month schedule of compliance for mercury is included in Part I.D. of the permit. The permittee will utilize the three-year timeframe to implement the pollution control measures which the permittee expects will result in compliance with the new mercury limitations.

In addition to effluent monitoring and limitations, the permittee is required to monitor the influent wastestream for mercury at a frequency of six times annually utilizing grab sampling.

Whole Effluent Toxicity Testing

The permittee submitted a whole effluent toxicity tests (WETT) with the renewal application as required in 327 IAC 5-2-3(g). The submitted WETT did not indicate toxicity. No further WETT is required except that which is required with subsequent NPDES permit renewals.

Backsliding

None of the concentration limits included in this permit conflict with antibacksliding regulations found in 327 IAC 5-2-10(11), therefore, backsliding is not an issue.

Reopening Clauses

Four reopening clauses were incorporated into the permit in Part I.C. One clause is to incorporate effluent limits from any further wasteload allocations performed, a second clause is to allow for changes in the sludge disposal standards, a third clause is to incorporate any applicable effluent limitation or standard issued or approved under section 301(b)(2)(C), (D) and (E), 304(b)(2), and 307(a)(2) of the Clean Water Act, and a fourth clause is to include a case-specific Method Detection Level (MDL).

Compliance Status

The permittee has no enforcement actions at the time of this permit preparation. However, a review of the last three years of Discharge Monitoring Reports (DMRs) for the facility revealed several violations for TRC and *E. coli*.

Expiration Date

A five-year NPDES permit is proposed.

Drafted by: Julie Morris
August 18, 2010

POST PUBLIC NOTICE ADDENDUM: September 2010

The draft NPDES permit renewal for the City of West Lafayette Wastewater Treatment Plant was made available for public comment from August 27, 2010 through September 27, 2010 as part of Public Notice No. 2010-8G-RD. A comment letter from Mr. David Henderson, Utility Director, was received on September 23, 2010. The comments submitted, and this Office's corresponding responses, are summarized below: Any changes to the permit and/or fact sheet are so noted below.

Comment 1: Mr. Henderson stated that the dates on the Schedule of Compliance for *E. coli* at CSO Outfall 007, located on page 31 of the permit, need to be changed.

Response 1: This Office has made the requested changes to the permit.

Comment 2: Mr. Henderson requested that the following language be added to Part II.B.1 of the permit: Bypass of treatment units, not entire processes, does not constitute a bypass as defined in Part II.B.2.a.(1) of this permit, provided that the permittee is maintaining in good working order and efficiently operating the facilities and system, provided effluent that complies with the requirements of Part I.A. of this permit, and achieving compliance with the other terms and conditions of this permit.

Response 2: The following language has been added to the bypass provisions located in Part II.B.2.f:

Note: Bypass of treatment units, not entire treatment processes, does not constitute a bypass as noted in Part II.B.2 of the permit, provided that the permittee is at all times: maintaining in good working order and efficiently operating all facilities and systems; providing the best quality effluent; and achieving compliance with the terms and conditions of the permit.

Comment 3: Mr. Henderson requested that item g. in Part II.B.2 be deleted. Mr. Henderson stated that other provisions included in the draft permit adequately differentiate between authorized discharges and those that are prohibited in accordance with state and federal laws and regulations.

Response 3: The following language has been added to Part II.B.2.g of the permit:

This prohibition does not apply to back ups of wastewater into private properties that are due solely to a failure or blockage of private laterals that are not the responsibility of the permittee.

Comment 4: Mr. Henderson requested that the monthly average limitation for *E. coli* in Table 2 in the Attachment A of the permit be deleted. Mr. Henderson stated that the monthly average limitation should not be applied to the intermittent or wet weather discharges from the CSO Outfall 007. Mr. Henderson stated that the daily maximum limitation is sufficient to address water quality impacts from discharges from Outfall 007. Mr. Henderson also requested the language addressing the monthly average limitation for *E. coli* in footnotes [4] and [5] of Table 2 in the Attachment A of the permit be deleted.

Response 4: Footnote [5] on pg 30 of the permit states that "The *E. coli* monthly average shall be the geometric mean of all grab samples collected during the month, provided that five (5) or more grab samples are collected…If there are less than five (5) discharges in a calendar month, then the monthly average does not need to be reported on the Discharge Monitoring Report (DMR). If Outfall 007 discharges five (5) times or more during a calendar month, then the monthly average *E. coli* value shall be calculated as a geometric and reported on the DMR." No changes to the permit have been made.

Comment 5: Mr. Henderson requested that the total residual chlorine effluent limitations in Table 2 in Attachment A of the permit should be changed from 0.01 mg/l (monthly average) and 0.02 mg/l (daily maximum) to 0.02 mg/l and 0.04 mg/l respectively to be consistent with the effluent limitations for Outfall 001 found on pg. 3 of the permit.

Response 5: The requested changes have been made to the permit.

As the changes made to the permit were considered insignificant, no additional public notice is required.

Drafted by: Julie Morris
September 28, 2010

STATE OF INDIANA
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

PUBLIC NOTICE NO. 2010 – 10F– F

DATE OF NOTICE: OCTOBER 25, 2010

The Office of Water Quality issues the following NPDES FINAL PERMIT.

MAJOR – RENEWAL

CITY OF WEST LAFAYETTE WWTP, Permit No. IN0024821, TIPPECANOE COUNTY, 500 S River Rd, West Lafayette, IN. This municipal facility discharges 9.0 million gallons daily of treated sanitary & combined sewer wastewater into the Wabash River. Permit Writer: Julie Morris at 317/232-8739, jkmorris@idem.in.gov.

APPEAL PROCEDURES FOR FINAL PERMITS

The Final Permits are available for review & copies at IDEM, Indiana Government Center, North Bldg, 100 N Senate Ave, Indianapolis, IN, Rm 1203, Office of Water Quality/NPDES Permit Section, from 9 – 4, M - F (copies 10¢ per page). Each Final Permit is available at the respective, local County Health Department. **Please tell others you think would be interested in this matter.** Regarding your rights and responsibilities pertaining to the Public Notice process and timeframes, please refer to IDEM websites: http://www.in.gov/idem/5474.htm and IDEM Permit Guide (Public Participation): http://www.in.gov/idem/4172.htm. **To view the Citizen Guide go to:** http://www.in.gov/idem/5803.htm.

Appeal Procedure: Any person affected by the issuance of the Final Permit may appeal by filing a Petition for Administrative Review with the Office of Environmental Adjudication **within** eighteen (18) days of the date of this Public Notice. Any appeal request must be filed in accordance with IC 4-21.5-3-7 and must include facts demonstrating that the party requesting appeal is the applicant; a person aggrieved or adversely affected or is otherwise entitled to review by law.
Timely filing: The Petition for Administrative Review must be received by the Office of Environmental Adjudication (OEA) **within** 18 days of the date of this Public Notice; either by U.S. Mail postmark or by private carrier with dated receipt. This Petition for Administrative Review represents a request for an Adjudicatory Hearing, therefore must:

- state the name and address of the person making the request;
- identify the interest of the person making the request;
- identify any persons represented by the person making the request;
- state specifically the reasons for the request;
- state specifically the issues proposed for consideration at the hearing;
- identify the Final Permit Rule terms and conditions which, in the judgment of the person making the request, would be appropriate to satisfy the requirements of the law governing this NPDES Permit rule.

If the person filing the Petition for Administrative Review desires any part of the NPDES Final Permit Rule to be stayed pending the outcome of the appeal, a Petition for Stay must be included in the appeal request, identifying those parts to be stayed. Both Petitions shall be mailed or delivered to the address here:
Phone: 317/232-8591.

Environmental Law Judge
Office of Environmental Adjudication
IGC – North Building- Rm 501
100 N. Senate Avenue
Indianapolis IN 46204

Stay Time frame: If the Petition (s) is filed **within** eighteen (18) days of the mailing of this Public Notice, the effective date of any part of the permit, within the scope of the Petition for Stay is suspended for fifteen (15) days. The Permit will become effective again upon expiration of the fifteen (15) days, unless or until an Environmental Law Judge stays the permit action in whole or in part.

Hearing Notification: Pursuant to Indiana Code, when a written request is submitted, the OEA will provide the petitioner or any person wanting notification, with the Notice of pre-hearing conferences, preliminary hearings, hearing stays or orders disposing of the Petition for Administrative Review. Petition for Administrative Review must be filed in compliance with the procedures and time frames outlined above. Procedural or scheduling questions should be directed to the OEA at the phone listed above.

INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT	STATUS: Final	POLICY NUMBER: Water-016	
AGENCY NONRULE POLICY DOCUMENT	AUTHORIZED: Thomas W. Easterly, Commissioner		
SUBJECT: CSO Treatment Facilities	SUPERSEDES: New	ISSUING OFFICE(S): Office of Water Quality	
	ORIGINALLY EFFECTIVE: Date April 11, 2008	RENEWED/REVISED: Date	

Disclaimer: This nonrule policy document (NPD) is intended solely as guidance and does not have the effect of law or represent formal Indiana Department of Environmental Management (IDEM) decisions or final actions. This nonrule policy document shall be used in conjunction with applicable laws. It does not replace applicable laws, and, if it conflicts with these laws, the laws shall control. This nonrule policy document may be put into effect by IDEM 30 days after presentation to the appropriate board. Pursuant to IC 13-14-11.5, this policy will be available for public inspection for at least 45 days prior to presentation to the appropriate board. If the nonrule policy is presented to more than one board, it will be effective 30 days after presentation to the last board. IDEM will submit the policy to the Indiana Register for publication. Revisions to the policy will follow the same procedure of presentation to the board and publication.

1. PURPOSE

Most Combined Sewer Overflow (CSO) communities in Indiana have already analyzed or are in the process of analyzing a range of alternatives for controlling CSOs for purposes of long term control plan development. The purpose of this document is to inform CSO communities that, in addition to the reasonable range of alternatives described in U.S. EPA's CSO Policy, IDEM is willing to accept, for additional evaluation as part of a community's alternatives analysis, a treatment basin alternative[1] provided that such alternative meets the criteria set forth in this nonrule policy document (NPD).

[1] For technical information concerning one type of CSO treatment basin, see *Michigan Combined Sewer Overflow Control Manual, September 26, 1994* and http://www.rougeriver.com/

Consistent with the CSO Policy, IDEM will determine the appropriateness of such an alternative on a case-by-case basis, in the context of evaluating all of the alternatives.

2. SCOPE

This policy affects CSO communities that choose to consider a CSO Treatment Facility as part of a broader alternatives analysis in order to be consistent with the 1994 CSO Control Policy.

3. SUMMARY

A CSO Treatment Facility designed and operated as discussed in this document provides a prescribed high level of CSO treatment that precludes the need for a use attainability analysis.

4. DEFINITIONS

The following definitions apply to the defined term as used in this NPD:

“CSO” means combined sewer overflow and is the combination of sanitary sewage and storm water in the same conduit (sewer pipe).

“CSO Community” means a community (municipality) that has combined sewer overflow discharges.

“Combined Sewer Overflow Control Policy” or “Policy” is the U.S. EPA policy governing the control of combined sewer overflows from CSO communities.

“CSOOP” means combined sewer overflow operational plan.

“LTCP” means long term control plan, a document required to be prepared by CSO Communities for the elimination or management of combined sewer overflow discharges.

“NPDES” means National Pollutant Discharge Elimination System and is a national program for the issuance of permits to entities that have direct discharge of treated wastewater into receiving waters.

5. ROLES

CSO treatment facilities as part of a community’s Long Term Control Plan is reviewed for approval by the Office of Water Quality’s Wet Weather Section.

6. POLICY

CSO Treatment Facilities

6.A. CSO Treatment Facility Design Criteria

In developing information concerning CSO Treatment Facilities, CSO communities should evaluate facilities designed to meet the following general criteria:

1. Retention, for transportation to and treatment at the wastewater treatment plant ("WWTP"), of flows generated during storms no smaller than the "One Year, One Hour Storm." These alternatives should also provide for the transport of this entire volume to the WWTP and the full treatment of that same entire volume within 48 hours. (See 6.B.8. below). Inherent in this requirement is the complete transport of this flow within the sewer conveyance system to and adequate treatment of this flow at the WWTP.

2. Treatment of combined sewage flows generated during storms no smaller than the "Ten Year, One Hour Storm," which includes, at a minimum, the following:

   a. The detention of flows for settling that achieves the Total Suspended Solids ("TSS") control described in 6.B.10 with the ten year one hour peak hourly flow retained for no less than 30 minutes.

   b. Skimming of the detained flows to remove solids and floatables.

   c. Disposal of the solids and floatables in accordance with any applicable solid waste disposal laws and regulations.

   d. Disinfection of all detained flows, to the effluent level set forth in 6.B.9.

   e. Dechlorination, if necessary, so that the effluent from the CSO Treatment Facility does not exceed the Total Residual Chlorine ("TRC") level set forth in 6.B.9.

3. Combined sewage flows in excess of the "Ten Year One Hour" (or higher) designed storm used for sizing of the CSO Treatment Facility should receive whatever treatment is feasible given capacity limitations at the CSO Treatment Facility and the WWTP.

The discharger may also evaluate alternative facilities that will achieve equivalent or better treatment and control than would a facility that meets the criteria set forth in 6.A.1., 6.A.2., and 6.A.3., above.

For CSOs into waters of the state where pollutants other than *E. coli* may be causing water quality problems, CSO communities must also evaluate, as part of the alternatives evaluation, the effectiveness of any CSO Treatment Facility alternative in treating those additional pollutants of concern.

6.B. Other Assumptions and Criteria to Use in Evaluating a CSO Treatment Facility

The following assumptions and design criteria should be applied when considering inclusion of a CSO Treatment Facility in the alternatives analysis in accordance with this nonrule policy document:

1. The Ten Year, One Hour Storm and the One Year, One Hour Storm should be defined in either of the following:

    a. *Bulletin 71, Rainfall Frequency Atlas of the Midwest*, which can be found at: www.sws.uiuc.edu/pubdoc/B/ISWSB-71.pdf The Huff Climatic Regions for Indiana map should be used.

    b. The HERPICC Storm Water Drainage Manual, July 1995, which can be found on the Purdue University website: http://www.ecn.purdue.edu/INLTAP/Publications/documents/Stormwater%20Drainage%20 manual.pdf

2. Rainfall should be assumed to be of uniform intensity and distribution over the entire service area for a duration of exactly one hour. Zero rainfall shall be assumed both before and after the one hour rainfall event.

3. Antecedent conditions should be assumed to be average warm weather conditions.

4. Retention/CSO Treatment Facilities should be sized based on case-specific sewer system response to the two theoretical design storms described in 6.B.1. above. All Primary treatment facilities should be sized for no less than thirty minutes detention time for solids removal and disinfection at no less than the “Ten Year, One Hour Storm,” and retention of all flow for ultimate transport to the WWTP at no less than the “One Year, One Hour Storm.” Where ‘equivalent’ facilities are proposed, both criteria would be considered.

5. Detention time for solids removal and disinfection should be calculated on the basis of maximum hourly flow.

6. Sewer system response should be estimated using data and appropriate engineering models (SWMM, etc.). Actual characterization data should be used in lieu of strictly model default data. Time of Concentration should not be

assumed to be one hour just because the “One Hour” storm is used as a definition.

7. Retention/CSO Treatment Facilities should be configured to optimize solids removal and disinfection.

8. Dewatering times should be less than 48 hours from the time when rainfall ceases. All combined sewage retained in the facility should be transported to the WWTP and receive full treatment at the WWTP, regardless of storm size. Dewatering while a bypass is in progress should not be considered.

9. Disinfection should be controlled to achieve the daily maximum *E. coli* concentration of 235/100 ml. If disinfection is carried out using chlorine or hypochlorite, dechlorination must be employed to meet a maximum TRC of .06 mg/l.

10. Combined sewage Facilities should be designed and operated to meet an appropriate level of TSS control to ensure effective disinfection.

12. The CSO community should evaluate how any CSO Treatment Facility alternative developed in accordance with this document would perform over the course of a “typical year.” This will assist in evaluating the costs, benefits, and effectiveness of such an alternative compared to the other alternatives that are being considered.

6.C. Treatment Flows in Excess of the Ten Year, One Hour Storm

Combined sewage flows in excess of the design storm used for sizing of the CSO Treatment Facility should receive whatever treatment is feasible, given capacity limitations at the CSO Treatment Facility and at the WWTP.

Since most storm and combined sewers are designed to handle the ten year storm without surcharging, this will probably mean that flows greater than those generated by the “Ten Year, One Hour Storm” should be transported to the CSO Treatment Facility, but the degree of treatment may need to be less than thirty minutes detention. The important point here is that no untreated overflows should occur from a CSO Treatment Facility. No untreated overflows means that pump stations should be provided with firm pump capacity to handle all flows transported by the existing collection system, even when it may be more than the ten year storm flow.

6.D. Permitting CSO Treatment Facilities

If an alternative including a CSO Treatment Facility is ultimately selected as part of the LTCP that is ultimately approved by IDEM, discharges from CSO Treatment Facilities

will require effluent grab sampling. Effluent limits shall be imposed for *E. coli* and monitoring may be required for flow, biochemical oxygen demand ("BOD"), total suspended solids ("TSS"), Ammonia Nitrogen (as N), Total Phosphorus (as P), pH, dissolved oxygen ("DO"), and total residual chlorine ("TRC"), if applicable. Metals monitoring may also be required on a case-by-case basis.

6.E. APPENDICES

6.E.1. ENFORCEMENT DISCRETION LANGUAGE

The City/Town of _____'s approved CSOOP, LTCP, and NPDES permit outline the wet weather operating procedures and design capabilities of the WWTP and CSO Treatment Facility. All CSO Treatment Facility wet weather discharges shall receive the specified treatment to the extent possible. In conditions where wet weather discharges from the CSO Treatment Facility result from a storm event, rainfall amount, or intensity which exceed the design capacity of the facility, the permittee shall provide documentation that all conditions and requirements expressed in its NPDES permit, including Attachment A, were achieved. All documentation regarding performance of the WWTP and CSO Treatment Facility during storm events identified above would be reviewable by IDEM with exercise of enforcement discretion for CSO Treatment Facility discharges accorded to it under IC 13–30 for these storm events.

6.E.2. SAMPLING PROTOCOL

BASIN DISCHARGE SAMPLING

Effluent composite sampling, either by automatic sampler collecting at set intervals or by grab samples collected at the CSO Treatment Facility collected during discharges from the wet weather treatment component shall be initiated within 30 minutes from the beginning of a discharge event, must be representative of the discharge, and must be of sufficient quantity to ensure the parameters can be measured. Sampling must continue no less frequently than every two hours during the duration of the event. For events lasting more than 24 hours, a new sampling period shall be initiated each day. Composite samples may be used to analyze parameters identified. The daily average shall be reported as the maximum daily concentration. The average of the daily averages shall be reported as the monthly concentration. Facilities are encouraged to collect more data to better understand the discharges from CSO outfalls.

For *E. coli*, the daily maximum shall be the geometric mean of all samples on any

discharge day. The *E. coli* monthly average shall be the geometric mean of all samples collected during the month, provided that five (5) or more samples are collected. The goal of the effluent monitoring program is to collect at least three (3) samples during each discharge event, and the samples shall be collected at shorter intervals at the onset of the event if the permittee estimates that the event duration may be less than six (6) hours.

For purposes of reporting on a discharge event that lasts less than twenty-four (24) hours but occurs during two (2) calendar days, the pollutant concentrations for the event shall be reported as daily values on the day when the majority of the discharge occurred.

7. REFERENCES

8. SIGNATURES

MAY 6, 2008

Thomas W. Easterly, Commissioner, Date
Indiana Department of Environmental Management

MAY 7, 2008

Bruno Pigott, Assistant Commissioner, Date
Office of Water Quality

May 9, 2008

Robert Keene, Assistant Commissioner, Date
Office of Legal Counsel

This policy is consistent with Agency requirements.

May 19, 2008

Indiana Department of Environmental Management Date
Quality Assurance Program
Planning and Assessment

APPENDIX C

IDEM State Judicial Agreement & Correspondence

COPY

STATE OF INDIANA)
) SS:
COUNTY OF TIPPECANOE)

IN THE TIPPECANOE CIRCUIT COURT

CAUSE NO.

COMMISSIONER, INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT,

Plaintiff,

v.

CITY OF WEST LAFAYETTE,

Defendant.

AGREED JUDGMENT

WHEREAS, concurrent with the filing of this Agreed Judgment, Plaintiff, the Commissioner of the Indiana Department of Environmental Management ("IDEM") has filed a complaint (the "Complaint") in this civil action against the Defendant, the City of West Lafayette (the "City"), in connection with the City's operation of its municipal wastewater treatment and collection system. The Complaint alleges that the City is in noncompliance with Title 13 of the Indiana Code, Title 327 of the Indiana Administrative Code Articles 2 and 5, and its National Pollutant Discharge Elimination System permit, including Attachment A (hereinafter collectively referred to as the "NPDES Permit") issued by IDEM pursuant to the Clean Water Act ("CWA"). IDEM seeks injunctive relief for the alleged noncompliance.

WHEREAS, the City denies any liability to IDEM arising out of the transactions or occurrences alleged in the Complaint.

WHEREAS, the City owns and operates a wastewater collection system comprised of combined and sanitary sewers, which includes four (4) combined sewer overflow ("CSO") outfalls, and the West Lafayette Wastewater Treatment Plant located at 500 South River Road in West Lafayette. The City is authorized by NPDES Permit No.0024821 to discharge wastewater

to the receiving waters, Wabash River, in accordance with effluent limitations, monitoring requirements, and other conditions contained in the NPDES Permit.

WHEREAS, the NPDES Permit identifies four (4) CSO outfalls in the City's sewage collection system, identified as Outfall Nos. 003, 004, 006, and 007.

WHEREAS, IDEM records for the last three (3) years indicate that the City has reported discharges from CSO Outfalls listed in the NPDES Permit. Some discharges were not provided with treatment, and IDEM claims that those discharges violated or threatened to violate the narrative effluent limitations contained in the NPDES Permit, including Attachment A.

WHEREAS, Pursuant to its NPDES Permit, the City submitted to IDEM in 1996, a CSO Long-Term Control Plan ("LTCP") that contains, among other elements, the following:

a. a description of the control/treatment measures that will be implemented by the City so that discharges from its CSO outfalls comply with the water quality based and technology based requirements of the CWA and State law, along with a schedule, that includes specific milestone dates, for implementation of the control/treatment measures; and

b. a description of the post-construction compliance monitoring program that will be implemented by the City in order to determine whether the control/treatment measures, upon implementation, are adequate to comply with the water quality-based and technology -based requirements of the CWA and State law, along with a schedule, that includes specific milestone dates for implementation of the post-construction compliance monitoring program.

WHEREAS, the City has performed various and substantial activities, both construction and operational in furtherance of the LTCP it submitted.

WHEREAS, the City submitted to IDEM a revised LTCP in 2001, which was approved on August 28, 2007. The LTCP contains a control approach that will be implemented over a 20

year period. The LTCP implementation schedule is attached to this Agreed Judgment, designated as Attachment 1, hereby incorporating by reference the approved LTCP.

WHEREAS, the Parties agree and the Court, by entering this Agreed Judgment, finds, that settlement of these matters, without protracted litigation, is fair, reasonable, and in the public interest.

NOW THEREFORE, before the taking of any testimony, without any admission by the City of any facts beyond those that the Parties have explicitly agreed to in this Agreed Judgment, and with the consent of the Parties, it is hereby ORDERED:

BACKGROUND

The City of West Lafayette has a history of proactively addressing environmental issues as follows:

a. In keeping with that commitment in 1993, the City began a 20-year plan to significantly reduce CSO discharge volume and comply with federal regulations related to the Clean Water Act with its Wastewater Treatment Plant Facilities Plan.

b. This plan was updated in 1996 with the Wastewater Treatment Plant and Collection System Facilities Plan Amendment No. 1 to include the CSO long-term control plan (LTCP).

c. In November of 2001 the City submitted the CSO LTCP to IDEM for review and approval.

d. Throughout this period facilities plans were developed to implement CSO control plan projects. Each of these facilities plans served to qualify the City for State Revolving Fund loan financing for the following projects: Wastewater Treatment Plant Upgrades (1997), New North River Road Lift Station (1999), New River Road Interceptor (2001), Happy Hollow

Interceptor Rehabilitation (2002), Wet Weather Treatment Facilities (2003), WWTP Anaerobic Digester Improvements (2004), and the Western Interceptor (Division 1- 2006; Division 2- initiation of construction anticipated in 2008; Division 3- INDOT schedule dependent).

e. The City has implemented the following projects based upon the recommendations included in the above studies:

- $18 million upgrade to Wastewater Plant (1997)
- $2.2 million foundation drain disconnect program in the Barbarry Neighborhood (1999)
- $2.3 million North River Road Lift Station (1999).
- $1.9 million Happy Hollow Road Interceptor Rehabilitation (2001)
- $4.4 million River Road Interceptor and separation of storm water from the sanitary lines in the levee area (2001).
- $0.16 million storm water vortex separator (2002).
- $5.9 million Wet Weather Treatment Facility (2003)
- $12.9 million on-going Western Interceptor (2006 and projected 2008)
- $9.6 million WWTP digester renovation with standby power (2007)
- $0.6 million separation of two areas of CSO collectors (2007).

f. These efforts have received local and national attention over the years as exemplified by receipt of the following recognition:

- 1963, Outstanding Civil Engineering Achievement, in a national competition, Ohio River Basin Clean Streams Program by the American Society of Civil Engineers in furthering the objectives of the eight-state Ohio River Valley Water Sanitation Commission.
- 1997, USPEA National Second Place Award for Combined Sewer Overflow Control Program Excellence.
- 2006, Clean Water State Revolving Fund PISCES award, for Performance and Innovation in the SRF Creating Environmental Success. They were the first city in Indiana to win this national award.

g. The City is proceeding with the final component of the LTCP, the Western Interceptor. This project is being constructed in three divisions. Division I is currently under construction. Division 2 will be bid in the summer of 2007. Division 3 will be constructed as part of the INDOT road construction project. The Division 3 schedule is being negotiated with INDOT.

JURISDICTION AND VENUE

1. This Court has jurisdiction over the subject matter of this action pursuant to Indiana Code §§ 13-30-4-1 and 13-14-2-6. The Complaint states claims upon which relief can be granted under Title 327 of the Indiana Administrative Code, Articles 2 and 5. Venue is proper in this Court as the City of West Lafayette is located in Tippecanoe County.

APPLICABILITY

2. The provisions of this Agreed Judgment shall apply to and be binding upon the State of Indiana, and the City and its officers, directors, agents, employees, successors, contractors and assigns and any person having notice of this Agreed Judgment who is, or will be acting on behalf of or in concert or participation with the City. The City shall provide a copy of this Agreed Judgment to any successor in interest at least thirty (30) days prior to transfer of that interest, and simultaneously shall verify in writing to IDEM that such notice has been given. Any sale or transfer of the City's interests in its wastewater treatment facilities shall not in any manner relieve the City of its responsibilities for meeting the terms and conditions of this Agreed Judgment. In any action to enforce this Agreed Judgment, the City shall not raise as a defense the failure by any of its officers, directors, agents, employees, successors, assigns or contractors to take actions necessary to comply with the Agreed Judgment.

OBJECTIVE

3. All plans, measures, reports, construction, maintenance, operational requirements and other obligations in this Agreed Judgment or resulting from the activities required by this Agreed Judgment shall have the objective of causing the City to achieve and maintain compliance with applicable State law and the applicable terms and conditions of the City's NPDES Permit.

COMPLIANCE AND IMPLEMENTATION OF THE APPROVED LONG TERM CONTROL PLAN

4. The City shall comply with 327 IAC 5-2-8(1), 327 IAC 2-1-6(a)(1), IC 13-18-4-5, IC 13-30-2-1, and all parts of the NPDES Permit, as provided in the LTCP.

5. Beginning on the Effective Date of this Agreed Judgment, and continuing during implementation of the LTCP pursuant to this Agreed Judgment, the City shall, at all times, operate its wastewater collection system and wastewater treatment system as efficiently and effectively as possible.

6. The City shall implement the LTCP, which is incorporated by reference herein, in accordance with the schedule set forth in Attachment 1.

7. The City may seek to amend or revise the approved LTCP in accordance with applicable laws, rules, policy and this Agreed Judgment. Upon the City's receipt of IDEM's approval of any amendment or revision to the LTCP, or upon resolution of any disputes pursuant to the Dispute Resolution provision of this Agreed Judgment concerning a proposed revision to the LTCP, the revised LTCP (including any additional post-construction monitoring and modeling) shall supersede the schedule contained in any previously approved LTCP or revised LTCP, or any previously-approved extension of deadlines, and the City shall implement the revised LTCP (including any additional post-construction monitoring and modeling) in accordance with the schedule in the approved revised LTCP.

IDEM APPROVAL OF SUBMISSIONS

8. The City shall notify IDEM, in writing, within thirty (30) days of completion of each action or milestone contained in the Schedule in Attachment 1 and any task or plan approved by IDEM pursuant to this Agreed Judgment. The notification shall include a description of the action completed and the date it was completed, and a progress report that

contains a summary of the activities undertaken to complete the task. The City shall adequately address any IDEM comments regarding the report, within the timeframe as mutually agreed by IDEM and the City.

9. Within sixty (60) days after completion of post-construction monitoring phase of the approved LTCP, the City shall submit to IDEM, for review and approval, a report that contains a summary of the data gathered as a result of the post-construction compliance monitoring and an evaluation of the success of the phase in meeting the goals of the LTCP. The City shall adequately address any IDEM comments regarding the report, within the timeframe mutually agreed by IDEM and the City.

10. Upon implementation of the LTCP, in the event that data resulting from CSO monitoring or other information indicates that the LTCP is not adequate to comply with the technological and water quality based requirements of the CWA, the City shall, within ninety (90) days of becoming aware of such inadequacy, develop and submit to IDEM, for approval, a CSO Compliance Plan ("CSO CP") that identifies (a) additional measures that will be implemented by the City; and (b) the post-construction compliance monitoring program that will be implemented by the City in order to determine whether the additional measures, upon implementation, are adequate, along with a schedule, that includes specific milestone dates.

11. The CSO CP is subject to IDEM approval. Following receipt of the CSO CP, IDEM may, in writing (a) approve all of or any portion of the CSO CP; (b) approve all or a portion of the CSO CP upon specified conditions; (c) disapprove of all or any portion of the CSO CP, notifying the City of deficiencies in the CP and granting the City additional time, as mutually agreed, within which to correct the deficiencies; (d) modify the submission to correct deficiencies; or (e) reject all or any portion of the CP.

12. The City, upon receipt of written notification from IDEM of approval of the CSO CP, shall implement the approved CSO CP and adhere to the schedules contained therein. The approved CSO CP shall be incorporated into this Agreed Judgment and shall be deemed an enforceable part thereof.

13. In the event that a Use Attainability Analysis ("UAA") is denied, the City shall, within ninety (90) days, develop and submit to IDEM, for approval, a CSO CP as stated above in Paragraphs 10, 11, and 12.

14. The provisions of Order Paragraphs 10, 11, and 12 shall continue to apply until post-construction monitoring indicates to IDEM that water quality standards are being met.

FUNDING

15. The City may seek Federal and State grant funding assistance. However, compliance with the terms of this Agreed Judgment is not conditioned on the receipt of Federal or State funds. In addition, failure to comply is not excused by the lack of Federal or State funds, or by the processing of any applications for the same.

COMMUNICATIONS

16. All submittals required by this Order, unless notified otherwise in writing, shall be sent to:

Chief, Wet Weather Section
Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
100 North Senate Avenue
Indianapolis, IN 46204-2251

STIPULATED PENALTIES

17. In the event the terms and conditions of the following Judgment paragraphs are violated, the IDEM may assess and the City shall pay a stipulated penalty in the following amount:

Order Paragraph Number	*Violation*	Penalty Amount
6	Failure to implement the approved LTCP and adhere to the milestones set forth in the schedule in Attachment 1 or the schedule then in effect.	$500 per each week or part thereof late
8	Failure to notify IDEM, in writing, within 30 days of completion of each action contained in the approved LTCP and any plan approved by IDEM pursuant to this Agreed Judgment.	$250 per each week or part thereof late
8	Failure to timely submit report.	$500 per each week or part thereof late
8	Failure to timely address any IDEM comments within the applicable timeframe.	$500 per each week or part thereof late
10	Failure to timely submit a CSO CP.	$500 per each week or part thereof late
11	Failure to timely revise and resubmit the CSO CP in accordance with written notice by IDEM.	$500 per each week or part thereof late
12	Failure to comply with any milestone contained in the schedule set forth in the approved CSO CP.	$500 per each week or part thereof late

18. Stipulated penalties shall be due and payable within thirty (30) days after the City receives written notice that the IDEM has determined a stipulated penalty is due. Assessment and payment of stipulated penalties shall not preclude the IDEM from seeking any additional relief against the City for violation of the Agreed Judgment. In lieu of any of the stipulated penalties given above, the IDEM may seek any other remedies or sanctions available by virtue of

the City's violation of this Agreed Judgment, or Indiana law, including but not limited to civil penalties pursuant to IC 13-30-4.

19. Stipulated penalties are payable by check to the Environmental Management Special Fund. Checks shall include the Case Number of this action and shall be mailed to:

Indiana Department of Environmental Management
Cashiers Office – Mail Code 50-10C
100 N. Senate Avenue
Indianapolis., IN 46204-2251

20. In the event that any stipulated amount assessed pursuant to Paragraph Nos. 17 and 18 is not paid within thirty (30) days of notice that it is due, the City shall pay interest on the unpaid balance at the rate established by IC 24-4.6-1-101. The interest shall continue to accrue until the stipulated penalty is paid in full.

FORCE MAJEURE

21. If any event occurs that causes or may cause the City to violate any provision or requirement of this Agreed Judgment, the City shall notify IDEM in writing within fourteen (14) days from the date the City first knew, or in the exercise of reasonable diligence should have known, that compliance with the Agreed Judgment would be prevented or delayed. The notice shall reference this Section of the Agreed Judgment and shall describe in detail the anticipated length of time the violation may persist, the precise cause or causes of the violation, the measures taken or to be taken by the City to prevent or minimize the violation and the timetable by which those measures will be implemented. The City shall adopt all reasonable measures to avoid or minimize any such violation. The City shall make all reasonable efforts to identify events that cause or may cause a violation of this Agreed Judgment. Failure by the City to comply with the notice requirements of this Paragraph shall constitute a waiver of the City's rights to obtain an extension of time or other relief under this Section based on such incident.

22. If IDEM agrees that the violation has been or will be caused by circumstances beyond the control of the City or any entity controlled by it, including its consultants and contractors, and that the City could not have prevented such violation, the time for performance of the requirement in question shall be extended for a period not to exceed the actual delay resulting from such circumstance, and stipulated penalties shall not be due for such delay or non-compliance. In the event IDEM does not agree that the violation was caused by circumstances beyond the control of the City and notifies the City of such determination, the City may invoke the dispute resolution provisions in this Agreed Judgment.

23. If the City invokes dispute resolution and IDEM or the Court determines that the violation was caused by circumstances beyond the control of the City or any entity controlled by it, and that the City could not have prevented such violation, the City shall be excused as to that violation, but only for the period of time the violation continues due to such circumstances.

24. The City shall bear the burden of proving that any delay or violation has been or will be caused by circumstances beyond its control, and that the City could not have prevented such violation, as set forth above. The City shall also bear the burden of establishing the duration and extent of any delay or violation attributable to such circumstances, that such duration or extension is or was warranted under the circumstances and that, as a result of the delay, a particular extension period is appropriate. Provided, however, that any delay caused by delays of INDOT proceeding with scheduled work on US 231 bypass or delays in processing approval of permits by any government agency shall be presumed to be circumstances beyond the control of the City and the City shall be entitled to a corresponding extension of time. An extension of one compliance date based on a particular circumstance beyond the City's control shall not automatically extend any subsequent compliance date or dates. Such an extension of a

compliance date(s) may be requested and shall be determined by the parties on an incident by incident basis.

25. Changed financial circumstances, unanticipated, increased costs or expenses associated with implementation of this Agreed Judgment shall not serve as a basis for excusing violations or granting extensions of time under this Agreed Judgment, except as expressly provided in Force Majeure.

26. Failure to apply for a required permit or approval or to provide in a timely manner all information required to obtain a permit or approval that is necessary to meet the requirements of this Agreed Judgment shall not, in any event, serve as a basis for excusing violations of or granting extensions of time under this Agreed Judgment. However, a permitting authority's failure to act in a timely manner on an approvable permit application or to provide review, comments, or approval of a submittal in accordance with an approved schedule or compliance plan under this Agreed Judgment may serve as a basis for an extension under the force majeure provisions of this Agreed Judgment.

27. The City shall make a showing of proof regarding the cause of each delayed incremental step or other requirement for which an extension is sought. The City may petition for the extension of more than one compliance date in a single request.

DISPUTE RESOLUTION

28. This Court shall retain jurisdiction of this matter for the purposes of implementing and enforcing the terms and conditions of this Agreed Judgment and for the purpose of adjudicating all disputes among the Parties that may arise under the provisions of this Agreed Judgment. Any dispute that arises with respect to the meaning, application, implementation, interpretation, amendment or modification of this Agreed Judgment, or with respect to the City's

compliance herewith (including the adequacy of the City's performance of the control measures and adequacy of the submittals required by this Agreed Judgment) or any delay hereunder, the resolution of which is not otherwise expressly provided for in this Agreed Judgment, shall in the first instance be the subject of informal negotiations. If any Party believes it has a dispute with any other Party, it shall notify all the other Parties in writing, including notice to the Indiana Attorney General, setting forth the matter(s) in dispute, and the Parties will proceed initially to resolve the matter in dispute by informal means. Such period of informal negotiations shall not exceed thirty (30) days from the date the notice was sent, unless the Parties agree otherwise.

29. If the informal negotiations are unsuccessful, the position of the IDEM shall control unless, within thirty (30) days after the conclusion of the informal negotiation period, the City invokes the formal dispute resolution procedures of this Section by serving on IDEM a written statement of position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation.

30. Within thirty (30) days of receiving the City's statement of position under Paragraph 29, the IDEM will serve on the City its written statement of position, including any supporting factual data, analysis, opinion, or documentation.

31. An administrative record of the dispute shall be maintained by IDEM and shall contain all statements of position, including supporting documentation, submitted pursuant to Paragraphs 29 and 30.

32. IDEM's statement of position shall be binding upon the City unless the City files a petition with the Court describing the nature of the dispute and a proposal for its resolution. The City's petition must be filed no more than thirty (30) days after receipt of IDEM's statement of position. IDEM shall then have thirty (30) days to file a response setting forth their position

and proposal for resolution. In any such dispute, the petitioner shall have the burden of proof, and the standard of review shall be that provided by applicable law, which shall be a preponderance of the evidence unless IDEM's position has been heard and approved by an administrative law judge.

33. Submission of any matter to the Court for resolution shall not extend any of the deadlines set forth in this Agreed Judgment, unless the Parties agree to such extension in writing or the Court allows the extension upon motion.

34. Stipulated penalties with respect to any disputed matter (and interest thereto) shall accrue in accordance with Paragraphs 21 and 22; however, payment of stipulated penalties, and any accrued interest, shall be stayed pending resolution of the dispute, as follows:

(a) If the dispute is resolved by informal agreement before appeal to this Court, accrued penalties (and interest), if any, determined to be owed shall be paid within sixty (60) days of the agreement or the receipt of IDEM's final position in writing.

(b) If the dispute is appealed to this Court and the IDEM prevails in whole or in part, the City shall pay all accrued penalties (and interest) determined to be owed, related to the issue(s) on which IDEM prevailed, within sixty (60) days of the Court's decision or order.

(c) In the event of an appeal, the City shall pay all accrued penalties (and interest) determined to be owed within sixty (60) days after a final decision no longer subject to judicial review has been rendered.

RIGHT OF ENTRY

35. IDEM, and its representatives, contractors, consultants, and attorneys shall have the right of entry into and upon the City's wastewater treatment facility and collection system, at all reasonable times, upon proper presentation of credentials, for the purposes of:

(a) Monitoring the progress of activities required by this Agreed Judgment;

(b) Verifying any data or information required to be submitted pursuant to this Agreed Judgment;

(c) Obtaining samples and, upon request, splits of any samples taken by the City or its consultants. Upon request, the City will be provided with splits of all samples taken by the IDEM; and

(d) Otherwise assessing the City's compliance with this Agreed Judgment.

This Section in no way limits or affects any right of entry and inspection held by IDEM pursuant to applicable Federal or State laws, regulations, or permits.

CERTIFICATION

36. Any report, plan, or other submission that the City is required by this Agreed Judgment to submit shall be signed by an official or authorized agent of the City and shall include the following certification:

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

37. The City or IDEM shall not object to the admissibility into evidence of any report, plan, or other submission prepared in accordance with this Paragraph or the information

contained in said reports in any proceeding initiated by any of the Parties to this Agreed Judgment to enforce this Agreed Judgment. Notwithstanding the above, the City or IDEM may seek in accordance with applicable law to submit any contradictory or other evidence as to any matter affected by the evidence referred to in the preceding section in any proceeding to enforce this Agreed Judgment.

NOT A PERMIT/COMPLIANCE WITH OTHER STATUTES/REGULATIONS

38. This Agreed Judgment is not and shall not be construed as a permit, or a modification of any existing permit, issued pursuant to Section 402 of the CWA, 33 U.S.C. § 1342, or State law, nor shall it in any way relieve the City of its obligations to obtain permits for its wastewater treatment facilities, collection system, or modifications thereto, and to comply with the requirements of any NPDES permit, as provided in Paragraph 4, or with any other applicable Federal or State law or regulation, including the obligation to obtain facility construction permits pursuant to Title 327 of the Indiana Administrative Code, Article 3. Any new permit, or modification of existing permits, must be complied with in accordance with applicable Federal and State laws and regulations.

39. Except as provided in Paragraph 4, nothing herein, including the incorporation of the CSO Control Measures specified in Attachment 1 into this Agreed Judgment, or IDEM's review or approval of any plans, reports, policies or procedures formulated pursuant to this Agreed Judgment (including any Revised CSO Control Measures Plan), shall be construed as relieving the City of the duty to comply with the CWA, the regulations promulgated there under, and all applicable permits issued there under, or as relieving the City of its duty to comply with applicable state law.

EFFECT OF COMPLIANCE

40. IDEM does not, by its consent to the entry of this Agreed Judgment, warrant or aver in any manner that the City's complete compliance with this Agreed Judgment will result in compliance with the provisions of the CWA, 33 U.S.C. §§ 1251 et seq., applicable state law, or the City's NPDES Permits.

EFFECT OF AGREED JUDGMENT AND NON-WAIVER PROVISIONS

41. Nothing contained in this Agreed Judgment shall be construed to prevent or limit IDEM's rights to obtain penalties or further or additional injunctive relief under State statutes or rules, including, but not limited to, criminal punishment under applicable State laws and rules respectively except as provided in this Agreed Judgment.

42. This Agreed Judgment resolves the civil claims of IDEM for civil penalties and injunctive relief for the violations alleged in the Complaint filed herein through the date of entry of this Agreed Judgment.

43. IDEM further reserves all rights against the City with respect to any violations by the City that occur after the date of lodging of this Agreed Judgment, with the exception given during the City's implementation of the LTCP, as long as the City is in compliance with the activities in the approved LTCP, and/or for any violations of applicable state law not covered by the Complaint filed herein, whether they occurred before or after the date of lodging of this Agreed Judgment.

44. The Parties agree that the City is responsible for achieving and maintaining compliance with all State laws, rules, and permits, and that compliance with this Agreed Judgment shall be no defense to any actions commenced by IDEM pursuant to said laws, regulations, or permits, except as set forth herein.

45. This Agreed Judgment does not limit or affect the rights of the Parties as against any third parties that are not Parties to this Agreed Judgment. The Parties recognize that this Agreed Judgment resolves only matters between IDEM and the City and that its execution does not preclude the City from asserting any legal or factual position in any action brought against it by any person or entity not a Party to this Agreed Judgment.

46. IDEM reserves any and all legal and equitable remedies available to enforce the provisions of this Agreed Judgment, except as provided above.

47. This Agreed Judgment shall not limit any authority of IDEM under any applicable statute or regulation, including the authority to seek information from the City, to require monitoring, to conduct inspections, or to seek access to the property of the City; nor shall anything in this Agreed Judgment be construed to limit the authority of IDEM to undertake any action against any person, including the City, in response to conditions that may present an imminent and substantial endangerment to the environment or to the public health or welfare.

48. Obligations of the City under the provisions of this Agreed Judgment to perform duties scheduled to occur after the signing, but prior to the date of entry, shall be legally enforceable from the date this Agreed Judgment is signed by the City. Liability for stipulated penalties, if applicable, shall accrue for violation of such obligations and payment of such stipulated penalties may be demanded by the IDEM as provided in this Agreed Judgment. The contempt authority of this Court shall also extend to violations of such obligations.

COSTS OF SUIT

49. Each Party shall bear its own costs and attorneys' fees with respect to matters related to this Agreed Judgment.

MODIFICATION

50. Except as provided below, there shall be no material modification of this Agreed Judgment, Exhibits attached to this Agreed Judgment, or the submittals approved under this Agreed Judgment without written approval by the Parties and the Court. Any non-material modification of this Agreed Judgment, its Exhibits, or approved submittals shall be in writing and signed by the Parties. Any modifications to the attached Exhibits or subsequently approved submittals that are specifically allowed under the terms of those Exhibits or submittals may be made in accordance with the terms of those Exhibits or approved submittals. All modifications, whether material or non-material, shall be deemed an enforceable part of this Agreed Judgment.

CONTINUING JURISDICTION

51. The Court shall retain jurisdiction to enforce the terms and conditions and achieve the objectives of this Agreed Judgment and to resolve disputes arising hereunder as may be necessary or appropriate for the construction, modification, implementation or execution of this Agreed Judgment.

TERMINATION

52. Upon motion filed with the Court by IDEM or the City, the Court may terminate the terms of this Agreed Judgment with mutual consent of IDEM and the City or after each of the following has occurred:

(a) The City has achieved compliance with all provisions contained in this Agreed Judgment, and subsequently has maintained satisfactory compliance with each and every provision for twelve consecutive months;

(b) The City has paid all penalties and other monetary obligations due hereunder, if any, and no penalties or other monetary obligations due hereunder are outstanding or owed to IDEM; and

(c) At least one hundred twenty (120) days prior to filing the motion, the City has certified to IDEM that it has complied with the terms of this Agreed Judgment and has provided sufficient documentation to IDEM to support its certification.

SIGNATORIES/SERVICE

53. The Indiana Deputy Attorney General signing this Agreed Judgment, on behalf of the State of Indiana and IDEM, and the undersigned representative of the City each certifies that he or she is authorized to enter into the terms and conditions of this Agreed Judgment and to execute and bind legally such Party to this document.

54. The Parties agree that the City need not file an answer to the Complaint in this action unless or until the Court expressly declines to enter this Agreed Judgment.

FINAL JUDGMENT

55. Upon approval and entry of this Agreed Judgment by the Court, this Agreed Judgment shall constitute the final judgment of the Court between IDEM and the City.

THE UNDERSIGNED PARTIES enter into this Agreed Judgment:

FOR THE STATE OF INDIANA
STEVE CARTER
Attorney General of Indiana

By:_____ DATED:_____

Sierra L. Cutts, Deputy Attorney General
Office of the Attorney General
Indiana Government Center South, 5th Floor
302 West Washington Street
Indianapolis, Indiana 46204

FOR IDEM

_____ DATED:_____

THOMAS W. EASTERLY, Commissioner
Indiana Department of Environmental Management
100 North Senate Avenue, IGCN 1301
Indianapolis, Indiana 46204

ATTEST: Judith C. Rhodes

FOR THE CITY OF WEST LAFAYETTE

Judith C. Rhodes
Clerk-Treasurer
City of West Lafayette

_____ DATED: 9/25/07

Jan H. Mills, Mayor for the City of West Lafayette

The Court finds there is no just reason for delay and therefore approves and enters this Agreed Judgment as a final judgment.

SO ORDERED this _____ day of _____, 2007.

_____
Judge, Tippecanoe Circuit Court

Distribution:

Sierra L. Cutts, Indiana Attorney General's Office, 302 West Washington Street, IGCS, 5th Floor, Indianapolis, Indiana 46204

Robert L. Bauman, Gambs Mucker & Bauman, 10 N. Fourth Street, Lafayette, Indiana 47901

HOME OF
PURDUE
UNIVERSITY

CITY OF
WEST LAFAYETTE

Wastewater Treatment Utility
500 South River Road
West Lafayette, Indiana 47906-4377
Phone: 765.775.5145
Fax: 765.775.5149

June 8, 2011

Paul Higginbotham, Permits Branch Chief
Indiana Department of Environmental Management
Office of Water Quality – Mail Code 65-42
Municipal NPDES Permits Section
100 N. Senate Avenue
Indianapolis, IN 46204-2251

Dear Mr. Higginbotham:

Re: Amended Agreed Judgment
City of West Lafayette
NPDES Permit No. IN0024821
Tippecanoe County

The City of West Lafayette has revised the information contained in Attachment 1 for West Lafayette's Agreed Judgment Cause No. 79C01-0710-CC-00105 as requested. The start and finish dates now correspond to the bar graph of the Gantt chart. We have also included the updated information regarding the Western Interceptor Division IV, which is being constructed during INDOT's US 231 Highway Relocation Project. The project has been bid, awarded, and is currently underway.

Please feel free to contact me at (765) 775-5145 or by e-mail at dhenderson@westlafayette.in.gov if you need any additional information or have any questions.

Sincerely,

David S. Henderson

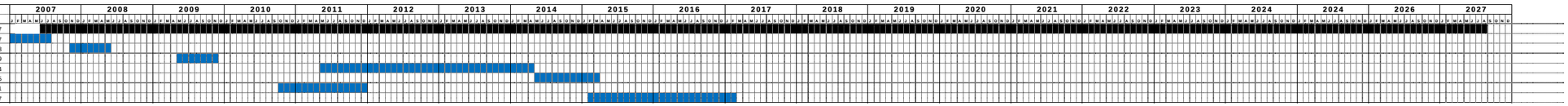
David S. Henderson
Utility Director
City of West Lafayette

CITY OF WEST LAFAYETTE

CSO LTCP IMPLEMENTATION SCHEDULE

Revised June 6, 2011

ID	Task Name	Start	Finish
1	CSO LTCP	03/30/07	09/01/27
2	Western Interceptor Division I	11/01/06	07/30/07
3	Western Interceptor Division II	11/01/07	05/30/08
4	Western Interceptor Division III (see Note 1)	03/10/09	11/30/09
5	Western Interceptor Division IV (see Note 2)	05/01/11	05/01/14
6	Western Interceptor Divison V	05/01/14	05/01/15
7	Revise and Update CSO LTCP	10/25/10	12/31/11
8	Western Interceptor Post Construction Monitoring	02/01/15	02/01/17



Notes:

1.) Division III, as shown on the previously submitted Attachment No. 1 - CSO LTCP Implementation Schedule dated August 2007, was subdivided into three construction divisions (Division III, IV, and V). Division III consisted of sewer construction for the remaining portion outside the limits of construction for the US 231 Highway Relocation Project. Division IV will consist of sewer construction for the remaining portion inside the limits of construction for the US 231 Highway Relocation Project. Division V will consist of sewer construction associated with the abandonment of three lift stations following the completion of Division IV.

2.) US 231 Highway Relocation Project was bid out January 26, 2011. INDOT awarded the contract to the successful bidder in February 2011 . Work on Division IV of the Western Interceptor began May 2011. The project has a projected construction schedule of three years. The Division V project schedule is directly related to the completion date for Division IV. The updated schedules for Divisions IV and V are contingent upon the updated INDOT schedule for construction of the US 231 Highway Relocation Project.

APPENDIX D

Financial Information & Rate Projections

West Lafayette, Indiana
LTCP Financial Information

Total LTCP cost	$24,500,000.00
Annual LTCP Cost per household (6% for 20 yrs)	$178.85
Number of households	11,945
Annual WW Costs per Household	$479.40
Annual Median Household Income [1] = (all incomes within the service area)	$31,885

Result	Economic Impact
If $WW_{(CPHI)}$ < 1%	LOW
If $WW_{(CPHI)}$ 1% - 2%	MEDIUM
If $WW_{(CPHI)}$ > 2%	HIGH

NOTES:

LTCP = Long Term Control Plan

WW = Wastewater

$WW_{(CPHI)}$ - Cost Per Household Indicator **2.1**

National Median Household Income = (2004) american community survey, 3-yr estimates 2008-2010	$51,222
Average Unemployment Rate for community = (calculated over 12 months in yr 2010)	6.6%
National Average Unemployment Rate = (calculated over 12 months in yr 2000)	9.6%
Overall Net Debt Per Capita = (including all local public debt - schools, residents, libraries, roads, bridges)	$2,893
Bond Rating = (for municipality, ratepayers & taxpayers)	AA
Property Tax Revenue = (as a % of Market Property Value)	0.77
Property Tax Revenue Collection Rate =	97.5%

NOTE: Financial information provided by O. W. Krohn & Associates

S-E Indicator Matrix	Municipality Value	Weak, Mid-Range or Strong	Municipality Score Weak=3 Mid-Range=2 Strong=1
Median Household Income	$31,885	Weak	3
Tax Collection Rate (%)	97.5%	Mid-Range	2
Bond Rating	AA	Strong	1
Tax Revenues as a % of Total Market value of taxable property	0.77%	Strong	1
Overall Net Debt Per Capita	$2,893	Mid-Range	2
Average Unemployment Rate	6.60%	Strong	1
S-E Indicator Matrix Total			**1.67**

Overall Financial Capability Matrix and Implementation Schedule Table

Length of Time for LTCP Implementation Schedule
High = 10-20 years
Medium = 5-10 years
Low = 5 years

S-E Indicator Score	If $WW_{(CPHI)}$ < 1%	If $WW_{(CPHI)}$ 1% - 2%	If $WW_{(CPHI)}$ > 2%
Above 2.5	Medium	High	High
1.5 to 2.5	Low	Medium	High
Below 1.5	Low	Low	Medium

WEST LAFAYATTE MUNCIPAL WASTEWATER UTILTY

PROJECTED CSO PROJECT RATE IMPACTS

		ALTERNATIVES								ALTERNATIVES WHICH INCLUDE EXPANDED WWTP (38 MGD PEAK)				
	2011 BUDGET	Alternative 1a-1 $24,500,000 CSO PROJECTS	Alternative 3a-1 $27,600,000 CSO PROJECTS	Alternative 2a-1 $34,200,000 CSO PROJECTS	Alternative 1b-1 $36,000,000 CSO PROJECTS	Alternative 2b-1 $43,500,000 CSO PROJECTS	Alternative 4 $47,500,000 CSO PROJECTS	Alternative 2c $54,700,000 CSO PROJECTS	Alternative 2d $59,700,000 CSO PROJECTS	Alternative 1a-2 $60,000,000 CSO PROJECTS	Alternative 3-2 $65,800,000 CSO PROJECTS	Alternative 2a-2 $73,200,000 CSO PROJECTS	Alternative 1b-2 $73,400,000 CSO PROJECTS	Alternative 2b-2 $80,000,000 CSO PROJECTS
OPERATING REVENUES	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500	$ 9,240,500
NON-OPERATING REVENUES (INTEREST AND TAP FEES)	270,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
CASH OPERATING EXPENSES (1)	(4,364,010)	(4,609,010)	(4,640,010)	(4,706,010)	(4,724,010)	(4,799,010)	(4,839,010)	(4,911,010)	(4,961,010)	(4,964,010)	(5,022,010)	(5,096,010)	(5,098,010)	(5,164,010)
PILT	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)	(528,200)
NET REVENUES AVAILABLE FOR DEBT SERVICE	$ 4,618,290	$ 4,253,290	$ 4,222,290	$ 4,156,290	$ 4,138,290	$ 4,063,290	$ 4,023,290	$ 3,951,290	$ 3,901,290	$ 3,898,290	$ 3,840,290	$ 3,766,290	$ 3,764,290	$ 3,698,290
DEBT SERVICE:														
MAX ANNUAL DEBT SERVICE OUTSTANDING BONDS	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925	$ 3,177,925
PROPOSED DEBT SERVICE (2)	-	1,965,943	2,214,695	2,744,296	2,888,733	3,490,553	3,811,523	4,389,270	4,790,482	4,814,555	5,279,962	5,873,757	5,889,806	6,419,407
PROPOSED COMBINED MAX ANNUAL DEBT SERVICE	$ 3,177,925	$ 5,143,868	$ 5,392,620	$ 5,922,221	$ 6,066,658	$ 6,668,478	$ 6,989,448	$ 7,567,195	$ 7,968,407	$ 7,992,480	$ 8,457,887	$ 9,051,682	$ 9,067,731	$ 9,597,332
BOND COVERAGE - 140%	1,271,170	2,057,547	2,157,048	2,368,889	2,426,663	2,667,391	2,795,779	3,026,878	3,187,363	3,196,992	3,383,155	3,620,673	3,627,092	3,838,933
REVENUE REQUIREMENTS	4,449,095	7,201,416	7,549,669	8,291,110	8,493,321	9,335,869	9,785,227	10,594,072	11,155,770	11,189,472	11,841,042	12,672,355	12,694,823	13,436,265
NET REVENUE DEFICIT		(2,948,126)	(3,327,379)	(4,134,820)	(4,355,031)	(5,272,579)	(5,761,937)	(6,642,782)	(7,254,480)	(7,291,182)	(8,000,752)	(8,906,065)	(8,930,533)	(9,737,975)
PERCENTAGE REVENUE DEFICIT (3)		34.68%	39.15%	48.64%	51.24%	62.03%	67.79%	78.15%	85.35%	85.78%	94.13%	104.78%	105.07%	114.56%
AVERAGE RESIDENTIAL BILL (5,000 GALLONS)	$ 28.05	$ 37.78	$ 39.03	$ 41.69	$ 42.42	$ 45.45	$ 47.07	$ 49.97	$ 51.99	$ 52.11	$ 54.45	$ 57.44	$ 57.52	$ 60.18

(1) CASH OPERATING EXPENSES REFLECT 2011 BUDGETED AMOUNTS ADJUSTED TO REFLECT ADDITIONAL OPERATING COSTS AT 1% OF THE PROPOSED PROJECT AMOUNT. PILT WAS NOT INCLUDED IN THE CALCULATION.

(2) ASSUMES 20 YEAR BOND AT A 5% INTEREST RATE.

(3) RATE INCREASE ADJUSTED TO BE APPLIED ONLY TO SEWER BILLINGS OF $8,500,000.

Prepared by O.W. Krohn & Associates

PRELIMINARY
FOR DELIBERATIVE PURPOSES

APPENDIX E

Flow Monitoring Study Report

West Lafayette, Indiana:
Temporary Flow Monitoring Study

November 10, 2010 – February 16, 2011

Prepared by:

ADS ENVIRONMENTAL SERVICES®

IDEX CORPORATION

A Division of ADS LLC

7215 East 21st Street, Suite D
Indianapolis, IN 46219
www.adsenv.com

April 7, 2011

City of W. Lafayette

ADS Environmental Services is pleased to present the W. Lafayette Data Review.
The data spans from November. 10, 2010 to February 16, 2011.
The data was analyzed in both hydrograph and scattergraph form. Hydrographs, scattergraphs, site reports, and a number of comments for each site are included in this report.

If you need any more information, please contact Eric M Hehmann with ADS at 317-357-9116.

Sincerely,
ADS ENVIRONMENTAL SERVICES

Eric M. Hehmann
Project Manger

TABLE OF CONTENTS

W. Lafayette Temporary Flow Monitoring
November 2010 to February 2011

Methodology……..2
Comments……3
Locations……4
TFM1
Site Report
Graphs
TFM2
Site Report
Graphs
TFM3
Site Report
Graphs
TFM4
Site Report
Graphs
TFM5
Site Report
Graphs
TFM6
Site Report
Graphs
TFM7
Site Report
Graphs
TFM8
Site Report
Graphs
TFM9
Site Report
Graphs
TFM10
Site Report
Graphs
TFM11
Site Report
Graphs

METHODOLOGY TABLE OF CONTENTS

CHAPTER 1 INTRODUCTION 1

1.1 Background 1

1.2 Project Scope 1

CHAPTER 2 EQUIPMENT AND METHODOLOGY 2

2.1 Flow Quantification Methods 2

2.1.1 Continuity Equation 2

2.1.2 Manning's Equation 2

2.2 Flow Monitoring Equipment 3

2.3 Installation 4

2.4 Data Collection, Confirmation, and Quality Assurance 5

CHAPTER 3 DATA ANALYSIS AND PRESENTATION 6

3.1 Data Analysis 6

3.2 Data Presentation 7

CHAPTER 1 Introduction

1.1 Background

ADS Environmental Services was contracted to conduct flow monitoring at eleven (11) flow locations in the City West Lafayette, Indiana. The objective of this study was to measure depth, velocity, flow rates, and provide a report of this data.

1.2 Project Scope

The scope of this study involved using temporary flow monitors to quantify wastewater flow at eleven (1) flow locations throughout the city's collection system. Specifically, the study included the following key components.

- Assess the flow monitoring sites for adequate hydraulic conditions.
- Ensure equipment functionality and/or repair.
- Flow monitor confirmations and data collections.
- Flow data analysis.
- Reporting.

CHAPTER 2 Equipment and Methodology

2.1 Flow Quantification Methods

There are two main equations used to measure open channel flow; the Continuity Equation and the Manning Equation. The Continuity Equation, which is considered the most accurate, can be used if both depth of flow and velocity are available. The Manning Equation only requires depth of flow and certain physical characteristics of the pipe. The Manning Equation can be used, where applicable, to corroborate or support the interpretation of results obtained from the Continuity Equation, and in certain cases, can be used to estimate velocity data in the event of sensor obstruction or failure. A more detailed discussion of each equation follows.

2.1.1 Continuity Equation

The Continuity Equation states that the flow quantity (Q) is equal to the wetted area (A) multiplied by the average velocity (V) of the flow.

$$\mathbf{Q = A * V}$$

This equation is applicable in a variety of conditions including backwater, surcharge, and reverse flow. Most modern flow monitoring equipment, including the ADS Models, measure both depth and velocity and therefore use the Continuity Equation to calculate flow quantities.

2.1.2 Manning Equation

The Manning Equation states the following:

$$\mathbf{Q = 1.486 * A * Rh^{2/3} * s^{1/2} / n}$$

Where,

Q = flow quantity

A = wetted area

s = slope of the hydraulic grade line (ideally equal to slope of pipe)

n = roughness factor for the pipe

Rh = hydraulic radius (wetted area / wetted perimeter)

Values of s and n can be approximated using "As Built" drawings or an equivalent ratio developed through a series of field confirmations.

Although the Manning Equation has been a traditional method of flow quantification, it is applicable only during uniform, steady flow conditions. Therefore, the Manning Equation is not suitable for sites that experience backwater, surcharge, or other varied unsteady flow conditions.

2.2 Flow Monitoring Equipment

A standard ADS temporary flow monitor was selected for this project. This flow monitor is an area velocity flow monitor that uses both the Continuity and Manning's equations to measure flow.

The ADS flow monitor consists of data acquisition sensors and a battery- powered microcomputer. The microcomputer includes a processor unit, data storage, and an on-board clock to control and synchronize the sensor recordings. The monitor was programmed to acquire and store depth of flow and velocity readings at 5-minute intervals. A laptop computer was used in the field to retrieve and store data from the monitor.

Three types of data acquisition sensors are available for the flow monitor. The primary depth measurement device is the ADS quad-redundant ultrasonic level sensor. This sensor uses four independent ultrasonic transceivers in pairs to measure the distance from the face of the transceiver housing to the water surface (air range) with up to four transceiver pairs, of the available one, active at one time. The elapsed time between transmitting and receiving the ultrasonic waves is used to calculate the air range between the sensor and flow surface based on the speed of sound in air. Sensors in the transceiver housing measure temperature, which is used to compensate the ultrasonic signal travel time. The speed of sound will vary with temperature.

Since the ultrasonic level sensor is mounted out of the flow, it creates no disturbance to normal flow patterns and does not affect site hydraulics.

Redundant flow depth data can be provided by a pressure depth sensor, and is independent from the ultrasonic level sensor. This sensor uses a piezo-resistive crystal to determine the difference between hydrostatic and atmospheric pressure. The pressure sensor is temperature compensated and vented to the atmosphere through a desiccant filled breather tube. Pressure depth sensors are typically used in larger size channels and applications where surcharging is anticipated. Its streamlined shape minimizes flow distortion.

Velocity is measured using the ADS V-3 digital Doppler velocity sensor. This sensor measures velocity in the cross-sectional area of flow. An ultrasonic carrier is transmitted upstream into the flow, and is reflected by suspended particles, air bubbles, or organic matter with a frequency shift proportional to the velocity of the reflecting objects. The reflected signal is received by the sensor and processed using digital spectrum analysis to determine the peak flow velocity. Collected peak velocity information is filtered and processed using field confirmation information and proprietary software to determine the average velocity, which is used to calculate flow quantities. The sensor's small profile, measuring 1.5 inches by 1.15 inches by 0.50 inches thick, minimizes the affects on flow patterns and site hydraulics.

2.3 Installation

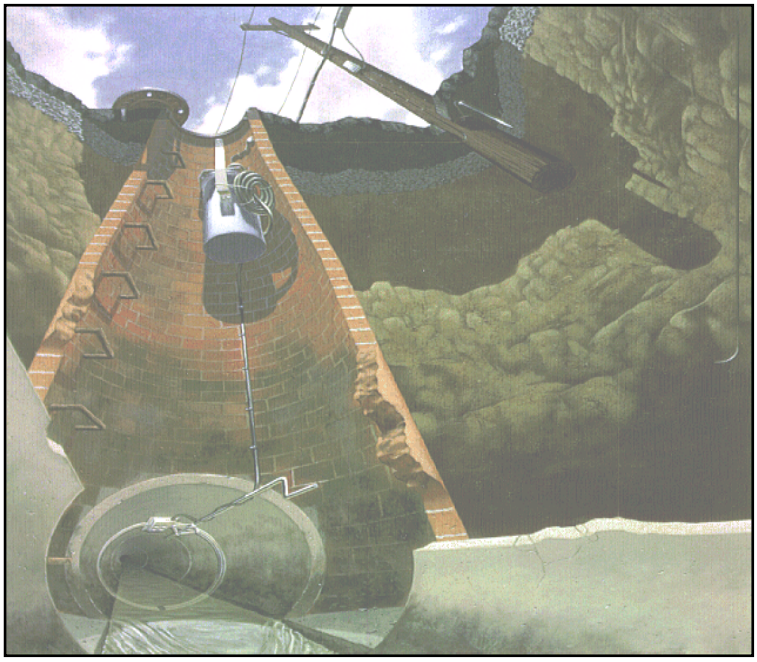
Installation of flow monitoring equipment typically proceeds in four steps. First, the site is investigated for safety and to determine physical and hydraulic suitability for the flow monitoring equipment. Second, the equipment is physically installed at the selected location. Third, the monitor is tested to assure proper operation of the velocity and depth of flow sensors and verify that the monitor clock is operational and synchronized to the master computer clock.

Fourth, the depth and velocity sensors are confirmed and line confirmations are performed. A typical flow monitor installation is shown in Figure 2.1.

The installation presented in Figure 2.1 is typical for circular or oval pipes up to approximately 42-inches in diameter or height. In this type of installation, depth and velocity sensors are mounted on an expandable ring and installed one to two pipe diameters upstream of the pipe/manhole connection in the incoming sewer pipe. This reduces the

affects of turbulence and backwater caused by the connection. This type of installation was used on this project.

Figure 2.1 Typical Installation



2.4 Data Collection, Confirmation, and Quality Assurance

During the monitoring period, field crews visit each monitoring location to retrieve data, verify proper monitor operation, and document field conditions. The following quality assurance steps are taken to assure the integrity of the data collected:

- **Measure Power Supply:** The monitor is powered by a dry cell battery pack. Power levels are recorded and battery packs replaced, if necessary. A separate battery provides back-up power to memory, which allows the primary battery to be replaced without the loss of data.

- **Perform Pipe Line Confirmations and Confirm Depth and Velocity:** Once equipment and sensor installation is accomplished, a member of the field crew

descends into the manhole to perform a field measurement of flow rate, depth and velocity to confirm they are in agreement with the monitor. Since the ADS V-3 velocity sensor measures peak velocity in the wetted cross-sectional area of flow, velocity profiles are also taken to develop a relationship between peak and average velocity in lines that meet the hydraulic criteria.

- **Measure Silt Level:** During site confirmation, a member of the field crew descends into the manhole and measures and records the depth of silt at the bottom of the pipe. This data is used to compute the true area of flow.
- **Confirm Monitor Synchronization:** The field crew checks the flow monitor's clock for accuracy.
- **Upload and Review Data:** Data collected by the monitor is uploaded and reviewed for comparison with previous data. All readings are checked for consistency and screened for deviations in the flow patterns, which indicate system anomalies or equipment failure.

CHAPTER 3 Data Analysis and Presentation

3.1 Data Analysis

The flow monitors were programmed to log data at 5-minute intervals throughout the monitoring period. The monitor stores raw data consisting of (1) the air range (distance from sensor to top of flow) for each active ultrasonic depth sensor pair and (2) the peak velocity. If the monitor is equipped with a pressure sensor, then a depth reading from this sensor may also be stored. When the data is collected by the field personnel, the air range is converted to depth data based on the pipe height and physical offset (distance from the top of the pipe to the surface of the ultrasonic sensor). The data is imported into ADS's proprietary software and is examined by a data analyst to verify its integrity. The data analyst also

reviews the daily field reports and site visit records to identify conditions that would affect the collected data.

Velocity profiles and line confirmation data developed by the field personnel are reviewed by the data analyst to identify inconsistencies and verify data integrity. Velocity profiles are reviewed and an average to peak velocity ratio is calculated for the site. This ratio is used in converting the peak velocity measured by the sensor to the average velocity used in the Continuity equation. A hydraulic coefficient (HC) is calculated from the data for each line confirmation. This hydraulic coefficient is the ratio of the coefficients s and n, previously discussed in the presentation of Manning's equation (section 2.1.2).

The data analyst selects which ultrasonic pairs and/or depth sensor entity will be used to calculate the final depth information. Silt levels present at each site visit are reviewed and representative silt levels established.

Selections for the above parameters can be constant or can change during the monitoring period. While the data analysis process is described in a linear manner, it often requires an iterative approach to accurately complete.

3.2 Data Presentation

This type of flow monitoring project generates a large volume of data. To facilitate review of the data, results have been provided in graphical and tabular formats. The flow data is presented graphically in the form of scattergraphs and hydrographs. Tables are provided in required CDM Excel data sheets. These tables show the flow rate for each day, along with the daily minimum and maximums, the times they were observed, the total daily flow, and total flow for the month (or monitoring period). The following explanation of terms may aid in interpretation of the tables and hydrographs:

AMMIN FLW -- The MIN FLOW observed during the a.m. hours (in MGD)

DFINAL – Final calculated depth measurement (in inches)

HYDRAULIC COEFF (HC) -- Calibrated factor for use in the Manning equation

MAX FLOW -- The maximum observed flow rate during the reporting period (in MGD)

MIN FLOW -- The minimum observed flow rate during the reporting period (in MGD)

QFINAL -- Final calculated flow rate (in MGD)

VFINAL – Final calculated flow velocity (in feet per second)

TOT FLOW -- Total volume of flow recorded for the indicated time period (in MG)

RAIN—Total rainfall received during reporting interval.

COMMENTS

TFM1- The site exhibits a regular repeatable diurnal flow pattern. One surcharge event was observed during the study period, this event occurred on November 24, 2010

TFM2 – This site exhibits a regular repeatable diurnal flow pattern. A maximum depth of 12.7" was recorded on Nov. 22, 2010. During the rain events on November 23rd, 24th and 25th the velocity sensor became fouled with debris causing erroneous readings.

TFM3 – An analysis of the scatter graph shows that a temporary blockage occurred during the study period. A maximum depth of 5.4" was recorded on 11/22/2010.

TFM4 – This site exhibits a regular repeatable diurnal flow pattern. A maximum depth of 57.1" was recorded on November 24, 2010. Pump station influence affected the site readings during the monitoring period.

TFM5 – A maximum depth of 35.9" was recorded on November 24, 2010. This site exhibits a regular repeatable diurnal flow pattern. The flow pattern also appears to be influenced by pump station activity.

TFM6 - This site exhibits a regular repeatable diurnal flow pattern. A maximum depth of 14.2" was recorded on November 24, 2010.

TFM7 - A maximum depth of 14.1" was recorded on November 22, 2010. During the rain events on November 23rd and 24th the velocity sensor became fouled with debris causing erroneous readings. An analysis of the scatter graph shows that a temporary blockage occurred during the study period.

TFM8 - This site exhibits a regular repeatable diurnal flow pattern. A maximum depth of 12.4" was recorded on November 24, 2010. During the rain events on November 24th and 25th the velocity sensor became fouled with debris causing erroneous readings.

TFM9 - This site exhibits a regular repeatable diurnal flow pattern. A maximum depth of 17.7" was recorded on November 24, 2010.

TFM10- A maximum depth of 9.8" was recorded on November 22, 2011. The site exhibited a regular repeatable diurnal flow pattern during the monitoring period. During the rain events on November 24th and 25th the velocity sensor became fouled with debris causing erroneous readings.

TFM11- Pump station influence can be seen in the data. A maximum depth of 16.5" was recorded on November 25, 2010.

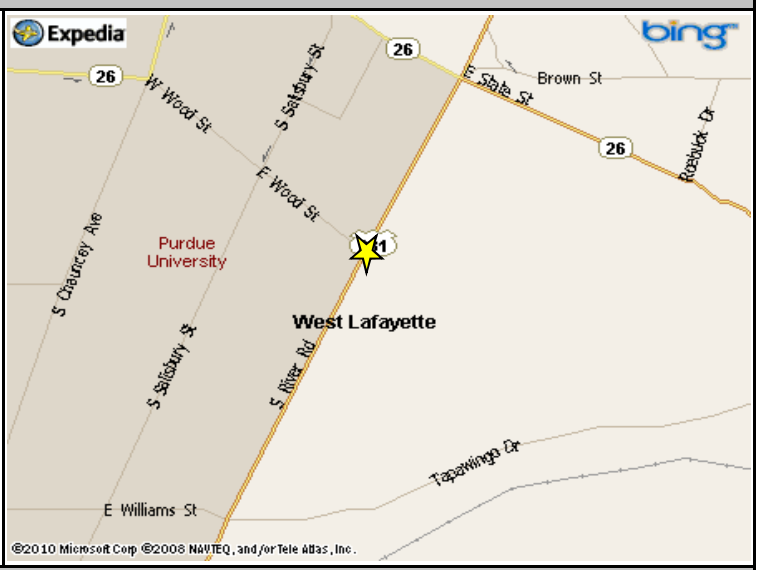
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM1	Monitor Series:	Flowshark	Monitor S/N:	20116	Map #:	
Address / Location:	229 N River Rd. (South bound lane)			Manhole #:			
				Pipe Diameter:	48.00 x 48.75 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.48.44		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	15 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Fast choppy flow		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/11/2010 11:45	##############	Access Pole #:	N/A
Pipe Diameter:	48.00 x 48.75 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	3 Inches		Trench Length:	N/A
Range (Air Dof):	4375 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.38 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.5 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	5.9 fps		This site captures meter 2 and 3's flow plus an additional 42 in line	
Silt:	0 Inches			
Pressure Serial #:	10725			
Performed By:	Brian Walker			

Additional Information

Project Name: West Lafayette

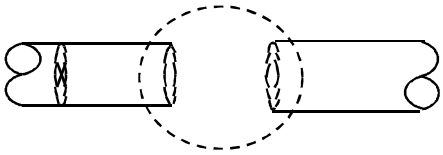
Project Number: 0

Site Name: WL_TFM1

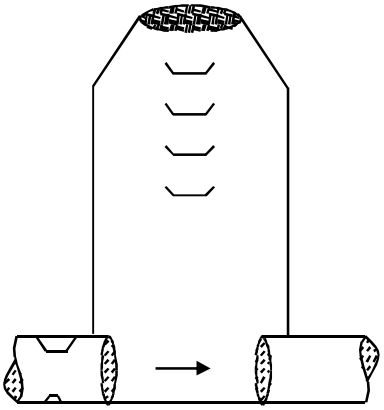
Contact Name: Eric Hehmann

Contact Number: 317-710-1199

Outgoing Line



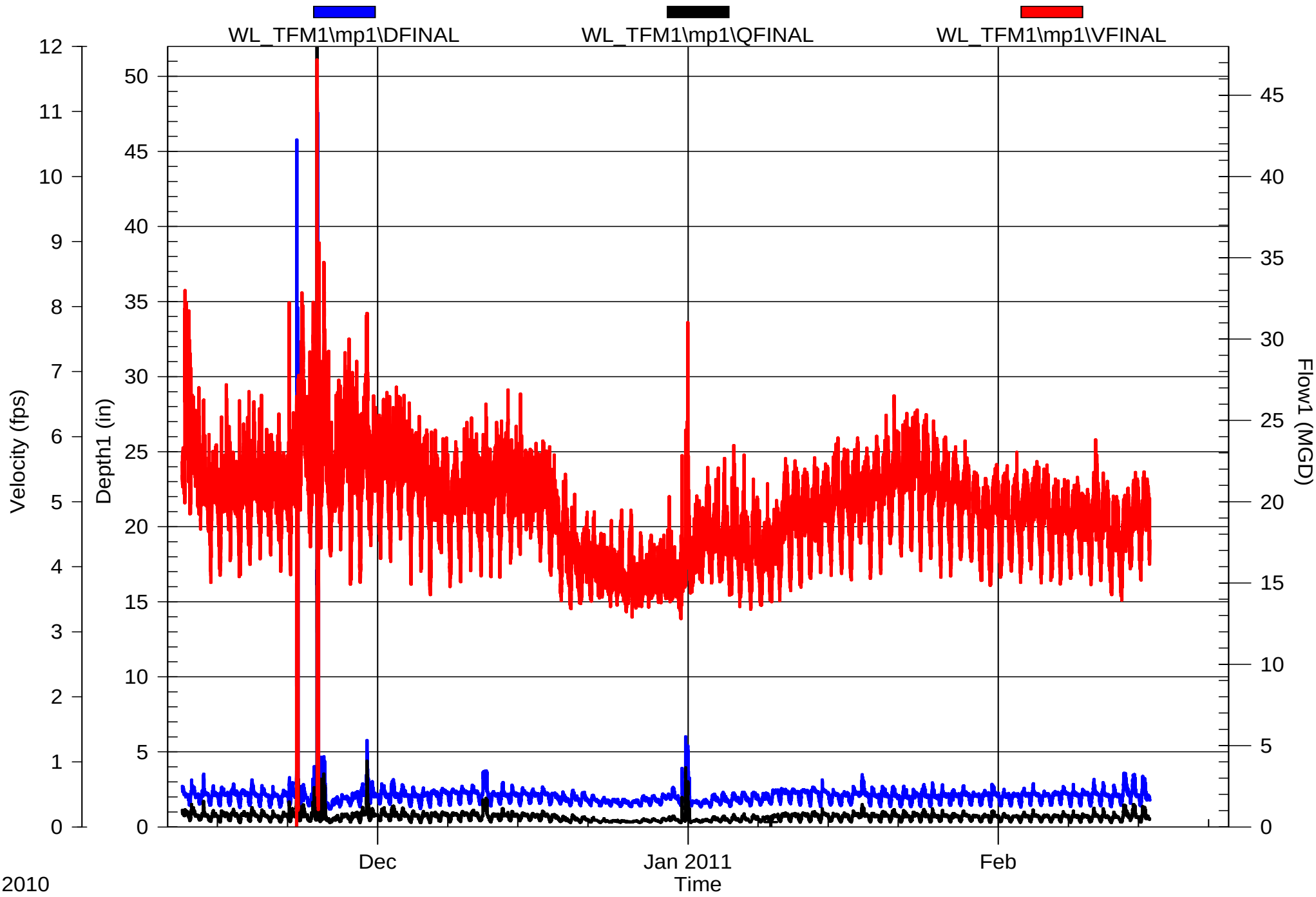
Planar



Cross Section

ADS Environmental Services

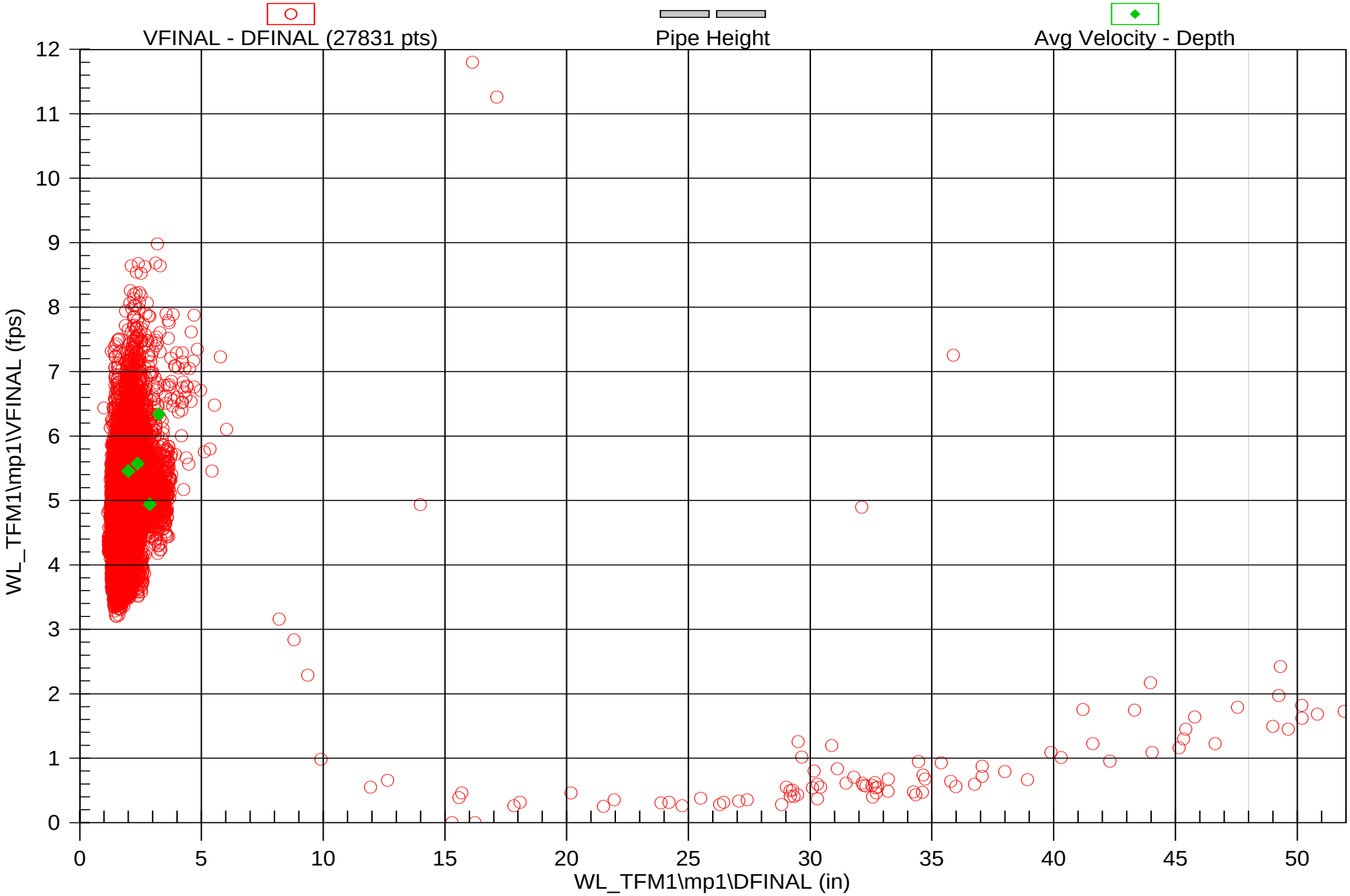
Pipe Height: 48.00



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 48.00



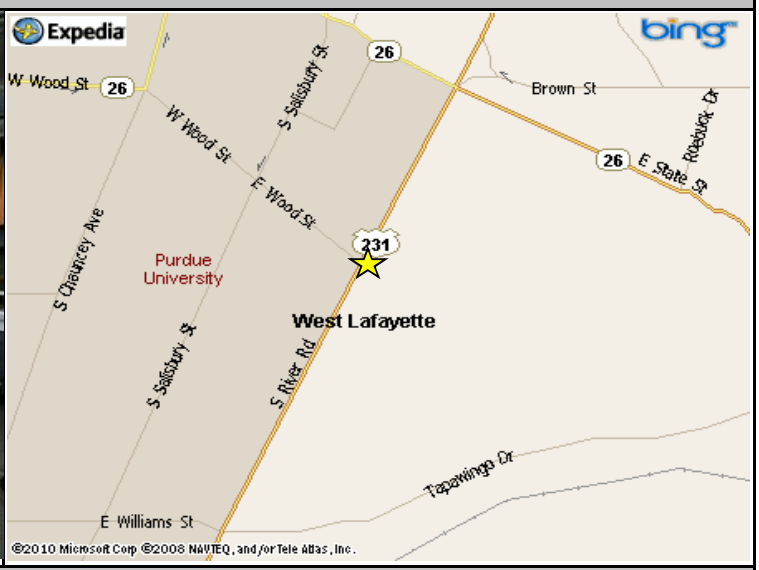
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

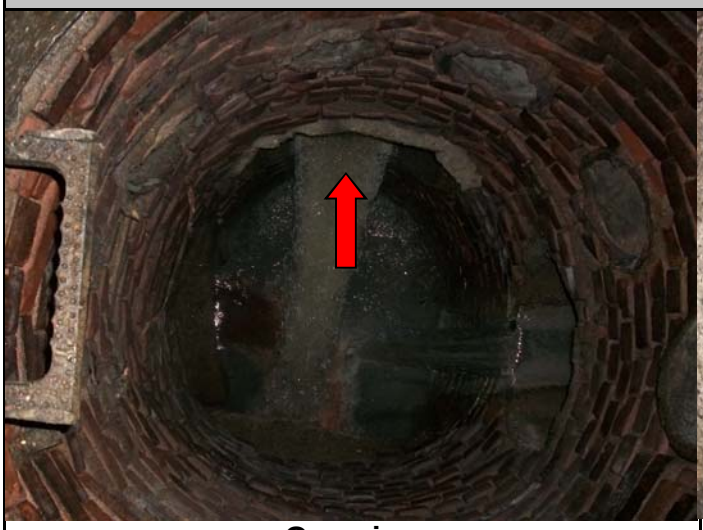
SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM2	Monitor Series:	Flowshark	Monitor S/N:	20744	Map #:	
Address / Location:	E. Wood St. and N. River Rd.			Manhole #:			
				Pipe Diameter:	33.25 x 33.50 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.8.239		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	15 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Fast choppy flow		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		



Overview

Incoming Line

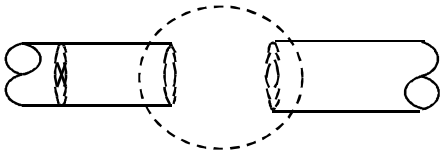
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 11:45	##############	Access Pole #:	N/A
Pipe Diameter:	33.25 x 33.50 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	2.5 Inches		Trench Length:	N/A
Range (Air Dof):	29.5 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.38 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.5 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	9.21 fps			
Silt:	0 Inches			
Pressure Serial #:	78567			
Performed By:	Brian Walker			

Additional Information

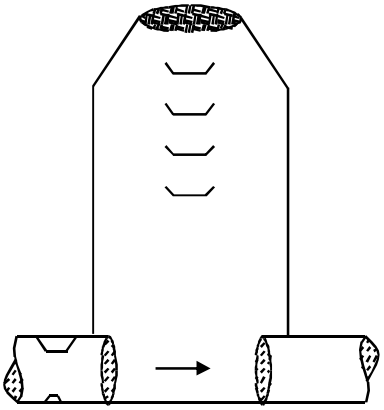
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM2

Outgoing Line



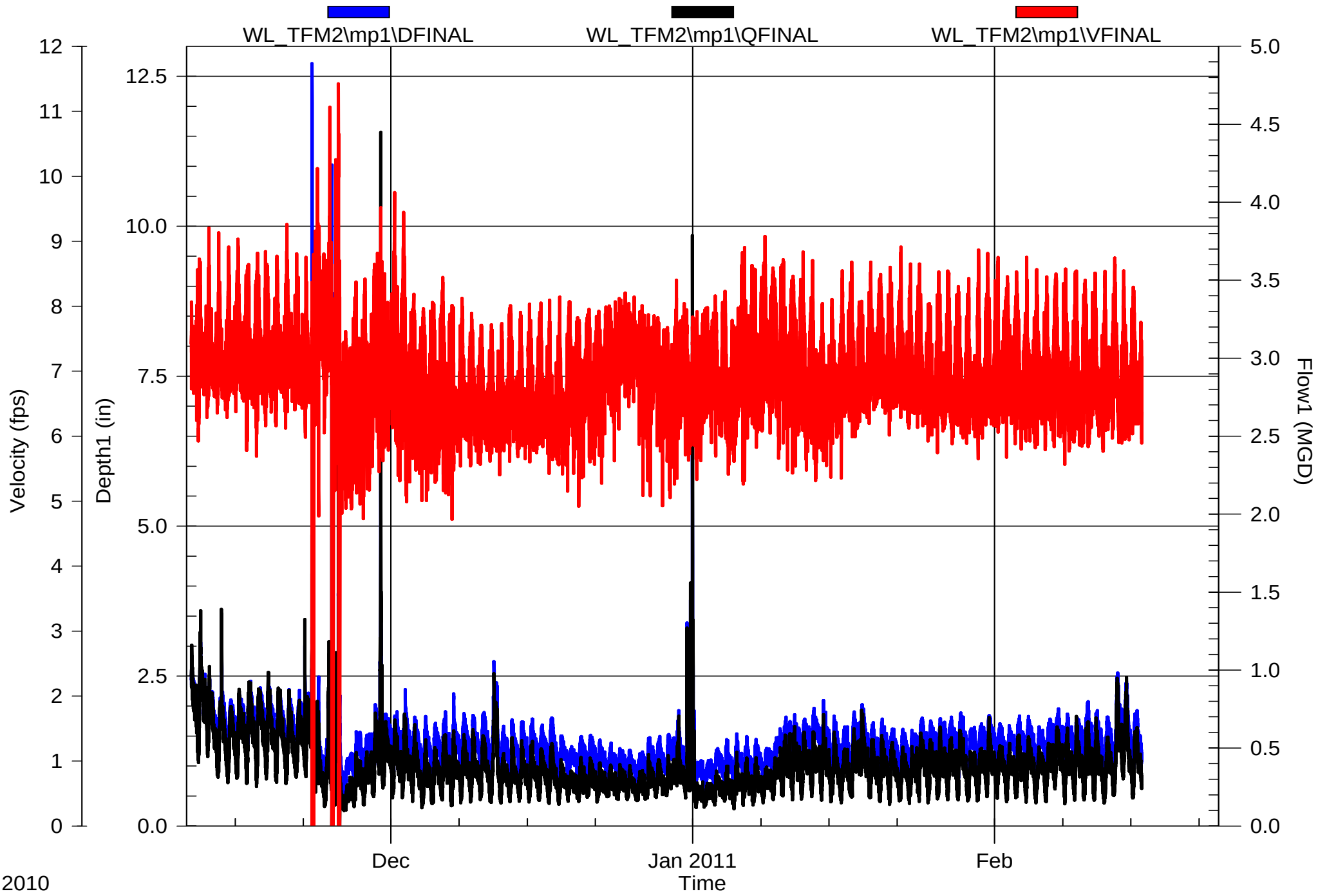
Planar



Cross Section

ADS Environmental Services

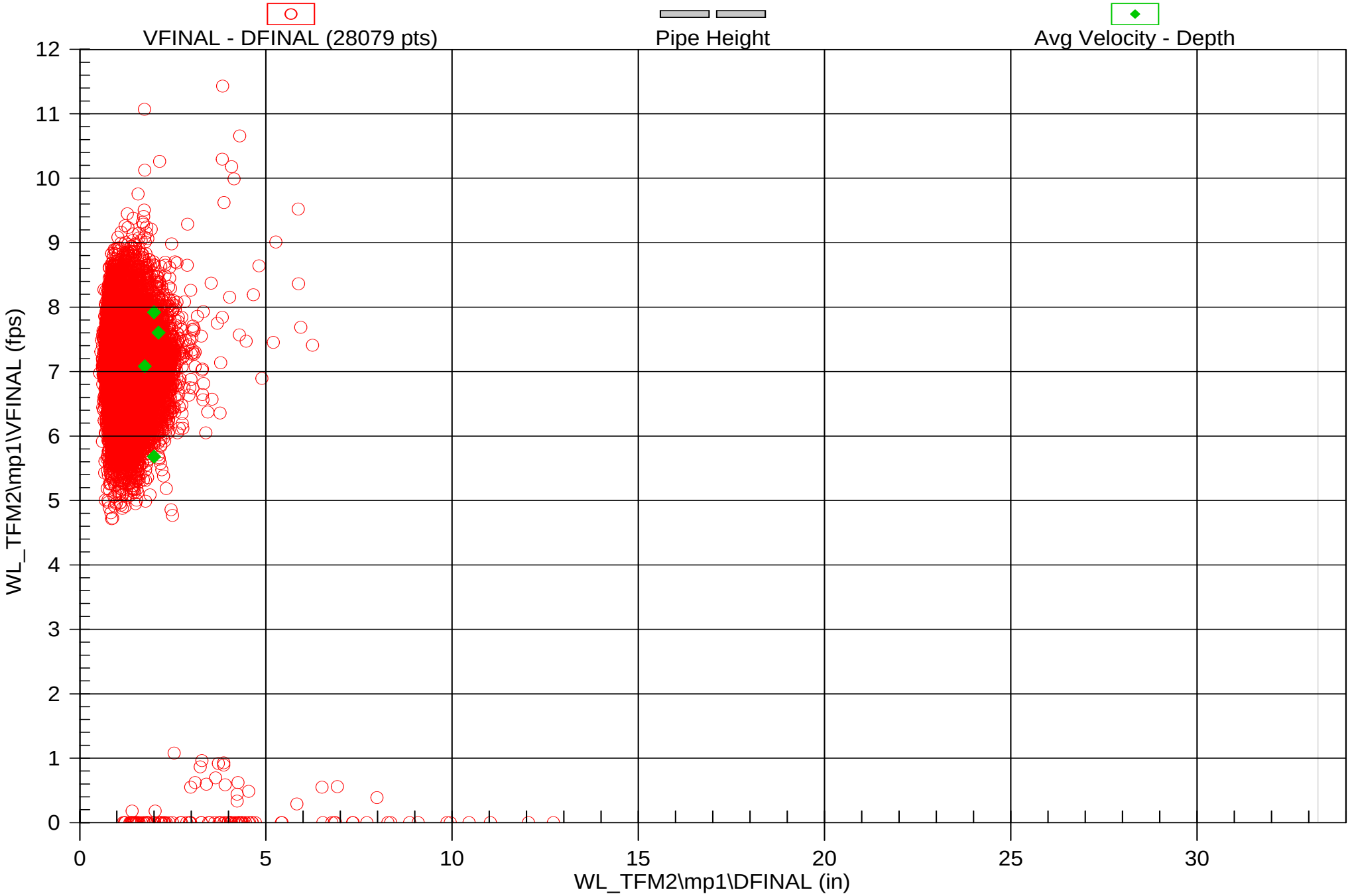
Pipe Height: 33.25



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 33.25



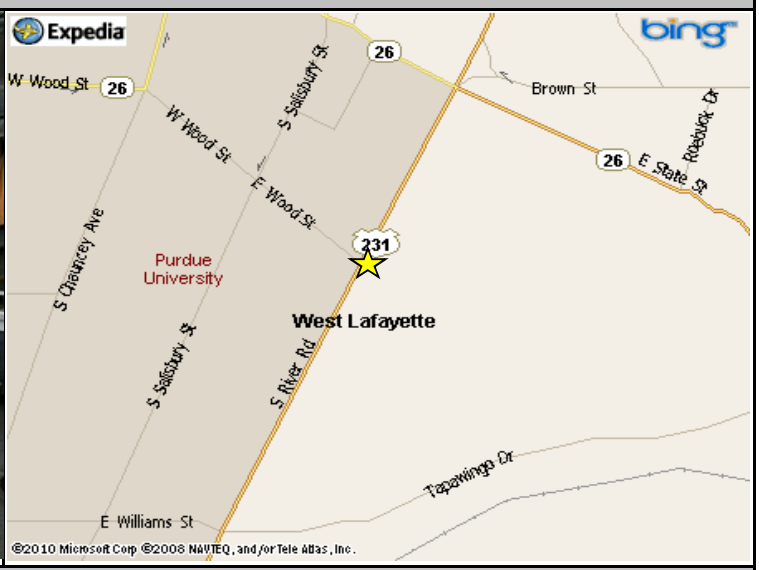
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

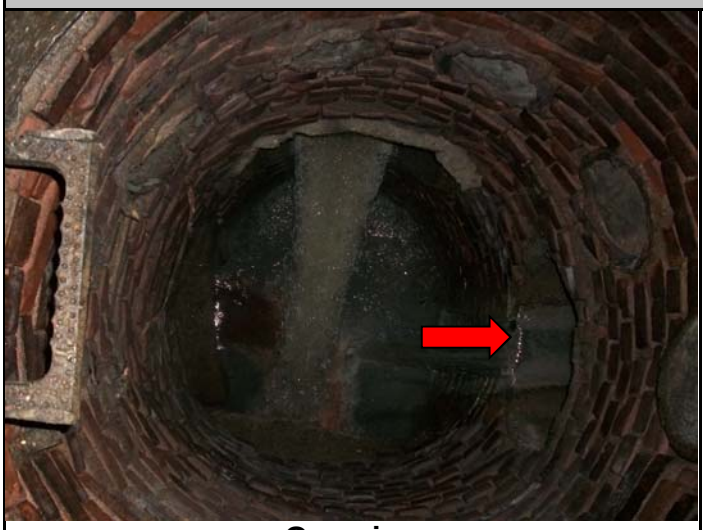
SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM3	Monitor Series:	Flowshark	Monitor S/N:	20133	Map #:	
Address / Location:	E. Wood St. and N. River Rd.			Manhole #:			
				Pipe Diameter:	24.00 x 24.50 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.48.195		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	15 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Good hydraulics		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		



Overview

Incoming Line

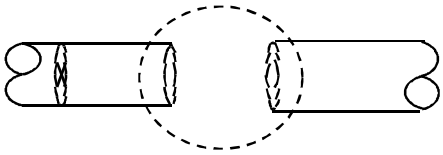
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 11:15	##############	Access Pole #:	N/A
Pipe Diameter:	33.25 x 33.50 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	1.88 Inches		Trench Length:	N/A
Range (Air Dof):	20.88 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.5 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	2.59 fps			
Silt:	0 Inches			
Pressure Serial #:	78342			
Performed By:	Brian Walker			

Additional Information

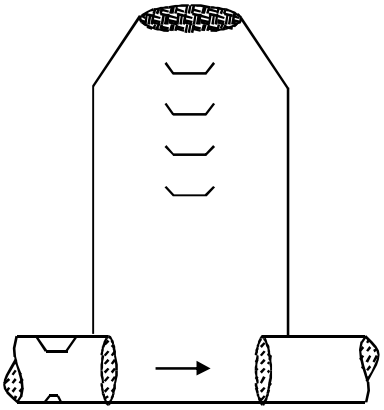
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM3

Outgoing Line

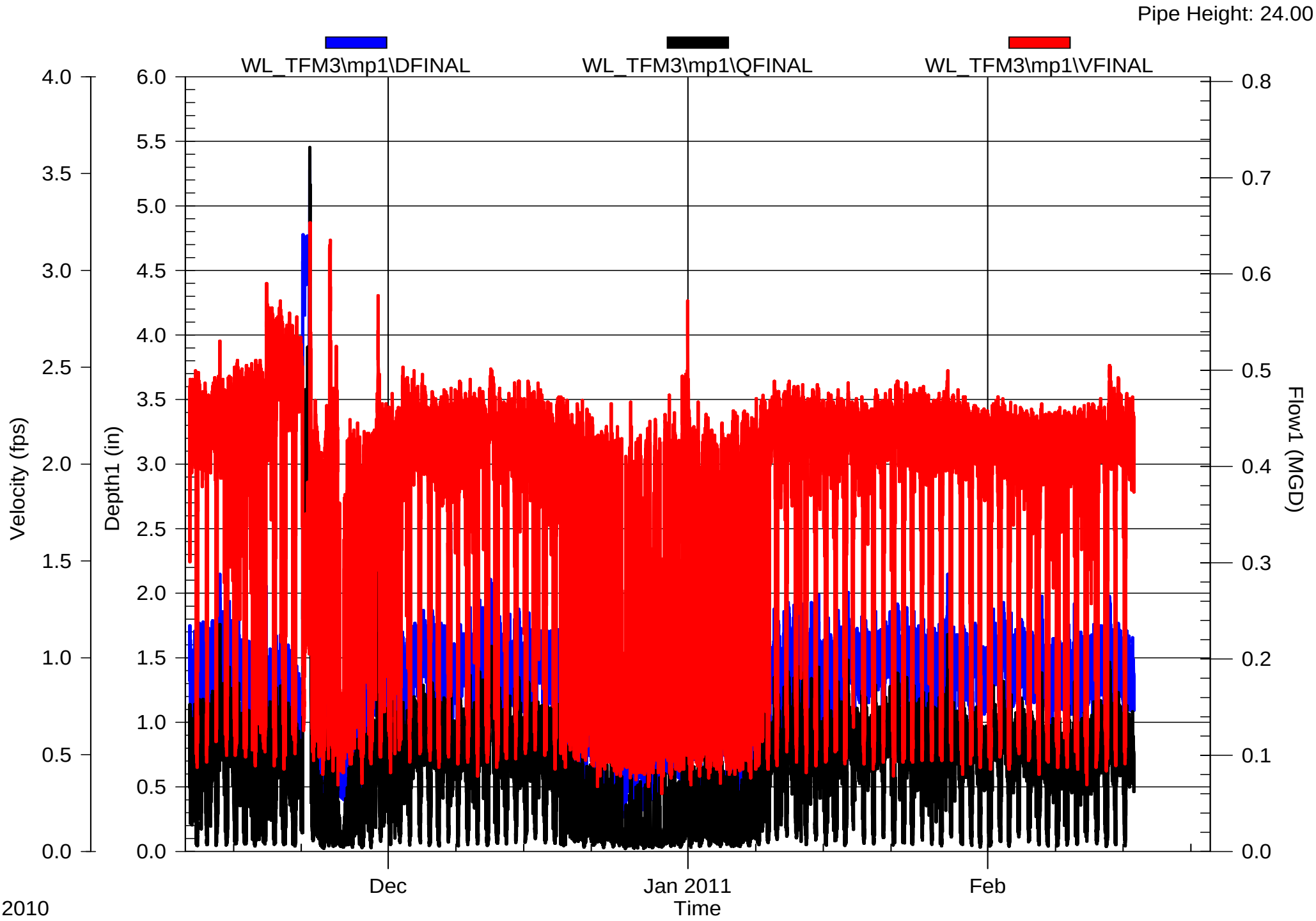


Planar



Cross Section

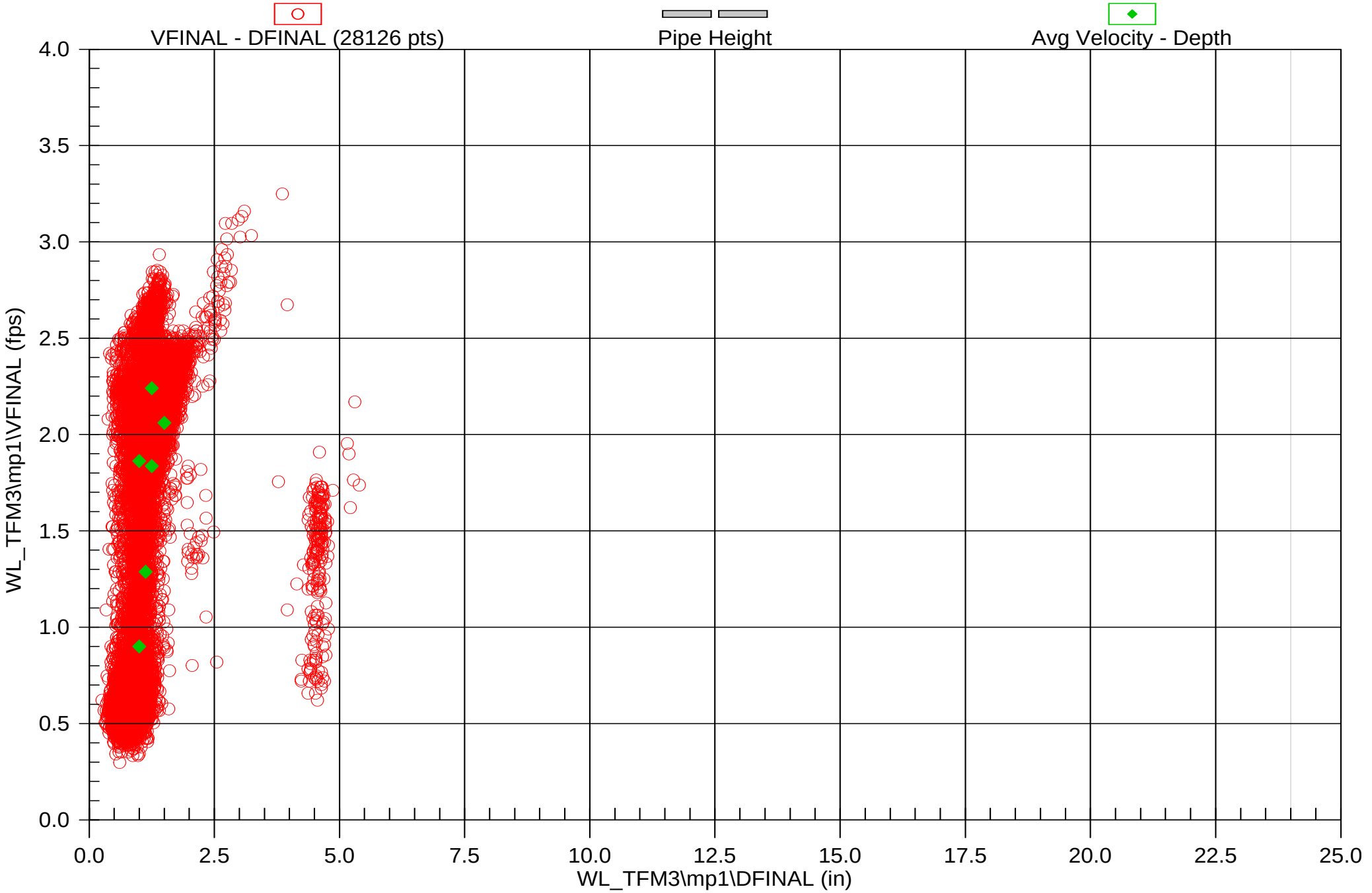
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 24.00



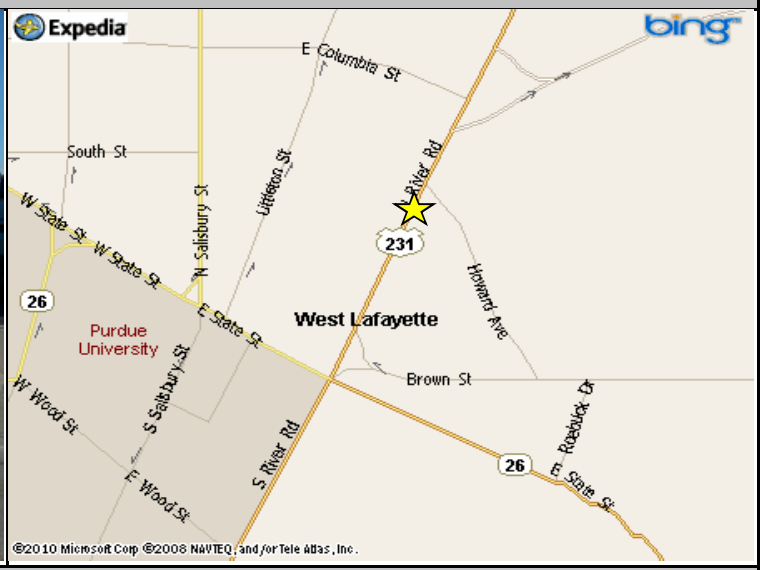
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM4	Monitor Series:	Flowshark	Monitor S/N:	20971	Map #:	
Address / Location:	North bound lane of N River Rd. 100ft. Sout of Howard Ave.			Manhole #:			
				Pipe Diameter:	72.00 x 72.00 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.49.120		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	14.5 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Good hydraulics		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 14:31	##############	Access Pole #:	N/A
Pipe Diameter:	72.00 x 72.00 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	12 Inches		Trench Length:	N/A
Range (Air Dof):	58.38 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.25 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	2.25 fps			
Silt:	0 Inches			
Pressure Serial #:	77339			
Performed By:	Brian Walker			

Additional Information

Project Name: West Lafayette

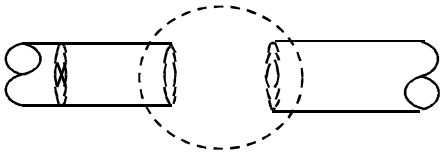
Project Number: 0

Site Name: WL_TFM4

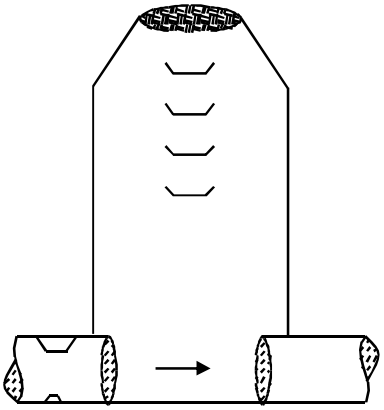
Contact Name: Eric Hehmann

Contact Number: 317-710-1199

Outgoing Line

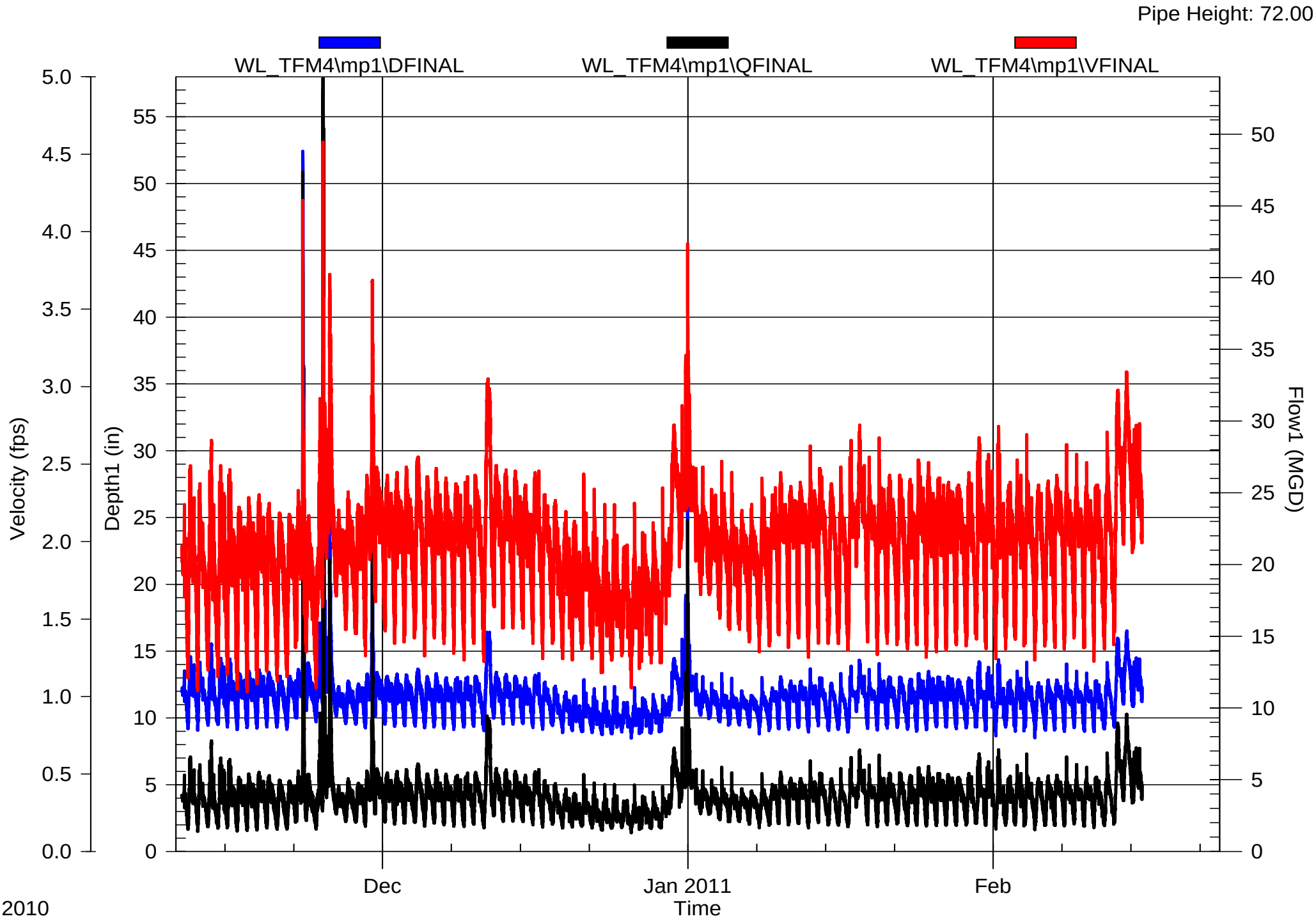


Planar



Cross Section

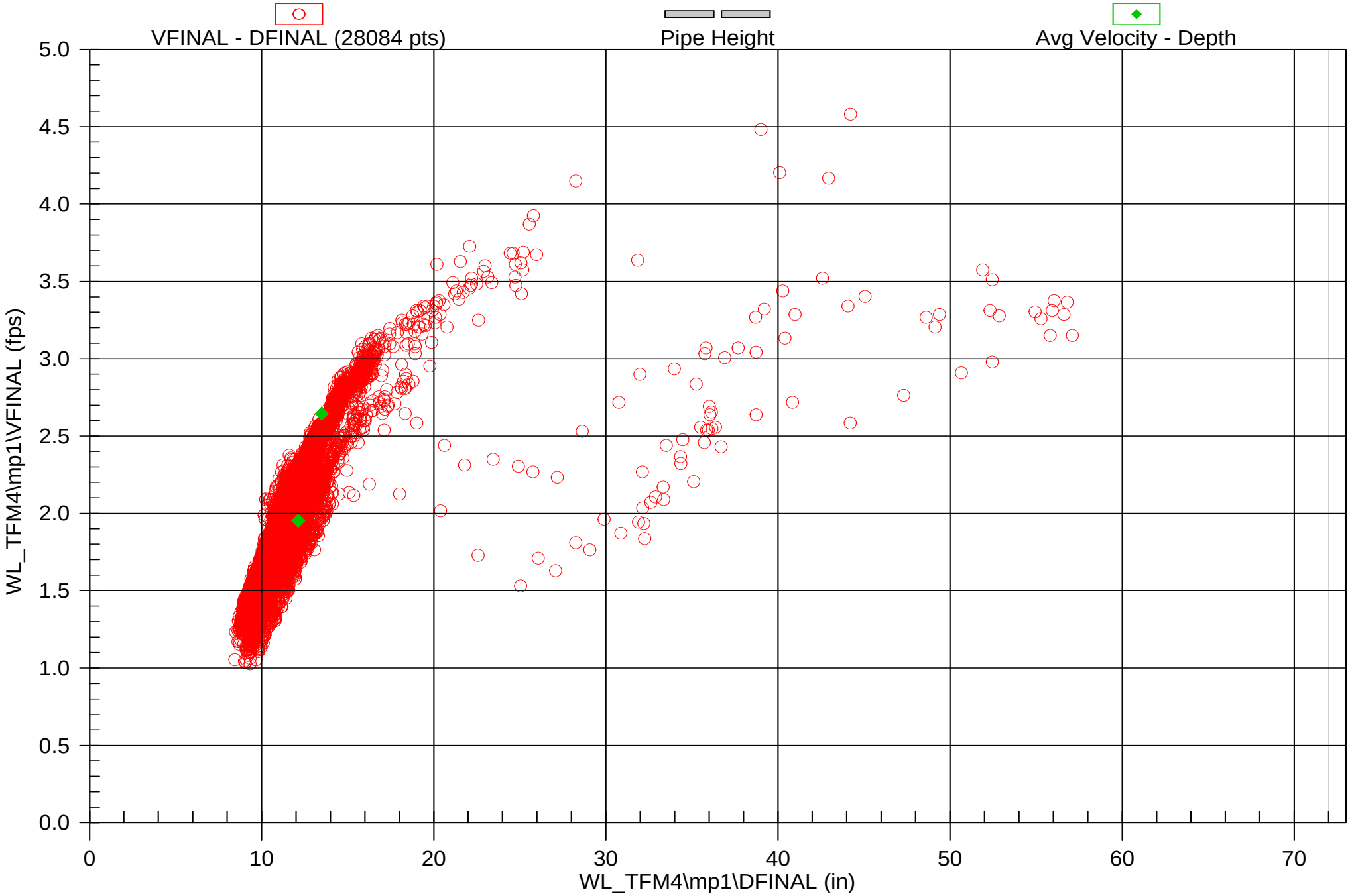
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 72.00



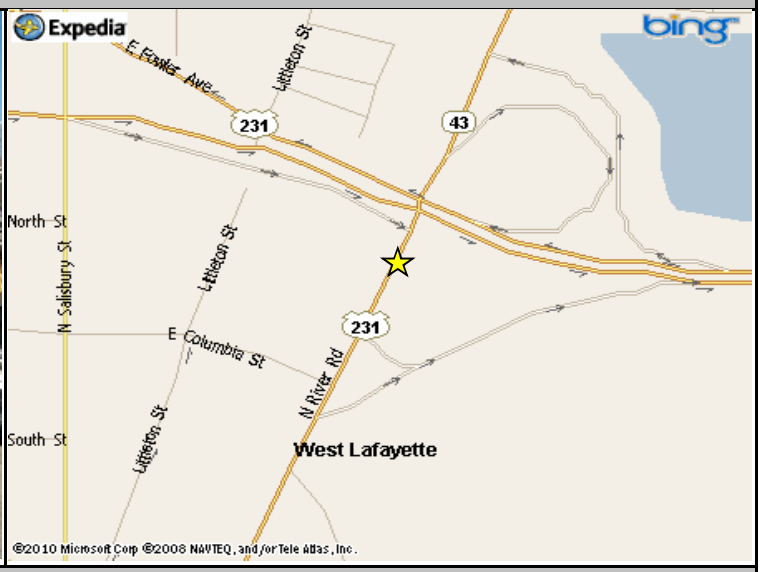
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM5	Monitor Series:	Flowshark	Monitor S/N:	20130	Map #:	
Address / Location:	243 N. River Rd. (200ft south 0f US 231 over pass)			Manhole #:			
				Pipe Diameter:	65.63 x 65.50 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.185.205		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	12.8 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Good hydraulics		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

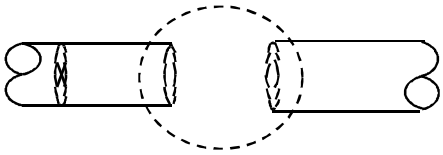
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 14:25	###############	Access Pole #:	N/A
Pipe Diameter:	65.63 x 65.50 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	8.38 Inches		Trench Length:	N/A
Range (Air Dof):	56 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.25 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	4.13 fps			
Silt:	0 Inches			
Pressure Serial #:	78552			
Performed By:	Brian Walker			

Additional Information

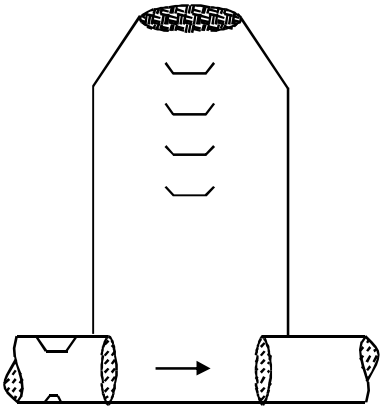
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM5

Outgoing Line

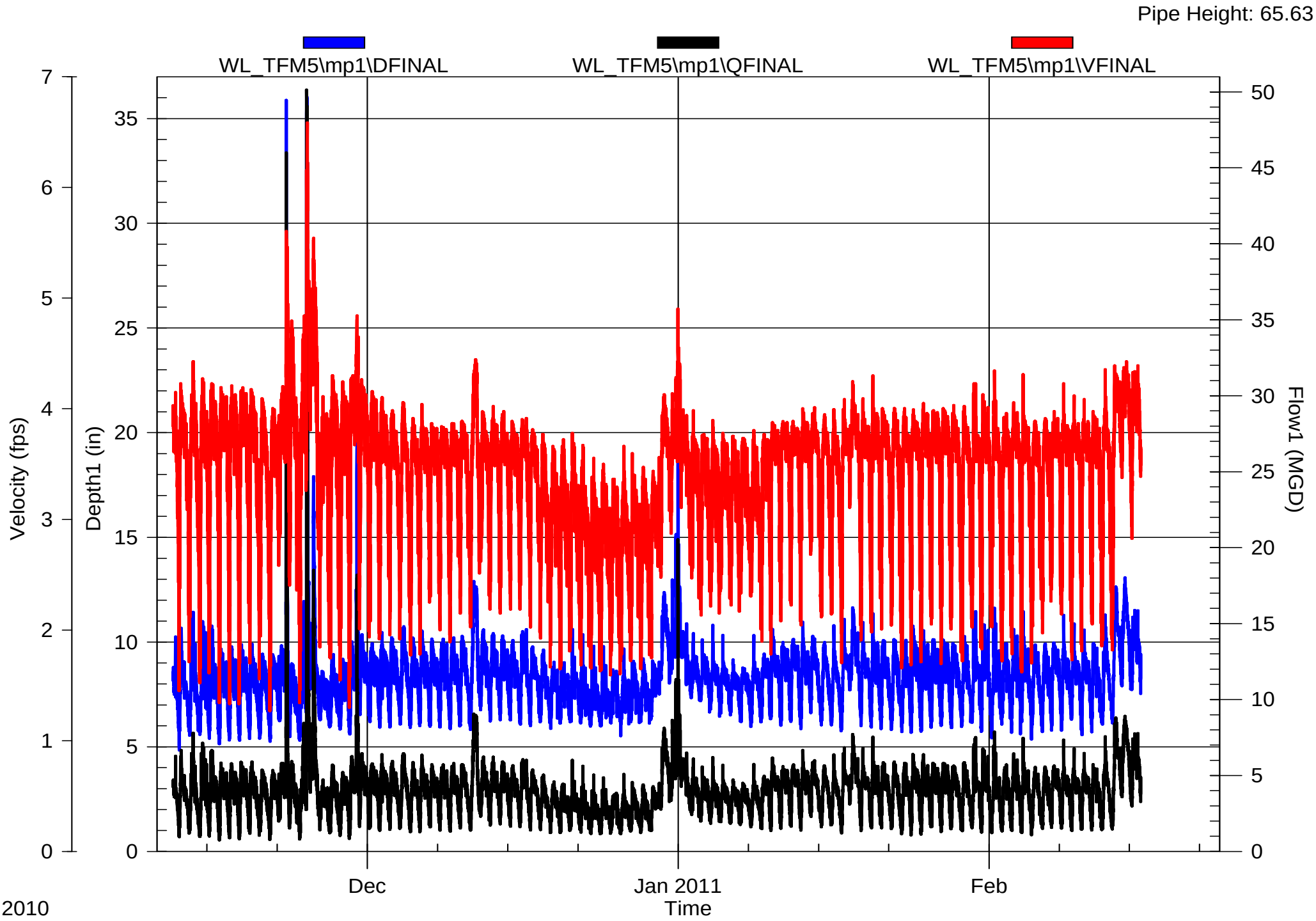


Planar



Cross Section

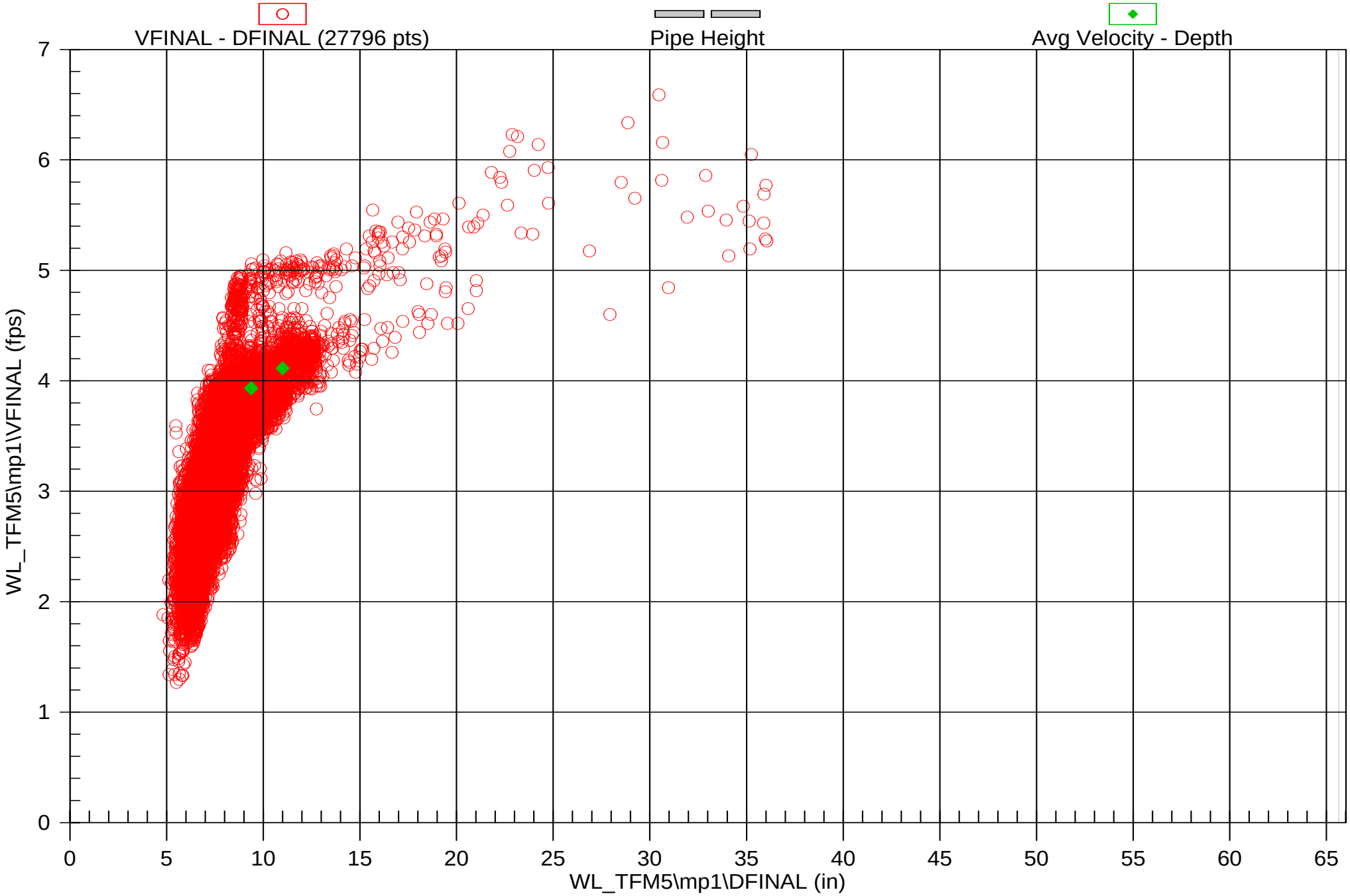
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 65.63



ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM6	Monitor Series:	Flowshark	Monitor S/N:	20249	Map #:	
Address / Location:	In Median on N River Rd. (North of Columbia St.)			Manhole #:			
				Pipe Diameter:	36.00 x 36.00 Inches		
Access:	Drive	Traffic Volume:	Heavy	Communications Number:	166.219.185.45		

Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	11.4 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Almost Stagnant		Active Pipe Connections?	Yes		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/11/2010 11:30	##############	Access Pole #:	N/A
Pipe Diameter:	36.00 x 36.00 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	4 Inches		Trench Length:	N/A
Range (Air Dof):	30.5 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	138 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	0.24 fps			
Silt:	0 Inches			
Pressure Serial #:	9785			
Performed By:	Brian Walker			

Additional Information

Project Name: West Lafayette

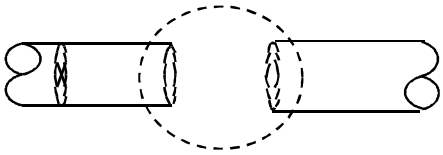
Project Number: 0

Site Name: WL_TFM6

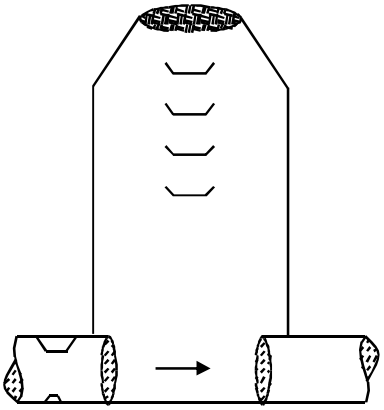
Contact Name: Eric Hehmann

Contact Number: 317-710-1199

Outgoing Line

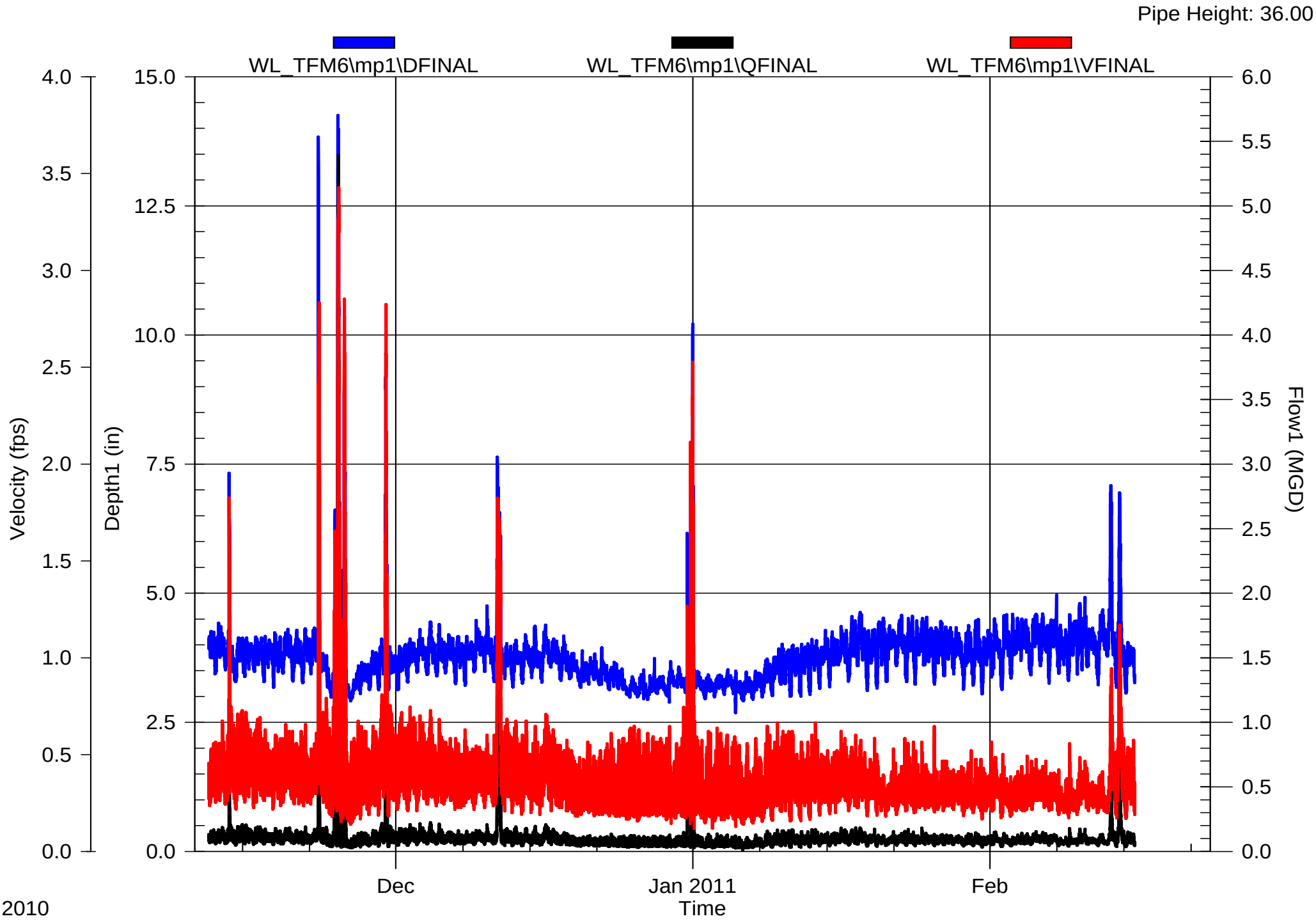


Planar



Cross Section

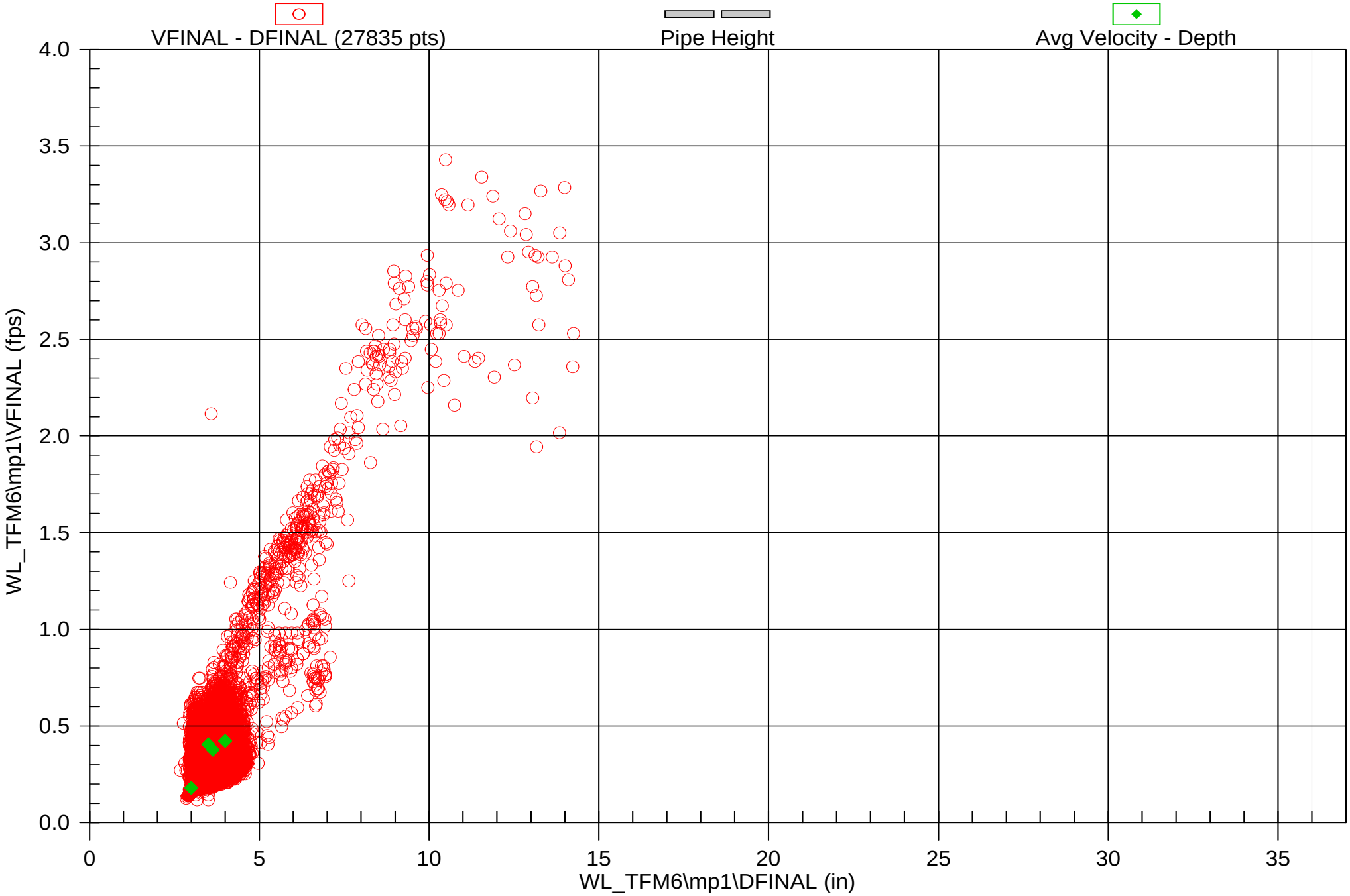
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 36.00



ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM7	Monitor Series:	Flowshark	Monitor S/N:	20107	Map #:	
Address / Location:	Quincey St. 200ft west of N River Rd. (On sidewalk)			Manhole #:			
				Pipe Diameter:	41.38 x 41.00 Inches		
Access:	Drive	Traffic Volume:	Medium	Communications Number:	166.219.9.31		

Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	8 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Fast choppy flow		Active Pipe Connections?	No		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 11:41	##############	Access Pole #:	N/A
Pipe Diameter:	41.38 x 41.00 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	4.25 Inches		Trench Length:	N/A
Range (Air Dof):	35.63 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.5 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	9.87 fps			
Silt:	0 Inches			
Pressure Serial #:	82135			
Performed By:	Brian Walker			

Additional Information

Project Name: West Lafayette

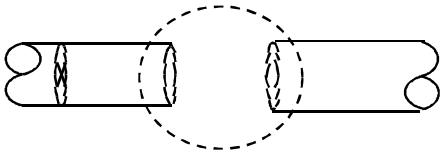
Project Number: 0

Site Name: WL_TFM7

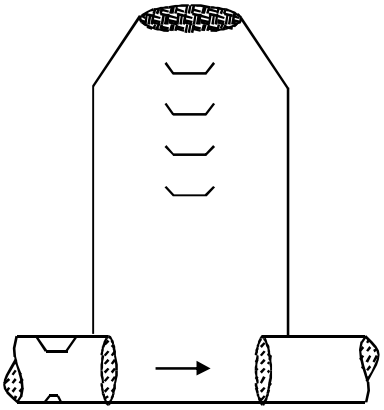
Contact Name: Eric Hehmann

Contact Number: 317-710-1199

Outgoing Line



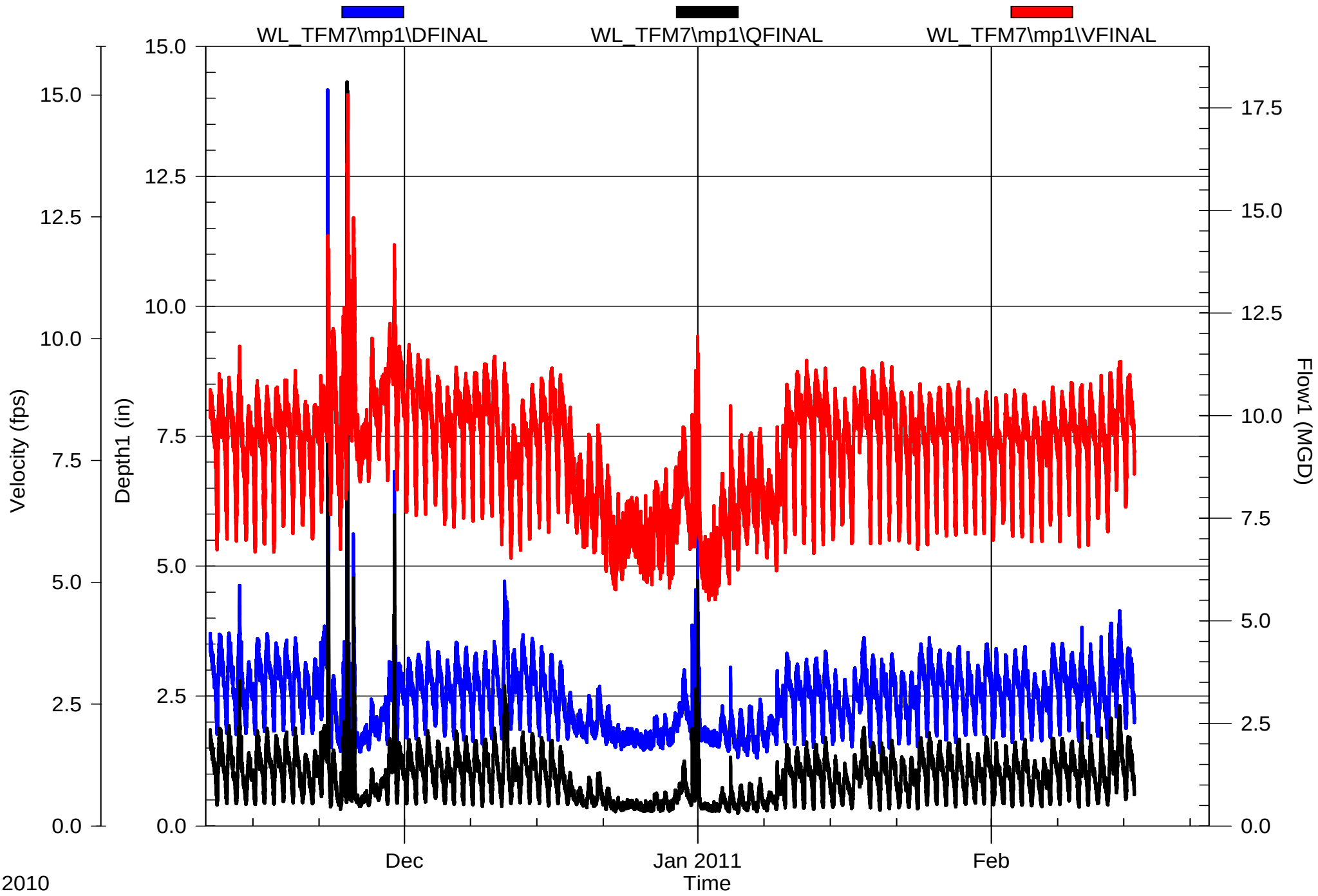
Planar



Cross Section

ADS Environmental Services

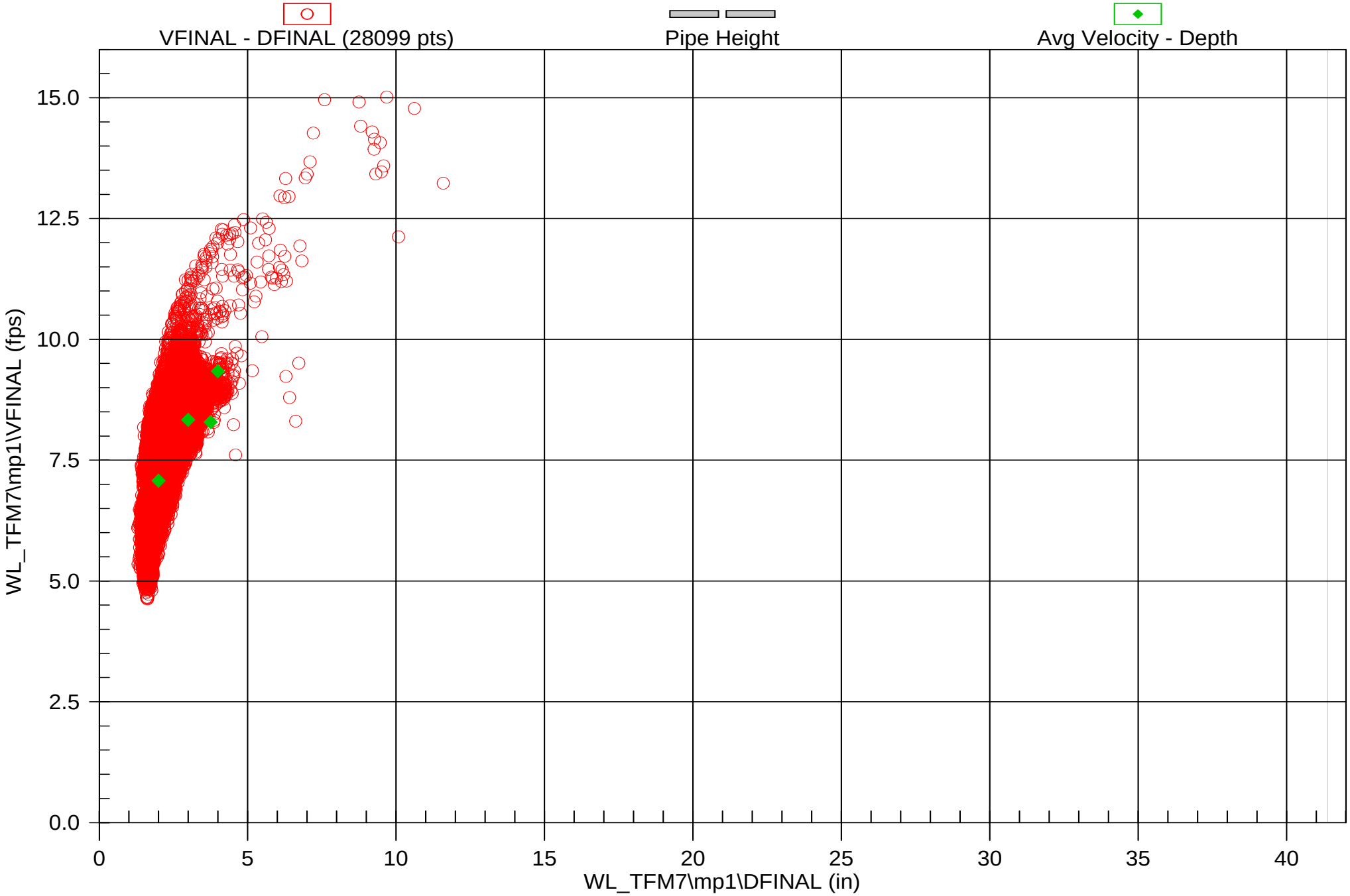
Pipe Height: 41.38



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 41.38



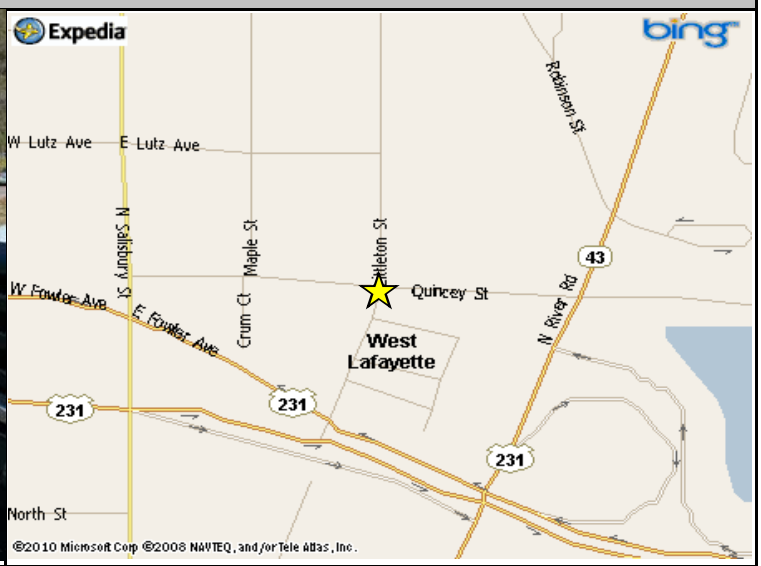
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM8	Monitor Series:	Flowshark	Monitor S/N:	20336	Map #:	
Address / Location:	Quincey St. 200ft west of N River Rd. (On sidewalk)			Manhole #:			
				Pipe Diameter:	42.38 x 42.00 Inches		
Access:	Drive	Traffic Volume:	Medium	Communications Number:	166.219.8.215		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	14 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Upstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Low fast moving flow		Active Pipe Connections?	No		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview | **Incoming Line**

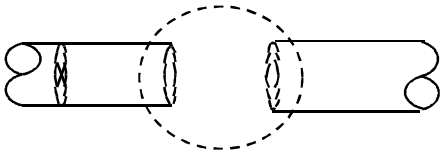
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 13:13	##############	Access Pole #:	N/A
Pipe Diameter:	42.38 x 42.00 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	0.5 Inches		Trench Length:	N/A
Range (Air Dof):	40.5 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.38 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	4.41 fps			
Silt:	0 Inches			
Pressure Serial #:	81663			
Performed By:	Brian Walker			

Additional Information

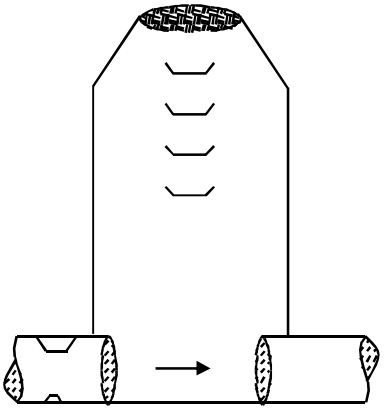
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM8

Outgoing Line

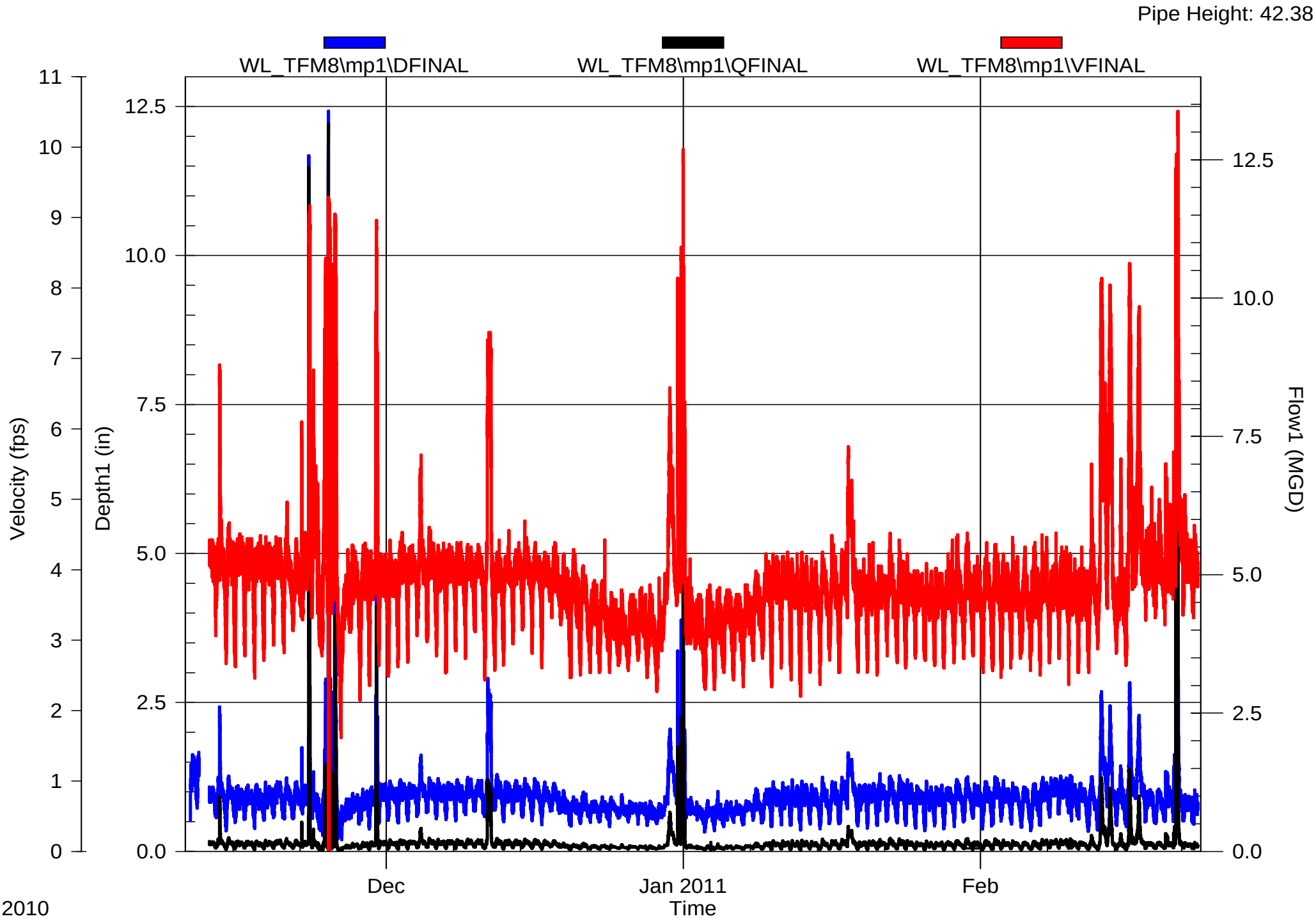


Planar



Cross Section

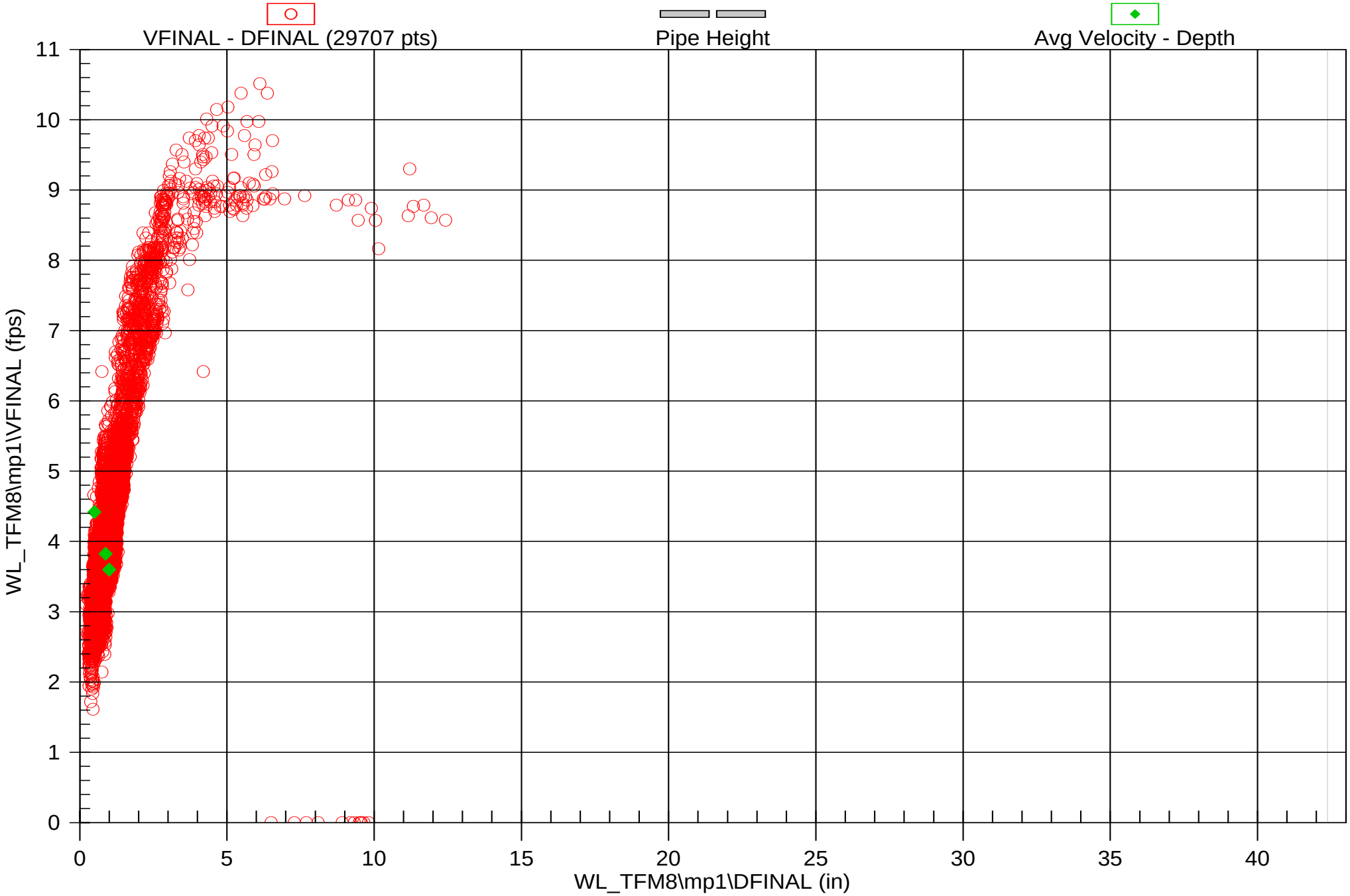
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 42.38



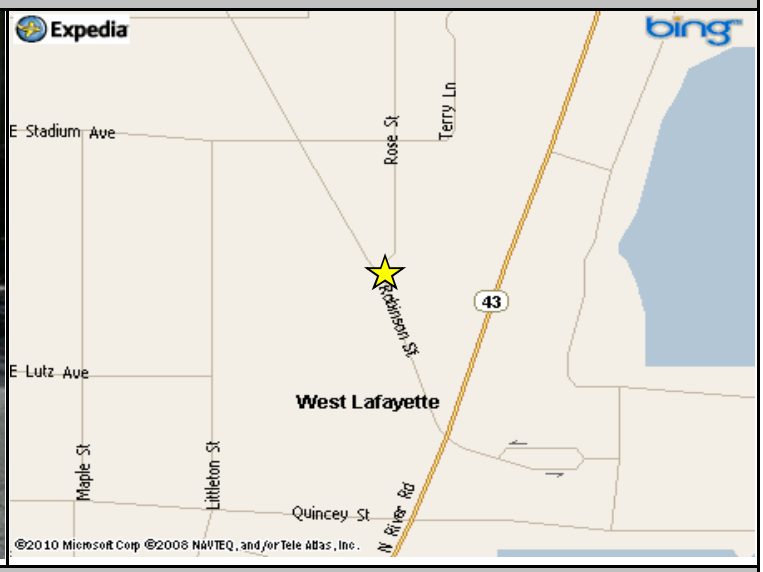
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM9	Monitor Series:	Flowshark	Monitor S/N:	20539	Map #:	
Address / Location:	Intersection of Robinson St. and Rose St.			Manhole #:			
				Pipe Diameter:	20.00 x19.75 Inches		
Access:	Drive	Traffic Volume:	Medium	Communications Number:	166.219.18.245		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	8.5 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Brick		Fair
Monitoring Location:	Downstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Low fast moving flow		Active Pipe Connections?	No		
			Pipe Material / Condition:	Vitrified Clay Pipe		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 13:40	##############	Access Pole #:	N/A
Pipe Diameter:	20.00 x 19.75 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	0.5 Inches		Trench Length:	N/A
Range (Air Dof):	18 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.25 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	2.03 fps		This is a reverse install that captures two incoming connections.	
Silt:	0 Inches			
Pressure Serial #:	79770			
Performed By:	Brian Walker			

Additional Information

Project Name: West Lafayette

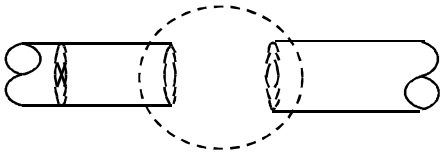
Project Number: 0

Site Name: WL_TFM9

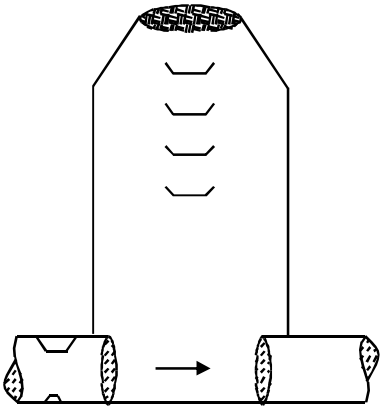
Contact Name: Eric Hehmann

Contact Number: 317-710-1199

Outgoing Line

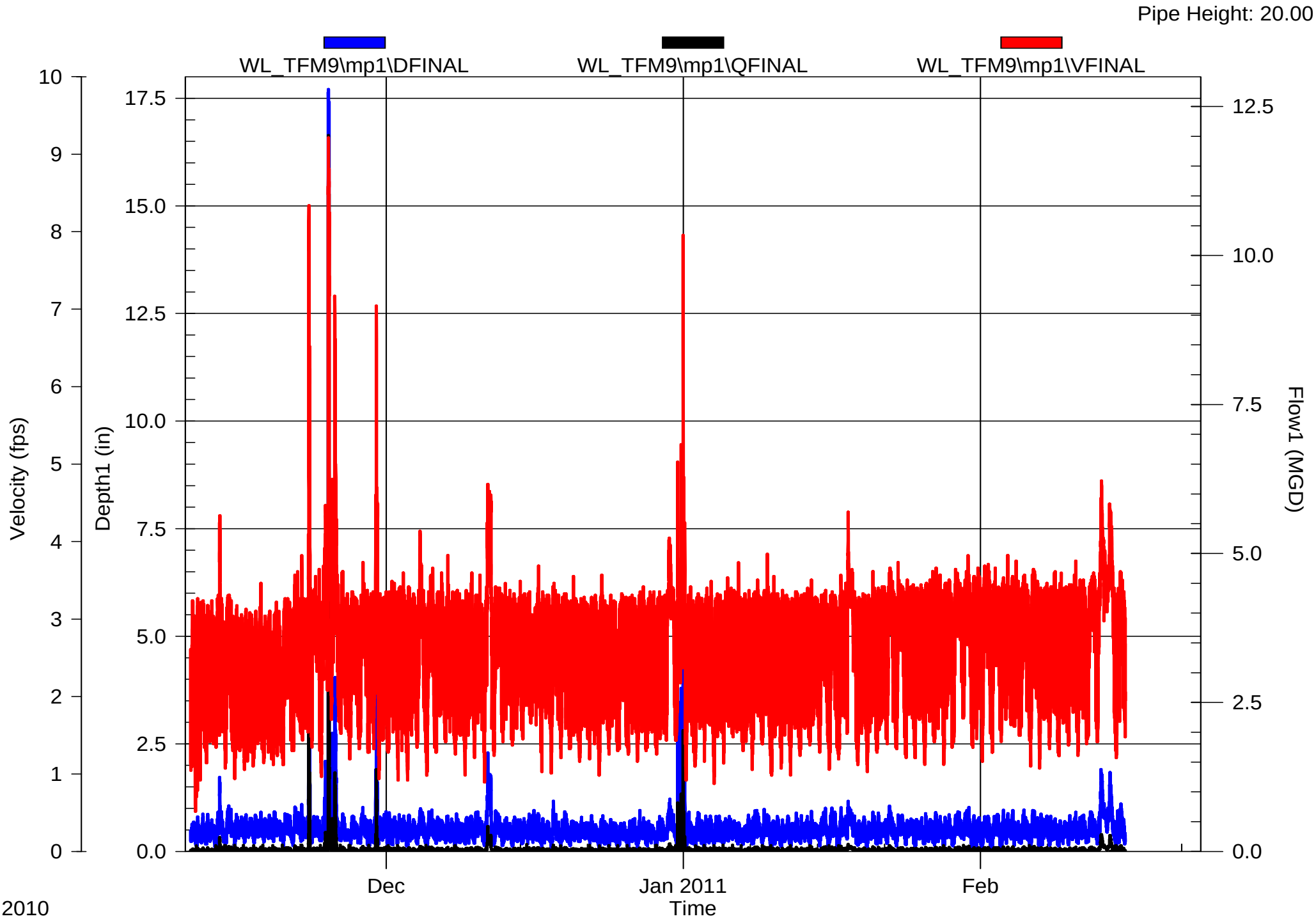


Planar



Cross Section

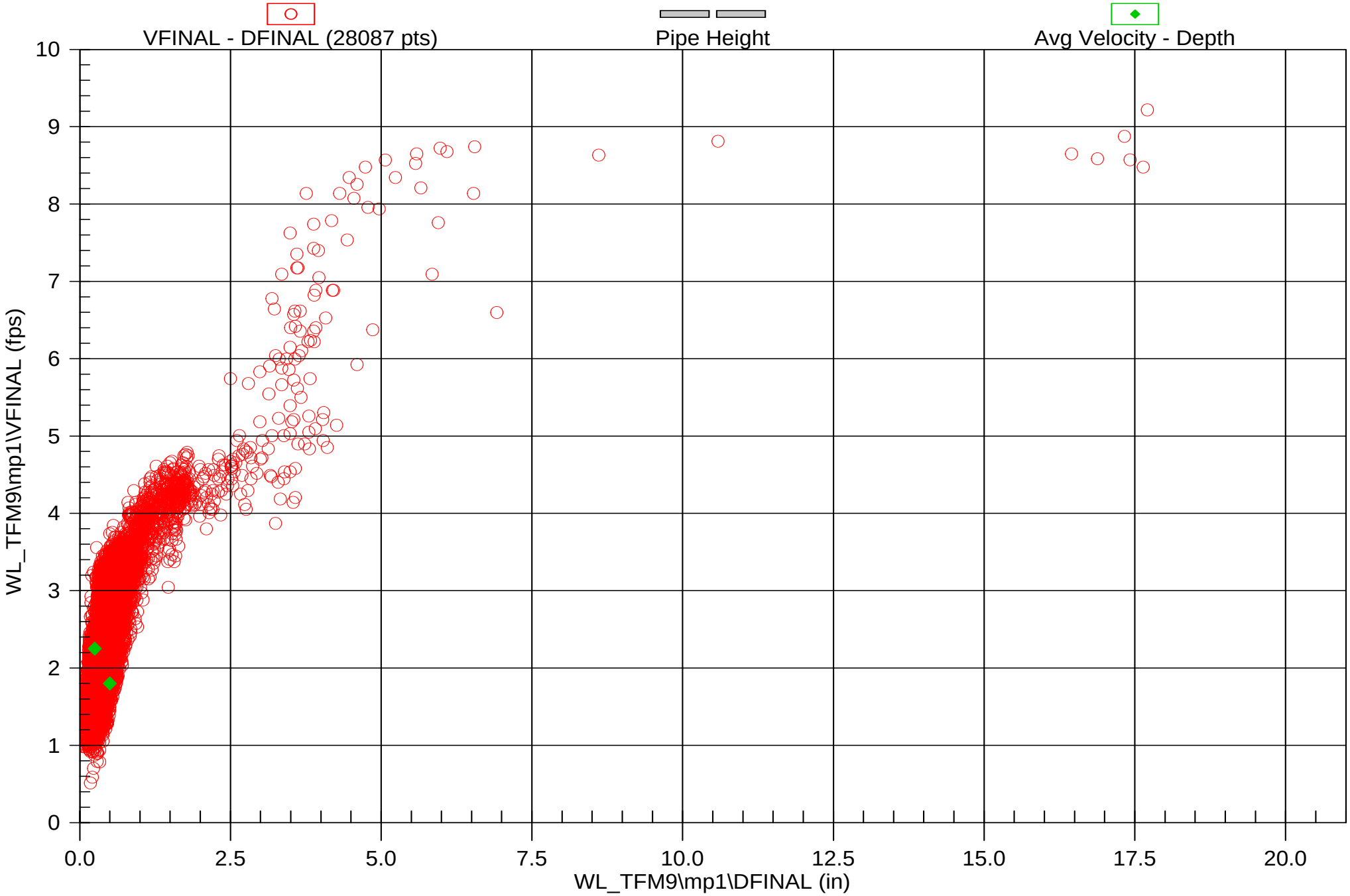
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 20.00



ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM10	Monitor Series:	Flowshark	Monitor S/N:	21673	Map #:	
Address / Location:	Dehart St (200ft West of River Rd)			Manhole #:			
				Pipe Diameter:	54.25 x 52.88 Inches		
Access:	Drive	Traffic Volume:	Medium	Communications Number:	166.219.51.242		

Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	12 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Downstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	Low fast moving flow		Active Pipe Connections?	No		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

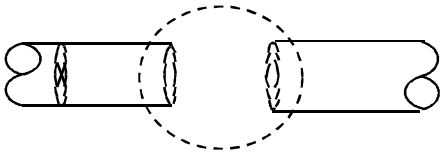
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 09:53	##############	Access Pole #:	N/A
Pipe Diameter:	54.25 x 52.88 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	1.75 Inches		Trench Length:	N/A
Range (Air Dof):	51.38 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.38 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	9.43 fps			
Silt:	0 Inches			
Pressure Serial #:	78354			
Performed By:	Brian Walker			

Additional Information

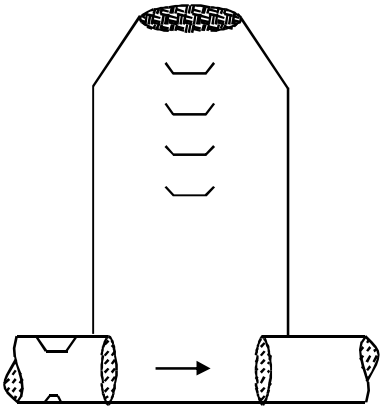
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM10

Outgoing Line

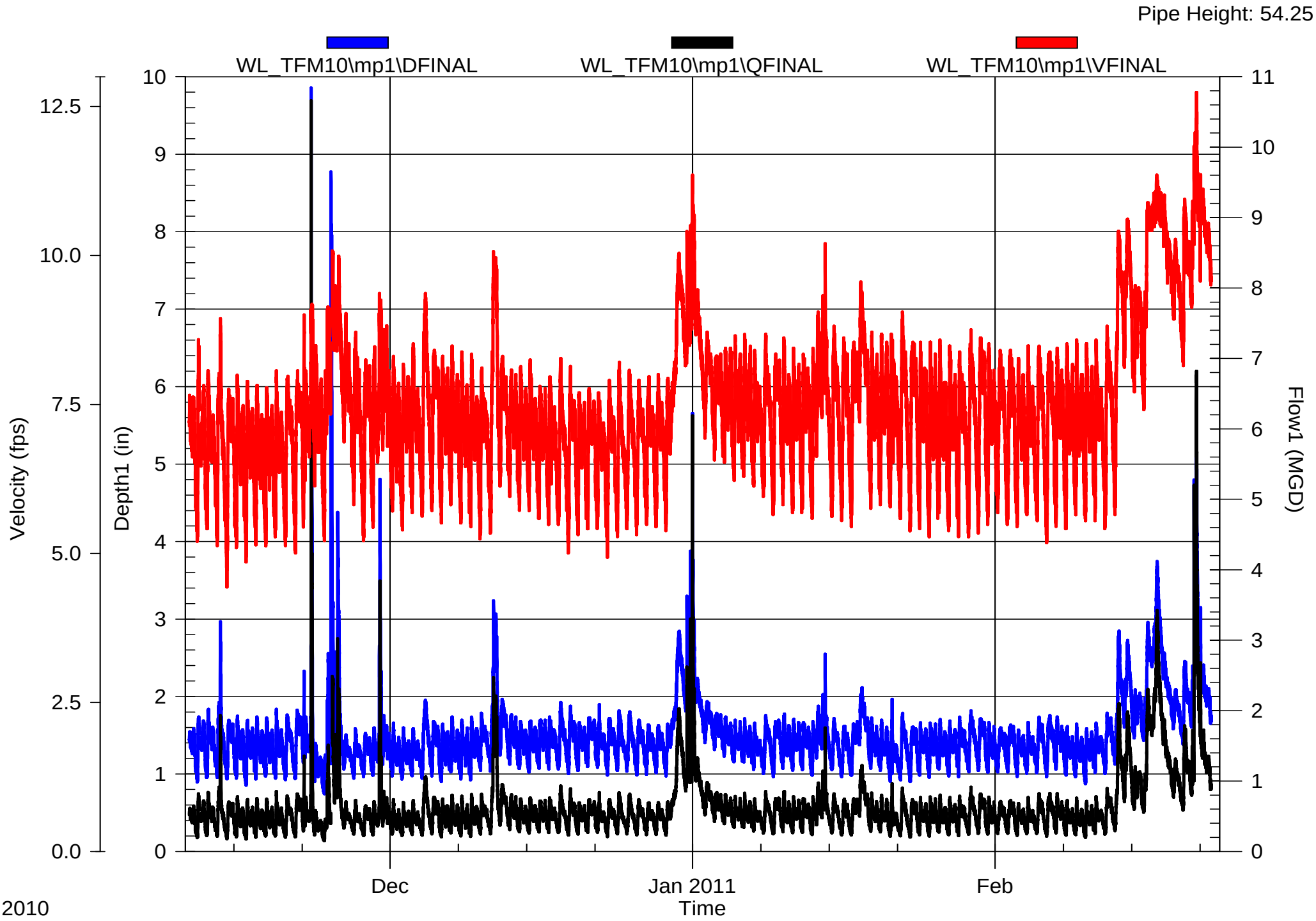


Planar



Cross Section

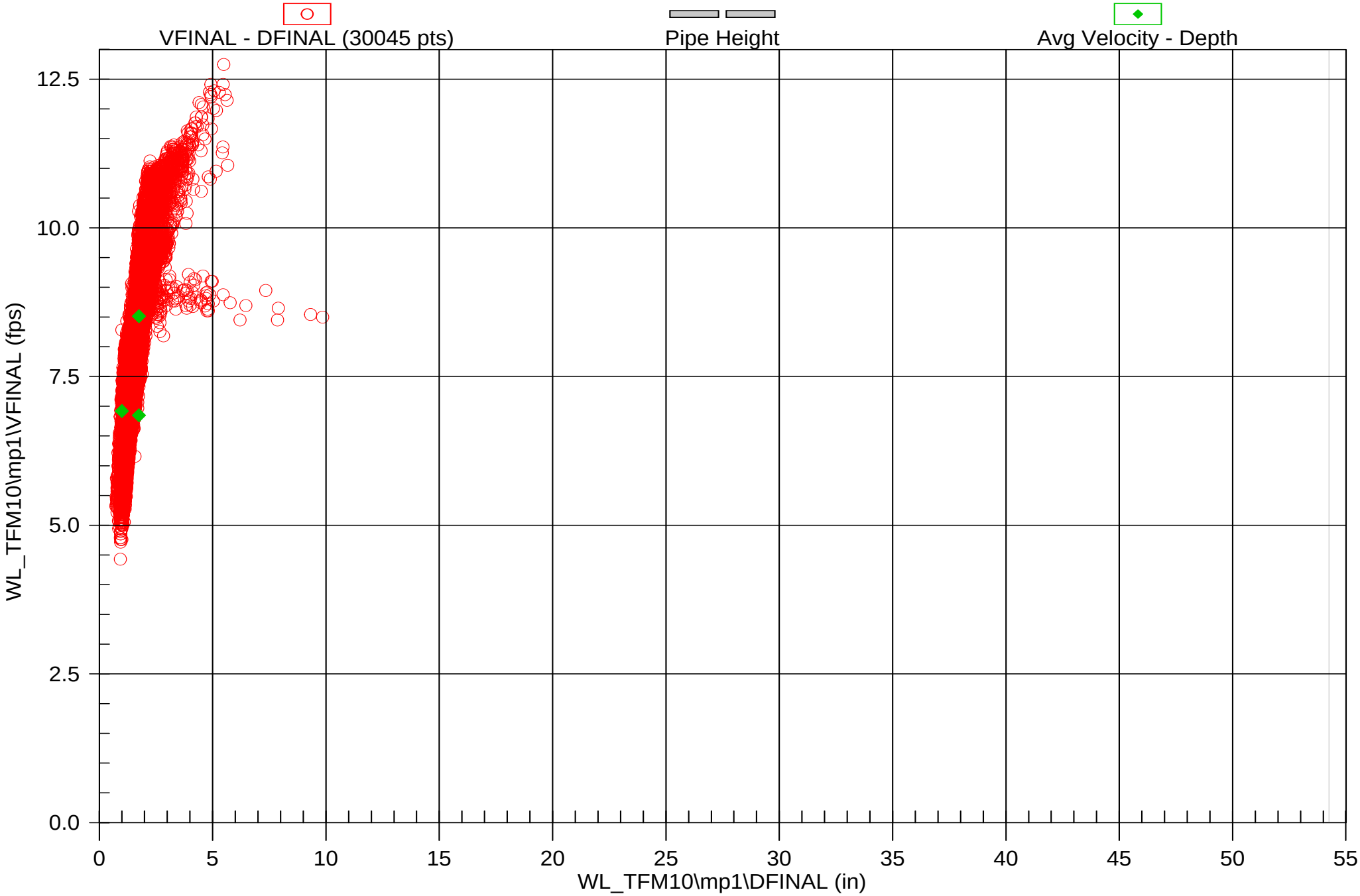
ADS Environmental Services



ADS Environmental Services

11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

Pipe Height: 54.25



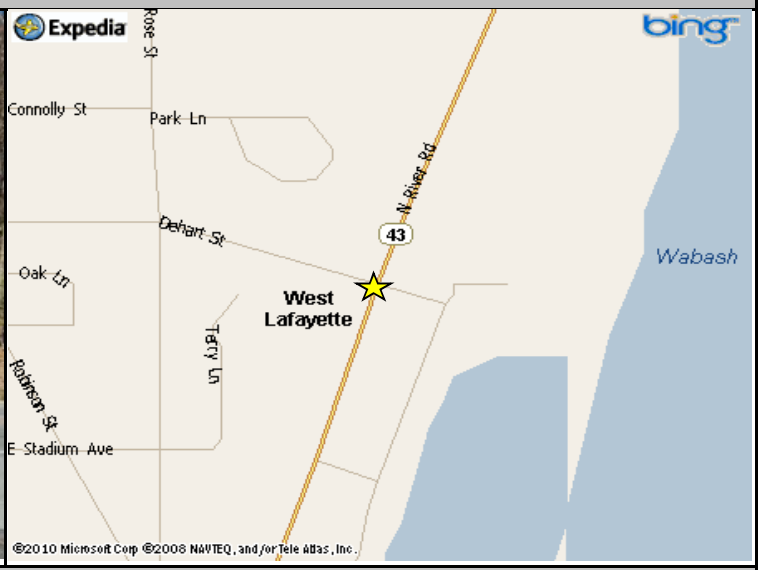
ADS ENVIRONMENTAL SERVICES®

A Division of *ADS LLC*

SITE REPORT

Project Name:	West Lafayette
Project Number:	
Contact Name:	Eric Hehmann
Contact Number:	317-710-1199

Site Name:	WL_TFM11	Monitor Series:	Flowshark	Monitor S/N:	20006	Map #:	
Address / Location:	Dehart St and N River Rd. (entrace to Williamsburg Apartments)			Manhole #:			
				Pipe Diameter:	24.13 x 24.63 Inches		
Access:	Drive	Traffic Volume:	Medium	Communications Number:	166.219.51.76		



Monitoring Point Information			Manhole Structure Information			
Installation Type:	Doppler Standard Ring and Crank Installation		Manhole Depth:	12 Feet		
Sensors / Devices:	Ultra, Velocity, Pressure (Non I.S.)		Manhole Material / Condition:	Concrete		Fair
Monitoring Location:	Downstream		Manhole Air Quality:	Acceptable		
Monitor Location:	Manhole		Min. M/H Opening Dia.:	24 Inches		
Rain Gauge Zone:	N/A		Manhole Diameter:	24 Inches		
Installation QC:	Brian Walker		Manhole Cover / Frame:	Concealed		
Hydraulics / Data Quality Rating:	fast moving flow		Active Pipe Connections?	No		
			Pipe Material / Condition:	Concrete		Fair
Surcharge Height:	Feet		Mini System Character:	Residential		

Overview

Incoming Line

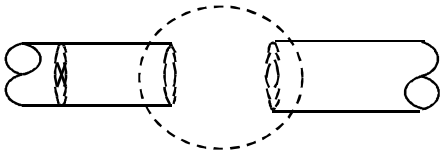
Meter Confirmation Information:			Communications and AC Power Information:	
Date/Time:	11/10/2010 15:25	##############	Access Pole #:	N/A
Pipe Diameter:	24.13 x 24.63 Inches		Distance From Manhole:	N/A
Pipe Shape:	Circular		Road Cut Length:	N/A
Depth of Flow (Wet Dof):	4.5 Inches		Trench Length:	N/A
Range (Air Dof):	18.25 Inches		AC Power Access Pole #:	N/A
Ultra. Physical Offset:	1.5 Inches		AC Power Trench Length:	N/A
Confidence (+/-):	0.25 Inches		**Additional Site Information / Comments:**	
Peak Velocity:	5.59 fps		This site is located 10 ft from CSO 003.	
Silt:	0 Inches			
Pressure Serial #:	79930			
Performed By:	Brian Walker			

Additional Information

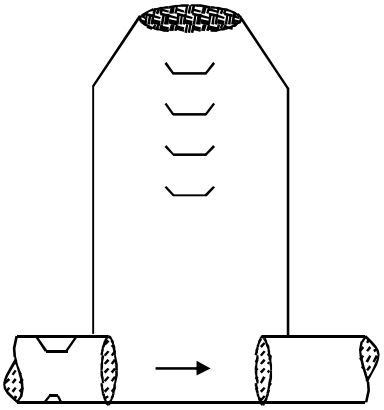
Project Name: West Lafayette
Project Number: 0
Contact Name: Eric Hehmann
Contact Number: 317-710-1199

Site Name: WL_TFM11

Outgoing Line

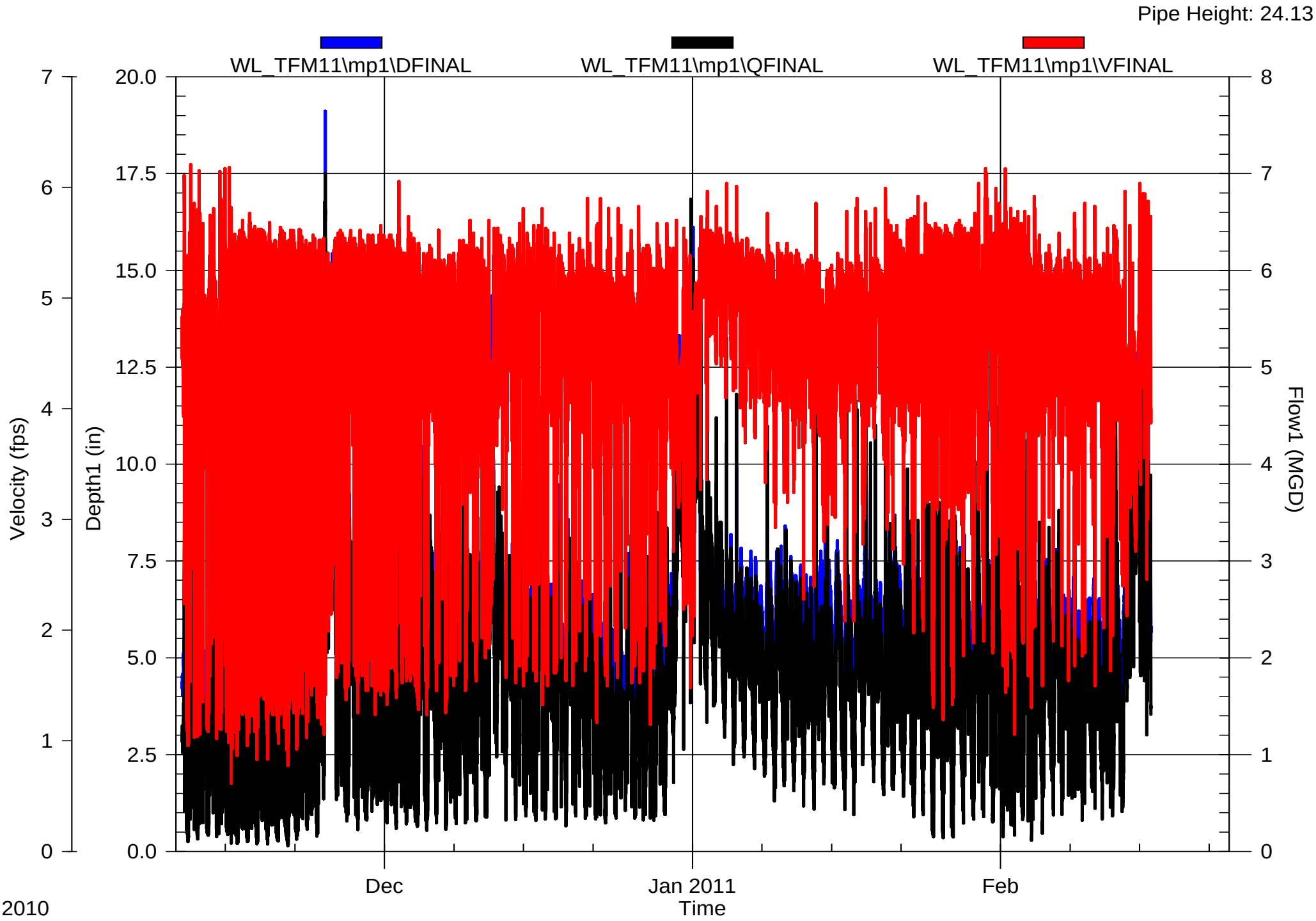


Planar



Cross Section

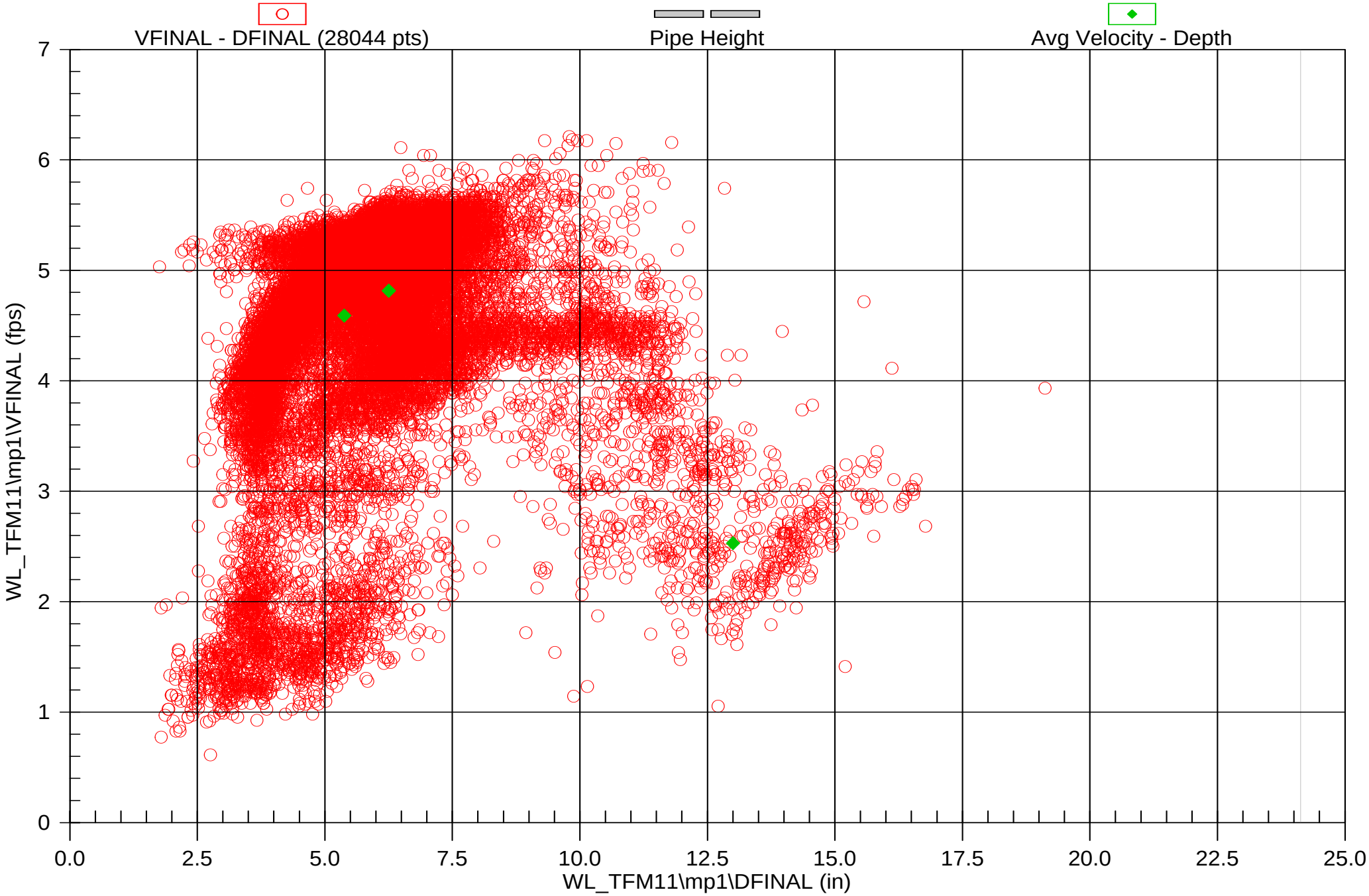
ADS Environmental Services



ADS Environmental Services

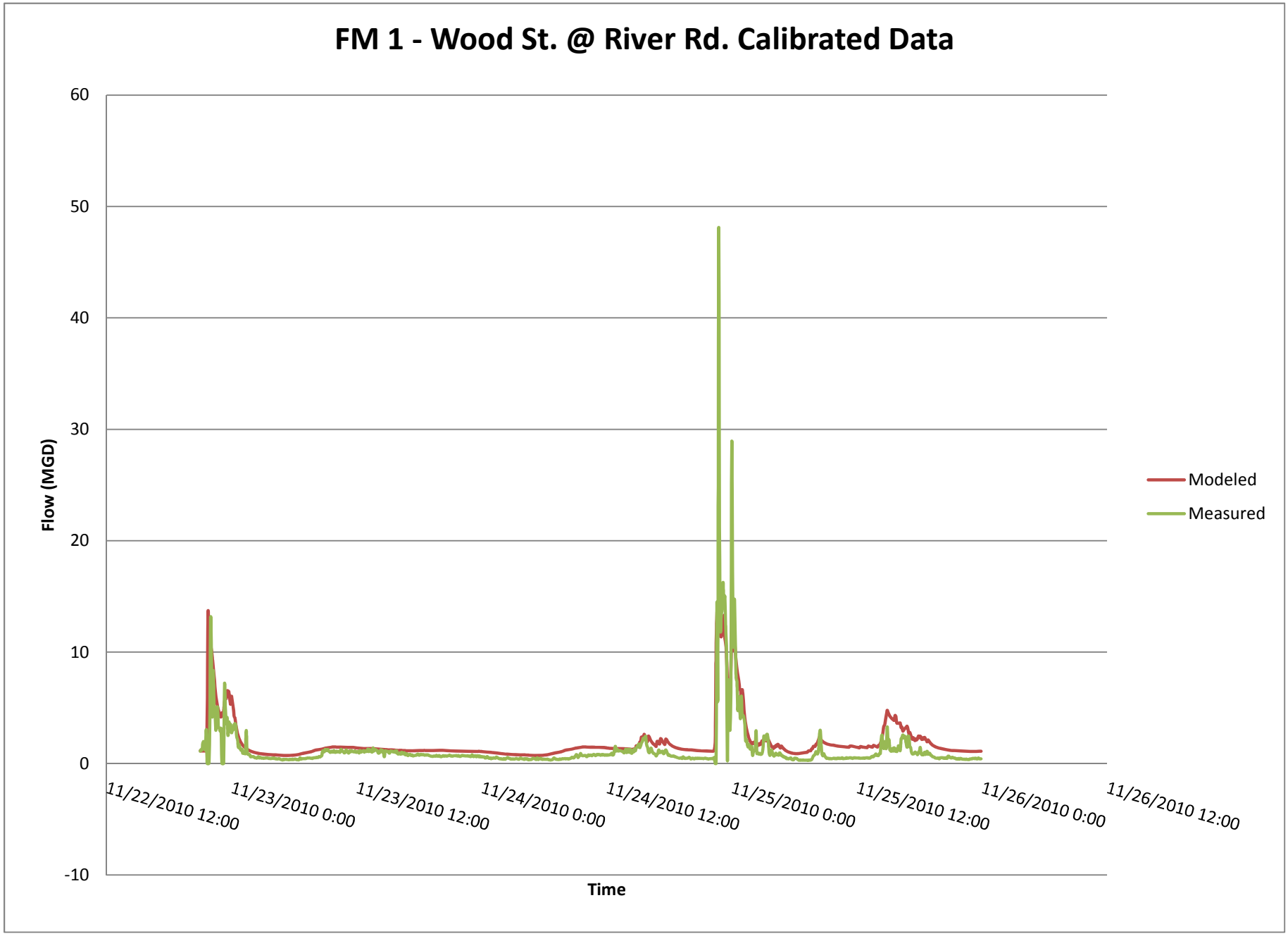
11/10/2010 12:00:00 AM - 2/23/2011 11:59:00 PM

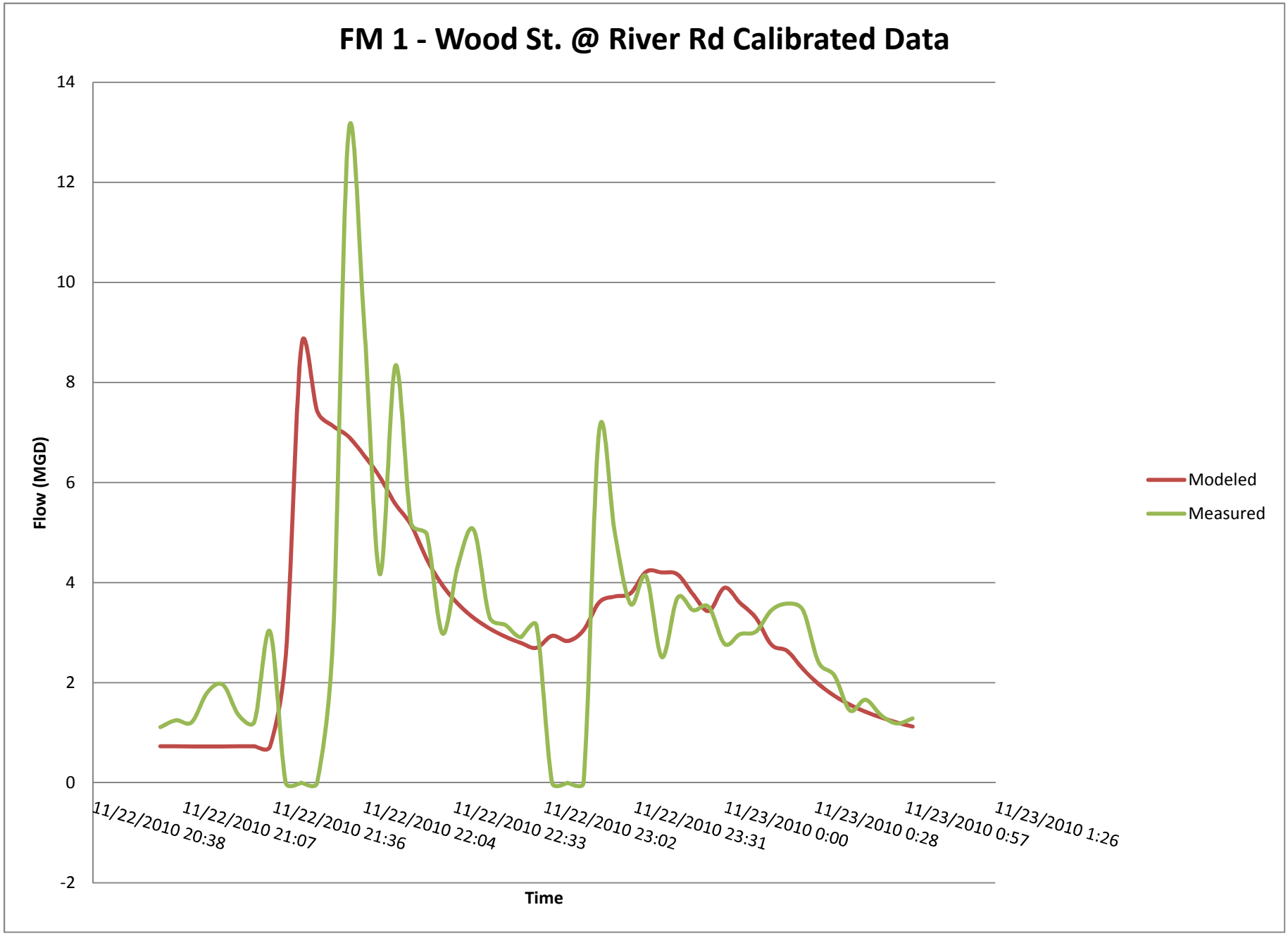
Pipe Height: 24.13

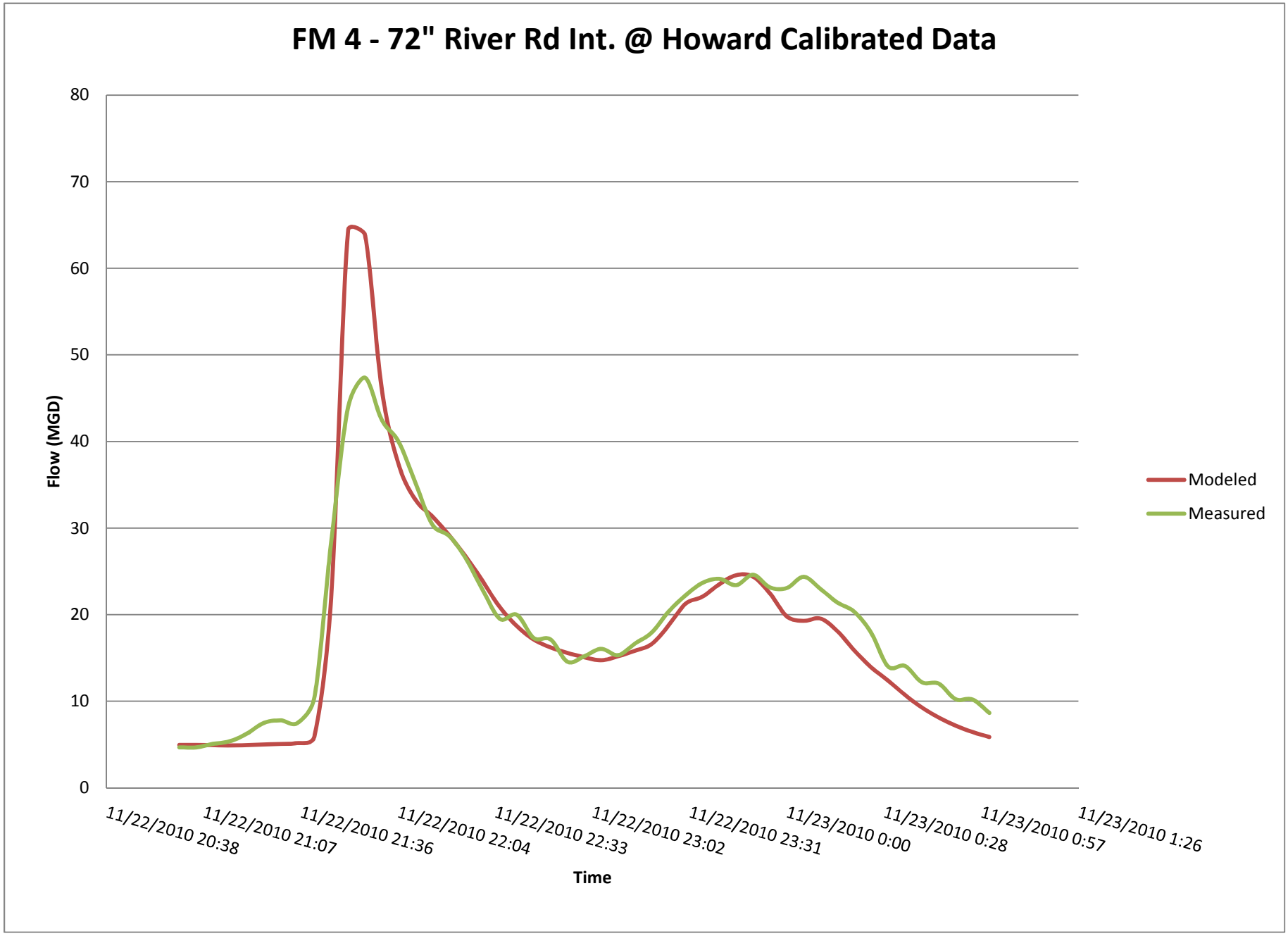


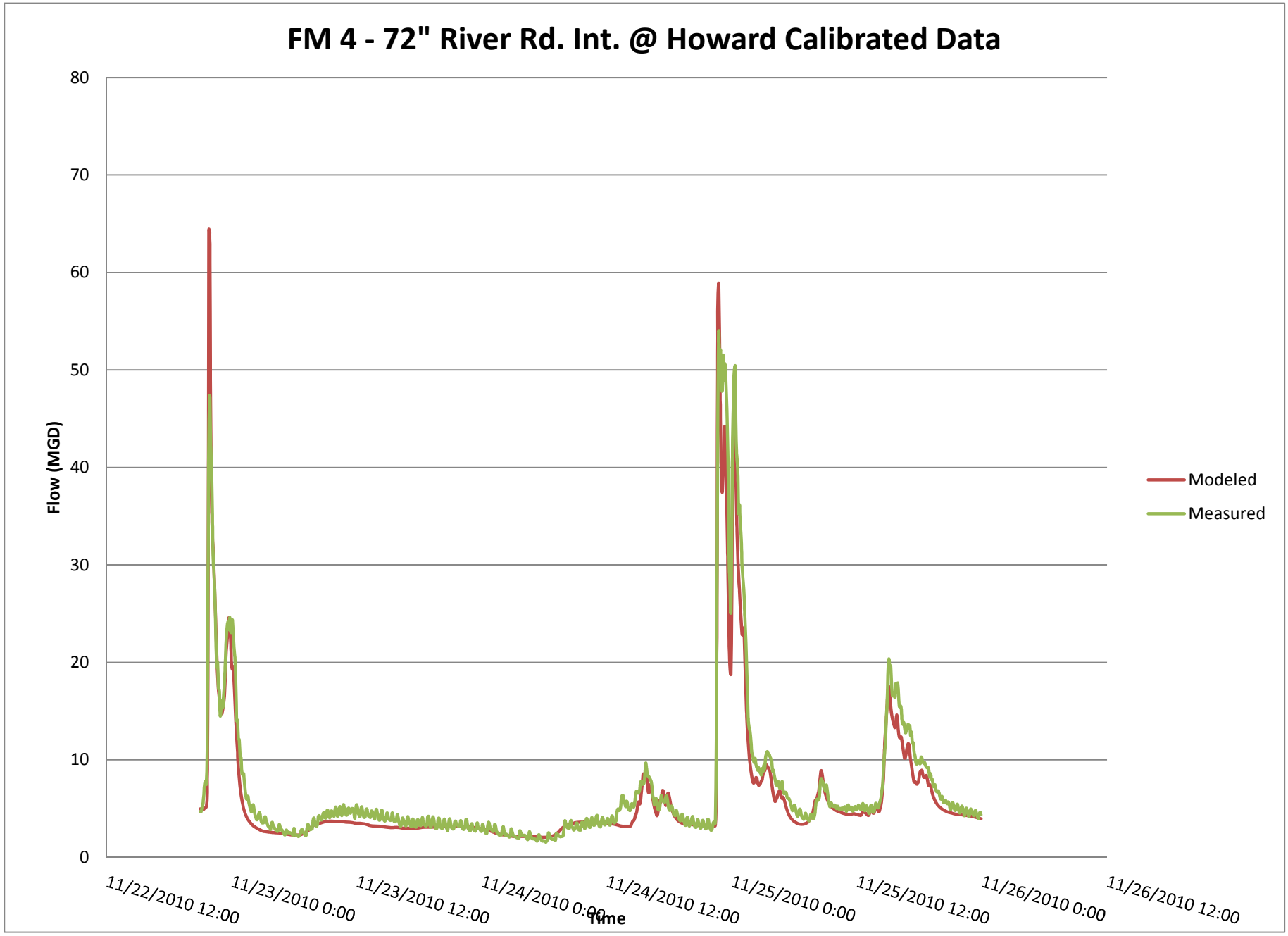
APPENDIX F

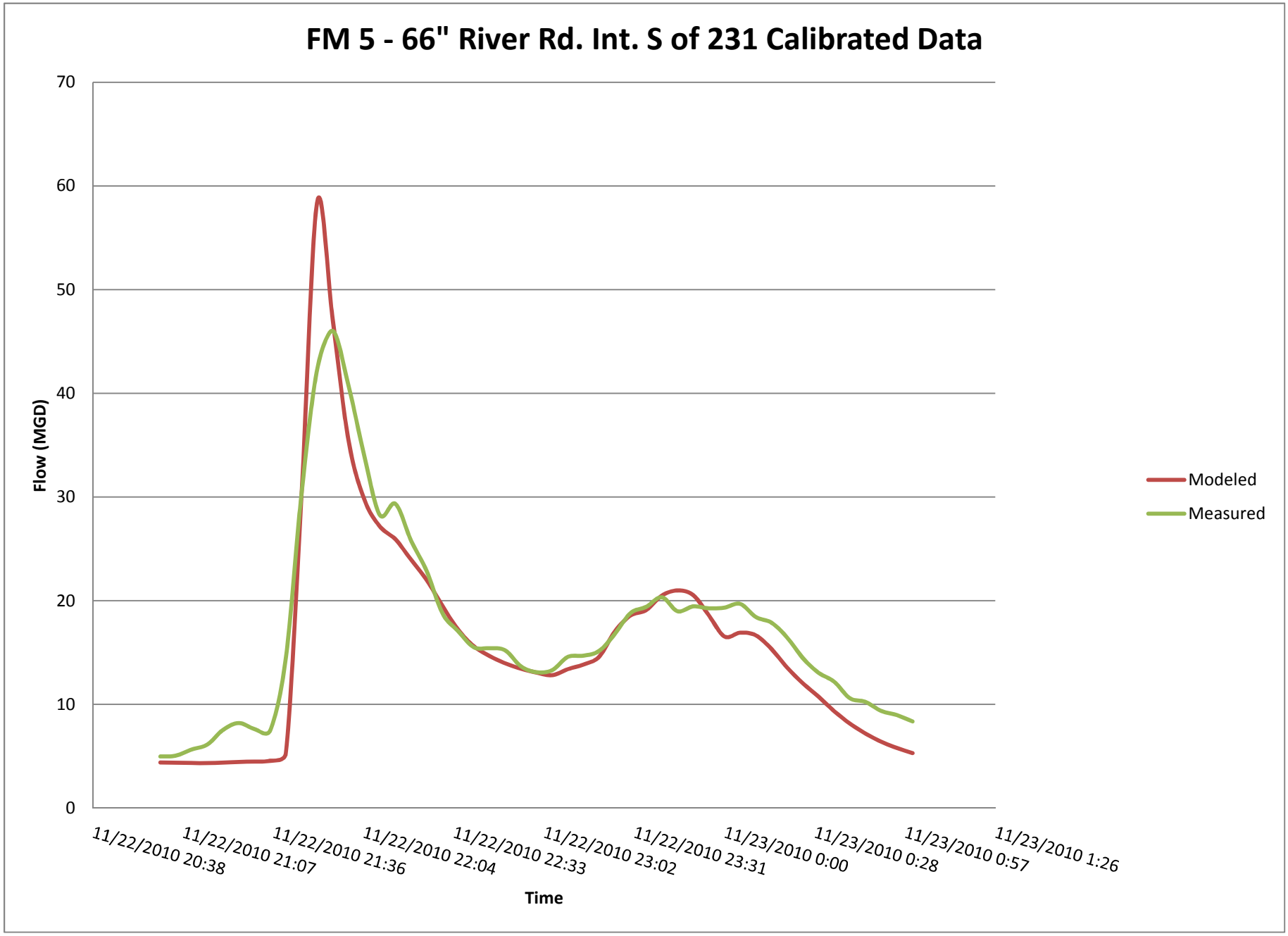
Modeling Calibration Comparisons

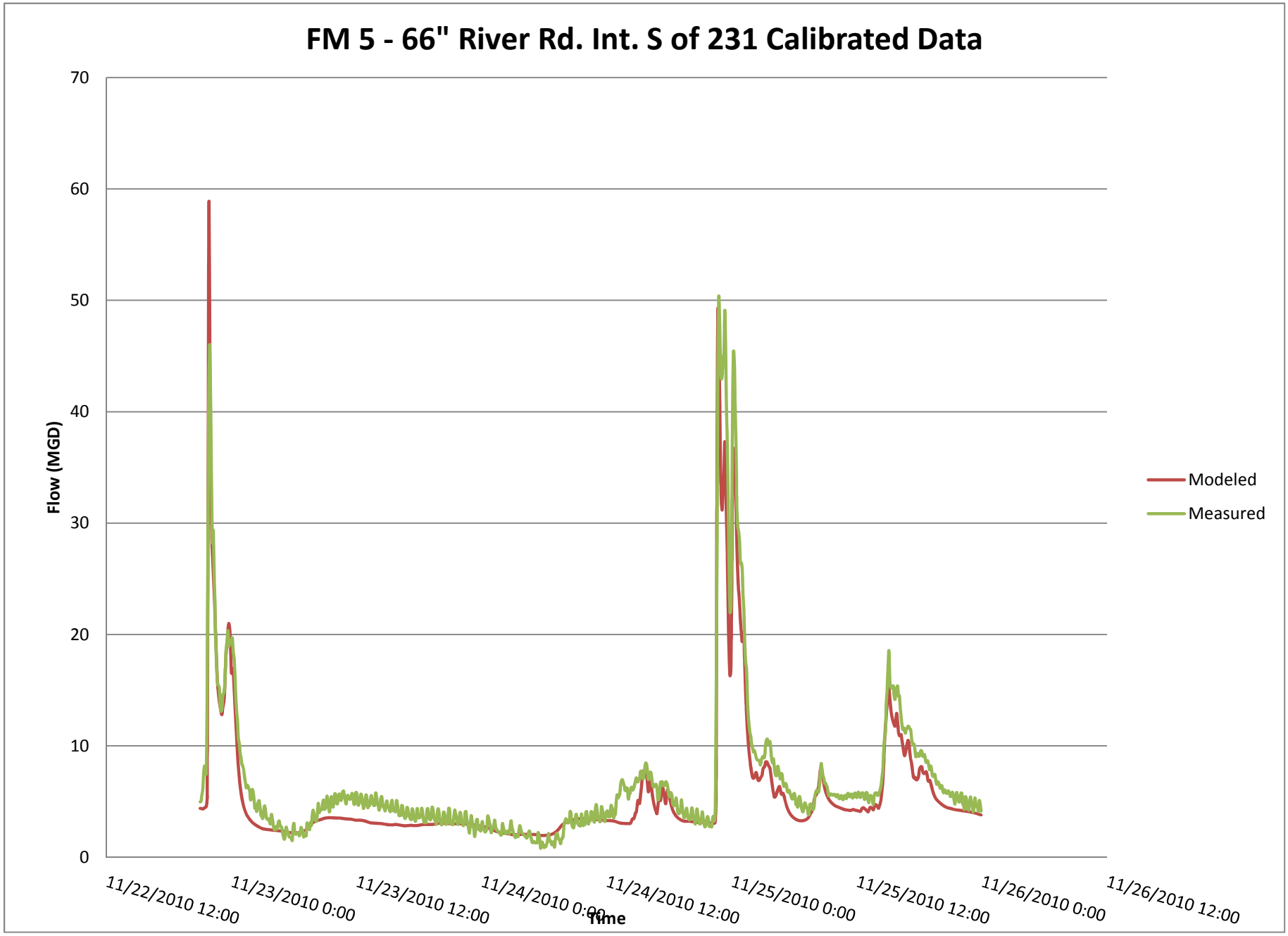

FM 1 - Wood St. @ River Rd. Calibrated Data
60
50
40
30
20
10
0
-10
Flow (MGD)
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

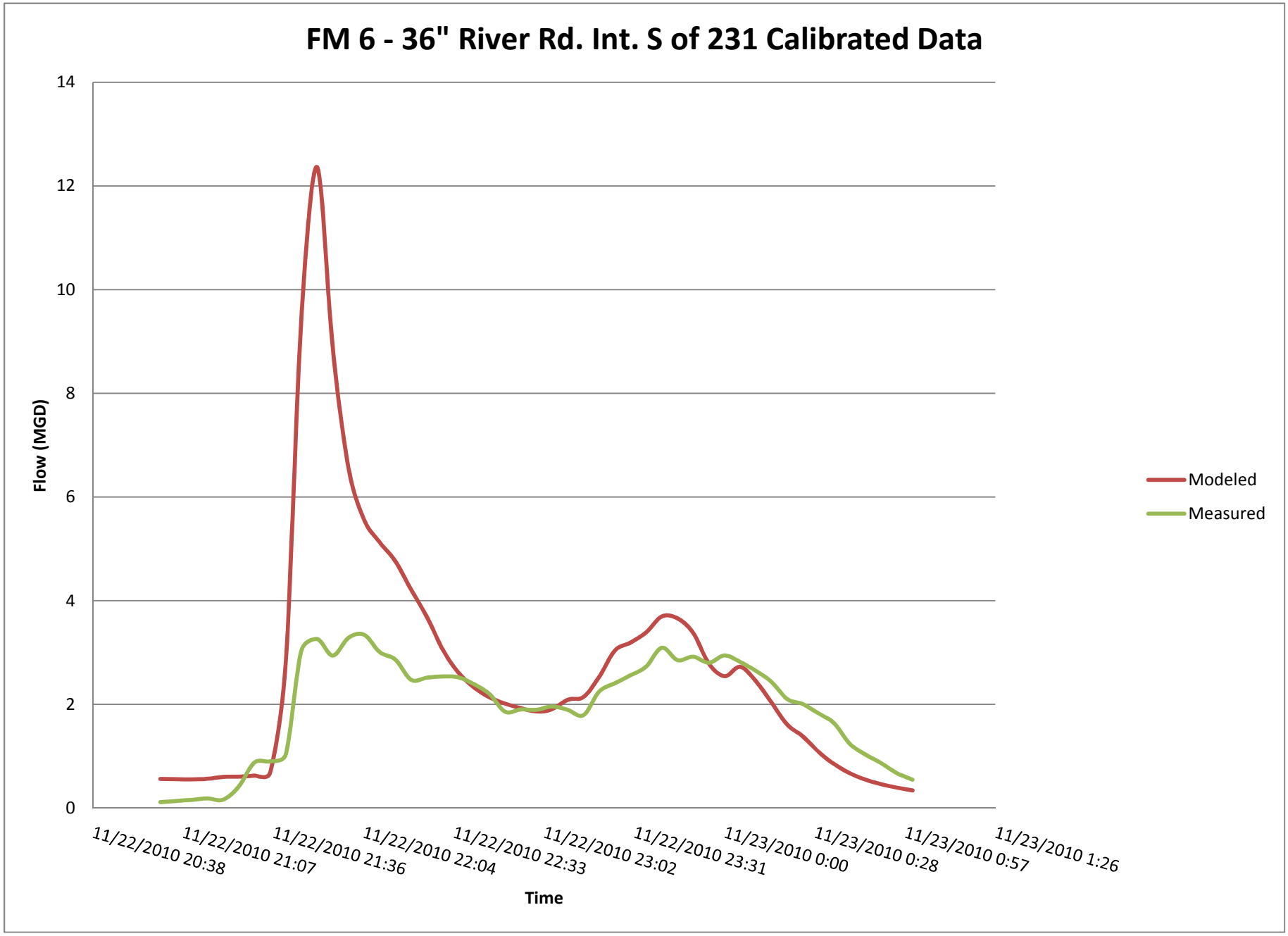

FM 1 - Wood St. @ River Rd Calibrated Data
14
12
10
8
6
4
2
0
-2
Flow (MGD)
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured

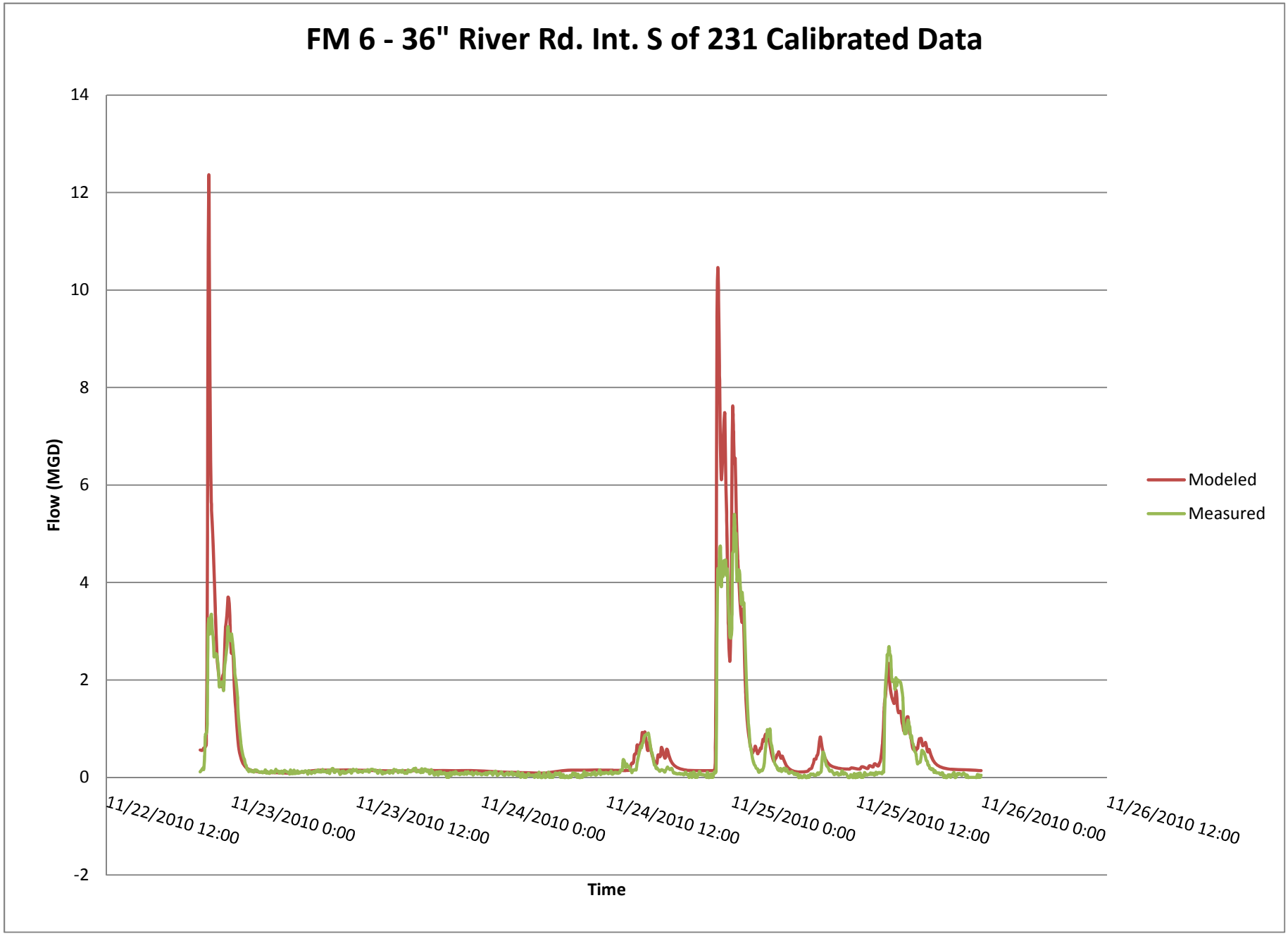

FM 4 - 72" River Rd Int. @ Howard Calibrated Data
Flow (MGD)
80
70
60
50
40
30
20
10
0
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured

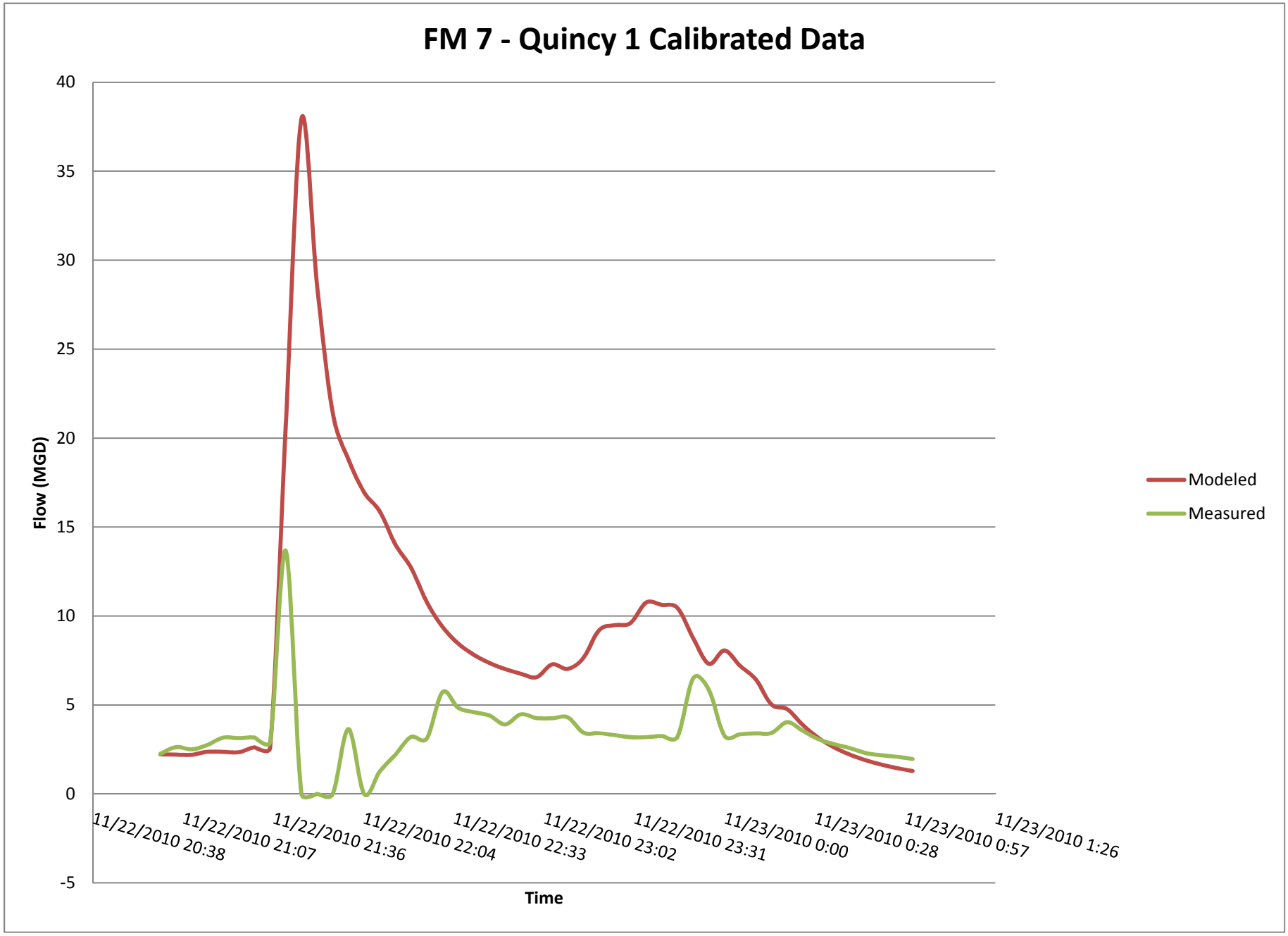

FM 4 - 72" River Rd. Int. @ Howard Calibrated Data
Flow (MGD)
80
70
60
50
40
30
20
10
0
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

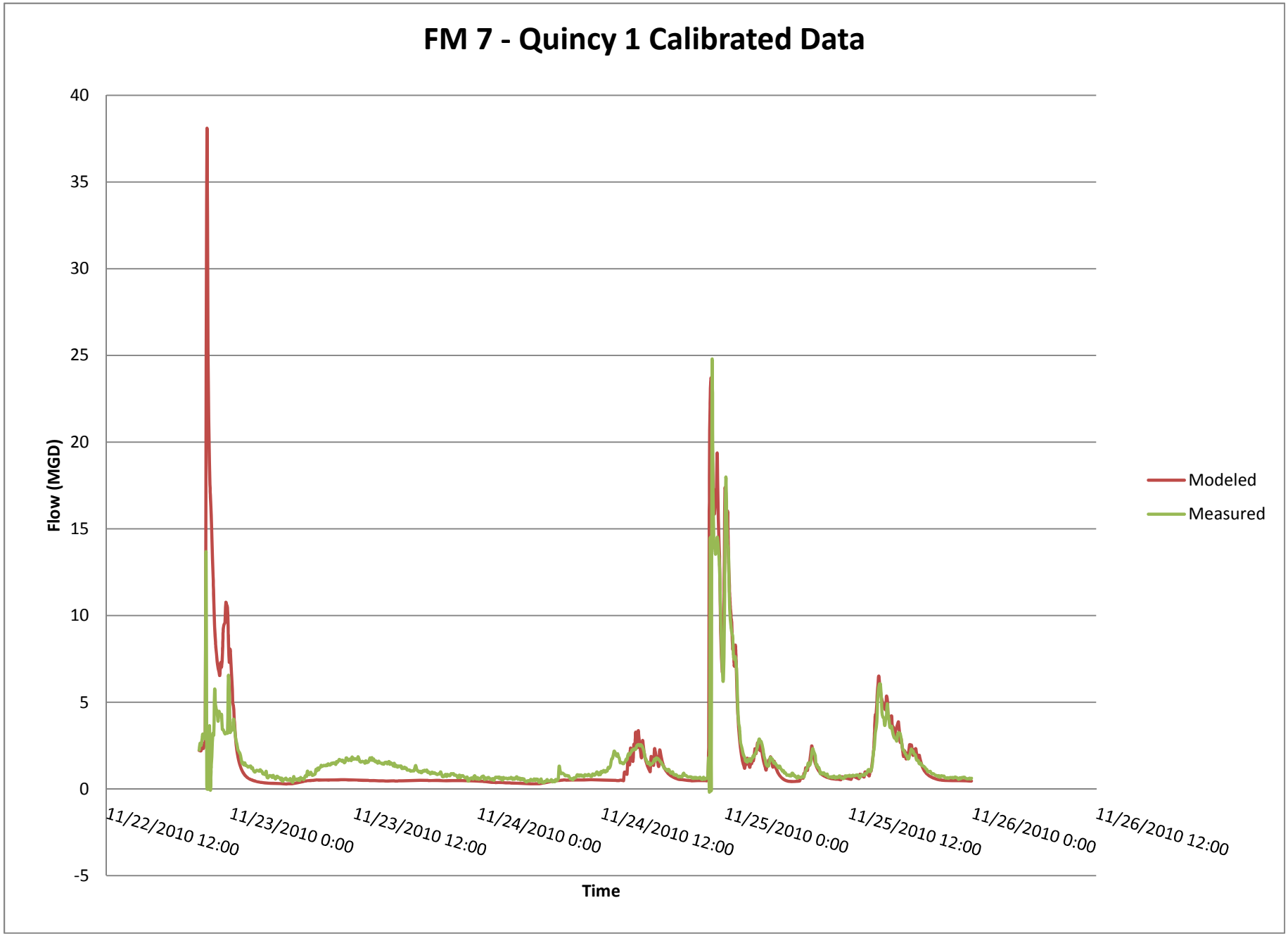

FM 5 - 66" River Rd. Int. S of 231 Calibrated Data
Flow (MGD)
70
60
50
40
30
20
10
0
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured

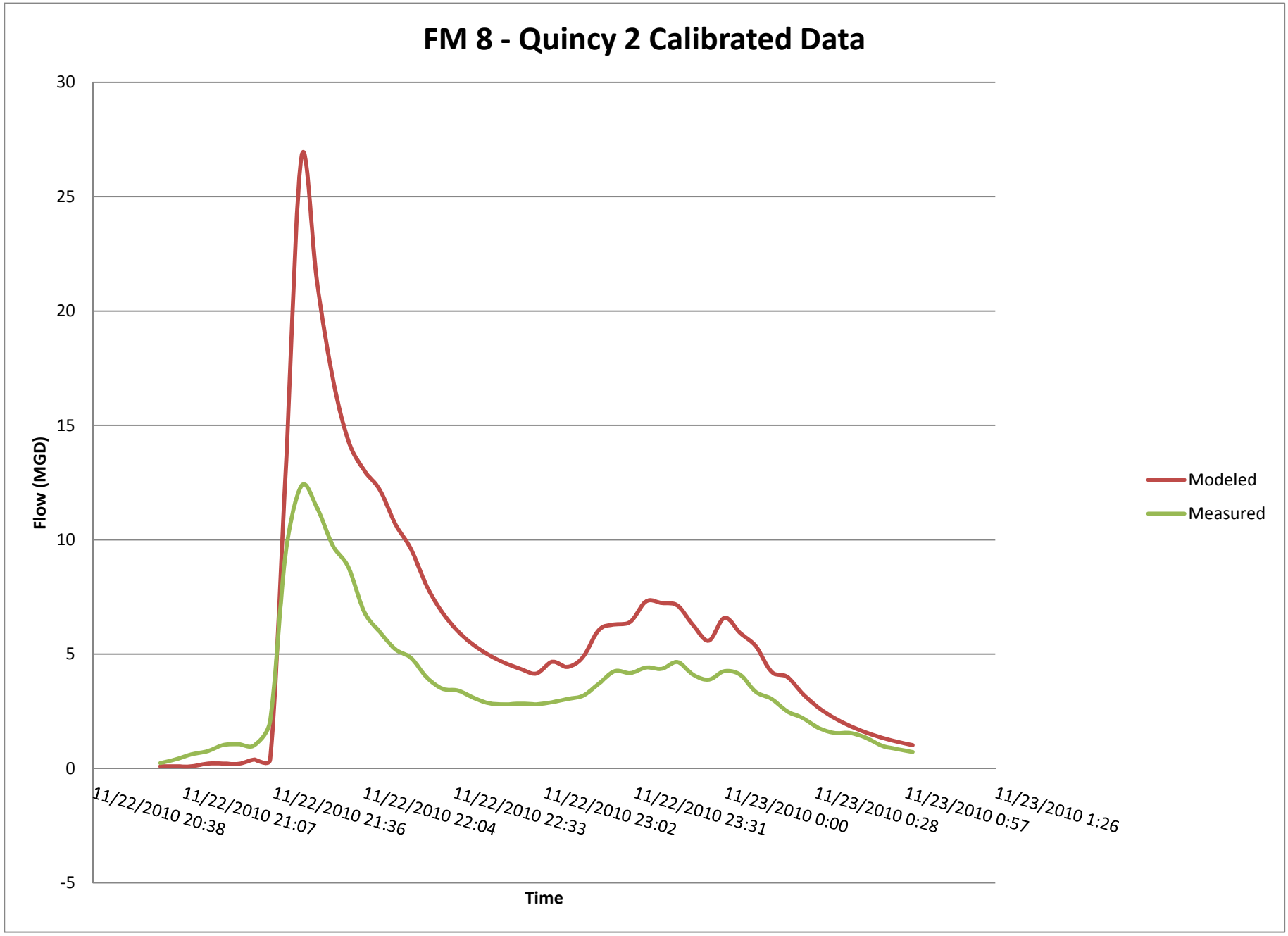

FM 5 - 66" River Rd. Int. S of 231 Calibrated Data
Flow (MGD)
70
60
50
40
30
20
10
0
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

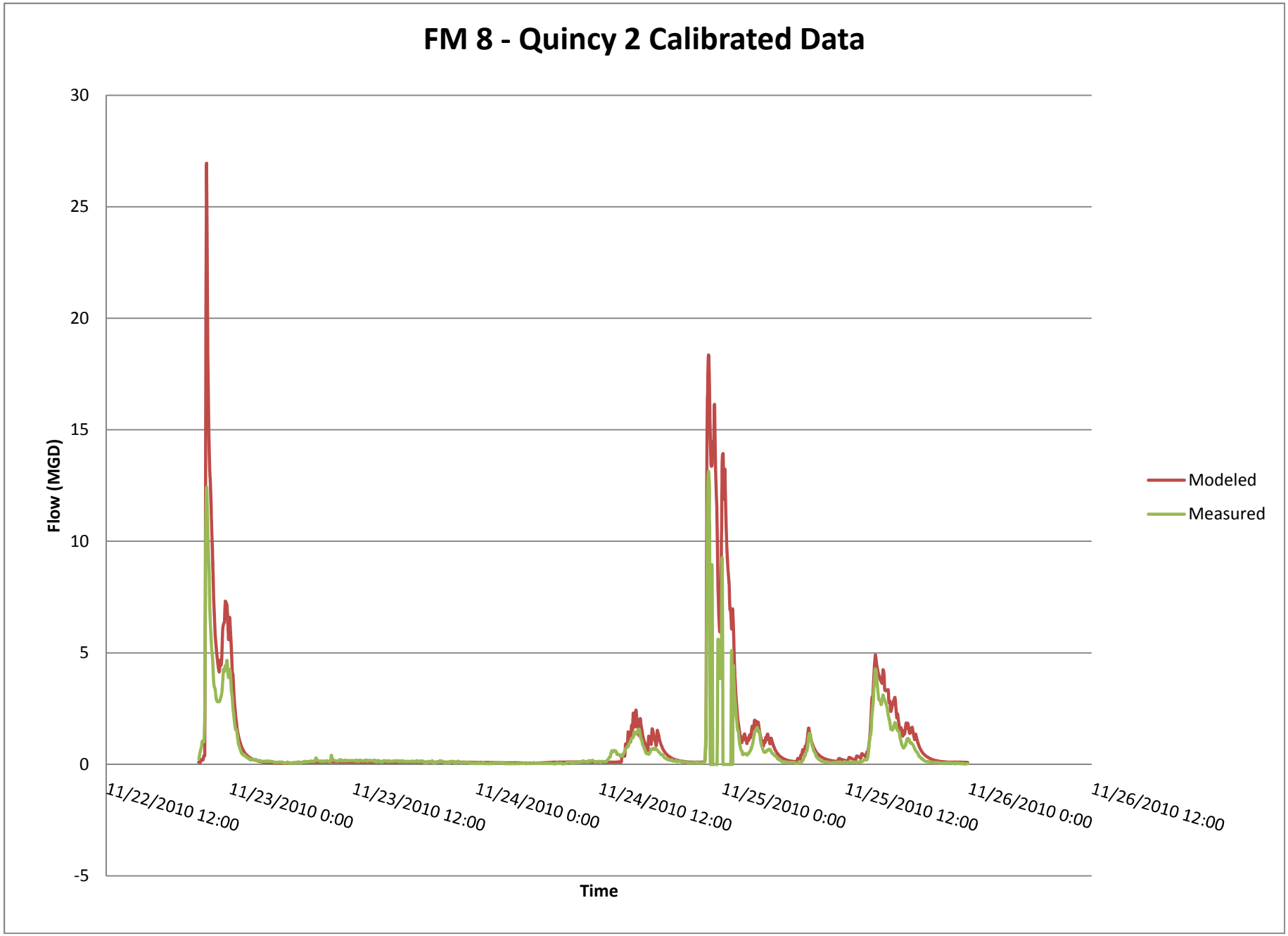

FM 6 - 36" River Rd. Int. S of 231 Calibrated Data
Flow (MGD)
14
12
10
8
6
4
2
0
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured

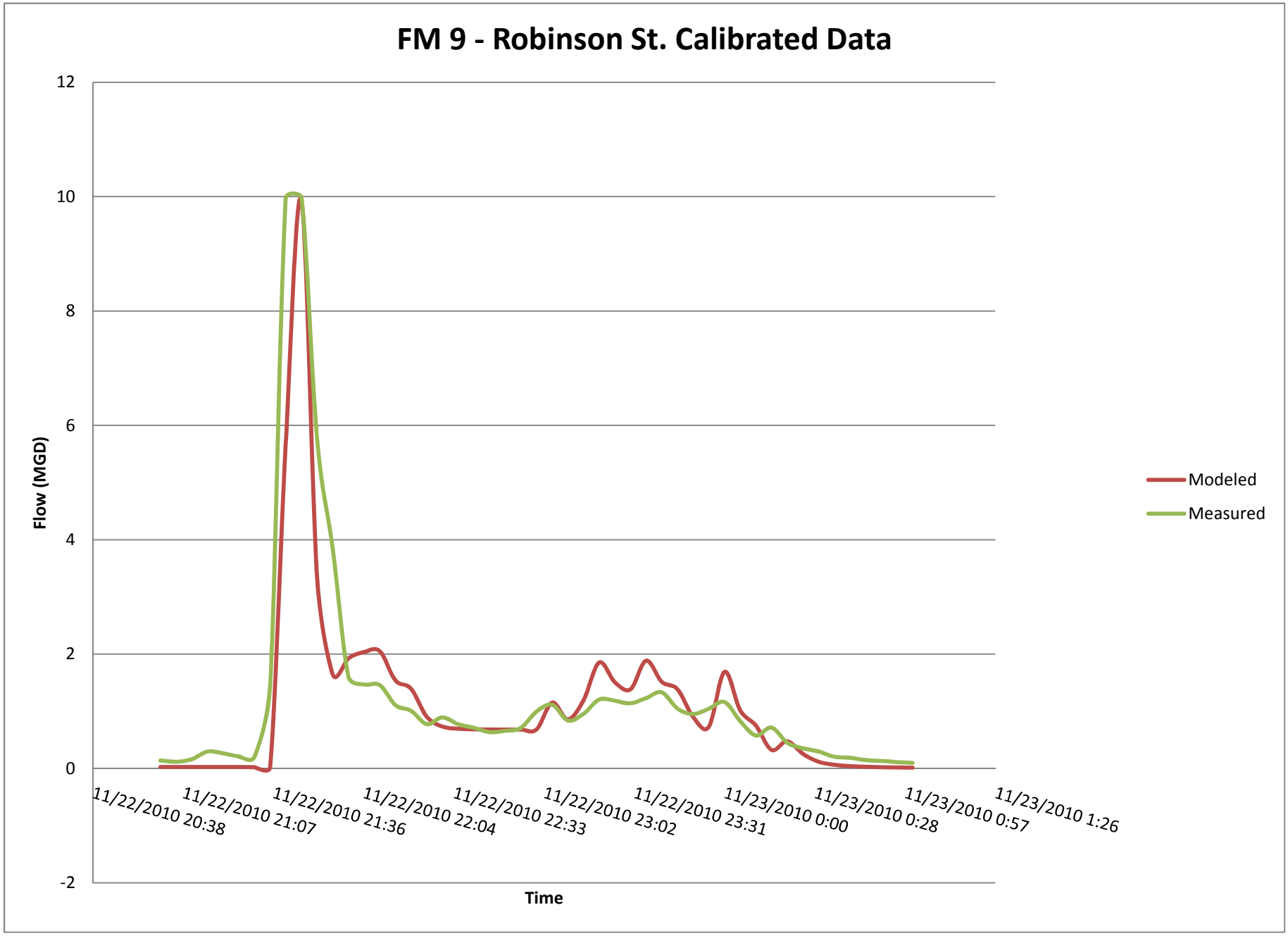

FM 6 - 36" River Rd. Int. S of 231 Calibrated Data
Flow (MGD)
14
12
10
8
6
4
2
0
-2
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

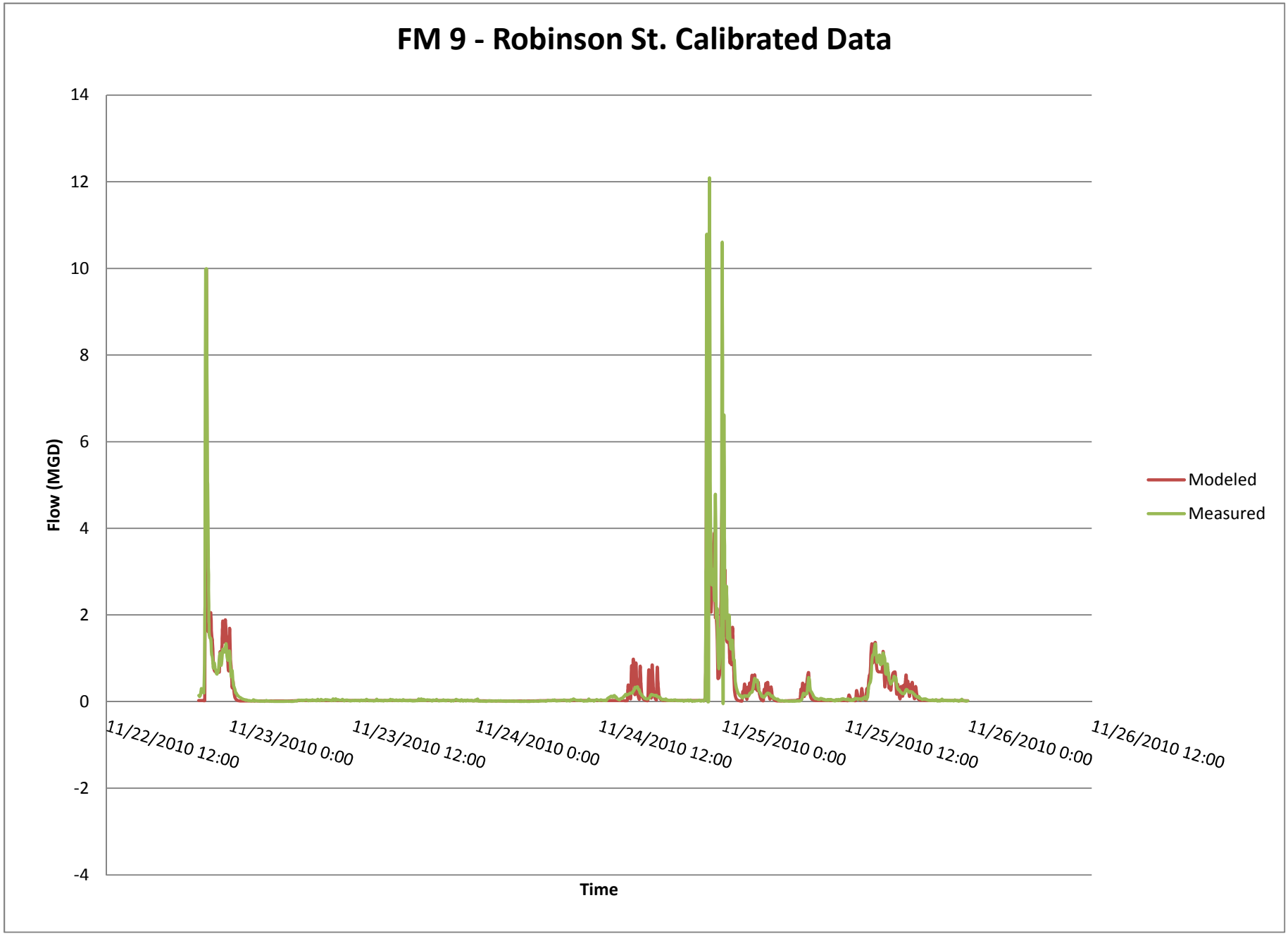

FM 7 - Quincy 1 Calibrated Data
Flow (MGD)
40
35
30
25
20
15
10
5
0
-5
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured

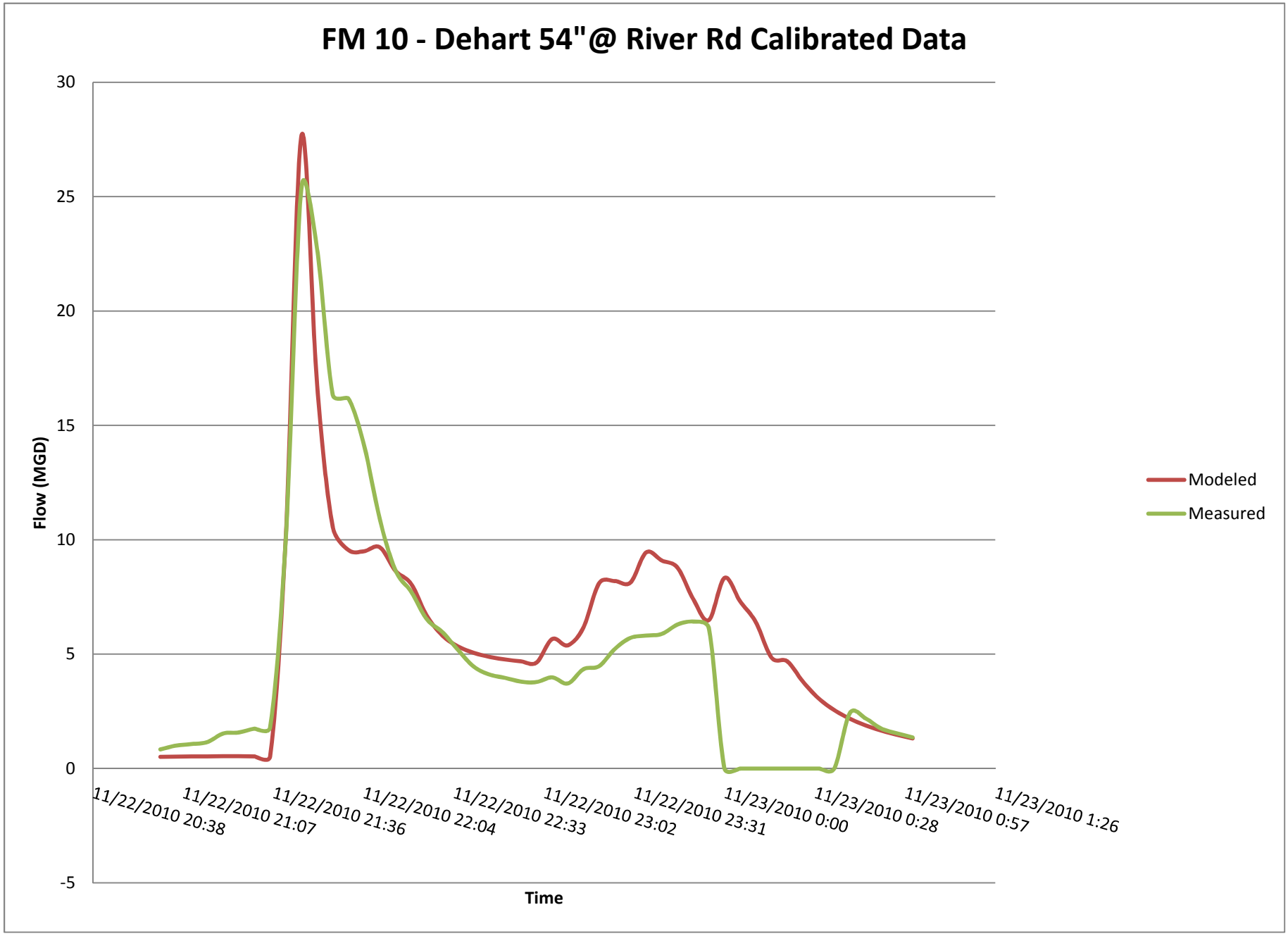

FM 7 - Quincy 1 Calibrated Data
Flow (MGD)
40
35
30
25
20
15
10
5
0
-5
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

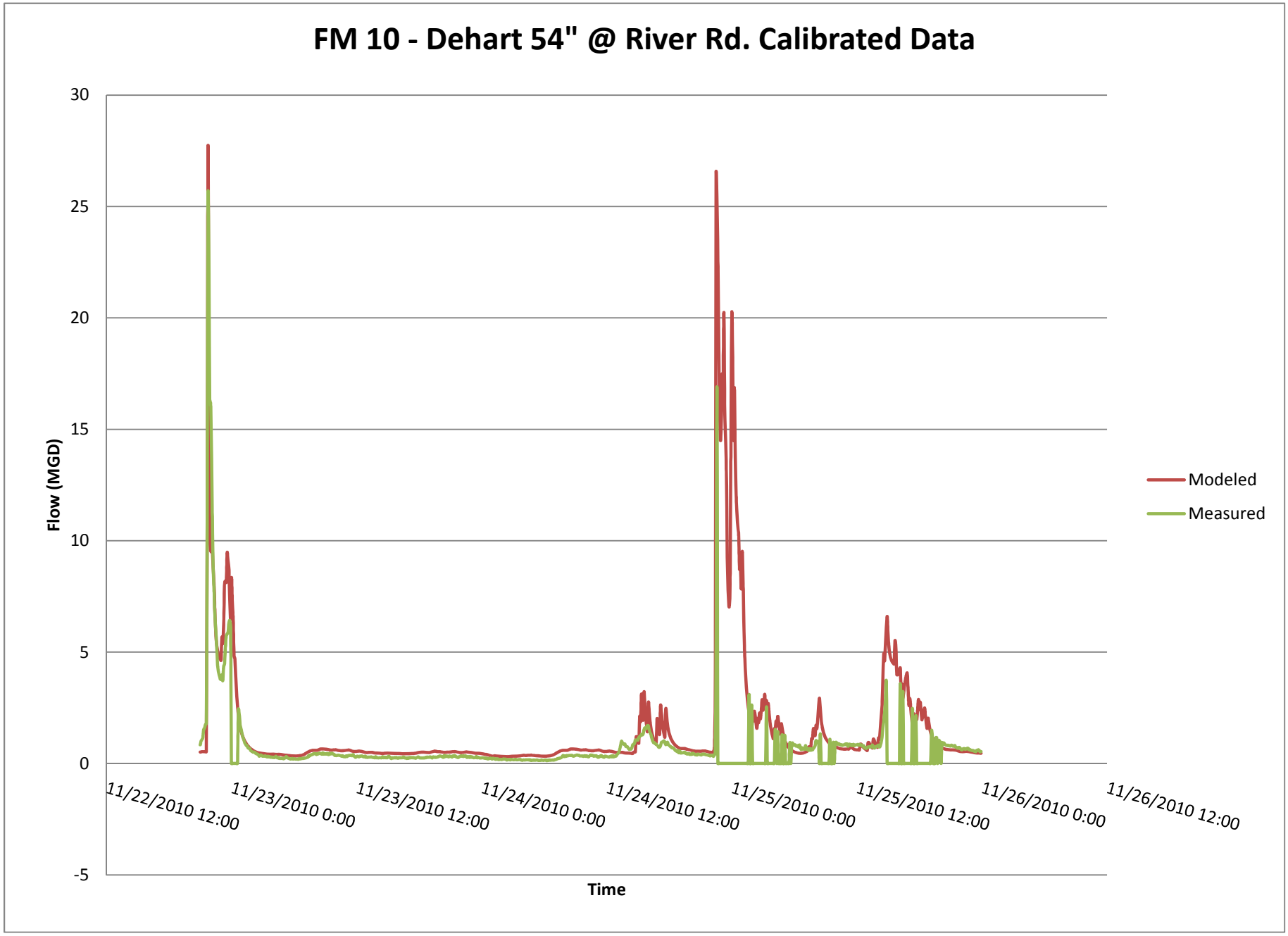

FM 8 - Quincy 2 Calibrated Data
30
25
20
15
10
5
0
-5
Flow (MGD)
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured


FM 8 - Quincy 2 Calibrated Data
30
25
20
15
10
5
0
-5
Flow (MGD)
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured


FM 9 - Robinson St. Calibrated Data
12
10
8
6
4
2
0
-2
Flow (MGD)
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured


FM 9 - Robinson St. Calibrated Data
14
12
10
8
6
4
2
0
-2
-4
Flow (MGD)
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured


FM 10 - Dehart 54"@ River Rd Calibrated Data
30
25
20
15
10
5
0
-5
Flow (MGD)
11/22/2010 20:38
11/22/2010 21:07
11/22/2010 21:36
11/22/2010 22:04
11/22/2010 22:33
11/22/2010 23:02
11/22/2010 23:31
11/23/2010 0:00
11/23/2010 0:28
11/23/2010 0:57
11/23/2010 1:26
Time
Modeled
Measured


FM 10 - Dehart 54" @ River Rd. Calibrated Data
30
25
20
15
10
5
0
-5
Flow (MGD)
11/22/2010 12:00
11/23/2010 0:00
11/23/2010 12:00
11/24/2010 0:00
11/24/2010 12:00
11/25/2010 0:00
11/25/2010 12:00
11/26/2010 0:00
11/26/2010 12:00
Time
Modeled
Measured

APPENDIX G

Public Participation Information

Citizens Advisory Committee

May 10, 2011 Meeting Notes

May 10, 2011 Meeting Sign-In

December 19, 2011 Public Hearing

Public Notification Proof of Publication

Meeting Minutes

Hearing Handout

West Lafayette CSO Long Term Control Plan
Citizens Advisory Committee Meeting
May 10, 2011 6:30pm

1. Introductions
2. Role of the Citizens Advisory Committee
3. What is a Combined Sewer Overflow (CSO) and why do we have them?
    a. Original sewers piped runoff and sewage directly to Wabash River
    b. Interceptor sewers and WWTP constructed
    c. Old outfalls became relief points (CSO)
    d. New development constructed with separate storm and sanitary sewers
4. What has been done to eliminate them?
    a. 1993 Wastewater Treatment Plant Facilities Plan
        i. Plant Improvements
        ii. Foundation drain disconnection program
        iii. North River Road Lift Station improvements
        iv. River Road Interceptor
        v. Western Sanitary Sewer Interceptor (future)
    b. 1996 CSO Long Term Control Plan and 2001 Update
        i. Revisions to 1993 Facilities Plan
        ii. Wet Weather Treatment Facility
        iii. Control alternatives based on "knee of the curve" affordability analysis
5. IDEM CSO Policy Timeline and West Lafayette Implementation
    a. 1993 - Wastewater Treatment Plant Facilities Plan
        i. Identifies CSO and wet-weather deficiencies
    b. 1996 –IDEM Issues Combined Sewer Overflow Strategy
        i. Combined Sewer System Operational Plan
        ii. Stream Reach Characterization and Evaluation
        iii. Requires CSO LTCP as part of NPDES permit renewal process
            1. Characterization, Monitoring, and Modeling of the Combined Sewer System
            2. Public Participation
            3. Consideration of Sensitive Areas
            4. Evaluation of CSO Control Alternatives
            5. Cost/Performance Evaluation
            6. CSO Operational Plan Revisions
            7. Maximizing Treatment of Wet Weather flows at the Wastewater Treatment Plant
            8. Implementation Schedule
            9. Post-Construction Compliance Monitoring Program
    c. 1996 – West Lafayette Amends Wastewater Treatment Plant Facilities Plan to meet IDEM CSO LTCP goals
    d. 2000 – SEA 431 passes, allowing CSOs with approved LTCP and Use Attainability Assessment (UAA)
    e. 2001 – LTCP Updated to include revised wet weather treatment recommendations
    f. 2001 - Combined Sewer Overflow (CSO) Long-Term Control Plan & Use Attainability Analysis Guidance Document

g. 2007 – West Lafayette CSO LTCP approved through State Judicial Agreement
h. 2007 - "Combined Sewer Overflow (CSO) Treatment Facility Design Criteria Nonrule Policy Water-16" defines Design Storm Approach eliminating the need for UAA
i. 2010 – IDEM requests West Lafayette analyze Design Storm Approach

6. Two method of Analysis: Presumptive Approach vs. Design Storm Approach
7. Presumptive Approach
    a. Alternatives with goal of limiting CSO's to 4 overflows/year each
        i. Requires Use Attainability Analysis (See 6.c below)
    b. "Combined Sewer Overflow (CSO) Long-Term Control Plan & Use Attainability Analysis Guidance Document" – IDEM September 2001
        i. Purpose is prepare a plan to enact controls that will reduce CSO discharges to meet the Clean Water Act
    c. Use Attainability Analysis (UAA)
        i. Establishes a limited-use subcategory for the water body which temporarily suspends the designated use during wet weather.
        ii. All waters in state designated for recreational use
        iii. Does not apply to an "existing use" – no suspension
        iv. City must have an approved LTCP and be implementing it on schedule
        v. Guidance document has very specific procedures for conducting UAA and affordability analyses
        vi. 6 options in UAA to suspend use - Most likely is to show widespread economic and social impact
            1. Based on wastewater costs, stormwater costs, non-point source controls, and/or water costs per household vs. MHI
            2. If >2%, a temporary suspension is approved
8. Design Storm Approach
    a. Based on NRCS design storm data for West Lafayette:
        i. 10 year, 1 hour Storm: 2.1 inches of rain in 1 hour
        ii. 1 year, 1 hour Storm: 1.2 inches of rain in 1 hour
    b. Full treatment at WWTP required for 1 year, 1 hour storm, primary treatment and disinfection required for flows greater than 1 year up to 10 year, 1 hour storm.
    c. Does not require Use Attainability Analysis
    d. "Combined Sewer Overflow (CSO) Treatment Facility Design Criteria Nonrule Policy Water-16" – IDEM October 2007
        i. Purpose is to prepare a plan to enact controls that will reduce CSO discharges to meet the Clean Water Act without suspending designated use
9. 2011 CSO LTCP Amendment
    a. Re-calibrate combined sewer system model
    b. Analyze 1-year and 10-year design storms
    c. Prepare alternatives based on 2007 guidance document
    d. Estimate cost to meet design storm criteria
    e. Evaluate results of Design Storm Approach for amended plan

5/10/11

West Lafayette Go Greener CSO Long Term Control Plan

Name	Email or Phone	Energy Efficienc	Natural Resource	Recyc/ Env	Smart Transit	Smart Develop	Public Outreach	City Policies	Other
Diane DAmico	765 · 418-1223								
Heather Gall	hpreisen@purdue.edu 973-800-8194								
ALLEN JACOBSEN	765-418-4007 greatwugawuga@gmail.com								
APARNA PURI	765.427-0542 apuri3821@comcast.net								
Kristin Flannelly	765-337-6303 kflannelly@yahoo.com								
Dave Henderson	765-775-5145 dhenderson@westlafayette.in.gov								
Lindsey Payne	949-357-4514 llopayne78@gmail.com								
Denise Blank	765-404-8230 d.blank@hotmail.com								

go greener

Journal and Courier
217 N. 6th Street
Lafayette, IN 47901

City of West Lafayette
(Governmental Unit)

Tippecanoe *County, Indiana*

Ad order #

1234309

PUBLISHER'S CLAIM

LINE COUNT

Display Matter (must not exceed two actual lines, neither of which shall total more than four solid lines of the type in which the body of the advertiserment is set)--number of equivalent lines.

Head--number of lines
Body--number of lines
Tail--number of lines
Total number of lines in notice

COMPUTATION OF CHARGES

47.00 lines 1.00 columns wide equals 47.00 equivalent lines at 0.3267 cents per line. $ 15.35

Additional charge for notices containing rule or tabular work (50 percent of above amount) $ $0.00

Charge for extra proofs of publication ($1.00 for each proof in excess of two) $

TOTAL AMOUNT OF CLAIM $ $15.35

DATA FOR COMPUTING COST

Width of single column 8.6 ems
Number of insertions
Size of type 7 points

Pursuant to the provisions and penalties of Ch. 155, Acts 1953, I hereby certify that the foregoing account is just and correct, that the amount claimed is legally due, after allowing all just credits, and the no part of the same has been paid.

LO

Notice of Public Hearing; City of West Lafayette, Indiana Combined Sewer Overflow (CSO) Long-Term Control Plan (LTCP) Amendment: The City of West Lafayette will hold a public hearing at 8:30 a.m. on December 19, 2011, at the Board of Works meeting at West Lafayette City Hall, Council Chambers, 609 West Navajo Street, West Lafayette, IN 47906. The City's engineering consultant will present the results and recommendations to the City's CSO LTCP Amendment to reduce combined sewer overflows. At this hearing there will be the opportunity for questions and comments from the public. Participation is welcomed and encouraged. Any written comments regarding this project should be sent to David S. Henderson, Utility Director, 500 South River Road, West Lafayette, IN 47906 prior to December 23, 2011.
NO.1234309
12/8/2011

Y OF
ENT

PUBLISHER'S AFFIDAVIT

Personally appeared before me, a notary public in and for said county and state, the undersigned Lorna Moore who, being duly sworn, says that she is Clerk of the Journal and Courier a daily newspaper of general circulation printed and published in the English language in the city of Lafayette in state and county aforesaid, and that the printed matter attached hereto is a true copy, which was duly published in said paper 1 time(s), the date(s) of publication being as follows :

12/8/2011

Lorna Moore

Subscribed and sworn to before me this : **Thursday, December 8, 2011**

City of West Lafayette, Indiana
Board of Public Works and Safety
AMENDED MINUTES

Approved at December 27, 2011, Board of Public Works and Safety meeting.

December 19, 2011
8:30 a.m.
City Hall Council Chambers

Members present were Bradley W. Marley, Jonathan C. Speaker, Elizabeth M. Stull, and Mayor John R. Dennis, who presided. Member Sana G. Booker was absent.

Mayor Dennis announced that the next Board of Works meeting would be at 11:00 a.m. on Tuesday, December 27. That meeting will be the first one of the new schedule, 11:00 a.m. on Tuesdays.

1. APPROVAL OF MINUTES
   a. December 12, 2011, Meeting
   Ms. Stull moved to accept the minutes of the December 12, 2011, Board of Works meeting. Mr. Marley seconded the motion. The motion was adopted.

2. NEW BUSINESS
   a. Contract: 2012 Crisis Center Support – Ms. Jane McCann, Executive Director
   Ms. Jane McCann, Executive Director of the Crisis Center, introduced Eric Vandevoorde, the Crisis Center Board President. She thanked the Board for the support of the Crisis Center; it is truly appreciated, as is the opportunity to serve the citizens of West Lafayette. In 2011, the Center received its American Association of Suicidology accreditation, good for five years. On January 12, the Alliance of Information & Referral Services will make a site visit to the Center. The Center is still a part of the National Suicide Prevention Lifeline, which serves Tippecanoe and the surrounding counties for suicide prevention, the number for which is advertised frequently in media outlets, such as the Dr. Phil Show. Ms. McCann offered to answer any questions.

   Ms. Stull moved that the 2012 Crisis Center contract be approved. Mr. Speaker seconded the motion.

   Ms. Stull commended Ms. McCann and the Crisis Center for the work that they do. Ms. Stull said she appreciated the work that they do for the citizens of West Lafayette. Ms. McCann thanked Ms. Stull for her words.

   Mayor Dennis said that he has a long history with the Crisis Center and recognizes that the Crisis Center is a great resource which continues to get better. Ms. McCann said that the Crisis Center Board of Directors and volunteers are keys to the Center's success. They should be thanked as well.

   Mayor Dennis asked City Attorney Burns if he had reviewed the contract. Mr. Burns said that he had reviewed it, and it looks great.

   The motion was adopted.

b. Public Hearing: Update to Combined Sewer Overflow Long Term Control Plan – WWTU
Wastewater Utility Director Henderson said that representatives from Wessler Engineering are present and will update the Board on the status of the City's combined sewer overflow (CSO) work. The City has been ahead of the curve in CSO work, and has made huge impacts with the work that has been done. The old way of constructing sewers was to have stormwater and sanitary waste travel in the same pipe. It was easy to install the pipe. To prevent backups into homes and businesses, relief points were constructed along the river, CSO outfalls. During times of heavy rains, raw sewage and stormwater would spill out of these points and keep water from backing up into homes and businesses. West Lafayette is one of more than 100 cities in Indiana that has to deal with the legacy of that situation. With enactment of the Clean Water Act of 1972, combination sewers can no longer be constructed. Storm and sanitary sewers must be separated. The City has worked on separation projects—projects to upsize pipes and pump stations, projects at the Wastewater Plant, and construction of the wet weather facility. Much work has been done to treat CSOs and to reduce the amount of sewage that spills into the Wabash during storms.

Clerk-Treasurer Rhodes stated that the Utility is wrapping up its first CSO plan, and the City is under an agreed order with IDEM (Indiana Department of Environmental Management) related to activities prior to 2007. Wastewater Utility Director Henderson said that this was a Judicial Agreement. Clerk-Treasurer Rhodes asked how the City gets itself untangled from that, at what point would the City be "blessed." Wastewater Utility Director Henderson answered that the Judicial Agreement covers an implementation period ending in September 2027. As the regulations have changed, the endpoint has moved out further. The final milestone project of the long term control plan, the Western Interceptor, is finishing. Part of the new plan is to monitor the effects of that, before sizing what the next project is. IDEM wants the City to capture and give full treatment to 1¼ inches of rain in an hour. That is a lot of water. The State Judicial Agreement will live on, because EPA (Environmental Protection Agency) wanted IDEM to have judicially-enforceable mechanisms for implementing these long term control plans. If they are done within five years, it is in a permit period. If it takes more time, the State Judicial Agreement controls. Communities that do not work toward resolution of these issues are subject to consent decrees and more heavy-handed enforcement actions. The City's approach is more of a partnership. Mayor Dennis asked if the potential exists for someone actually going to jail. Wastewater Utility Director Henderson said that is a possibility for those communities that do not work with IDEM. Mayor Dennis said that IDEM and EPA have taken this very seriously, and it is justified. The way that public waterways were treated 20, 30, or 50 years ago is criminal, and now it is supported by criminal statutes. Wastewater Utility Director Henderson agreed.

Wastewater Utility Director Henderson introduced Mr. Gary Ruston and Mr. Bill Leber of Wessler Engineering, who provided background on their work on modeling and offering alternatives to the City's long term control plan for the next 15 years. Mr. Ruston distributed a handout (attached) of his and Mr. Leber's remarks, which included a map of selected projects of the CSO drainage areas.

Mayor Dennis announced the public hearing on the Combined Sewer Overflow Long Term Control Plan. He said that public input is sought.

Mr. Ruston outlined this City's history in addressing the long term control plan and CSO projects. In 1993, the City's Wastewater Treatment Utility facilities plan identified some CSO and wet weather deficiencies. That plan later developed into the WWTU plant expansion that was done in the mid-1990s, which added significant capacity to the Wastewater Plant, to treat higher wet weather flows. In 1996, IDEM issued the CSO strategy, including the

primary items: a low capital cost CSO operational plan; a stream-reach characterization evaluation, upstream, in the City, and downstream from the City; and a CSO long term control plan as part of the NPDES discharge permit renewal process, with emphasis on public education, participation, and involvement. In 1996, the City amended the facilities plan to be the long term control plan. In 1999, the River Road Interceptor was constructed as part of the River Road-US231 improvements project. In 2000, State Enrolled Act 431 was passed which allowed CSOs to occur if a community had an approved long term control plan and an approved use attainability analysis (UAA). In 2001, the City began construction on the wet weather treatment facility; the CSO long term control plan was updated to include wet weather treatment facility recommendations; and IDEM issued its CSO long term control plan and use attainability analysis guidance document. In 2003, construction on the Western Interceptor Project began. In 2007, the City's CSO long term control plan was approved through a State Judicial Agreement, and IDEM issued the CSO treatment design criteria, which defined the design storm approach that eliminated the need for the use attainability analysis. In 2010, IDEM requested that West Lafayette analyze the design storm approach, which brings the issues where they are today, looking at an amendment to the long term control plan, to update and recalibrate the combined sewer system model, analyze the one-year and ten-year design storms, and to prepare alternatives based on the 2007 guidance document.

Mr. Leber said that the City has been proactive and ahead of the game on CSO controls. The drawback is that many of the guidance documents and revisions to the plans occurred after West Lafayette's implementation. West Lafayette's plan was based on the presumptive approach, where if there are four overflows per year on an annual basis, it is presumed that the City meets quality standards. Now, there are two methods of analysis, the presumptive approach and the design storm approach. The presumptive approach considers alternatives, with a goal of having four or fewer CSOs on an annual basis. It requires use attainability analysis, which was outlined in the 2001 CSO guidance document. The West Lafayette plan started in 1996; the guidance document was issued in 2001. The purpose is to prepare a plan that has controls to reduce CSO discharges and meet the Clean Water Act. Use attainability analysis establishes a limited-use subcategory for the receiving stream, the Wabash River, adjacent to the City that says that the City will temporarily suspend the designated use of that stream during wet weather. The goal for all water bodies is full-body recreational contact, "fishable and swimmable." Rain events which would cause CSO discharges mean that the use attainability analysis is no longer attainable. For use attainability analysis, the City must have a long term control plan and be implementing it on schedule. There are specific procedures for conducting the use attainability analysis and the affordability. In order to eliminate CSOs or to treat them to a level where all the discharges meet all the requirements of the Clean Water Act, a substantial social and economic hardship might be created for a community. Under the presumptive approach, the City would have to prove that it is spending enough money on a big enough project so that sewer bills get to a level of widespread economic hardship. That is calculated to be about 2% of a median household income for the community. Some socio-economic factors, such as the bond rating, the tax collection rate, etc., are considered. For West Lafayette, that is about 1.8% of the household income for sewer bills, which is approximately $48 per month. Translated into a project cost, that is about a $50 million project in addition to what already been completed in West Lafayette. Mr. Leber said there was some pushback to that. It is not entirely logical, so the design storm approach was developed.

Mr. Leber said that the design storm approach is such that a one-year, one hour storm, which is about 1.2 inches of rain, can be fully treated in the Plant. Additionally, there is control for a 10-year storm, 2.1 inches of rain in an hour, from which any CSOs would at

least receive partial treatment, such as the wet weather facility—getting rid of the solids and doing disinfecting for bacteria. If both of these criteria are met, there is no need for use attainability analysis. It would be assumed that the City was meeting its water quality standards. The design storm approach was issued by IDEM in 2007, in their Nonrule Policy Water-16.

For the past year, Mr. Leber said, the Utility and Wessler Engineering have been reviewing what would have to be done to implement controls that would get to a design storm approach. Now, the three CSOs that remain in the system would overflow in the 10-year storm scenario. As Wastewater Utility Director Henderson has reported, the final phase of the Western Interceptor is being implemented. It is anticipated that will reduce the number of CSOs, but it is not anticipated that that would cover the 10-year storm situation. Wessler Engineering and the Utility have come up with an approach that would cost approximately $24.5 million to get the City to the design storm level.

Mr. Ruston said that the design storm approach is about half the cost of the presumptive approach. Page 4 of the handout provides a summary of the alternatives and the probable costs. They are ranked in order of least cost to greatest cost. Wessler Engineering recommends Alternative 1A, which is the least cost. Green infrastructure, including rain barrels, rain gardens, etc., was considered. That is a more costly project, but it can be an option, if the opportunity arises, to solve other issues such as drainage problems. Every bit helps. The options go from having everything stored and treated at Plant to complete sewer separation, building completely new sanitary sewers throughout the combined sewer area. Alternative 4, the deep tunnel, is something that the City of Lafayette uses.

The primary alternatives are (1) full transport and treatment; (2) sewer separation, which involves new sanitary sewers; (3) interceptor and partial sewer separation, which is a combination of the first two alternatives; and (4) the deep tunnel storage. Alternative 1a, full transport and treatment at the wet weather facility for the one-year storm event, was selected as the recommended long term control plan. It involves three major projects, the wet weather treatment facility minor improvements, new combined interceptor to the Treatment Plant, and a major expansion of the wet weather facility to store the one-year storm and treat up to the 10-year storm.

Mr. Ruston explained that the map shows the combined sewer areas. The areas are shown as tributaries to CSOs, with the colored borders outlining the service areas, and the shaded areas being the actual combined sewer areas. The southern area is tributary directly to the Treatment Plant and is not tributary to any area. The proposed new sewer interceptor is shown as a black line and is not fixed at this time. When the time comes, further study will be done to specify the route. There is a note at the bottom about the expansion of the wet weather facility.

Mr. Ruston said that the proposed implementation schedule on page 3 shows that it is a long-range project. The State Judicial Agreement is set up with a schedule up to September 2027, and the schedule takes full advantage of that timeframe: (1) the wet weather treatment facility minor improvements would begin in 2013; (2) the new combined interceptor to the treatment plant in two phases beginning in 2016; and (3) a major expansion of the wet weather facility to store the one-year storm and treat up to the 10-year storm to begin in 2024 and complete in 2027.

Mr. Ruston said that the plan revised amendment is due to IDEM by the end of the year. There are some final changes to complete the report and prepare it for submission. The next step is approval by the Board next week.

Mayor Dennis said that there are many factors that affect governmental regulatory requirements and the philosophies involving those—the projected date for completion, things change, requirements change, leadership changes, priorities change. We start down a path and become very well invested in the direction. Mayor Dennis asked what assurance the City has that there would not be additional changes. Mr. Ruston said that we do not know. What Mr. Ruston foresees is that the amendment that the City submits ultimately, after rounds of comments, would be approved by IDEM, and the State Judicial Agreement would be revised to incorporate these changes. Once the City has the agreement, it is a good legal document. Mayor Dennis said that the presumption is that, once we adopt the amendment, it will be our own local process, statutorily supported, and therefore the potential for change is limited. Mr. Ruston answered that he would say yes. City Attorney Burns said that is an important distinction, that change would not be forced on us, once it is entered into the Judicial Agreement. If the City chose, for its own purposes, to make a change, that would be up to the City, as long as it fulfilled the requirements. If there was a better way to do it, we would pursue that, but it would not be imposed on us.

Mayor Dennis asked Mr. Henderson what the process of paying for this would be. Wastewater Utility Director Henderson answered that he would look at how the projects are funded throughout and looking when the rate impacts would hit. Mayor Dennis said that rate impacts is a way of saying rate increases. Mr. Henderson agreed, and said that they are trying to look at the next 15 years, comparing the projects and the costs. Mayor Dennis asked if the stormwater utility dovetails into these. Wastewater Utility Director Henderson answered that, if you have a funded stormwater utility, when you look at partial separation in the system, wastewater picks up the sanitary costs, and the stormwater utility picks up the costs of the new storm sewers. Cooperation is needed. With wastewater, there is more flexibility. Stormwater would have to be just the storm infrastructure, but that helps offload costs from the Utility.

Mayor Dennis complimented Wastewater Utility Director Henderson and Wessler Engineering for their help to get the City to this point. The City is now required to comply with specific regulations, whether it is funded or not. Philosophically things have changed. It is not just West Lafayette; it is everyone throughout the country.

Mr. Marley said that when he attended Purdue University, he lived in a fraternity on University Street that had backflow sometimes. He asked if the City has any citizens who have emergencies with backup problems. Wastewater Utility Director Henderson answered that there is a list that is maintained in the Engineer's Office of the storm-related problem areas. One of the areas that had problems no longer has a lift station that contributed to that. Problems are addressed on an ongoing basis. Backups are a priority.

Councilor Burch asked for clarification on the Wessler document where the statement, "Assumes project funding through State Revolving Fund (SRF) Loan Program," is included. She asked if the City would get money through that to pay for these projects. Wastewater Utility Director Henderson said that, as the City has done many times in the past, using the State Revolving Fund Loan Program for low-interest loans for projects would be considered. Those funds are set a federal level that are divvied out to the states, and the State takes the list of projects submitted and ranks them for funding. There is potential for SRF loans.

There were no other questions or discussion.

Mayor Dennis declared the public hearing closed. He thanked Mr. Ruston and Mr. Leber for their presentations.

c. Write Off Uncollectible Accounts: Total $393.20 from 8 Accounts – WWTU
Clerk-Treasurer Rhodes said that the Board wrote off $708.83 from seven uncollectible Wastewater accounts on May 31. This request is for $393.20 from eight accounts. With the exception of one bankruptcy, these were all sales that occurred prior to the final bill. There is a timing issue, although the City sends letters to all the parties. There is no legal means to enforce payment, particularly for low balance accounts. The cost of attempting to collect these from legal means far exceeds the amounts due. The Utility revenue billing is about $8 million, so the City is very effective in collections. She asked for Board approval for the write offs.

Mr. Marley moved that the request be approved. Mr. Speaker seconded the motion. The motion was adopted.

d. Salary Increase: Michael Rohler – Sacramento Course Vol. II Completion – WWTU
Wastewater Utility Director Henderson said that Michael Rohler is the newest operator, hired about eight months ago. He has completed another of the correspondence courses. The salary ordinance provides for increases for completion of these programs. The amount is $9.62 biweekly, $250.00 annually, and will be effective December 1, 2011. He requested Board approval.

Ms. Stull moved that the request be approved. Mr. Marley seconded the motion. The motion was adopted.

e. Contract: Motorola – 2012 Maintenance Services on Radios – Police
Police Chief Dombkowski said that this is a standard agreement with Motorola to service the 36 mobile and portable radios. These are the older radios that are not under warranties. The contract price is $234 more than last year, for a total of $3,153.48. Police Chief Dombkowski said that they have had repairs on radios that are not under warranty, and repairs can cost $1,500 to $2,000 per unit on a $5,000 radio.

Mr. Marley moved that the request be approved. Ms. Stull seconded the motion.

Mayor Dennis asked City Attorney Burns if he had reviewed the contract. Mr. Burns said that he had reviewed it, and that it was fine.

Clerk-Treasurer Rhodes said that we are covering two more radios than we did in the last contract, so that may account for the price increase.

The motion was adopted.

f. Contract: Fast Eddie's – 2012 Vehicle Cleaning – Police
Mayor Dennis asked that this item be tabled until next week. Police Chief Dombkowski agreed.

g. Contract Task Order #1: ADA Consultants of Indiana, LLC – Engineering
City Engineer Buck said that this contract is part of the general services agreement with ADA Consultants of Indiana. Mr. Dave Miehls, president of ADA Consultants of Indiana,

was present to answer any questions. Mr. Buck said that this task order is to begin analysis and review of four City facilities—City Hall, Morton Center, the pool, and the Lilly Nature Center. Work will continue through the first quarter of 2012. It will identify any deficiencies and what course of action might be pursued. Mr. Miehls completed the review of the City of Lafayette facilities last week. Mr. Buck asked for Board approval.

Mayor Dennis said that this is a good step in the right direction.

Mr. Marley moved that the request be approved. Ms. Stull seconded the motion.

Mr. Marley asked what use would be made of the information, once the report is complete. City Engineer Buck said it would be updated to the transition plan that is currently in process. The report will be a working document. The program for funding and any work undertaken will be reviewed as high, medium, and low priorities. The City will find a way to make the high priority items happen. Medium priority items will be added to the capital improvements plan, and low items may be more programmatic and would be done in the course of the change of business moving forward. The report will be a tool to be used to make the facilities fully compliant.

The motion was adopted.

h. Claims

i.	AP Docket	$378,497.62
ii.	AP Docket	89,873.58
iii.	AP Docket	1,330.00
iv.	AP Docket	70.00
v.	AP Docket for Redevelopment Commission	3,186.84
vi.	PR Docket	323,077.43

Ms. Stull moved that the claims be approved. Mr. Marley seconded the motion.

Questions raised about individual claims by the Board were answered by department heads and Clerk-Treasurer Rhodes.

The motion was adopted.

i. Informational Items

i. Project Payment List – WWTU

There were no questions or comments about the list.

j. Other Items

i. Wastewater Utility Director Henderson reported that he saw four wastewater plants in Denmark and Sweden, with interesting technologies. He visited the Krüger, Inc. research facility and saw a variety of waste being treated in bench top reactors. There were some bench top digesters. Mr. Henderson said it was a good opportunity to learn what is going on in parts of the world where space is limited for landfills and electricity is very expensive. There is mandatory separation of food waste.

ii. Street Commissioner Downey said that due to City holidays, there would be no brush pickup on Friday, December 23, and Monday, December 26. There is no provision for drop-off of Christmas trees. They should be put out with brush, and they will be picked up and composted. Street Commissioner Downey said that he drove one of the two new

snowplows that would be used this season. The second plow will be delivered this week.

iii. Councilor Burch and Councilor Hunt wished happy holidays to all.

iv. Parks Superintendent Payne said that the final Park Board meeting of the year is at 4:30 p.m. today at Morton Community Center.

v. City Engineer Buck thanked Atlas Excavating and Milestone Construction for their efforts to pave Carlisle and Windsor on Friday and Saturday. The shoulder of Northwestern also was paved on Saturday morning, which was the final day of the asphalt plant being opened. The detour has been removed and Carlisle is open. There should be no snowplowing hazards for the Street Department. Mr. Buck urged caution in that area and on Northwestern. Work continues on the east side of Salisbury Street north of Sagamore Parkway. Indiana American water is replacing a main in the parkway between the curb and the sidewalk. About two blocks at a time in that area will be disrupted for about two weeks, as the boring machine works. In the spring, service connections will be done. They do not have to be completed until May or June. They are also working on a few cul-de-sacs at the end of Cumberland, Crimson Court among them. City Engineer Buck reported that there is a secondary main to be installed along Happy Hollow Road. Mayor Dennis said that this is not a City project.

vi. Police Chief Dombkowski stated that he returned from Quantico, Virginia, where he attended Captain Leroux's graduation from the FBI Academy. Captain Leroux said that it was a great experience, and he thanked the Chief and the Mayor for the opportunity. There were people there from 50 states and 25 countries, and there was a lot of networking.

vii. Mayor Dennis made several announcements, subject to Council approval:

1. An IT director position will be created. This will be a department head position.
2. The Human Resources Director will be elevated to a department head position.

Other announcements from the Mayor:

3. City Engineer Buck will be named as Public Works Director, coordinating the work of Wastewater Utility Director Henderson and Street Commissioner Downey
4. At 1:00 p.m. today, department heads will be sworn in, including Captain Leroux as Deputy Chief for the Police Department
5. Fire Chief Drew will be stepping down as Chief, effective December 31. Assistant Chief Jeff Holder will be Acting Fire Chief. Mayor Dennis said it is his intention to hire a new Fire Chief from within the Fire Department.

viii. Fire Chief Drew thanked the Board for their service and for their support of the Fire Department.

3. ADJOURNMENT

There being no further business to come before the Board, Mr. Marley moved that the meeting be adjourned, and Mayor Dennis adjourned the meeting.

Acceptance of West Lafayette CSO Long Term Control Plan

APPROVED:

DATE: 12/27/2011

CITY OF WEST LAFAYETTE
BOARD OF PUBLIC WORKS AND SAFETY

John R. Dennis, Mayor

Sana G. Booker, Member

Bradley W. Marley, Member

Jonathan C. Speaker, Member

Elizabeth M. Stull, Member

Attest:

Clerk-Treasurer Judith C. Rhodes

West Lafayette CSO Long Term Control Plan
Public Hearing
December 19, 2011 8:30am

1. Introduction - What is a Combined Sewer Overflow (CSO) and why do we have them?
2. IDEM CSO Policy Timeline and West Lafayette Implementation
   a. 1993 - Wastewater Treatment Plant Facilities Plan
      i. Identifies CSO and wet-weather deficiencies
   b. 1996 –IDEM Issues Combined Sewer Overflow Strategy
      i. Combined Sewer Operational Plan
      ii. Stream Reach Characterization and Evaluation
      iii. Requires CSO Long Term Control Plan (LTCP) as part of NPDES permit renewal process
         - Characterization, Monitoring, and Modeling of the Combined Sewer System
         - Public Participation
         - Consideration of Sensitive Areas
         - Evaluation of CSO Control Alternatives
         - Cost/Performance Evaluation
         - C.S. Operational Plan Revisions
         - Maximizing Treatment of Wet Weather flows at the WWTP
         - Implementation Schedule
         - Post-Construction Compliance Monitoring Program
   c. 1996 – West Lafayette Amends Wastewater Treatment Plant Facilities Plan to meet IDEM CSO LTCP goals
   d. 1999 – River Road Interceptor Constructed
   e. 2000 – SEA 431 passes, legal mechanism to allow CSOs with approved LTCP and Use Attainability Analysis
   f. 2001 – Wet Weather Treatment Facility Construction Begins
   g. 2001 – LTCP Updated to include revised wet weather treatment recommendations
   h. 2001 – IDEM CSO LTCP & Use Attainability Analysis (UAA) Guidance Document
   i. 2003 – Western Interceptor Construction Begins
   j. 2007 – West Lafayette CSO LTCP approved through State Judicial Agreement (SJA)
   k. 2007 - "Combined Sewer Overflow Treatment Facility Design Criteria Nonrule Policy Water-16" defines Design Storm Approach eliminating the need for UAA
   l. 2010 – IDEM requests West Lafayette analyze Design Storm Approach
   m. 2011 - CSO LTCP Amendment
      i. Update and re-calibrate combined sewer system model
      ii. Analyze 1-year and 10-year design storms
      iii. Prepare alternatives based on 2007 guidance document
3. Two method of Analysis: Presumptive Approach vs. Design Storm Approach
   a. Presumptive Approach
      i. Alternatives with goal of limiting CSO's to 4 overflows/year
         - Requires Use Attainability Analysis
      ii. "Combined Sewer Overflow (CSO) Long-Term Control Plan & Use Attainability Analysis Guidance Document" – IDEM September 2001

- Purpose is prepare a plan to enact controls that will reduce CSO discharges to meet the Clean Water Act

iii. Use Attainability Analysis (UAA)
- Establishes a limited-use subcategory for the water body which temporarily suspends the designated use during wet weather.
  - All waters in state designated for recreational use
  - Does not apply to an "existing use" – no suspension
- City must have an approved LTCP and be implementing it on schedule
- Guidance document has very specific procedures for conducting UAA and affordability analyses
- 6 options in UAA to suspend use - Most likely is to show widespread economic and social impact
  - Based on wastewater costs vs. MHI
  - If >1.8%, a temporary suspension is approved

iv. Presumptive Approach Cost Estimate: $50 million

b. Design Storm Approach

i. Based on NRCS design storm data for West Lafayette:
- 10 year/1 hour Storm: 2.1 inches of rain in 1 hour
- 1 year/1 hour Storm: 1.2 inches of rain in 1 hour

ii. Full treatment at WWTP required for 1 year/1 hour storm, primary treatment and disinfection required for flows greater than 1 year up to 10 year/1 hour storm.

iii. Does not require Use Attainability Analysis

iv. "Combined Sewer Overflow (CSO) Treatment Facility Design Criteria Nonrule Policy Water-16" – IDEM October 2007
- Purpose is to prepare a plan to enact controls that will reduce CSO discharges to meet the Clean Water Act <u>without suspending designated use</u>

v. Design Storm Approach Cost Estimate: $24.5 million

4. Selected Approach and Plan
   a. Design Storm Approach with no untreated overflows during the 10-year, 1-hour storm, no UAA required.
   b. Four primary alternatives were analyzed
      i. Full Transport and Treat
      ii. Sewer Separation
      iii. Interceptor and Partial Sewer Separation
      iv. Deep Tunnel Storage
   c. Alternative 1a was selected for recommended LTCP
      i. Wet Weather Treatment Facility Minor Improvements
      ii. New Combined Sewer Interceptor to WWTP
      iii. Wet Weather Treatment Facility Expansion
         - Store 1/1 storm, treat up to 10/1 storm
   d. 15-year implementation schedule (attached) consistent with 2007 SJA
   e. Post Construction Monitoring after key milestone projects

TABLE 5.3: Proposed LTCP Implementation Schedule

TASK	*DURATION**	*COMPLETION DATE*
Post-Construction Monitoring		
Upon completion of the Western Interceptor – Division V	12 months	March 2012 thru February 2013
Project 1: WWF Minor Improvements		
Study/PER	4 months	July 2013
Design	5 months	December 2013
Permitting	4 months	April 2014
Bidding/Bonds/Financial	5 months	September 2014
Construction	10 months	July 2015
Post-Construction Monitoring	12 months	June 2016
Project 2: New Interceptor – Phase 1		
- Study/PER	6 months	December 2016
- SRF Review/approval*	4 months	April 2017
- Design	8 months	December 2017
- Permitting	4 months	April 2018
- Bidding/Bonds/Financial	5 months	September 2018
- Construction	14 months	November 2019
Project 3: New Interceptor – Phase 2		
- Study/PER update	4 months	April 2020
- SRF Review/approval*	4 months	August 2020
- Design	8 months	April 2021
- Permitting	4 months	August 2021
- Bidding/Bonds/Financial	5 months	January 2022
- Construction	14 months	March 2023
- Post-Construction Monitoring	12 months	February 2024
Project 4: WWF Expansion		
- Study/PER	5 months	July 2024
- SRF Review/approval*	4 months	November 2024
- Design	8 months	July 2025
- Permitting	4 months	November 2025
- Bidding/Bonds/Financial	5 months	April 2026
- Construction	15 months	July 2027
- Post-Construction Monitoring	12 months	June 2028

- Overall schedule assumes IDEM approval of LTCP by July 2012
- *Assumes project funding through State Revolving Fund (SRF) Loan Program
- All project timelines dependent upon timeliness of reviews and schedule limitations of funding agencies
- Per 2007 SJA, LTCP implementation must be complete by September 1, 2027

West Lafayette CSO Long Term Control Plan

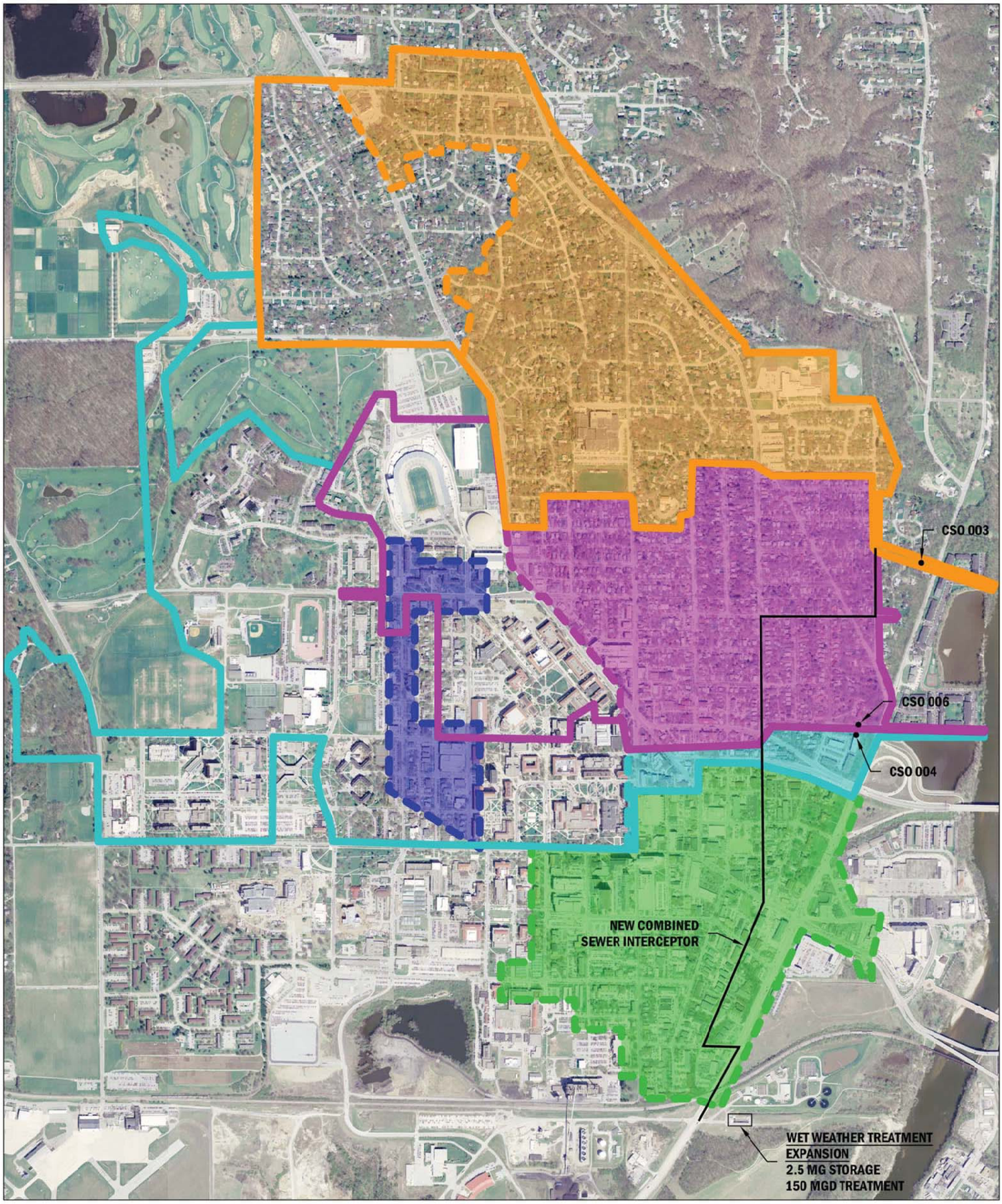
West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Project Costs

Summary of Alternatives

Alternative	Description	Total Cost
Alternative 1a	Full Transport and Treat - WWF Storage for 1yr Storm	$ 24,500,000
Alternative 3a	Interceptor and Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 28,400,000
Alternative 5a	Green Infrastructure (10% Combined Service Area) - WWF Storage for 1 yr Storm	$ 33,300,000
Alternative 1b	Full Transport and Treat - WWF Storage for 10 yr Storm	$ 34,400,000
Alternative 2a	Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 35,100,000
Alternative 5b	Green Infrastructure (25% Combined Service Area) - WWF Storage for 1 yr Storm	$ 42,800,000
Alternative 2b	Partial Sewer Separation - WWF Storage for 10 yr Storm	$ 43,700,000
Alternative 3b	Interceptor and Partial Sewer Separation - WWF Storage for 10 yr Storm	$ 44,300,000
Alternative 4	Deep Tunnel - Full Storage and Pumping	$ 47,500,000
Alternative 2c	Complete Sewer Separation - WWF Storage for 1 yr Storm	$ 54,700,000
Alternative 2d	Complete Sewer Separation - WWF Storage for 10 yr Storm	$ 59,500,000

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.



LEGEND

	= CSO #003		= CSO OTHER
	= CSO #006		= WWTP
	= CSO #004		= COMBINED SEWER BOUNDARY

FIGURE 5.2
SELECTED PROJECTS
CSO DRAINAGE AREAS
WEST LAFAYETTE, INDIANA
DECEMBER 2011

jconline.com
Lafayette • West Lafayette, Indiana

Plan to control sewer overflows heads to state officials

A $24.5 million, long-term plan to curb combined sewer overflows in West Lafayette will head to state officials for approval this week.

This morning, the city's board of works approved a 15-year update to West Lafayette's efforts to drastically reduce the number of times raw sewage spills into the Wabash River.

At the meeting, Mayor John Dennis emphasized that the city remains committed to reducing overflows, which is required by state and federal law.

"This (plan) is a roadmap of where we need to go in the future," he said.

The plan lays out four major projects that would be completed in the next 15 years.

They include two phases of a new interceptor, and minor improvements to and an expansion of the city's wet weather treatment facility.

Now that the board has approved the plan, it will go to officials at the Indiana Department of Environmental Management by the end of the week, said city Utility Director Dave Henderson.

That office then will review the document, comment on its specifics and consider it for formal approval later in 2012, Henderson said.

For more information about this story, read Wednesday's J&C.

AdChoices

Ads by Pulse 360

Illinois: 50 Year Old Mom Looks 30!
"Her Clever $5 Wrinkle Therapy Angers Botox Doctors. We Reveal How"
consumerlifestyletrends.com/

Mortgage Rates Hit 2.75% (3.1% APR)
If you owe under $729k, you probably qualify for the Govt Refi Program.
www.MortgageRatesExperts.com

Refinance Rates Hit 2.9%
$160k Illinois Mortgage $632mo. No Hidden Fees. No SSN Required!
mortgage.refinance.lendgo.com

Advertisement

Print Powered By FormatDynamics

APPENDIX H

Opinions of Probable Cost

H-1 Summary of Alternatives

H-2 Alternative 1a – Full Transport and Treat – WWF Storage for 1yr Storm

H-3 Alternative 1b – Full Transport and Treat – WWF Storage for 10yr Storm

H-4 Alternative 2a – Partial Sewer Separation – WWF Storage for 1yr Storm

H-5 Alternative 2b – Partial Sewer Separation – WWF Storage for 10yr Storm

H-6 Alternative 2c – Complete Sewer Separation WWF Storage for 1yr Storm

H-7 Alternative 2d – Complete Sewer Separation WWF Storage for 10yr Storm

H-8 Alternative 3a – Interceptor and Partial Sewer Separation – WWF Storage for 1yr Storm

H-9 Alternative 3b – Interceptor and Partial Sewer Separation – WWF Storage for 10yr Storm

H-10 Alternative 4 – Deep Tunnel Storage – Full Storage and Pumping

H-11 Alternative 5a – Green Infrastructure (10% Combined Service Area) – WWF Storage for 1yr Storm

H-12 Alternative 5b – Green Infrastructure (25% Combined Service Area) – WWF Storage for 1yr Storm

H-13 Summary of Alternatives Not Included in Report (WWTP Expanded to 38 MGD Peak)

H-14 Alternative 1a-2 – Full Transport and Treat – WWF Storage for 1yr Storm

H-15 Alternative 1b-2 – Full Transport and Treat – WWF Storage for 10yr Storm

H-16 Alternative 2a-2 – Partial Sewer Separation – WWF Storage for 1yr Storm

H-17 Alternative 2b-2 – Partial Sewer Separation – WWF Storage for 10yr Storm)

H-18 Alternative 3-2 – Interceptor and Partial Sewer Separation – WWF Storage for 1yr Storm

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Project Costs

Summary of Alternatives

Alternative	Description	Total Cost
Alternative 1a	Full Transport and Treat - WWF Storage for 1 yr Storm	$ 24,500,000
Alternative 1b	Full Transport and Treat - WWF Storage for 10 yr Storm	$ 34,400,000
Alternative 2a	Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 35,100,000
Alternative 2b	Partial Sewer Separation - WWF Storage for 10 yr Storm	$ 43,700,000
Alternative 2c	Complete Sewer Separation - WWF Storage for 1 yr Storm	$ 54,700,000
Alternative 2d	Complete Sewer Separation - WWF Storage for 10 yr Storm	$ 59,500,000
Alternative 3a	Interceptor and Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 28,400,000
Alternative 3b	Interceptor and Partial Sewer Separation - WWF Storage for 10 yr Storm	$ 44,300,000
Alternative 4	Deep Tunnel - Full Storage and Pumping	$ 47,500,000
Alternative 5a	Green Infrastructure (10% Combined Service Area) - WWF Storage for 1 yr Storm	$ 33,300,000
Alternative 5b	Green Infrastructure (25% Combined Service Area) - WWF Storage for 1 yr Storm	$ 42,800,000

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 1a - Full Transport and Treat - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	54-inch Interceptor	LFT	800	$ 450	$ 360,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	78-inch Interceptor	LFT	3,500	$ 795	$ 2,782,500
	84-inch Interceptor	LFT	1,000	$ 900	$ 900,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Wet Weather Facility Expansion	LSUM	1	$ 9,200,000	$ 9,200,000
	Utility Relocations (5%)	LSUM	1	$ 306,000	$ 306,000
	Maintenance of Traffic (3%)	LSUM	1	$ 183,000	$ 183,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 214,000	$ 214,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 306,000	$ 306,000
				Subtotal Construction Costs	**$ 16,325,000**
				20% Contingency	$ 3,265,000
				Total Construction Costs	**$ 19,590,000**
				Non-Construction Costs	**$ 4,897,500**
				Total Project Cost	**$ 24,500,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 1b - Full Transport and Treat - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	54-inch Interceptor	LFT	800	$ 450	$ 360,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	78-inch Interceptor	LFT	3,500	$ 795	$ 2,782,500
	84-inch Interceptor	LFT	1,000	$ 900	$ 900,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Wet Weather Facility Expansion	LSUM	1	$15,800,000	$ 15,800,000
	Utility Relocations (5%)	LSUM	1	$ 306,000	$ 306,000
	Maintenance of Traffic (3%)	LSUM	1	$ 183,000	$ 183,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 214,000	$ 214,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 306,000	$ 306,000
				Subtotal Construction Costs	**$ 22,925,000**
				20% Contingency	$ 4,585,000
				Total Construction Costs	**$ 27,510,000**
				Non-Construction Costs	**$ 6,880,000**
				Total Project Cost	**$ 34,400,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2a - Partial Sewer Separation - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	260	$ 70,000	$ 18,200,000
	Wet Weather Facility Expansion	LSUM	1	$ 3,750,000	$ 3,750,000
	Final Cleanup & Restoration	LSUM	1	$ 910,000	$ 910,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 546,000	$ 546,000
				Subtotal Construction Costs	**$ 23,406,000**
				20% Contingency	$ 4,681,000
				Total Construction Costs	**$ 28,090,000**
				Non-Construction Costs	**$ 7,020,000**
				Total Project Cost	**$ 35,100,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2b - Partial Sewer Separation - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	260	$ 70,000	$ 18,200,000
	Wet Weather Facility Expansion	LSUM	1	$ 9,500,000	$ 9,500,000
	Final Cleanup & Restoration	LSUM	1	$ 910,000	$ 910,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 546,000	$ 546,000
				Subtotal Construction Costs	**$ 29,156,000**
				20% Contingency	$ 5,831,000
				Total Construction Costs	**$ 34,987,000**
				Non-Construction Costs	**$ 8,750,000**
				Total Project Cost	**$ 43,700,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2c - Complete Sewer Separation - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	497	$ 70,000	$ 34,790,000
	Wet Weather Facility Improvements	LSUM	1	$ 630,000	$ 630,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 1,044,000	$ 1,044,000
				Subtotal Construction Costs	**$ 36,464,000**
				20% Contingency	$ 7,293,000
				Total Construction Costs	**$ 43,760,000**
				Non-Construction Costs	**$ 10,940,000**
				Total Project Cost	**$ 54,700,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2d - Complete Sewer Separation - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	497	$ 70,000	$ 34,790,000
	Wet Weather Facility Expansion	LSUM	1	$ 3,860,000	$ 3,860,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 1,044,000	$ 1,044,000
				Subtotal Construction Costs	**$ 39,694,000**
				20% Contingency	$ 7,939,000
				Total Construction Costs	**$ 47,630,000**
				Non-Construction Costs	**$ 11,910,000**
				Total Project Cost	**$ 59,500,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 3a - Interceptor and Partial Sewer Separation - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (Upstream od CSO 003)	ACRE	95	$ 70,000	$ 6,650,000
	48-inch Interceptor	LFT	100	$ 340	$ 34,000
	66-inch Interceptor	LFT	3,500	$ 625	$ 2,187,500
	72-inch Interceptor	LFT	1,000	$ 715	$ 715,000
	Road Reconstruction	LFT	4,600	$ 105	$ 483,000
	Wet Weather Facility Expansion	LSUM	1	$ 7,200,000	$ 7,200,000
	Utility Relocations (5%)	LSUM	1	$ 503,000	$ 503,000
	Maintenance of Traffic (3%)	LSUM	1	$ 302,000	$ 302,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 352,000	$ 352,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 503,000	$ 503,000
				Subtotal Construction Costs	**$ 18,929,500**
				20% Contingency	$ 3,786,000
				Total Construction Costs	**$ 22,720,000**
				Non-Construction Costs	**$ 5,680,000**
				Total Project Cost	**$ 28,400,000**

Note:

All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 3b - Interceptor and Partial Sewer Separation - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (Upstream od CSO 003)	ACRE	95	$ 70,000	$ 6,650,000
	48-inch Interceptor	LFT	100	$ 340	$ 34,000
	66-inch Interceptor	LFT	3,500	$ 625	$ 2,187,500
	72-inch Interceptor	LFT	1,000	$ 715	$ 715,000
	Road Reconstruction	LFT	4,600	$ 105	$ 483,000
	Wet Weather Facility Expansion	LSUM	1	$17,800,000	$ 17,800,000
	Utility Relocations (5%)	LSUM	1	$ 503,000	$ 503,000
	Maintenance of Traffic (3%)	LSUM	1	$ 302,000	$ 302,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 352,000	$ 352,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 503,000	$ 503,000
				Subtotal Construction Costs	**$ 29,529,500**
				20% Contingency	$ 5,906,000
				Total Construction Costs	**$ 35,440,000**
				Non-Construction Costs	**$ 8,860,000**
				Total Project Cost	**$ 44,300,000**

Note:

All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 4 - Deep Tunnel - Full Storage and Pumping

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	15-foot Diameter Tunnel	LF	5,000	$ 5,600	$ 28,000,000
	48-inch Interceptor	LF	1,160	$ 340	$ 394,400
	Road Reconstruction	LF	1,200	$ 90	$ 108,000
	Utility Relocations (3%)	LSUM	1	$ 855,000	$ 855,000
	Maintenance of Traffic (1%)	LSUM	1	$ 285,000	$ 285,000
	Final Cleanup & Restoration (2%)	LSUM	1	$ 570,000	$ 570,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 1,425,000	$ 1,425,000
				Subtotal Construction Costs	**$ 31,637,400**
				20% Contingency	$ 6,327,000
				Total Construction Costs	**$ 37,964,400**
				Non-Construction Costs	**$ 9,490,000**
				Total Project Cost	**$ 47,500,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 5a - Green Infrastructure (10% Combined Service Area) - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	54-inch Interceptor	LFT	800	$ 450	$ 360,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	78-inch Interceptor	LFT	3,500	$ 795	$ 2,782,500
	84-inch Interceptor	LFT	1,000	$ 900	$ 900,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Green Infrastructure Retrofits	SFT	3,180,000	$ 1.50	$ 4,770,000
	Wet Weather Facility Expansion	LSUM	1	$ 9,500,000	$ 9,500,000
	Utility Relocations (5%)	LSUM	1	$ 544,000	$ 544,000
	Maintenance of Traffic (3%)	LSUM	1	$ 327,000	$ 327,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 381,000	$ 381,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 544,000	$ 544,000
				Subtotal Construction Costs	**$ 22,182,000**
				20% Contingency	$ 4,436,000
				Total Construction Costs	**$ 26,618,000**
				Non-Construction Costs	**$ 6,650,000**
				Total Project Cost	**$ 33,300,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana

Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 5b - Green Infrastructure (25% Combined Service Area) - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	48-inch Interceptor	LFT	800	$ 340	$ 272,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	72-inch Interceptor	LFT	3,500	$ 715	$ 2,502,500
	78-inch Interceptor	LFT	1,000	$ 795	$ 795,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Green Infrastructure Retrofits	SFT	7,950,000	$ 1.50	$ 11,925,000
	Wet Weather Facility Expansion	LSUM	1	$ 8,100,000	$ 8,100,000
	Utility Relocations (5%)	LSUM	1	$ 878,000	$ 878,000
	Maintenance of Traffic (3%)	LSUM	1	$ 527,000	$ 527,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 615,000	$ 615,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 878,000	$ 878,000
				Subtotal Construction Costs	**$ 28,566,000**
				20% Contingency	$ 5,713,000
				Total Construction Costs	**$ 34,279,000**
				Non-Construction Costs	**$ 8,570,000**
				Total Project Cost	**$ 42,800,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Project Costs

Summary of Alternatives Not Included in Report (WWTP Expanded to 38 MGD Peak)

Alternative	Description	Total Cost
Alternative 1a-2	Full Transport and Treat - WWF Storage for 1 yr Storm	$ 60,500,000
Alternative 1b-2	Full Transport and Treat - WWF Storage for 10 yr Storm	$ 72,000,000
Alternative 2a-2	Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 74,100,000
Alternative 2b-2	Partial Sewer Separation - WWF Storage for 10 yr Storm	$ 80,300,000
Alternative 3-2	Interceptor and Partial Sewer Separation - WWF Storage for 1 yr Storm	$ 66,700,000

Note: *All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.*

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 1a-2 - Full Transport and Treat - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	54-inch Interceptor	LFT	800	$ 450	$ 360,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	78-inch Interceptor	LFT	3,500	$ 795	$ 2,782,500
	84-inch Interceptor	LFT	1,000	$ 900	$ 900,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Wet Weather Facility Expansion	LSUM	1	$ 7,200,000	$ 7,200,000
	WWTP Expansion to 38 MGD	LSUM	1	$26,000,000	$ 26,000,000
	Utility Relocations (5%)	LSUM	1	$ 306,000	$ 306,000
	Maintenance of Traffic (3%)	LSUM	1	$ 183,000	$ 183,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 214,000	$ 214,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 306,000	$ 306,000
				Subtotal Construction Costs	**$ 40,325,000**
				20% Contingency	$ 8,065,000
				Total Construction Costs	**$ 48,390,000**
				Non-Construction Costs	**$ 12,097,500**
				Total Project Cost	**$ 60,500,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 1b-2 - Full Transport and Treat - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	54-inch Interceptor	LFT	800	$ 450	$ 360,000
	60-inch Interceptor	LFT	2,300	$ 550	$ 1,265,000
	78-inch Interceptor	LFT	3,500	$ 795	$ 2,782,500
	84-inch Interceptor	LFT	1,000	$ 900	$ 900,000
	Road Reconstruction	LFT	7,700	$ 105	$ 808,500
	Wet Weather Facility Expansion	LSUM	1	$ 14,900,000	$ 14,900,000
	WWTP Expansion to 38 MGD	LSUM	1	$ 26,000,000	$ 26,000,000
	Utility Relocations (5%)	LSUM	1	$ 306,000	$ 306,000
	Maintenance of Traffic (3%)	LSUM	1	$ 183,000	$ 183,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 214,000	$ 214,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 306,000	$ 306,000
				Subtotal Construction Costs	**$ 48,025,000**
				20% Contingency	$ 9,605,000
				Total Construction Costs	**$ 57,630,000**
				Non-Construction Costs	**$ 14,410,000**
				Total Project Cost	**$ 72,000,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2a-2 - Partial Sewer Separation - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	260	$ 70,000	$ 18,200,000
	Wet Weather Facility Expansion	LSUM	1	$ 3,750,000	$ 3,750,000
	WWTP Expansion to 38 MGD	LSUM	1	$ 26,000,000	$ 26,000,000
	Final Cleanup & Restoration	LSUM	1	$ 910,000	$ 910,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 546,000	$ 546,000
				Subtotal Construction Costs	**$ 49,406,000**
				20% Contingency	$ 9,881,000
				Total Construction Costs	**$ 59,287,000**
				Non-Construction Cost	**$ 14,820,000**
				Total Project Cost	**$ 74,100,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 2b-2 - Partial Sewer Separation - WWF Storage for 10 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (upstream of CSO 003, 004, & 006)	ACRE	260	$ 70,000	$ 18,200,000
	Wet Weather Facility Expansion	LSUM	1	$ 7,900,000	$ 7,900,000
	WWTP Expansion to 38 MGD	LSUM	1	$26,000,000	$ 26,000,000
	Final Cleanup & Restoration	LSUM	1	$ 910,000	$ 910,000
	Mob/Demob/Bonds/Insurance	LSUM	1	$ 546,000	$ 546,000
				Subtotal Construction Costs	**$ 53,556,000**
				20% Contingency	$ 10,711,000
				Total Construction Costs	**$ 64,267,000**
				Non-Construction Costs	**$ 16,070,000**
				Total Project Cost	**$ 80,300,000**

Note: All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

West Lafayette CSO Long Term Control Plan

West Lafayette, Indiana
Project No. 138910-01-001

Engineer's Opinion of Probable Construction Costs

Alternative 3-2 - Interceptor and Partial Sewer Separation - WWF Storage for 1 yr Storm

Item	Description	Unit	Quantity	Unit Cost	Total Cost
	Sewer Separation (Upstream od CSO 003)	ACRE	95	$ 70,000	$ 6,650,000
	48-inch Interceptor	LFT	100	$ 340	$ 34,000
	66-inch Interceptor	LFT	3,500	$ 625	$ 2,187,500
	72-inch Interceptor	LFT	1,000	$ 715	$ 715,000
	Road Reconstruction	LFT	4,600	$ 105	$ 483,000
	Wet Weather Facility Expansion	LSUM	1	$ 6,720,000	$ 6,720,000
	WWTP Expansion to 38 MGD	LSUM	1	$ 26,000,000	$ 26,000,000
	Utility Relocations (5%)	LSUM	1	$ 503,000	$ 503,000
	Maintenance of Traffic (3%)	LSUM	1	$ 302,000	$ 302,000
	Final Cleanup & Restoration (3.5%)	LSUM	1	$ 352,000	$ 352,000
	Mob/Demob/Bonds/Insurance (5%)	LSUM	1	$ 503,000	$ 503,000
				Subtotal Construction Costs	**$ 44,449,500**
				20% Contingency	$ 8,890,000
				Total Construction Costs	**$ 53,340,000**
				Non-Construction Costs	**$ 13,340,000**
				Total Project Cost	**$ 66,700,000**

Note:

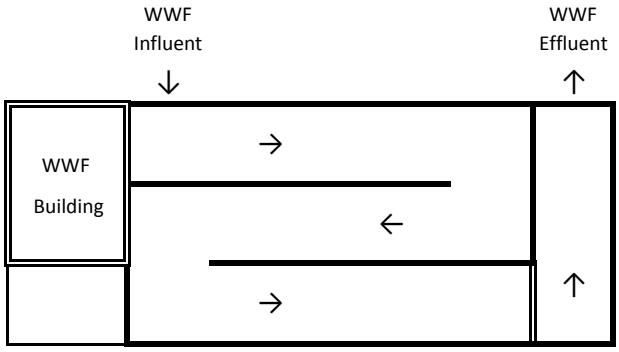
All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

APPENDIX I

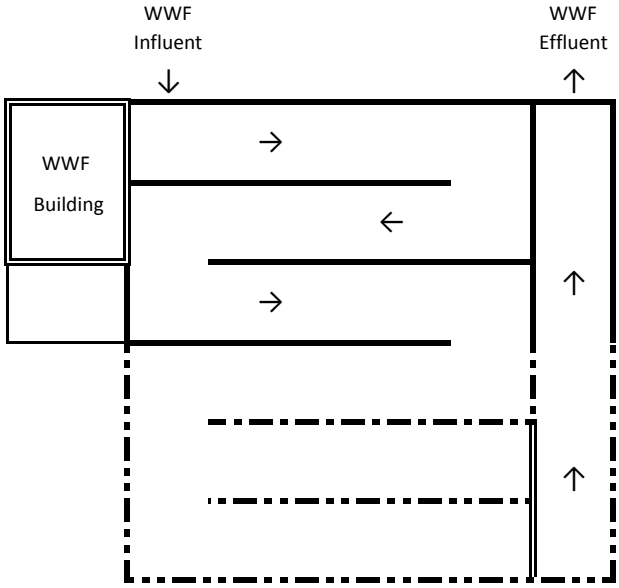
Wet Weather Facility Expansion Layout Options & Cost Opinions

WEST LAFAYETTE CSO LONG-TERM CONTROL PLAN
WWF EXPANSION - BASIC LAYOUT OPTIONS

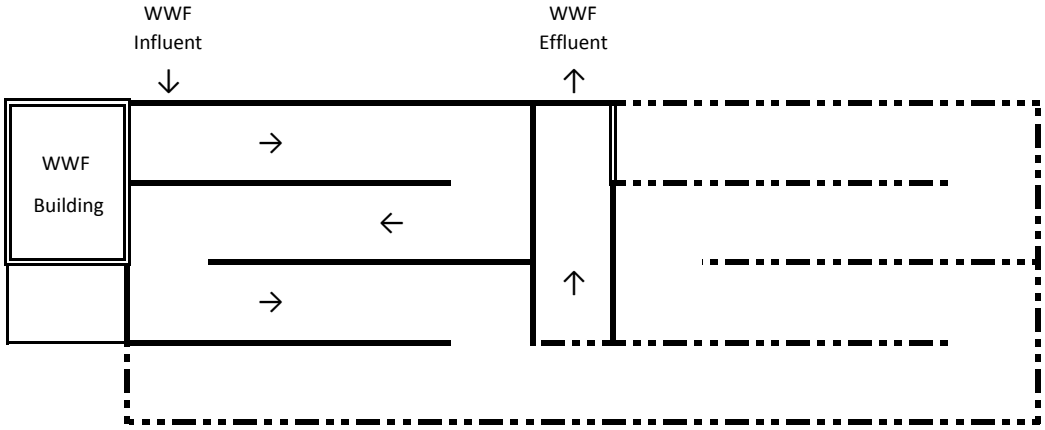
EXISTING WWF
585,000 gals.



LAYOUT OPTION 4
Raise CSO Screens 2'
Raise interior walls 2'
Add 3 passes
1,400,000 gals.

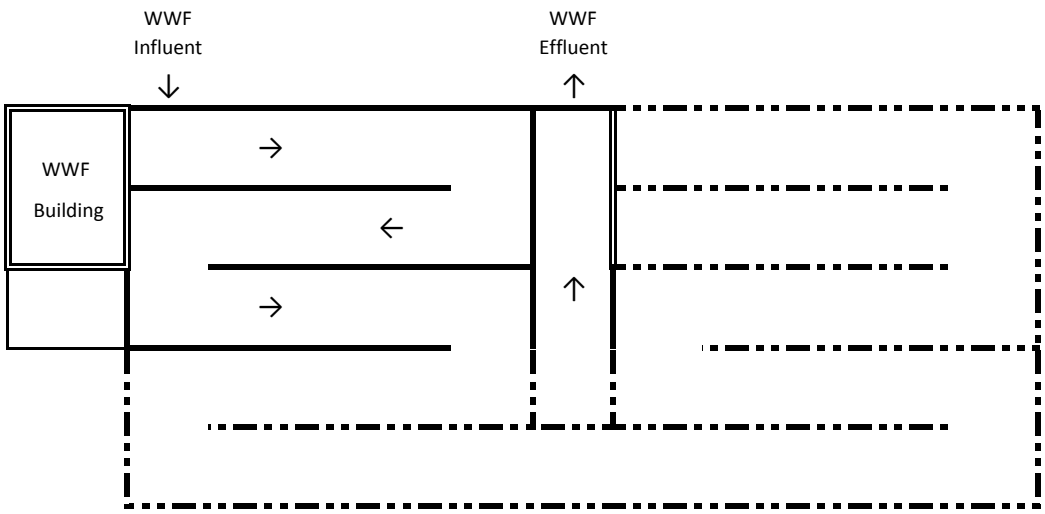


LAYOUT OPTION 5
Raise CSO Screens 2'
Raise interior walls 2'
Add 4 passes
1,866,000 gals.

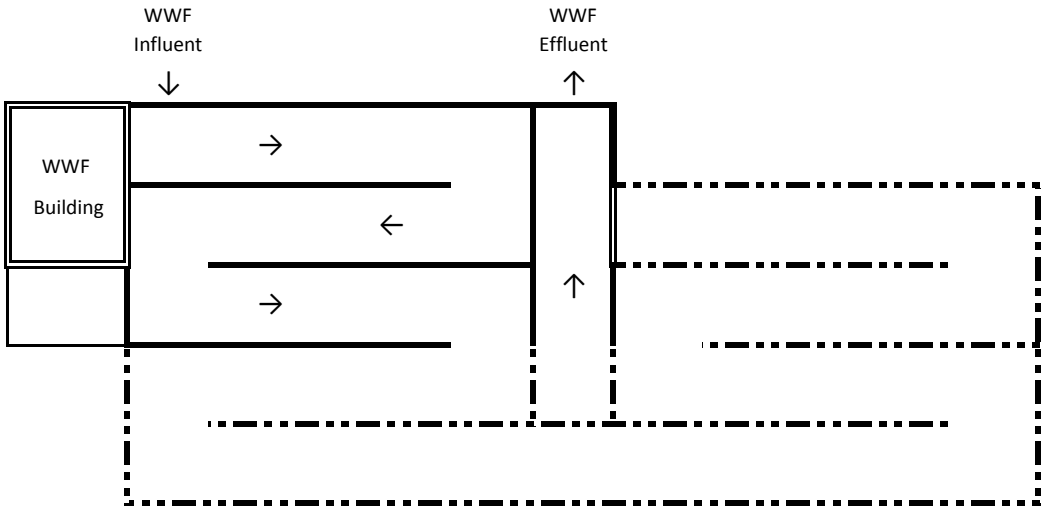


WEST LAFAYETTE CSO LONG-TERM CONTROL PLAN
WWF EXPANSION - BASIC LAYOUT OPTIONS

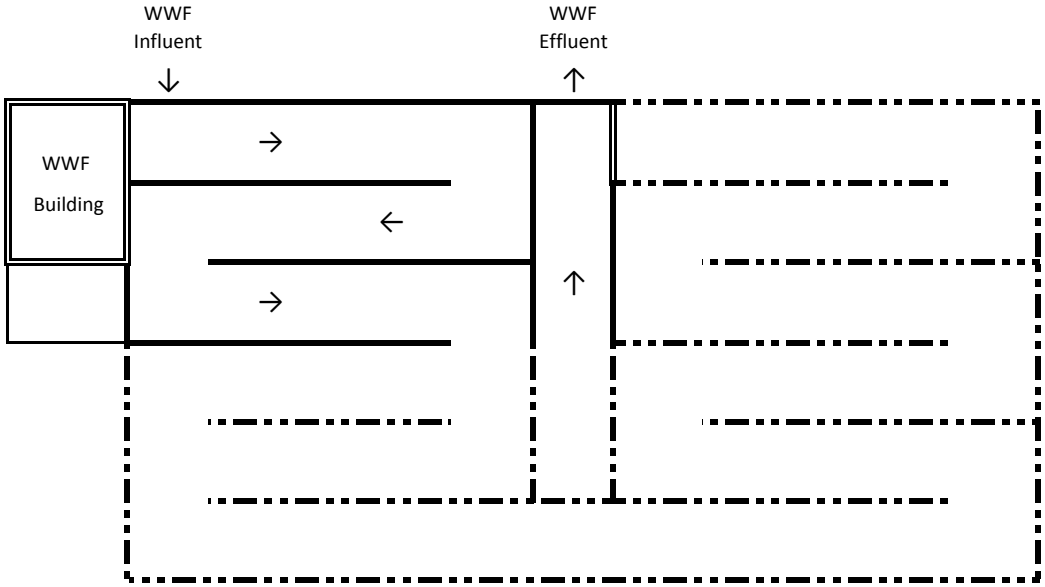
LAYOUT OPTION 6
Raise CSO Screens 2'
Raise interior walls 2'
Add 7 passes
2,334,000 gals.



LAYOUT OPTION 7
Raise CSO Screens 2'
Raise interior walls 2'
Add 6 passes
2,100,000 gals.

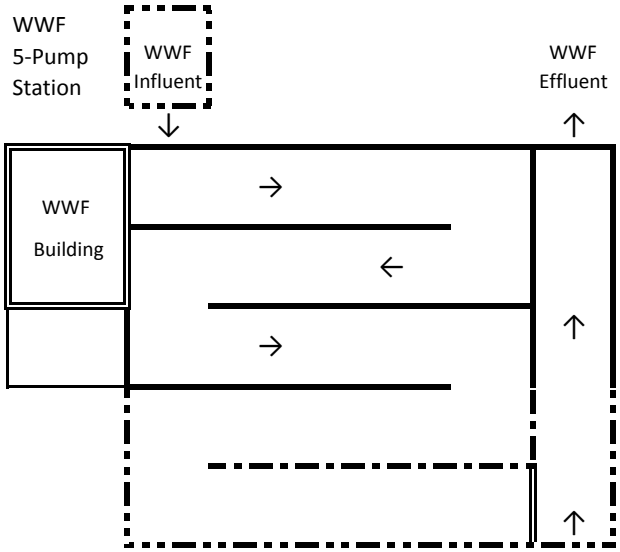


LAYOUT OPTION 8
Raise CSO Screens 2'
Raise interior walls 2'
Add 9 passes
2,800,000 gals.



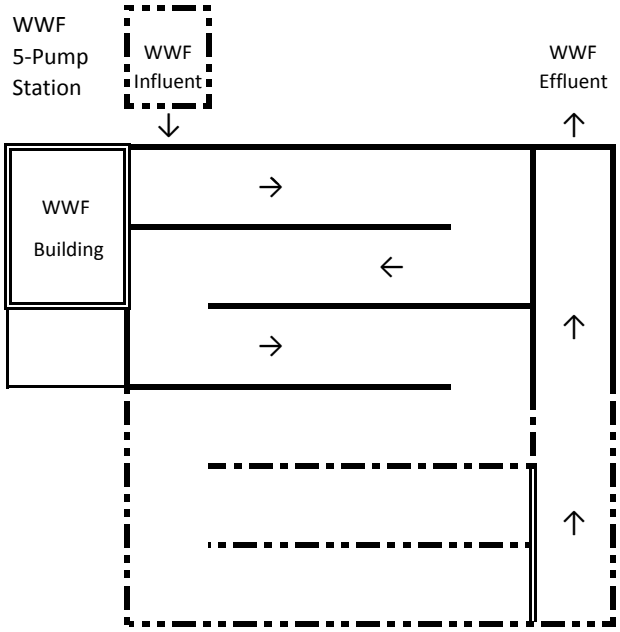
LAYOUT OPTION 9
Raise CSO Screens 15'
5-Pump Station
Raise interior walls 15'
Add 2 passes

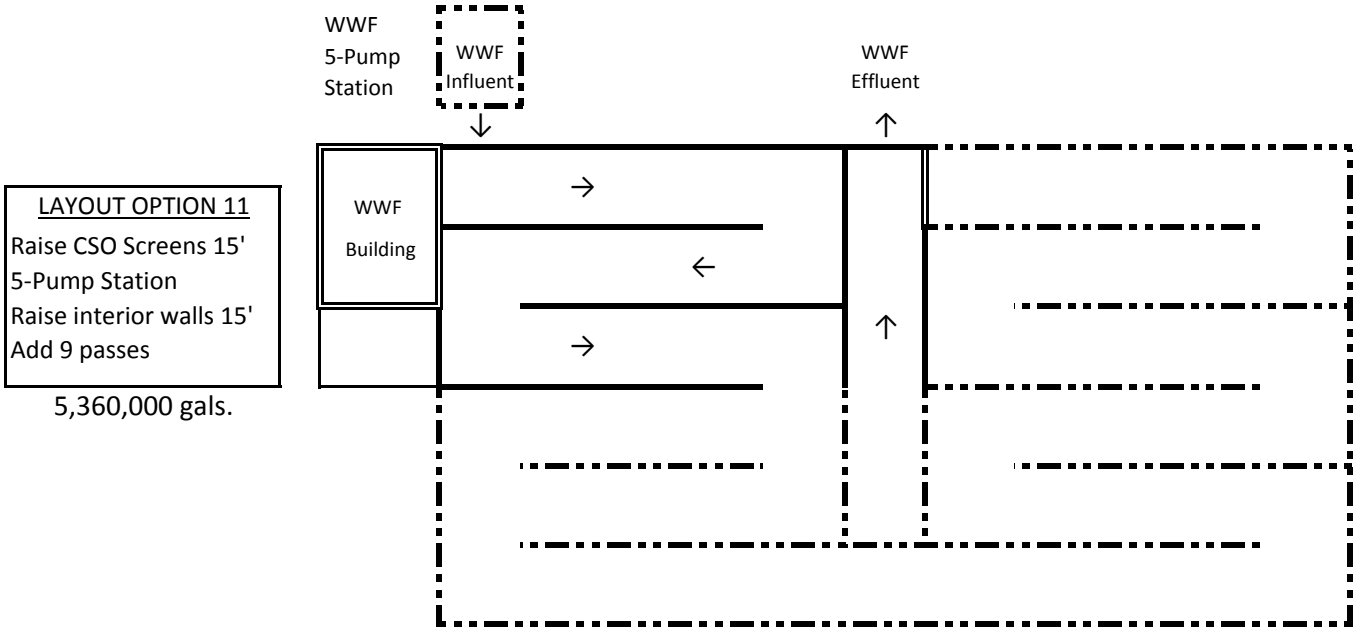
2,233,000 gals.



LAYOUT OPTION 10
Raise CSO Screens 15'
5-Pump Station
Raise interior walls 15'
Add 2 passes

2,680,000 gals.




WWF
5-Pump
Station
WWF
Influent
WWF
Effluent
WWF
Building
LAYOUT OPTION 11
Raise CSO Screens 15'
5-Pump Station
Raise interior walls 15'
Add 9 passes
5,360,000 gals.

- END -

WEST LAFAYETTE - CSO LONG-TERM CONTROL PLAN
WWF EXPANSION OPTIONS - OPINIONS OF PROBABLE CONSTRUCTION COST

All opinions of probable costs are based upon 2011 dollars and will likely increase with time. In providing these cost opinions, Wessler Engineering has no control over costs of labor, equipment, materials, or contractors' methods of pricing. The cost opinions were made without the benefit of design plans and specifications and are provided on the basis of the Engineer's qualifications and experience. Wessler Engineering makes no warranty, expressed or implied, as to the accuracy of such cost opinions as compared to bids or actual costs.

RAISE WWF WEIR/WALLS ALTERNATIVES

Alternative R1 - Raise WWF Weir/Walls 2'

	Quantity	Unit	Unit Cost	Total Cost
Raise CSO Screens	1	LS	$20,000	$20,000
CSO Screening Scoops	1	LS	$80,000	$80,000
WWF Structural Modifications	1	LS	$65,000	$65,000
Misc Metals	1	LS	$35,000	$35,000
Miscellaneous Construction (5%)	1	LS	$10,000	$10,000
Mob/Demob (5%)	1	LS	$10,000	$10,000
			Subtotal	$220,000
			Contingency (20%)	$40,000
			TOTAL Construction	**$260,000**

Alternative R2 - Raise WWF Weir/Walls 15' (Pump Station Required)

	Quantity	Unit	Unit Cost	Total Cost
CSO Screening Scoops	1	LS	$80,000	$80,000
WWF Structural Modifications	1	LS	$310,000	$310,000
Misc Metals	1	LS	$60,000	$60,000
Miscellaneous Construction (5%)	1	LS	$23,000	$23,000
Mob/Demob (5%)	1	LS	$23,000	$23,000
			Subtotal	$500,000
			Contingency (20%)	$100,000
			TOTAL Construction	**$600,000**

WWF PUMP STATION OPTIONS

Alternative PS1 - 3-Pump Station

Pumps - 14,000 gpm each, 200 hp, 30' head

	Quantity	Unit	Unit Cost	Total Cost
New Pump and Motor	3	EA	$300,000	$900,000
VFD's	3	EA	$30,000	$90,000
Piping/Fittings	1	LS	$100,000	$100,000
30-inch Knife Gate Valve, Manual	3	EA	$45,000	$135,000
30-inch Check Valve	3	EA	$33,000	$99,000
Influent Piping Modifications	1	LS	$100,000	$100,000
Structural Concrete	1	LS	$250,000	$250,000
Excavation/Backfill/Earth Retention	1	LS	$200,000	$200,000
Misc Metals	1	LS	$30,000	$30,000
Erosion Control	1	LS	$10,000	$10,000
Site Work	1	LS	$70,000	$70,000
Electrical/I&C	1	LS	$400,000	$400,000
New Generator and ATS	1	LS	$300,000	$300,000
Miscellaneous Construction (5%)	1	LS	$119,000	$119,000
Mob/Demob (5%)	1	LS	$134,000	$134,000
			Contingency (20%)	$590,000
			TOTAL Construction	**$3,500,000**

Alternative PS2 - 4-Pump Station

Pumps: 17-18,000 gpm each, 250 hp, 30' head

	Quantity	Unit	Unit Cost	Total Cost
New Pump and Motor	4	EA	$330,000	$1,320,000
VFD's	4	EA	$35,000	$140,000
Piping/Fittings	1	LS	$150,000	$150,000
30-inch Knife Gate Valve, Manual	4	EA	$45,000	$180,000
30-inch Check Valve	4	EA	$33,000	$132,000
Influent Piping Modifications	1	LS	$100,000	$100,000
Structural Concrete	1	LS	$300,000	$300,000
Excavation/Backfill/Earth Retention	1	LS	$250,000	$250,000
Misc Metals	1	LS	$35,000	$35,000
Erosion Control	1	LS	$10,000	$10,000
Site Work	1	LS	$70,000	$70,000
Electrical/I&C	1	LS	$500,000	$500,000
New Generator and ATS	1	LS	$350,000	$350,000
Miscellaneous Construction (5%)	1	LS	$159,000	$159,000
Mob/Demob (5%)	1	LS	$177,000	$177,000
		Contingency (20%)		$770,000
		TOTAL Construction		**$4,600,000**

Alternative PS3 - 5-Pump Station

Pumps: 18-22,000 gpm each, 300 hp, 30' head

	Quantity	Unit	Unit Cost	Total Cost
New Pump and Motor	5	EA	$370,000	$1,850,000
VFD's	5	EA	$40,000	$200,000
Piping/Fittings	1	LS	$200,000	$200,000
30-inch Knife Gate Valve, Manual	5	EA	$45,000	$225,000
30-inch Check Valve	5	EA	$33,000	$165,000
Influent Piping Modifications	1	LS	$100,000	$100,000
Structural Concrete	1	LS	$380,000	$380,000
Excavation/Backfill/Earth Retention	1	LS	$280,000	$280,000
Misc Metals	1	LS	$40,000	$40,000
Erosion Control	1	LS	$10,000	$10,000
Site Work	1	LS	$70,000	$70,000
Electrical/I&C	1	LS	$600,000	$600,000
New Generator and ATS	1	LS	$400,000	$400,000
Miscellaneous Construction (5%)	1	LS	$206,000	$206,000
Mob/Demob (5%)	1	LS	$226,000	$226,000
		Contingency (20%)		$990,000
		TOTAL Construction		**$5,900,000**

WWF EXPANSION ALTERNATIVES

Alternative 1a - WWF Expansion

2,511,000 gal/150 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 8	1	LS	$7,000,000	$7,000,000
Relocate Disinfection point (7/12)	1	LS	$70,000	$70,000
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (9)	1	LS	$230,000	$230,000
Dewatering Pumps/Valves/Piping (6)	1	LS	$400,000	$400,000
Elect/I&C	1	LS	$330,000	$330,000
Miscellaneous Construction (5%)	1	LS	$420,000	$420,000
Mob/Demob (5%)	1	LS	$420,000	$420,000
			Subtotal	$9,180,000
		Contingency (20%)		$1,840,000
		TOTAL Construction		**$11,000,000**

Alternative 1a - WWF Expansion using Pump Station

2,511,000 gal/150 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS3 Subtotal	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 10	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point	1	LS	$0	$0
Disinfection Equipment Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$50,000	$50,000
Miscellaneous Construction (5%)	1	LS	$440,000	$440,000
Mob/Demob (5%)	1	LS	$440,000	$440,000
			Subtotal	$9,580,000
			Contingency (20%)	$1,920,000
			TOTAL Construction	**$11,500,000**

Alternative 1b - WWF Expansion (Pump Station req'd)

5,751,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 11+ (5,	1	LS	$7,800,000	$7,800,000
Relocate Disinfection point (7/12)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (9)	1	LS	$230,000	$230,000
Dewatering Pumps/Valves/Piping (6)	1	LS	$400,000	$400,000
Elect/I&C	1	LS	$330,000	$330,000
Miscellaneous Construction (5%)	1	LS	$720,000	$720,000
Mob/Demob (5%)	1	LS	$720,000	$720,000
			Subtotal	$15,770,000
			Contingency (20%)	$3,150,000
			TOTAL Construction	**$18,900,000**

Alternative 2a - WWF Expansion

1,070,000 gal/ 104 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 4	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point	1	LS	$0	$0
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$30,000	$30,000
Miscellaneous Construction (5%)	1	LS	$170,000	$170,000
Mob/Demob (5%)	1	LS	$170,000	$170,000
			Subtotal	$3,750,000
			Contingency (20%)	$750,000
			TOTAL Construction	**$4,500,000**

Alternative 2b - WWF Expansion

2,905,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Conc/Metals - Option 8+ (2,8	1	LS	$7,300,000	$7,300,000
Relocate Disinfection point (7/12)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (9)	1	LS	$230,000	$230,000
Dewatering Pumps/Valves/Piping (6)	1	LS	$400,000	$400,000
Elect/I&C	1	LS	$330,000	$330,000
Miscellaneous Construction (5%)	1	LS	$430,000	$430,000
Mob/Demob (5%)	1	LS	$430,000	$430,000
			Subtotal	$9,460,000
			Contingency (20%)	$1,890,000
			TOTAL Construction	**$11,400,000**

Alternative 2b - WWF Expansion using Pump Station

2,905,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS2	1	LS	$3,870,000	$3,870,000
Excavation/Conc/Metals - Option 10+ (2,	1	LS	$3,300,000	$3,300,000
Relocate Disinfection point	1	LS	$0	$0
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping??	1	LS	$0	$0
Elect/I&C??	1	LS	$30,000	$30,000
Miscellaneous Construction (5%)	1	LS	$390,000	$390,000
Mob/Demob (5%)	1	LS	$390,000	$390,000
			Subtotal	$8,640,000
			Contingency (20%)	$1,730,000
			TOTAL Construction	**$10,400,000**

Alternative 2c - WWF Expansion

206,000 gal/ 60 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
WWF Mixing Improvements	1	LS	$300,000	$300,000
New effluent flow meter	1	LS	$50,000	$50,000
Miscellaneous Construction (5%)	1	LS	$30,000	$30,000
Mob/Demob (5%)	1	LS	$30,000	$30,000
			Subtotal	$630,000
			Contingency (20%)	$130,000
			TOTAL Construction	**$800,000**

Alternative 2c-2 - WWF Expansion

0 gal/ 0 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$250,000	$250,000
New effluent flow meter	1	LS	$50,000	$50,000
Miscellaneous Construction (5%)	1	LS	$15,000	$15,000
Mob/Demob (5%)	1	LS	$15,000	$15,000
			Subtotal	$330,000
			Contingency (20%)	$70,000
			TOTAL Construction	**$400,000**

Alternative 2d - WWF Expansion

1,267,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 4	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point (4/6)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$50,000	$50,000
Miscellaneous Construction (5%)	1	LS	$180,000	$180,000
Mob/Demob (5%)	1	LS	$180,000	$180,000
			Subtotal	$3,860,000
			Contingency (20%)	$770,000
			TOTAL Construction	**$4,600,000**

Alternative 2d - WWF Expansion using Pump Station

1,267,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS1	1	LS	$2,940,000	$2,940,000
Relocate Disinfection point	1	LS	$0	$0
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates	1	LS	$0	$0
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$20,000	$20,000
Miscellaneous Construction (5%)	1	LS	$180,000	$180,000
Mob/Demob (5%)	1	LS	$180,000	$180,000
			Subtotal	$3,870,000
			Contingency (20%)	$770,000
			TOTAL Construction	**$4,600,000**

Alternative 3a - WWF Expansion

2,174,000 gal/ 130 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 7	1	LS	$5,500,000	$5,500,000
Relocate Disinfection point (4/9)	1	LS	$70,000	$70,000
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (6)	1	LS	$170,000	$170,000
Dewatering Pumps/Valves/Piping (3)	1	LS	$280,000	$280,000
Elect/I&C	1	LS	$230,000	$230,000
Miscellaneous Construction (5%)	1	LS	$330,000	$330,000
Mob/Demob (5%)	1	LS	$330,000	$330,000
			Subtotal	$7,220,000
			Contingency (20%)	$1,440,000
			TOTAL Construction	**$8,700,000**

Alternative 3a - WWF Expansion using Pump Station

2,174,000 gal/ 130 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 10	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point	1	LS	$0	$0
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$70,000	$70,000
Miscellaneous Construction (5%)	1	LS	$440,000	$440,000
Mob/Demob (5%)	1	LS	$440,000	$440,000
			Subtotal	$9,600,000
			Contingency (20%)	$1,920,000
			TOTAL Construction	**$11,500,000**

Alternative 3b - WWF Expansion (Pump Station req'd)

5,100,000 gal/ 160 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 11- (5,3	1	LS	$7,000,000	$7,000,000
Relocate Disinfection point (7/12)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (9)	1	LS	$230,000	$230,000
Dewatering Pumps/Valves/Piping (6)	1	LS	$400,000	$400,000
Elect/I&C	1	LS	$330,000	$330,000
Miscellaneous Construction (5%)	1	LS	$650,000	$650,000
Mob/Demob (5%)	1	LS	$650,000	$650,000
			Subtotal	$14,830,000
			Contingency (20%)	$2,970,000
			TOTAL Construction	**$17,800,000**

Alternative 5a (GI-10%) - WWF Expansion

2,200,000 gal/ 138 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 6	1	LS	$6,000,000	$6,000,000
Relocate Disinfection point (6/10)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (7)	1	LS	$190,000	$190,000
Dewatering Pumps/Valves/Piping (5)	1	LS	$350,000	$350,000
Elect/I&C	1	LS	$280,000	$280,000
Miscellaneous Construction (5%)	1	LS	$360,000	$360,000
Mob/Demob (5%)	1	LS	$360,000	$360,000
			Subtotal	$7,880,000
			Contingency (20%)	$1,580,000
			TOTAL Construction	**$9,500,000**

Alternative 5b (GI-25%) - WWF Expansion

1,700,000 gal/ 106 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 5	1	LS	$5,000,000	$5,000,000
Relocate Disinfection point (5/8)	1	LS	$70,000	$70,000
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (5)	1	LS	$150,000	$150,000
Dewatering Pumps/Valves/Piping (4)	1	LS	$320,000	$320,000
Elect/I&C	1	LS	$250,000	$250,000
Miscellaneous Construction (5%)	1	LS	$310,000	$310,000
Mob/Demob (5%)	1	LS	$310,000	$310,000
			Subtotal	$6,720,000
			Contingency (20%)	$1,340,000
			TOTAL Construction	**$8,100,000**

ALTERNATIVES NOT INCLUDED IN REPORT

Alternatives listed below include a WWTP Expansion (to 38 MGD peak flow) which were evaluated but were not included in the report due to much higher estimated costs

Alternative 1a-2 - WWF Expansion

1,940,800 gal/160 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Excavation/Concrete/Metals - Option 7	1	LS	$5,500,000	$5,500,000
Relocate Disinfection point (4/9)	1	LS	$70,000	$70,000
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (6)	1	LS	$170,000	$170,000
Dewatering Pumps/Valves/Piping (3)	1	LS	$280,000	$280,000
Elect/I&C	1	LS	$230,000	$230,000
Miscellaneous Construction (5%)	1	LS	$330,000	$330,000
Mob/Demob (5%)	1	LS	$330,000	$330,000
			Subtotal	$33,220,000
			Contingency (20%)	$1,440,000
			TOTAL Construction	**$34,700,000**

Alternative 1a-2 - WWF Expansion using Pump Station

1,940,800 gal/160 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 9	1	LS	$2,200,000	$2,200,000
Relocate Disinfection point	1	LS	$0	$0
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (2)	1	LS	$90,000	$90,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$50,000	$50,000
Miscellaneous Construction (5%)	1	LS	$390,000	$390,000
Mob/Demob (5%)	1	LS	$390,000	$390,000
			Subtotal	$34,660,000
			Contingency (20%)	$1,730,000
			TOTAL Construction	**$36,400,000**

Alternative 1b-2 - WWF Expansion (Pump Station req'd)

5,022,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 11- (5,3	1	LS	$7,000,000	$7,000,000
Relocate Disinfection point (7/12)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (9)	1	LS	$230,000	$230,000
Dewatering Pumps/Valves/Piping (6)	1	LS	$400,000	$400,000
Elect/I&C	1	LS	$330,000	$330,000
Miscellaneous Construction (5%)	1	LS	$680,000	$680,000
Mob/Demob (5%)	1	LS	$680,000	$680,000
			Subtotal	$40,890,000
			Contingency (20%)	$2,980,000
			TOTAL Construction	**$43,900,000**

Alternative 2a-2 - WWF Expansion

651,000 gal/ 102 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Excavation/Concrete/Metals - Option 4	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point	1	LS	$0	$0
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$30,000	$30,000
Miscellaneous Construction (5%)	1	LS	$171,000	$171,000
Mob/Demob (5%)	1	LS	$171,000	$171,000
			Subtotal	$29,750,000
			Contingency (20%)	$750,000
			TOTAL Construction	**$30,500,000**

Alternative 2b-2 - WWF Expansion

2,333,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Excavation/Concrete/Metals - Option 6	1	LS	$6,000,000	$6,000,000
Relocate Disinfection point (6/10)	1	LS	$70,000	$70,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (7)	1	LS	$190,000	$190,000
Dewatering Pumps/Valves/Piping (5)	1	LS	$350,000	$350,000
Elect/I&C	1	LS	$280,000	$280,000
Miscellaneous Construction (5%)	1	LS	$360,000	$360,000
Mob/Demob (5%)	1	LS	$360,000	$360,000
			Subtotal	$33,880,000
			Contingency (20%)	$1,580,000
			TOTAL Construction	**$35,500,000**

Alternative 2b-2 - WWF Expansion using Pump Station

2,333,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Alternative PS2	1	LS	$3,870,000	$3,870,000
Excavation/Conc/Metals - Option 9	1	LS	$2,200,000	$2,200,000
Relocate Disinfection point	1	LS	$0	$0
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (2)	1	LS	$90,000	$90,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$30,000	$30,000
Miscellaneous Construction (5%)	1	LS	$340,000	$340,000
Mob/Demob (5%)	1	LS	$340,000	$340,000
			Subtotal	$33,420,000
			Contingency (20%)	$1,480,000
			TOTAL Construction	**$34,900,000**

Alternative 2d-2 - WWF Expansion

806,000 gal/ 0 MGD (10/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
Excavation/Concrete/Metals - Option 12	1	LS	$1,540,000	$1,540,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (1)	1	LS	$70,000	$70,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$40,000	$40,000
Miscellaneous Construction (5%)	1	LS	$100,000	$100,000
Mob/Demob (5%)	1	LS	$100,000	$100,000
			Subtotal	$28,120,000
			Contingency (20%)	$420,000
			TOTAL Construction	**$28,500,000**

Alternative 3-2 - WWF Expansion

1,621,000 gal/ 143 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R1 Subtotal	1	LS	$220,000	$220,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Excavation/Concrete/Metals - Option 5	1	LS	$5,000,000	$5,000,000
Relocate Disinfection point (5/8)	1	LS	$70,000	$70,000
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (5)	1	LS	$150,000	$150,000
Dewatering Pumps/Valves/Piping (4)	1	LS	$320,000	$320,000
Elect/I&C	1	LS	$250,000	$250,000
Miscellaneous Construction (5%)	1	LS	$310,000	$310,000
Mob/Demob (5%)	1	LS	$310,000	$310,000
			Subtotal	$32,720,000
			Contingency (20%)	$1,340,000
			TOTAL Construction	**$34,100,000**

Alternative 3-2 - WWF Expansion using Pump Station

1,621,000 gal/ 143 MGD (1/1 storage)

	Quantity	Unit	Unit Cost	Total Cost
Alternative R2 Subtotal	1	LS	$500,000	$500,000
WWTP Expansion (38 MGD peak)	1	LS	$26,000,000	$26,000,000
Alternative PS3	1	LS	$4,950,000	$4,950,000
Excavation/Conc/Metals - Option 10	1	LS	$3,000,000	$3,000,000
Relocate Disinfection point	1	LS	$0	$0
Disinfection Equip Expansion	1	LS	$40,000	$40,000
New effluent flow meter	1	LS	$50,000	$50,000
Flush gates (3)	1	LS	$110,000	$110,000
Dewatering Pumps/Valves/Piping	1	LS	$0	$0
Elect/I&C	1	LS	$70,000	$70,000
Miscellaneous Construction (5%)	1	LS	$440,000	$440,000
Mob/Demob (5%)	1	LS	$440,000	$440,000
			Subtotal	$35,600,000
			Contingency (20%)	$1,920,000
			TOTAL Construction	**$37,500,000**

- **- END -**

WESSLER
ENGINEERING

More than a Project™

6219 South East Street
Indianapolis, IN 46227

P (317) 788-4551
F (317) 788-4553

WesslerEngineering.com
Project #138910.01.001