Green City, Clean Waters

Outlying Communities Report

Consent Order & Agreement

Regulatory Deliverable

City of Philadelphia Combined Sewer Overflow Long Term Control Plan Update

Submitted to
The Commonwealth of Pennsylvania
Department of Environmental Protection

By The Philadelphia Water Department
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Glossary of Acronyms

ADDWF	Average daily dry weather flow
ASCE	American Society of Civil Engineers
ASOS	Automated Surface Observing System
BWWF	Base wastewater flow
CAD	Calibrated average difference
CAP	Corrective action plan
CAPIT	Capital Program Integrated Tracking System
CCTV	Closed Circuit Television
CD	Compact disk
CDF	Cumulative distribution function
CDP	Cumulative distribution plot
CMP	Connection management plan
COA	Consent Order Agreement
CSO	Combined Sewer Overflow
DBMS	Database management system
DWF	Dry weather flow
FOG	Fat/oil/grease
GARR	Gage adjusted radar rainfall
GIS	Geographic information system
gpad	Gallons per-acre per day
gpcd	Gallons per-capita per day
GWI	Groundwater infiltration
H&H	Hydraulic and hydrologic
I/I	Inflow and infiltration
IDF	Intensity-duration-frequency
IT	Information Technology
LTCPU	Long Term Control Plan Update
mgd	Million gallons per day
MIT	Minimum inter-event time
NCDC	National Climactic Data Center
NEXRAD	Next Generation Weather Radar
NWS	National Weather Service
ODBC	Open database connection
PADEP	Pennsylvania Department of Environmental Protection
PHL	Philadelphia International Airport
QA	Quality assurance
QA/QC	Quality assurance / quality control
QC	Quality controlled

RDII	Rainfall dependent infiltration and inflow
RTU	Real-time control unit
SSES	Sewer System Evaluation Survey
SSOAP	Sanitary Sewer Overflow Analysis Program
SSS	Sanitary Sewer System
SWMM	Storm Water Management Model
US EPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WEF	Water Environment Federation
WWF	Wet weather flow

1.0 Introduction

This Outlying Communities Report describes the activities conducted by the Philadelphia Water Department (Water Department) to analyze, quantify and characterize the dry weather and wet weather flows conveyed from outlying community points of connection to the City's combined and separate sewer systems. The Outlying Communities Report is a requirement of the Water Department's Consent Order and Agreement (COA), and this submission is intended to meet that reporting requirement.

On June 1, 2011, the Commonwealth of Pennsylvania approved the City of Philadelphia's CSO Long Term Control Plan Update (LTCPU) and issued the COA to provide the regulatory framework for the implementation of the plan. The approved LTCPU and its supplements are called the *Green City, Clean Waters* program and represent the City's commitments towards meeting CSO control regulatory obligations, while helping to revitalize the City.

The Outlying Communities Report is a continuation of the Sanitary Sewer Evaluation Survey (SSES) activities required by the COA. As required by the COA, two reports are to be prepared and submitted to the Pennsylvania Department of Environmental Protection (PADEP) as part of the SSES. By June 1, 2014, the Water Department was to submit a report documenting the completed Phase 1 scope of work and the Phase 2 activities for the separate sanitary sewershed areas located within the City limits. This requirement was met as the *Green City, Clean Waters Sewer System Evaluation Survey* was submitted to PADEP on June 1, 2014. By June 1, 2015, the Water Department is to submit an Outlying Communities Report documenting the completed Phase 2 work for the separate sanitary sewershed areas of satellite municipalities that contribute wastewater flow to the Water Department collection system. This report is intended to fulfill that second reporting requirement.

1.1 Background Information

There are 10 municipal entities currently that convey separate sanitary flows to the Philadelphia Water Department sewer system through designated points of connection between the City and community collection systems. Service agreements have been established between the City of Philadelphia and these outlying communities.

1.2 Approach for the Outlying Communities Report

The development of the approach for this Outlying Communities Report, and previously submitted SSES report, was derived in-part from the American Society of Civil Engineers (ASCE) and the Water Environment Federation (WEF) Manual of Practice FD-6, "Existing Sewer Evaluation and Rehabilitation". The first phase, the problem identification phase, was intended to identify available historical data, assess the reliability, decide if additional data are needed, and determine how this additional data would be collected. This first phase involved the cataloging and evaluation of existing historical data that are critical to successfully and efficiently performing the SSES.

The second phase of the SSES, the analytical study phase, involved using reliable data for performing global analyses and evaluations of sanitary sewer systems during dry and wet weather conditions. A primary part of the evaluation involved analysis of monitored precipitation and sewer flow data to quantify and characterize dry weather flow and rainfall dependent infiltration and inflow (RDII).

The results of these analyses for the sanitary sewered areas within the City were summarized and presented in the *Green City, Clean Waters Sewer System Evaluation Survey* which was submitted on June 1, 2014. The analyses and results for monitored tributary areas outside the City are summarized and presented in this report, the *Green City, Clean Waters Outlying Communities Report*.

1.3 Overview of Report Contents

This Outlying Communities Report is organized into five sections and three appendices that are described briefly below.

Section 1 provides an overview of the report, including descriptions of the regulatory context behind the document, the scope of work and required elements, a brief explanation of the Water Department's approach for meeting the regulatory and reporting requirements, and potential future efforts after the submission of this document.

Section 2 documents the completed Phase 1 activities for the outlying community service areas. Note that the completed Phase 1 activities for both the City and outlying community areas were included in the *Green City, Clean Waters Sewer System Evaluation Survey*. The following categories of pertinent available data are re-iterated for the outlying community areas in this report.

- Sanitary sewer flow monitoring data collected from outlying community service area billing meters
- Regional precipitation monitoring data providing coverage for the City and outlying community service areas
- Sanitary sewer system data and geographic information system (GIS) coverage from the outlying communities
- Other pertinent data categories such as demographic, topographic, population and land use data for outlying community service areas

Section 3 provides summary documentation for the analytical and assessment approaches used to conduct the Phase 2 activities for the outlying community service areas. The narrative explains how sewershed delineations and sewershed precipitation were refined and verified from the available historical data. The associated quality assurance review procedures that were conducted for the monitored precipitation and wastewater flow data are also documented. The section concludes with descriptions of the analysis methods, tools, and procedures that were used to quantify and characterize dry and wet weather flow conveyed from the monitored outlying community areas.

Section 4 provides a summary of the Phase 2 analysis results and conclusions for the outlying community service areas. Analysis results from the precipitation gage and radar-rainfall system monitoring data analyses are provided. Dry weather analysis results are presented using a series of summary tables, cumulative distribution functions (CDFs), and color coded GIS maps. Similarly, wet weather analysis results for each of the analyzed outlying community sewershed areas are provided.

Section 5 describes actions taken to date and potential future efforts to identify needs to reduce outlying community wet weather flows that may have a significant influence on the City's CSO discharge volumes.

The three appendices provide more detailed information and results for the various analyses that were conducted. Appendix A provides the results of the long-term regional precipitation characterization analysis as a series of plots comparing historical average monthly precipitation volumes and event frequencies to those observed during the period coinciding with the outlying community flow monitoring activities. Appendix B provides more detailed information on the dry weather flow analysis results; including average weekday and weekend dry weather flow hydrographs and ground water infiltration ratios. Finally, Appendix C provides a series of spreadsheets that documents the wet weather flow analysis results, including the RDII quantification for each successfully monitored storm. All three appendices are provided in digital format on the enclosed Compact Disc (CD) found in the back of the report.

2.0 Summary of Available Historical Data from Phase 1 Activities

This section describes and documents the Sewer System Evaluation Survey (SSES) Phase 1 activities that were completed for the satellite separate sanitary sewer collection systems outside the City. The Phase 1 scope of work included the processes of identifying and gathering the available historical data and assessing its reliability. Subsequently, the data was assessed to verify that the collected data was sufficiently complete and up to date to quantify and characterize dry and wet weather flow from the separate sanitary sewershed areas within the outlying communities. Finally a determination was made if additional data would be needed, and if so, how this data would be collected.

It is important to note for context, that the completed Phase 1 SSES activities for both the City and outlying community areas were previously presented in the *Green City, Clean Waters Sewer System Evaluation Survey,* which was submitted on June 1, 2014. This report submission focuses the documentation on the outlying community sewershed areas.

2.1 Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Billing Meters

The Water Department maintains a network of continuously recording sanitary sewer flow meters at major points of connection from outlying communities contributing sanitary sewer flows to the City wastewater collection system. These meters are used to quantify the flow contributions to the City sewer system from outlying customer communities for purposes of sewer service billing and evaluating compliance with contractual flow limits. There are two categories of these "billing meter" sites: permanent and portable. For the permanent billing meter sites, the monitoring equipment is installed within permanent monitoring structures, and with some exceptions, the sites generally monitor flow from larger outlying community sewershed areas with larger service populations. For the portable monitoring sites, also known as standardized monitoring sites, the equipment is installed on a temporary basis within ordinary sewer manholes and, with some exceptions, these sites generally monitor flow from smaller sewershed areas with smaller service populations. The City generally deploys the portable flow meters for approximately three month periods, rotating through the sites once every two to three years to identify changes in flow quantities and update standardized billing rates if needed.

While primarily established for quantifying wastewater flow contributions from outlying communities for sewer service billing purposes and evaluating contractual flow limits, the data from these monitors can be analyzed and used for characterization of tributary sewershed areas, estimating average dry weather and peak wet weather flows, base wastewater flow (BWWF), groundwater infiltration (GWI), and rainfall dependent infiltration and inflow (RDII).

The range of completed activities conducted for the outlying communities Phase 1 activities included a review of the historical and current sanitary sewer flow monitoring data collected at each of the billing meter locations. The existing data were identified and evaluated to assess data availability, as the Phase 1 inventory investigations identified available flow data from 2004 to the present. For the outlying communities Phase 2 analyses, it was decided to use the more recent monitoring data from 2007 through June 2014, where the Water Department has collected data at 51 billing meter locations. Thirty five of these locations are permanent monitoring sites, while the remaining 16 sites are portable. Table 2-1 provides a list of the permanent sanitary sewer flow monitors used in the analysis, while Table 2-2 provides a list of portable sanitary sewer flow monitors used in the analysis. These tables include the names of the monitoring sites and the associated contractual community, the pipe diameter, the tributary drainage area, and the tributary population, land use statistics, the dates monitoring started and ended, and the monitoring duration.

In order to process the flow data collected in the field, the data were converted to text files that were loaded into a series of spreadsheets. These spreadsheet data files were then compiled with all applicable field documentation necessary to assess the accuracy and reliability of the data. Finally, in preparation for the quality assurance / quality control (QA/QC) process, both the data and supporting documentation were archived by contract community and site name in a folder directory structure. Additional details regarding data management can be found in Section 2.4 (Data Management Approach). Once the current and historical data were compiled, the data then went through a series of established QA/QC protocols in order to determine reliability for use in sewershed characterization and for the estimation of dry and wet weather flows. These QA/QC protocols and procedures are discussed in detail in Section 3.3 (Quality Assurance Reviews for Precipitation and Flow Monitoring Data). Once the collected data were quality-reviewed, the amount of data considered to be of acceptable quality was quantified as a percentage for each monitoring site. This capture percentage for each individual deployment, or the percentage of usable data meeting quality assurance standards, can be found in Tables 2-1 and 2-2. Table 2-3 summarizes the percentage of acceptable quality data collected by both the permanent and portable meters.

Table 2-4 lists the permanent and portable monitoring sites with significant periods of unreliable data. The table also provides a short description of the quality concerns of the data collected. There was one site, MBE_13 in Bensalem Township, where the data quality was determined to be unacceptable for the entire monitoring duration. There were two portable billing meter areas identified in the table where the data quality was determined to be unacceptable for an individual equipment deployment period. Fortunately, each of these monitoring sites had two successful monitoring deployments were the data quality was acceptable for sewershed characterization.

Figure 2-1 is an overview map of the entire Philadelphia Water Department service area, showing the locations of the outlying community billing meters. The individual metering chambers or manholes where the monitoring was conducted are represented by blue circles. The tributary drainage areas are depicted by the blue shading. Figures 2-2 through 2-4 display the coverage provided by the flow monitoring sites at a greater level of detail in the northeast, northwest and southwest areas of the City, respectively.

The Phase 1 inventories, QA/QC reviews, and data assessments were successfully completed for the wastewater flow monitoring data collected from the network of permanent and portable flow meters at the points of connection from outlying community sewershed areas. By completing these Phase 1 activities, the Water Department was able to confirm that the historical data have adequate geographical coverage and monitoring duration, are suitably current, and are sufficiently reliable to meet the needs and requirements of the SSES phase 2 analyses. It is important to note that the monitored data may not always reflect the total flow generated from the outlying community sewershed areas, as it would not include any flows lost from possible SSO discharges upstream of the billing meter locations within the municipal collection systems.

Table 2-1: Summary of Available Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Areas (Permanent Meters)

Monitoring Site	Contract Community	Pipe Size (inches)	Tributary Drainage Area (acres)	Tributary Service Population	Tributary Drainage Area Land Use [1]					Available Flow Monitoring Data			
					Industrial and Commercial	Recreational	Residential	Roads and Utilities	Undeveloped	Data Start	Data End[2]	Duration (months)	Data Capture Percentage[3]
MA_2	Abington Township	10	3,161	10,222	8%	4%	71%	0%	17%	4/1/12	6/30/14	27.0	97%
MBE_1	Bensalem Township	12	241	879	39%	0%	49%	6%	7%	4/1/12	6/30/14	27.0	97%
MBE_2	Bensalem Township	10	212	1,894	16%	0%	77%	3%	4%	4/1/12	6/30/14	27.0	89%
MBE_3	Bensalem Township	12	90	554	30%	2%	68%	0%	1%	3/15/14	6/30/14	3.5	73%
MBE_3	Bensalem Township	12	90	554	30%	2%	68%	0%	1%	1/1/12	8/26/12	7.8	28%
MBE_3	Bensalem Township	12	90	554	30%	2%	68%	0%	1%	2/24/10	12/31/10	10.2	78%
MBE_4	Bensalem Township	12	193	1,377	38%	1%	51%	1%	10%	4/1/12	6/30/14	27.0	83%
MBE_5	Bensalem Township	24	1,024	2,563	63%	5%	24%	2%	7%	4/1/12	6/30/14	27.0	92%
MBE_6	Bensalem Township	16	742	4,567	24%	2%	71%	1%	2%	4/1/12	6/30/14	27.0	99%
MBE_7	Bensalem Township	12	204	2,110	15%	1%	78%	1%	6%	4/1/12	6/30/14	27.0	94%
MBE_8	Bensalem Township	12	230	1,318	39%	9%	45%	2%	6%	4/26/14	6/30/14	2.1	78%
MBE_8	Bensalem Township	12	230	1,318	39%	9%	45%	2%	6%	1/1/10	12/31/10	12.0	76%
MBE_9	Bensalem Township	10	290	2,023	49%	4%	18%	11%	18%	4/5/14	6/30/14	2.8	0%
MBE_9	Bensalem Township	10	290	2,023	49%	4%	18%	11%	18%	2/14/13	5/17/13	3.0	100%
MBE_9	Bensalem Township	10	290	2,023	49%	4%	18%	11%	18%	1/1/10	12/31/10	12.0	82%
MBE_10	Bensalem Township	12	37	272	9%	0%	90%	0%	2%	4/1/12	6/30/14	27.0	54%
MBE_11	Bensalem Township	8	71	0	97%	0%	0%	3%	1%	1/1/10	7/31/10	6.9	94%
MBE_12	Bensalem Township	12	36	1,288	45%	0%	42%	3%	11%	4/1/12	6/30/14	27.0	99%
MBE_13	Bensalem Township	10	17	12	86%	0%	0%	0%	14%	1/1/12	6/30/14	30.0	0%
MBE_14	Bensalem Township	8	15	30	42%	0%	14%	15%	29%	7/1/12	6/30/14	24.0	65%
MBE_15	Bensalem Township	9.5	145	849	49%	4%	39%	5%	4%	1/1/10	12/31/10	12.0	98%

Monitoring Site	Contract Community	Pipe Size (inches)	Tributary Drainage Area (acres)	Tributary Service Population	Tributary Drainage Area Land Use [(1)]					Available Flow Monitoring Data			
					Industrial and Commercial	Recreational	Residential	Roads and Utilities	Undeveloped	Data Start	Data End[(2)]	Duration (months)	Data Capture Percentage[(3)]
MBE_16	Bensalem Township	12	25	904	0%	12%	79%	7%	2%	4/1/12	6/30/14	27.0	42%
MB_1	Bucks County	42	24,992	96,028	14%	6%	44%	4%	33%	1/1/12	6/30/14	30.0	99%
MC_1	Cheltenham Township	16	203	3,533	26%	3%	69%	0%	3%	4/1/12	6/30/14	27.0	100%
MC_2	Cheltenham Township	36	8,444	64,742	17%	6%	67%	2%	9%	4/1/12	11/25/13	19.8	96%
MC_3	Cheltenham Township	10	139	1,208	28%	1%	67%	0%	3%	4/1/12	6/30/14	27.0	99%
MD_1	Delaware County	66	41,340	277,202	15%	6%	59%	3%	18%	4/1/11	6/30/14	39.0	99%
ML_1	Lower Merion Township	24	2,671	15,278	9%	4%	76%	2%	10%	4/1/12	6/30/14	27.0	99%
ML_3	Lower Merion Township	14	618	3,782	11%	6%	79%	2%	2%	4/1/12	6/30/14	27.0	97%
ML_4	Lower Merion Township	24	7,486	26,716	11%	3%	74%	2%	11%	10/1/10	9/30/11	12.0	65%
ML_5	Lower Merion Township	16	1,064	8,883	11%	7%	78%	0%	4%	1/1/12	6/30/14	30.0	98%
ML_6	Lower Merion Township	8	58	420	56%	3%	34%	7%	0%	1/1/12	6/30/14	30.0	93%
ML_7	Lower Merion Township	12	205	373	69%	0%	11%	5%	15%	4/1/12	6/30/14	27.0	98%
MLM_1	Lower Moreland Township	10	448	1,748	18%	0%	76%	0%	5%	1/1/12	6/30/14	30.0	92%
MLM_2	Lower Moreland Township	12	1,797	6,529	14%	4%	74%	1%	7%	1/1/12	6/30/14	30.0	36%
MSH_1	Lower Southampton Township	30	5,132	21,642	16%	3%	71%	1%	8%	1/1/12	6/30/14	30.0	75%
MS_2	Springfield Township	30	2,648	12,155	10%	9%	69%	2%	10%	4/1/12	6/30/14	27.0	78%
MS_3	Springfield Township	20	1,429	6,941	11%	10%	70%	1%	8%	4/1/12	6/30/14	27.0	84%
MS_6	Springfield Township	12	189	1,169	48%	3%	40%	6%	4%	4/1/12	6/30/14	27.0	100%
MUD_1	Upper Darby Township	24	7,668	100,393	16%	9%	67%	2%	6%	1/1/11	6/30/14	42.0	99%

(1) Land Use data courtesy of The Delaware Valley Regional Planning Commission. Data was collected from aerials flown in Spring, 2010. Changes to Land Use occurring after Spring, 2010 are not reflected.

(2) As of June 30, 2014

(3) Data capture percentage is defined as monitored flow data that was deemed to be reasonably reliable after undergoing QA/QC reviews. This percentage reflects the amount of reasonably reliable data that were analyzed within the date ranges listed under the "Data Start" and "Data End" columns.

Table 2-2: Summary of Available Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Areas (Portable Meters)

Monitoring Site	Contract Community	Pipe Size (inches)	Tributary Drainage Area (acres)	Tributary Service Population	Tributary Drainage Area Land Use (1)					Available Flow Monitoring Data				
					Industrial and Commercial	Recreational	Residential	Roads and Utilities	Undeveloped	Data Start	Data End(2)	Duration (months)	Data Capture Percentage(3)	Overall Data Capture Percentage(3)
MA_1	Abington Township	10	32	169	0%	0%	93%	0%	7%	2/13/13	5/16/13	3.0	100%	87%
MA_1	Abington Township	10	32	169	0%	0%	93%	0%	7%	2/6/10	5/7/10	3.0	100%	
MA_1	Abington Township	10	32	169	0%	0%	93%	0%	7%	8/28/07	11/16/07	2.6	60%	
MA_3	Abington Township	12	353	3,456	15%	1%	74%	0%	10%	2/13/13	3/7/14	12.7	98%	99%
MA_3	Abington Township	12	353	3,456	15%	1%	74%	0%	10%	2/6/10	5/7/10	3.0	100%	
MA_3	Abington Township	12	353	3,456	15%	1%	74%	0%	10%	8/29/07	11/17/07	2.6	100%	
MA_4	Abington Township	10	120	432	3%	0%	82%	0%	15%	2/13/13	5/16/13	3.0	100%	100%
MA_4	Abington Township	10	120	432	3%	0%	82%	0%	15%	2/6/10	5/7/10	3.0	100%	
MA_4	Abington Township	10	120	432	3%	0%	82%	0%	15%	8/31/07	11/17/07	2.6	100%	
MBE_17	Bensalem Township	8	27	3	14%	0%	1%	0%	85%	2/11/13	5/16/13	3.1	100%	100%
ML_2	Lower Merion Township	8	55	379	31%	28%	38%	0%	3%	2/13/13	5/17/13	3.1	100%	87%
ML_2	Lower Merion Township	8	55	379	31%	28%	38%	0%	3%	2/6/10	5/31/10	3.7	62%	
ML_2	Lower Merion Township	8	55	379	31%	28%	38%	0%	3%	8/16/07	11/16/07	3.0	100%	
MLM_3	Lower Moreland Township	8	96	344	12%	0%	83%	0%	5%	2/6/10	5/5/10	2.9	100%	92%
MLM_3	Lower Moreland Township	8	96	344	12%	0%	83%	0%	5%	8/17/07	11/17/07	3.0	84%	
MLM_4	Lower Moreland Township	10	22	80	0%	0%	99%	0%	1%	2/13/13	5/17/13	3.1	98%	92%
MLM_4	Lower Moreland Township	10	22	80	0%	0%	99%	0%	1%	2/6/10	5/5/10	2.9	77%	
MLM_4	Lower Moreland Township	10	22	80	0%	0%	99%	0%	1%	8/28/07	11/17/07	2.7	100%	

Monitoring Site	Contract Community	Pipe Size (inches)	Tributary Drainage Area (acres)	Tributary Service Population	Tributary Drainage Area Land Use [1]					Available Flow Monitoring Data				
					Industrial and Commercial	Recreational	Residential	Roads and Utilities	Undeveloped	Data Start	Data End[2]	Duration (months)	Data Capture Percentage[3]	Overall Data Capture Percentage[3]
MLM_5	Lower Moreland Township	8	13	54	0%	2%	98%	0%	0%	2/13/13	5/17/13	3.1	0%	67%
MLM_5	Lower Moreland Township	8	13	54	0%	2%	98%	0%	0%	2/6/10	5/5/10	2.9	100%	
MLM_5	Lower Moreland Township	8	13	54	0%	2%	98%	0%	0%	9/8/07	11/17/07	2.3	100%	
MLM_6	Lower Moreland Township	8	17	79	0%	0%	100%	0%	0%	2/11/13	5/16/13	3.1	100%	100%
MLM_6	Lower Moreland Township	8	17	79	0%	0%	100%	0%	0%	2/6/10	5/5/10	2.9	100%	
MLM_6	Lower Moreland Township	8	17	79	0%	0%	100%	0%	0%	8/28/07	11/17/07	2.7	100%	
MLM_7	Lower Moreland Township	10	23	87	0%	0%	95%	0%	5%	2/13/13	5/16/13	3.0	100%	67%
MLM_7	Lower Moreland Township	10	23	87	0%	0%	95%	0%	5%	2/6/10	5/5/10	2.9	100%	
MLM_7	Lower Moreland Township	10	23	87	0%	0%	95%	0%	5%	8/16/07	11/17/07	3.1	0%	
MSH_2	Lower Southampton Township	8	60	282	0%	0%	98%	0%	2%	2/13/13	5/16/13	3.0	97%	91%
MSH_2	Lower Southampton Township	8	60	282	0%	0%	98%	0%	2%	2/6/10	5/4/10	2.9	76%	
MSH_2	Lower Southampton Township	8	60	282	0%	0%	98%	0%	2%	9/1/07	11/16/07	2.5	100%	
MS_1	Springfield Township	12	77	404	3%	4%	83%	0%	10%	2/11/13	5/16/13	3.1	100%	100%
MS_1	Springfield Township	12	77	404	3%	4%	83%	0%	10%	2/6/10	5/6/10	2.9	100%	
MS_1	Springfield Township	12	77	404	3%	4%	83%	0%	10%	8/16/07	11/17/07	3.1	100%	
MS_4	Springfield Township	12	64	399	6%	0%	94%	0%	0%	2/11/13	5/16/13	3.1	100%	100%
MS_4	Springfield Township	12	64	399	6%	0%	94%	0%	0%	2/6/10	5/25/10	3.6	100%	
MS_4	Springfield Township	12	64	399	6%	0%	94%	0%	0%	8/31/07	11/17/07	2.6	100%	
MS_5	Springfield Township	8	69	410	0%	1%	99%	0%	0%	2/15/13	5/15/13	2.9	100%	89%
MS_5	Springfield Township	8	69	410	0%	1%	99%	0%	0%	2/6/10	5/6/10	2.9	100%	
MS_5	Springfield Township	8	69	410	0%	1%	99%	0%	0%	8/17/07	11/17/07	3.0	68%	

Monitoring Site	Contract Community	Pipe Size (inches)	Tributary Drainage Area (acres)	Tributary Service Population	Tributary Drainage Area Land Use [1]					Available Flow Monitoring Data				
					Industrial and Commercial	Recreational	Residential	Roads and Utilities	Undeveloped	Data Start	Data End[2]	Duration (months)	Data Capture Percentage[3]	Overall Data Capture Percentage[3]
MS_7	Springfield Township	12	13	110	0%	0%	100%	0%	0%	2/16/13	5/16/13	2.9	100%	89%
MS_7	Springfield Township	12	13	110	0%	0%	100%	0%	0%	2/6/10	5/7/10	3.0	82%	
MS_7	Springfield Township	12	13	110	0%	0%	100%	0%	0%	8/29/07	11/17/07	2.6	85%	
MS_8	Springfield Township	10	5	11	95%	0%	5%	0%	0%	2/14/13	5/16/13	3.0	100%	100%
MS_8	Springfield Township	10	5	11	95%	0%	5%	0%	0%	2/6/10	5/7/10	3.0	100%	
MS_8	Springfield Township	10	5	11	95%	0%	5%	0%	0%	10/27/07	11/16/07	0.7	100%	

(1) Land Use data courtesy of The Delaware Valley Regional Planning Commission. Data was collected from aerials flown in spring, 2010. Changes to Land Use occurring after spring, 2010 are not reflected.

(2) As of June 30, 2014

(3) Data capture percentage is defined as monitored flow data that was deemed to be reasonably reliable after undergoing QA/QC reviews. This percentage reflects the amount of reasonably reliable data that were analyzed within the date ranges listed under the "Data Start" and "Data End" columns.

Table 2-3: Summary of Acceptable Quality Data Collected

Percentage of Acceptable Quality Data	Number of Permanent Meter Sites	Number of Portable Meter Sites
100%	2	6
90% to 99.9%	19	4
50% to 89.9%	10	6
0.1% to 49.9%	3	0
0%	1	0
Total	**33**	**18**

Table 2-4: Sanitary Sewer Flow Monitoring Locations with Significant Periods of Unusable Data

Monitoring Site	Contract Community	Meter Type	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End	Duration (months)	Data Capture Percentage	Comments
MBE_9	Bensalem Township	Permanent	290	2,023	4/5/14	6/30/14	2.8	0%	The collected data during 2014 have been determined to be unusable and will not be used for sewershed characterization. The sensor does not appear to be calibrated when comparing metered readings to field measurements. Instead, data collected during the 2010 and 2013 deployments will be used for sewershed characterization.
MBE_13	Bensalem Township	Permanent	17	12	1/1/12	6/30/14	30.0	0%	The collected data have been determined to be unusable and will not be used for sewershed characterization. The level data are very erratic due to the low depths and slow velocities.
MLM_5	Lower Moreland Township	Portable	13	54	2/13/13	5/17/13	3.1	0%	The collected data during 2013 have been determined to be unusable and will not be used for sewershed characterization. The velocity data are very erratic throughout the monitoring period. Instead, data collected during 2007 and 2010 deployments will be used for sewershed characterization.
MLM_7	Lower Moreland Township	Portable	23	87	8/16/07	11/17/07	3.1	0%	The 2007 data collected at this site have been determined to be unusable and will not be used for sewershed characterization. The level data are very erratic due to the low depths and slow velocities. The level data also appears to drift throughout the monitoring period. Data collected during 2010 and 2013 deployments will be used for sewershed characterization.

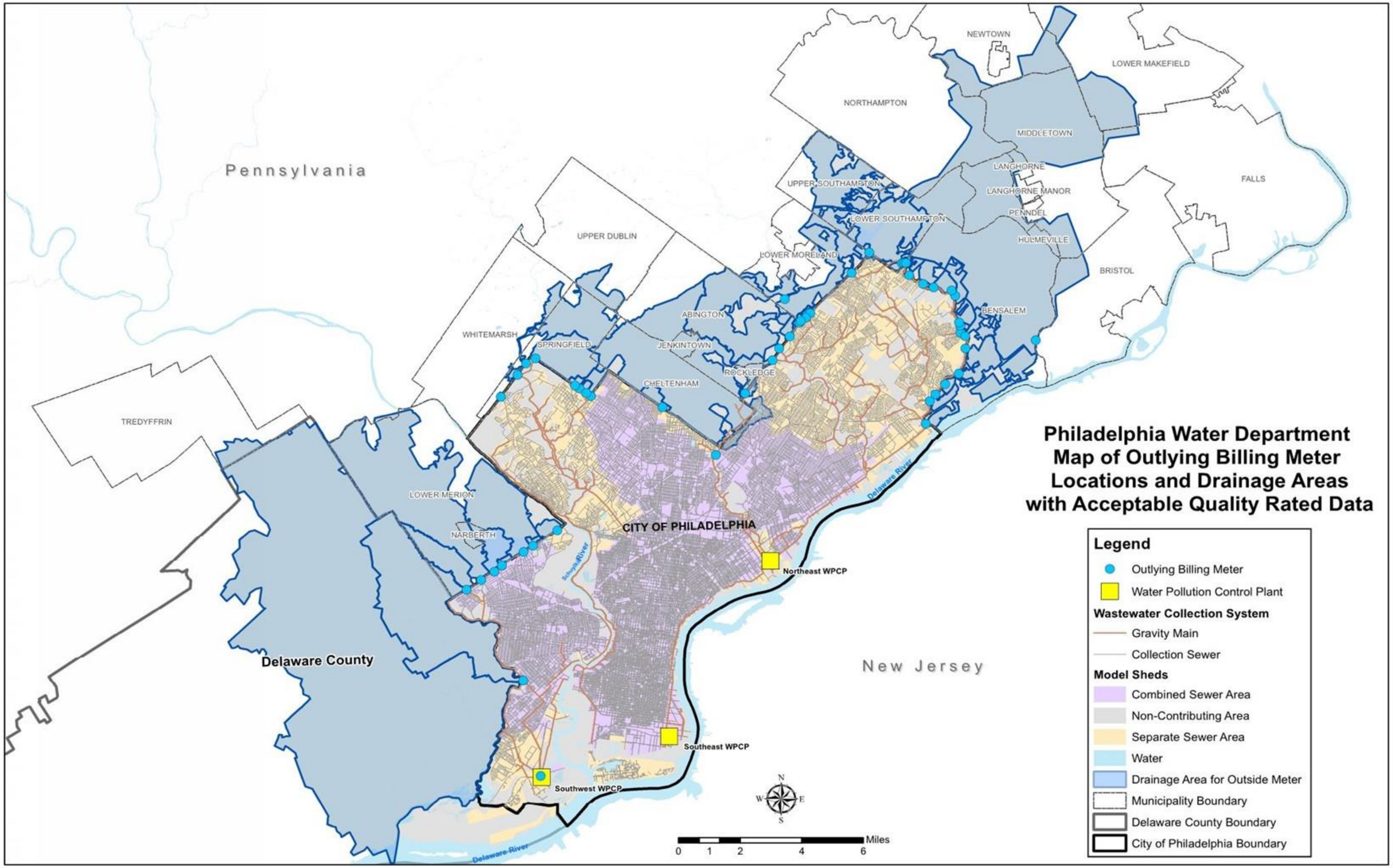


Figure 2-1: Map of the Outlying Community Billing Meter Locations and Tributary Drainage Areas with Acceptable Quality Rated Data (Entire Service Area)

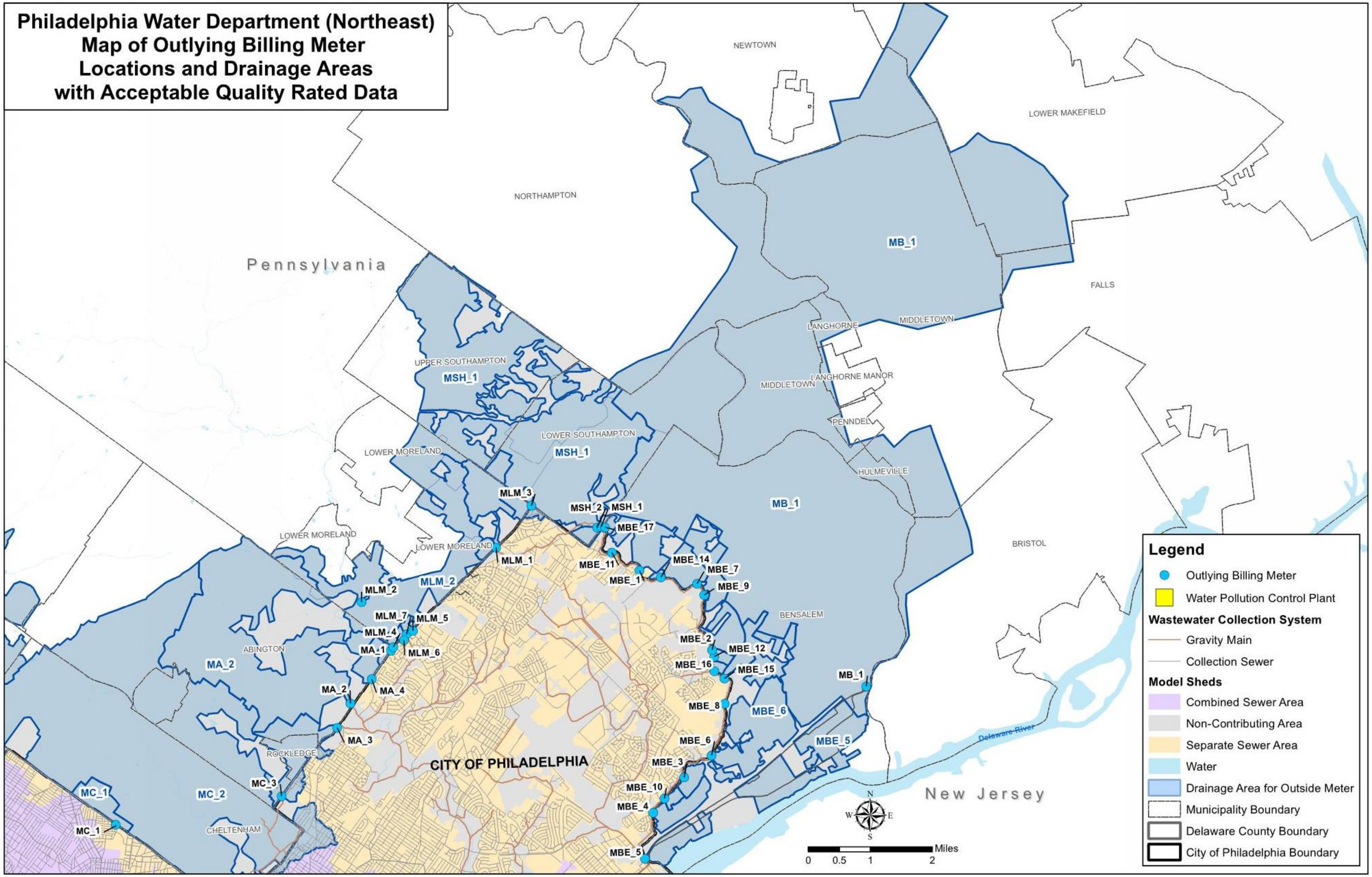


Figure 2-2: Map of the Outlying Community Billing Meter Locations and Tributary Drainage Areas with Acceptable Quality Rated Data (Northeast Area)

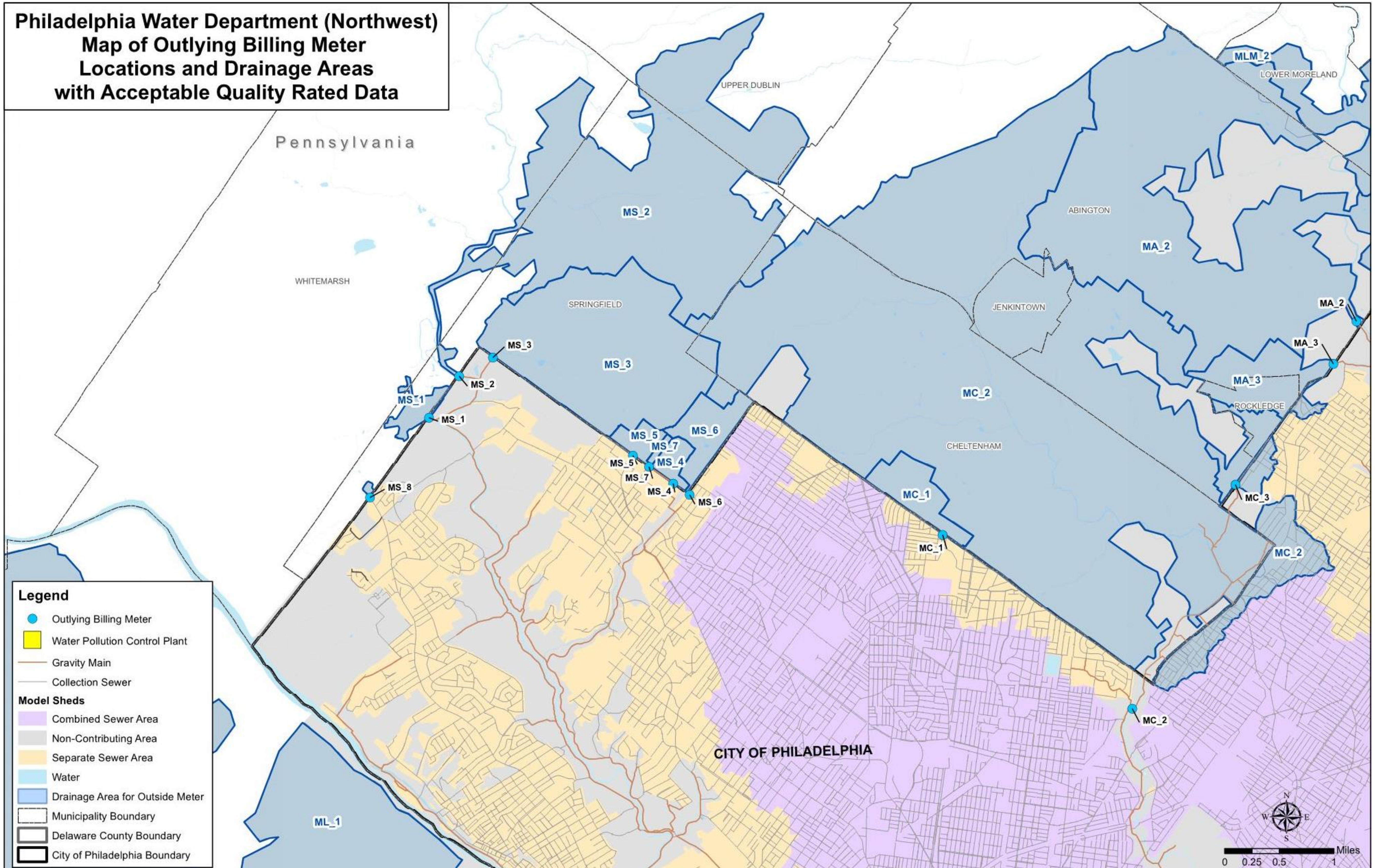


Figure 2-3: Map of the Outlying Community Billing Meter Locations and Tributary Drainage Areas with Acceptable Quality Rated Data (Northwest Area)

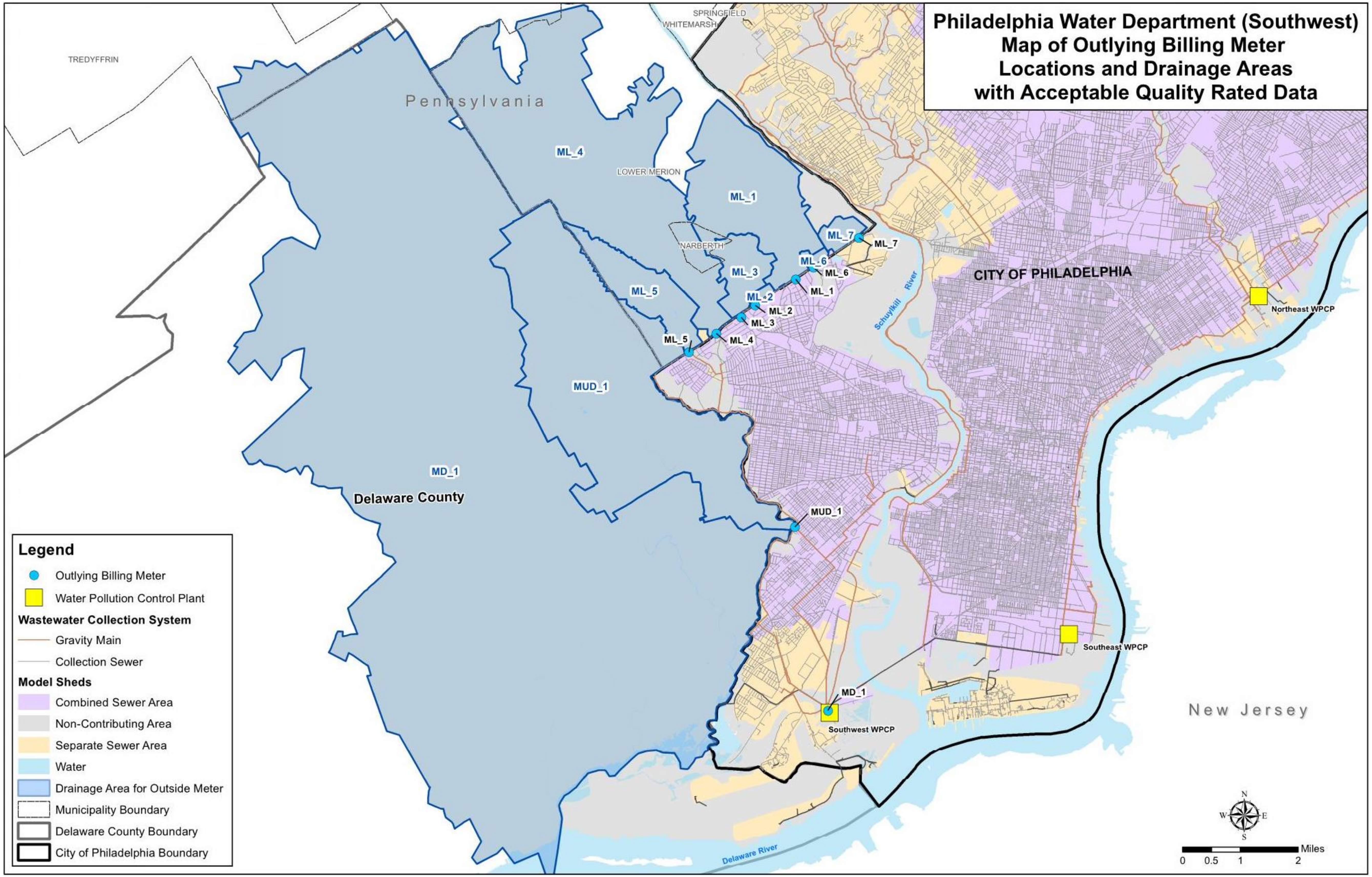


Figure 2-4: Map of the Outlying Community Billing Meter Locations and Tributary Drainage Areas with Acceptable Quality Rated Data (Southwest Area)

2.2 Collected Precipitation Data

Phase 1 SSES activities for the outlying community areas included a review and assessment of the available historic precipitation data. Precipitation data are a fundamental component of the Water Department's Sanitary Sewer System (SSS) monitoring program. Accurate and representative precipitation data has been, and will continue to be, used in conjunction with the SSS flow monitoring data to conduct sewershed characterization analyses and to validate the regional hydrologic and hydraulic (H&H) models developed and maintained by the Water Department.

In conjunction with the Phase 1 monitoring activities the Water Department has implemented, there are four primary sources of precipitation data used in the SSES.

- The Philadelphia International Airport (PHL) rain gage
- The Water Department's rain gage network
- Gage adjusted radar rainfall system (GARR)
- Area-weighted, sewershed specific precipitation data

The availability of the four categories of precipitation data are detailed in Table 2-5 below. The remainder of this section will focus on the first three sources of data. The area-weighted sewershed specific precipitation data is briefly discussed here; however, it is discussed in detail in Section 3.2 (Refinement and Verification of Sewershed Precipitation) of this report. Section 3.2 will describe how this source of precipitation data is derived and also how it is used in conjunction with the United States Environmental Protection Agency's Sanitary Sewer Overflow Analysis and Planning (SSOAP) toolbox to perform subsequent sewershed characterization analyses.

Table 2-5: Precipitation Data Utilized in the SSES

Precipitation Data Source	Data Start	Data End	Primary Use
PHL Rain Gage	1940	Present	Establishing long-term precipitation characteristics over the Water Department service area
Water Department Rain Gage Network	1990	Present	Generation of Calibrated Radar Rainfall with a 1 km by 1 km pixel resolution
Calibrated Radar Rainfall System	2007	Present	Flow data QA/QC for post April 2007 flow data
Sewershed Specific Data	2007	Present	Sewershed characterization for post April 2007 flow data

2.2.1 The Philadelphia International Airport Rain Gage

One source of precipitation data used in the SSES was the PHL rain gage. The data gathered from this gage was used to establish long-term precipitation characteristics over the Water Department service area. Data from this gage were available from 1940 through the present. While this gage provides a long-term record, it does not account for the spatial distribution of rainfall over the service area. Section 4.1 (Precipitation Data Analysis Results) further discusses these long-term characteristics and how they were derived.

2.2.2 The Water Department's Rain Gage Network

The Water Department currently maintains a rain gage network consisting of 35 tipping bucket rain gages located throughout the City and outlying communities that record rainfall depths (minimum recorded depth of 0.01 inches) in 2.5-minute increments. During 2013, the Water Department expanded their gage network from 24 gages to 35 gages. The raw 2.5-minute tipping bucket rain gage data was extracted from a link to the Water Department's real-time control unit (RTU) database which collects data directly via automatic telephone polling of the gages. The Water Department's raw 2.5-minute data were then summed to fixed 15-minute intervals. The locations of the 35 Water Department rain gages are presented in Figure 2-5.

2.2.3 Gage Adjusted Radar Rainfall Measurements

Like any rain gage network, the City gage network cannot fully quantify and characterize the spatial variability of precipitation volumes and patterns that occur between the gage sites. To better characterize the spatial variability of rainfall, the Water Department obtained a higher resolution, spatially distributed set of rainfall data to be used along with the existing rain gage network. A professional services contractor, specializing in providing radar rainfall data, generated gage adjusted radar rainfall (GARR) data with a 1 km by 1 km pixel resolution in 15 minute reporting increments covering the Water Department's service area for the period of April 2007 through the present. This high-resolution, spatially distributed precipitation data were acquired for the SSS flow monitoring program and the calibration of H&H models as part of the Phase 1 and Phase 2 SSES activities.

In order to produce quality controlled GARR over the Water Department service area, the radar rainfall provider utilizes the National Weather Service's (NWS) Next Generation Weather Radar (NEXRAD). The NEXRAD program generates products used for estimating spatially variable rainfall data. The Water Department's rain gage data, along with neighboring United States Geological Survey (USGS) and NWS rain gages, are used to calibrate NEXRAD data to create a detailed and accurate rainfall record that preserves the total rainfall volume reported at the gages while incorporating the spatial variability provided by the NEXRAD data. In the production of GARR, radar rainfall is bias corrected through comparison with rain gage accumulations. Due to the large extent of the GARR grid, a local bias adjustment method is used to adjust the radar rainfall using the ratio of gage to radar accumulations from surrounding gages with the closest gage having the most weight. The local bias approach distributes the variation of bias over the region, and is computed and applied to the data.

Precipitation data from as many as 51 gages were used to adjust the radar. The City of Philadelphia provided data for 35 Water Department rain gages. In addition, rain gage data were obtained from ten USGS stations and six NWS Automated Surface Observing System (ASOS) stations. The City also provided GIS files showing the geographic extent of the system, which determined the coverage extent of the 1 km by 1 km pixel domain. Figure 2-5 depicts the spatial distribution of the GARR network along with locations of the 35 Water Department rain gages. Note that USGS and NWS rain gages used for producing the GARR are located outside the bounds of the GARR grid.

2.2.4 Area-Weighted Sewershed Specific Precipitation Data

After acquiring the calibrated radar rainfall data, the Water Department then applied this data to the specific sewershed areas tributary to each of the individual flow monitoring locations. This was done by intersecting the delineated tributary drainage areas (described in Section 3.1 - Refinement and Verification of Sewershed Delineations and Information) for each flow monitor with the 1 km by 1 km pixel grid, and calculating area-weighted precipitation data for each tributary drainage area. By doing this, a precipitation data set unique to each flow monitor's tributary drainage area was produced. More information regarding this process is found in Section 3.2 (Refinement and Verification of Sewershed Precipitation) of this report.

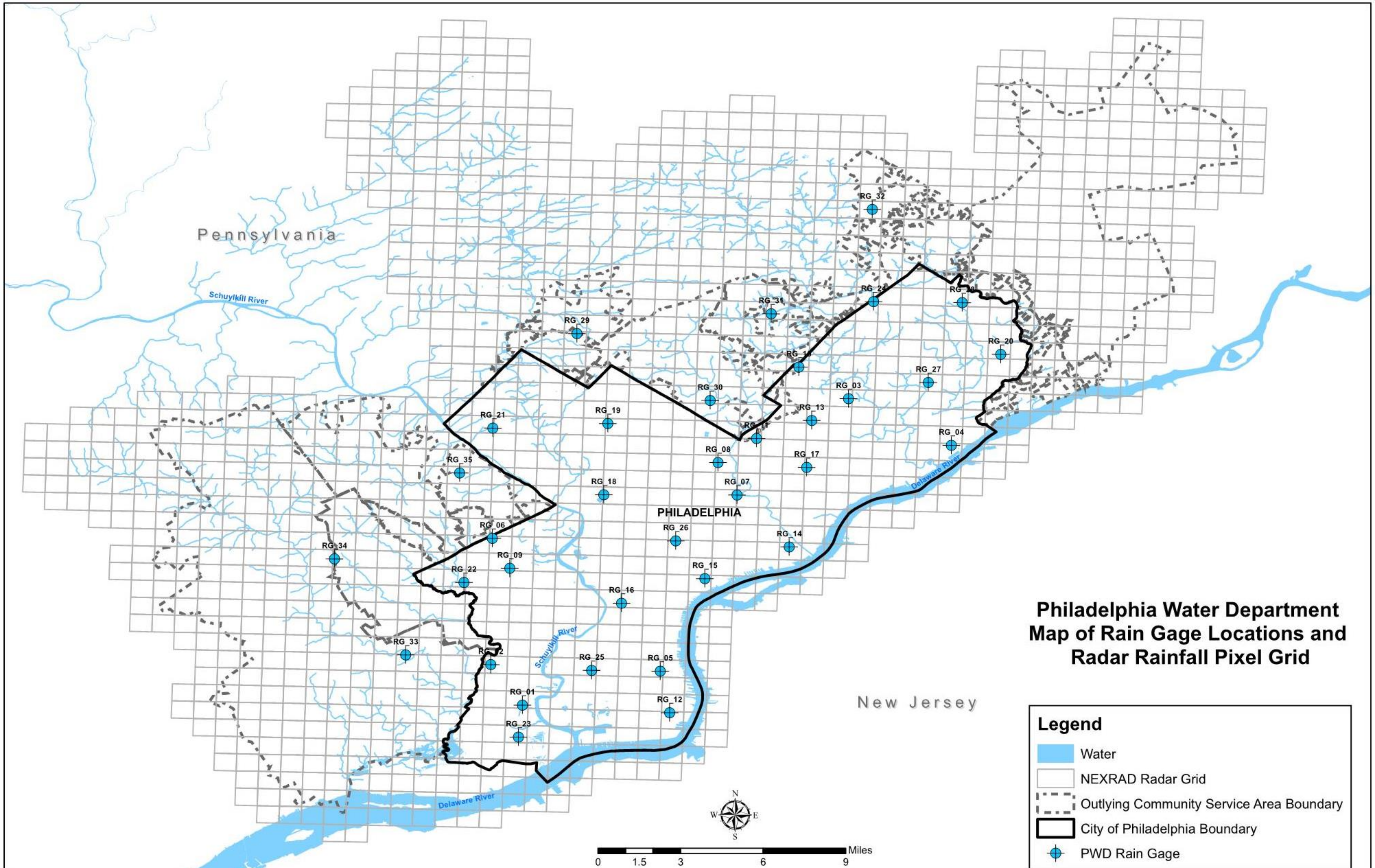


Figure 2-5: The Philadelphia Water Department Rain Gage Network Locations and 1x1 km Radar Rainfall Pixel Grid

2.2.5 Precipitation Data in the Flow Monitoring QA/QC Process

In order to assess and ensure the quality of the collected wastewater flow monitoring data, the precipitation data were used by the data analysts in the quality assurance and quality control (QA/QC) process. During the QA/QC process, precipitation data were superimposed onto time-series plots in order to correlate the observed rainfall to the sanitary sewer responses. This also aided in confirming that increases in level, velocity, and corresponding flow rates throughout the monitoring period were attributed to precipitation events and not spurious discharges or errant data. Data from either the nearest network gage or the calibrated radar-rainfall network (if available) were used as an acceptable source of precipitation data. Figure 2-6 illustrates an example time-series plot with precipitation data superimposed. Additional information about these plots and the flow data QA/QC process is can be found in Section 3.3 (Quality Assurance Reviews for Precipitation and Flow Monitoring Data).

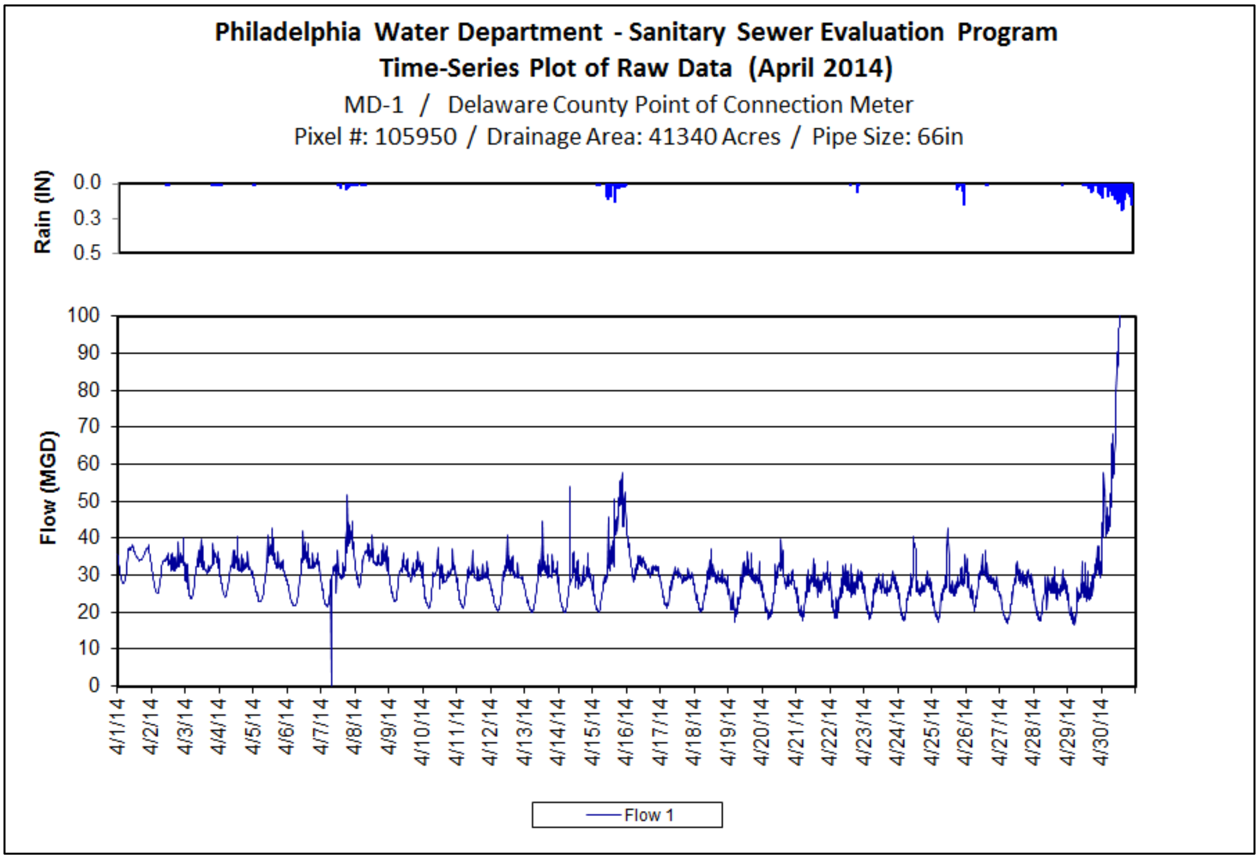


Figure 2-6: Example Time-Series Plot with Precipitation Data Superimposed

The completed Phase 1 activities for the Outlying Communities Report confirmed that the available historic record for precipitation data was adequate to meet the needs and requirements of the SSES. The long-term record from the PHL gage provided the needed historic context, while the data from the Water Department gage network, coupled with the data from the high-resolution radar-rainfall system, provided the needed spatially distributed data. The archived record data were verified to be adequately accurate, reliable, and up to date to conduct the subsequent Phase 2 analyses, and quantify and characterize precipitation over the Water Department service area. It was further determined that no additional data needed to be collected to meet the needs and requirements of the SSES.

2.3 Sewer System Data and other GIS Coverage for Outlying Community Areas

The Phase 1 SSES activities included a review and evaluation of the historical mapping and drawing information available for the separate sanitary sewers located within the outlying community service areas. These outlying communities are shown on Figures 2-1 through 2-4 in Section 2.1 (Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Billing Meters) of this report. Points of connection between these community systems and the Water Department sewer system were identified and analyzed, and the extent and location of the corresponding tributary areas from the outlying communities were delineated. The existing available data for each customer community were inventoried, cataloged, and evaluated to assess its age, completeness and reliability. The availability and extent of GIS coverage were also investigated. The available information was evaluated for completeness and where gaps and/or inconsistencies were identified, the outlying communities were contacted and the necessary information was obtained.

Sanitary Sewer Maps

The completed SSES Phase 1 assessment confirmed that all of the outlying communities that convey wastewater flow to the Water Department have maps of their separate sanitary sewer collection systems. Some communities also had other archived sewer system plans and drawings. The sewer map information was typically superimposed over street system base maps and provided the locations of manholes and pipes, pipe sizes, direction of flow, and often the invert elevations of junction structures. Each of the outlying communities has a service agreement with the City for the collection and treatment of their sanitary wastes. These service agreements direct the outlying communities to provide the City with mapping of the existing tributary sewer systems as well as updated information if any changes or extensions to the system are made. The completed Phase 1 SSES activities included contacting the outlying communities, verifying the sewer mapping in possession of the Water Department was current, and obtaining any needed updated information.

GIS Databases

Few of the outlying communities were found to have integrated the sewer system information from their maps into GIS databases. Therefore, it was usually the information contained within the sewer maps that was assessed for the Phase 1 SSES to determine the age, completeness and reliability of available outlying community data. The outlying community paper maps, or scanned copies of the sewer maps, were geo-referenced into the PA Southeast State Plane Coordinate System so they could be viewed together and overlaid with other GIS data such as census population information. The resulting GIS database information for the outlying community service areas was subsequently integrated into the Water Department's GIS database.

GIS pipe networks were generally unavailable for outlying community areas, and visual inspections of the rectified map layers along with orthophotographic overlays were performed to determine connectivity and flow direction. This GIS information on the outlying community service areas was applied to available digital orthophotography and census population data, allowing sewershed delineations and corresponding service populations to be generated. This allowed the analysts to trace the network of sewer system pipes upstream from any selected point of interest and check the connectivity of the sewer system. The completed analyses were able to identify specific gaps and inconsistencies within the available community data. The affected outlying communities were subsequently contacted and the needed information was obtained.

After gaps and inconsistencies identified in the Phase 1 assessments were remedied, the completed SSES inventories and assessments confirmed that the existing information collected and archived by the Water Department on the outlying community service areas were sufficiently complete, current, and reliable to meet the requirements of the SSES. They were also sufficient to meet the input data requirements for H&H modeling tools and system characterization, and to support the implementation of the City's *Green City, Clean Waters* program.

Other GIS Coverage

The Phase 1 SSES activities conducted for the Outlying Communities Report included an inventory and review of spatially referenced GIS information that would supplement the collected sanitary sewer infrastructure information, and be useful and relevant to supporting the City's *Green City, Clean Waters* program. This supplemental data was explored both for areas within the City and for the outlying community areas. The existing available data were identified, inventoried and evaluated to assess the age, completeness and reliability. Pertinent data categories that were successfully identified and obtained included the following.

- 2010 census block data
- Land use data
- Orthophotography data
- Street center line data

All the data categories listed above were found to contain useful and relevant information that could supplement the information found within the sanitary sewer maps and the GIS database. Orthophotography and street centerline data were used to support the delineation of sewershed areas tributary to points of connection between outlying community collection systems and the Water Department system. The census block data were used to help derive the service populations associated with the delineated sewershed areas. Land use data were used in the analyses to characterize tributary service areas within the Outlying Communities.

The completed Phase 1 inventories and assessments for the Outlying Communities Report confirmed that other spatially referenced GIS information collected and archived by the Water

Department was relevant and useful in supplementing the collected sanitary sewer system information. The Phase 1 activities were able to verify that the total inventory of the various categories of GIS database information obtained, archived and utilized by the Water Department was sufficiently complete and current. It was also determined the information was reliable to support H&H modeling, the quantification and characterization of dry and wet weather flow, and the identification of any sewershed areas that may convey relatively high inflow and infiltration to the Water Department system.

2.4 Data Management Approach

One important aspect of the Phase 1 SSES activities that supported the preparation of this Outlying Communities Report was the management and organization of the large quantity of data utilized by the Philadelphia Water Department. This section documents the means and methods that were used to manage the data. A proper data management approach is necessary to archive the data in a consistent and organized form. This allows for accurate and efficient reference when looking back through large amounts of data. Over the years, the Water Department has obtained and archived a large volume of data relevant to supporting the City's *Green City, Clean Waters* program. The data were stored with consistent formatting, labeling, and documentation, making the data readily accessible and straightforward for multiple users. The categories of Water Department data that needed to be managed and were pertinent to the SSES include the following.

- Regional and local precipitation data
- Sanitary sewer flow monitoring data
- Geographic Information Systems (GIS) data

In addition to describing the various approaches used to manage these data sets, this section also identifies and describes the various software programs and analysis tools that were used in conducting the Phase 2 analysis activities for the outlying community areas.

2.4.1 Data Management Software and Procedures

The Water Department utilized either a local network drive or Microsoft SQL Server databases in order to store and retrieve data. In this capacity, the data can be stored and retrieved by multiple users across the local system. The data on both systems were backed up on a regular basis by the Water Department's Information Technology (IT) group. Since SQL Server has the ability to allow other software applications to retrieve data stored within it, the Water Department staff used Microsoft Access (MS Access) as an interface with an open database connection (ODBC) to the SQL Server. By doing this, they are able to query selected data from the database as necessary. Currently these servers house the flow monitoring data for the outlying community billing meters and the precipitation data collected by the Water Department's rain gage network. In addition, the SQL Server was also used to store the GIS geo-databases used for this report.

Management of Regional and Local Precipitation Data

The Water Department has acquired several sources of precipitation data used as part of the Phase 2 activities. They are the Philadelphia International Airport (PHL) rain gage data, the Water Department's rain gage network data, the gage adjusted radar rainfall system data, and the area-weighted sewershed precipitation data. These data were previously described in Section 2.2 (Collected Precipitation Data).

The PHL rainfall data were collected from the rain gage located at the Philadelphia International Airport (WBAN ID 13739). The data were in 1 hour increments and were downloaded from the National Climatic Data Center (NCDC) and stored in a database that resides on the Water Department's server. The long-term record data used for the Phase 2 analyses ranged from 1961 through the present.

The Water Department's rain gage data available for this report extended from 1990 through the present. However, the data from 2007 through June 2014 period were sufficient for the Phase 2 analyses. The raw 2.5-minute tipping bucket rain gage data were extracted from a Telog Instruments database using MS Access open database connection (OBDC) links. The raw 2.5-minute data were then imported to MS Excel and summed to fixed 15-minute intervals. Quality assurance and quality control (QA/QC) procedures were performed on this 15 minute data to visually identify and flag any suspect or missing data. The data were then brought back into MS Access where the flagged data were subsequently removed and any gaps filled using an inverse distance weighting procedure that was applied to accepted data from surrounding gages so that a continuous precipitation record was available for each gage location. Copies of the precipitation data were stored and loaded into MS Excel spreadsheets for use during the quality assurance reviews of the wastewater flow monitoring data.

The calibrated radar rainfall system data were available in 15-minute reporting periods from January 2004 through the present. However, the data from January 2007 through June 2014 were sufficient for the Phase 2 analyses. The data were stored in comma separated values (.csv) file format on the local network share drive.

The area-weighted sewershed precipitation data were generated using a GIS based program with the output data in the form of a text (.txt) file and a United States Environmental Protection Agency Storm Water Management Model (SWMM) input (.inp) file.

Management of Sanitary Sewer Flow Monitoring Data

The sanity sewer monitoring data collected for the outlying communities is described in Section 2.1 (Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Billing Meters). Data management began in the field when the technicians maintained field logs of flow monitoring measurements and equipment interrogations. The data from these field logs were then entered into MS Excel spreadsheets for storage.

After physical measurements and corresponding data were collected in the field, the permanent billing meter data is then transmitted wirelessly (using Telog Instruments software) from the meter into MS Access databases for storage. For portable billing meters, the field technicians downloaded the data from the flow meter and uploaded it to their laptops. In preparation for

QA/QC analyses, both the permanent and portable flow meter data were uploaded into quarterly MS Excel files after which they were named and stored in a consistent and logical manner in order to identify the meter's location and the time period the data were collected.

When the MS Excel files were generated, the data were in 15-minute reporting increments and the quarterly site files would contain three months of raw and quality-reviewed data. Within the MS Excel files, there are worksheet tabs labeled as *Flow Data* which contain the raw interrogated data from the portable meters, or the permanent meter data that were previously stored in MS Access databases. These data include the date, time, monitored level(s), monitored velocity and corresponding calculated flow rate(s). In this same worksheet tab the quality-reviewed data were labeled as the corrected level and flow. The quality-reviewed data also have a column that grades the data and communicates what form of data correction was used (if a data correction method was needed for a particular range of data). Rainfall data, obtained from nearby rain gages or the region's calibrated radar rainfall network, were also added to this spreadsheet.

Any field documentation by the field technicians was also stored in each MS Excel file. A worksheet tab labeled *Site Info* contains site specific information such as sewershed name, pipe diameter, meter type, and installation and removal dates. This worksheet also includes any available field data information, such as dates of site visits, documentation of field measurements and adjustments, and documentation of any general observations made by the technicians.

Once these MS Excel files were created and finalized, they were saved on the local network server in a uniform directory so that the data can be accessed in a consistent fashion at any time.

Management of Geographic Information Systems (GIS) Data

Another key set of data used during the Phase 1 and Phase 2 activities was GIS data. As described in Section 2.3 (Sewer System Data and other GIS Coverage for Outlying Community Areas), GIS infrastructure data were stored within geodatabases. By doing this, the GIS databases can be updated on an as-needed basis as revisions to the data or improvements to the sewer system are implemented. Also, by storing the data in a database, Water Department users had one centralized location that housed all the files allowing the data to be more readily and easily maintained. Within the geodatabase there are feature classes which are stored as points, lines, polygons and annotations. Much of the Water Department's GIS data were stored in Esri ArcSDE geodatabases. The allowable size of ArcSDE geodatabases depends on the licensing agreements on SQL Server. With some licensing agreements there is a 4GB limit, but for those operating on an ArcGIS Server enterprise, the database size is unlimited. By using this type of database, users have the ability to extract the data to smaller personal geodatabases or separate shapefiles. These geodatabases are ultimately housed on the local network server for final storage.

2.4.2 Data Analysis Tools

The Water Department utilized several software programs and analysis tools for the outlying communities Phase 2 activities. Below is a listing of these programs and tools. The remainder of this section will describe each one of these and their specific purposes.

- The United States Environmental Protection Agency (US EPA) Sanitary Sewer Overflow Analysis Program (SSOAP) toolbox
- Esri ArcMap Geo-database analysis tools
- Microsoft Access analysis tools
- Microsoft Excel analysis tools
- NetSTORM analysis tool

The USEPA Sanitary Sewer Overflow Analysis Program Toolbox

One of the key tools used by the Water Department to characterize dry and wet weather flow from monitored sanitary sewer flow data was the US EPA SSOAP toolbox. The SSOAP toolbox is a collection of computer software tools used for the quantification of dry and wet weather flow and allow for capacity analysis and condition assessment of sanitary sewer systems. Further details regarding this tool and analysis approach can be found in Section 3.5 (Wet Weather Flow Characterization) of this report.

The SSOAP toolbox also serves as a form of independent data storage. Flow monitoring and precipitation data are uploaded into a proprietary SSOAP database (.sdb) file. This file provides storage capacity while at the same time enabling the toolbox the ability to analyze the uploaded data. It does not use a stand-alone database, instead giving the user the ability to specify the location of each .sdb database. The SSOAP toolbox also offers the user the ability to export the analysis results to either text editor (.txt) or comma separated values (.csv) file formats.

Esri ArcMap Geo-database Analysis Tools

Esri ArcMap software tools were used extensively for both displaying and analyzing geographic information as part of the SSES. The software allowed for the overlaying of orthophotography with sewer system maps in order to facilitate more accurate delineation of tributary drainage areas. A geo-processing tool that performed spatial intersections of two polygon layers was used for drainage area characterization in order to estimate population and characterize land use. In addition, spatial intersections of the monitor drainage area polygons with the gage adjusted radar rainfall (GARR) grid polygons were used to generate shed rainfall from GARR data.

Microsoft Access Analysis Tools

One of the main applications used for storing the Water Department's rain gage precipitation data throughout the SSES was the MS Access database management system (DBMS). Choosing a relational database such as MS Access gave the Water Department the conveniences of adding, modifying or deleting tabular data from the database, while also providing the valuable tool of querying the data stored in the database. As new precipitation data were being collected, they were uploaded to the database for storage and then readily accessible when needed. As this database grew over time, the capacity of a stand-alone MS Access database was reached and this rain gage data was expanded to multiple databases with one central database providing the ability of linking to or querying data from the others.

In addition to the Water Department's rain gage precipitation data, raw flow monitoring data from the outlying community billing meters was also managed via MS Access. As mentioned above, this data was stored in SQL Server; however the Water Department manages this data using a MS Access interface with an ODBC. By using MS Access as an interface with the ODBC, the Water Department can directly query and manage the data on the SQL Server in an effective manner, while preserving the integrity of the raw data. The Office of Watersheds downloads these data from SQL Server and stores them in a MS Access database from which QA/QC reviews were performed and quality flagging of the data was conducted. The Water Department's rain gage precipitation data and the raw flow monitoring data from the outlying community billing meters were queried or extracted from these databases for further analyses as part of this report.

Microsoft Excel Analysis Tools

The MS Excel software program was used to conduct the QA/QC reviews for the flow monitoring data and for post-processing data from other software packages. As a QA/QC tool, MS Excel was used to generate monthly time-series and scatter plots of the raw and corrected data as described in Section 3.3 (Quality Assurance Reviews for Precipitation and Flow Monitoring Data). These time-series and scatter plot tools expedited the QA/QC reviews by enabling the analysts to quickly review and assess the data, and determine whether the data is errant or of acceptable quality. Scatter plots were generated for each month of data collected, displaying flow or velocity on the vertical axis versus monitored depth on the horizontal axis. Field measured data points were superimposed over the monitored data to verify the equipment was properly calibrated. Time-series plots were generated for each month of data collected displaying flow, level and velocity on the vertical axis versus time on the horizontal axis. Field measured data points were superimposed over the monitored data to verify the equipment was properly calibrated. A secondary time-series plot was placed above the flow data plot displaying precipitation on the vertical axis versus time on the horizontal axis. This enabled the analyst to correlate the observed rainfall to the sanitary sewer responses.

In addition, analysis results from the SSOAP toolbox were compiled into MS Excel workbooks in order to perform system-wide comparisons and subsequent analyses. These analyses included the development of cumulative distribution function (CDF) curves that were used in Section 4.2 (Dry Weather Flow Analysis Results) and Section 4.3 (Wet Weather Flow Analysis Results) to rank the groundwater infiltration and rainfall dependent infiltration flow volumes and identify specific sewershed areas with relatively high wet weather flow volumes.

The MS Excel software program was also used to perform QA/QC of the Water Department's rain gage data. The Water Department's raw 2.5-minute rain gage data were summed into 15-minute increments and imported to a MS Excel workbook for performing QA/QC procedures. The QA/QC procedures identified and flagged questionable and missing data. The quality reviewed data were then imported into an MS Access database where flagged data were replaced with quality accepted data from surrounding gages using the inverse distance squared weighting method.

NetSTORM Analysis Tool

NetSTORM is a CDM Smith computer program for precipitation data assessment and rapid long-term urban runoff simulation. The software performs the following functions.

- Storage – Treatment – Overflow Runoff Modeling
- Precipitation intensity – duration – frequency (IDF) analysis
- Time series aggregation and synthetic disaggregation
- Data conversion from various US National Weather Service formats to tabular formats
- SWMM and MOUSE calibration and statistics tools

NetSTORM adapts selected algorithms originally included in the U.S. Army Corps of Engineers HEC-STORM program and extends the STORM methodology to simulate systems with multiple control structures. It has been used in CSO, SSO, industrial stormwater, and pump station planning studies worldwide. The IDF analysis module of NetSTORM was used to conduct the precipitation analyses, which are described and presented in Section 4.1 (Precipitation Data Analysis Results) of this report.

3.0 Summary of Analytical Assessment Approach

This section provides summary documentation of the analytical and assessment methodologies used to conduct the Phase 2 analysis activities for the outlying community sewershed areas. The narrative explains how sewershed delineations and sewershed precipitation were refined and verified from the available historical data. Explanations are also provided for the quality assurance review procedures that were conducted for the monitored precipitation and wastewater flow data. The section concludes with descriptions of the analysis methods, tools, and procedures that were used to quantify and characterize dry and wet weather flow conveyed from the successfully monitored outlying community sewershed areas.

3.1 Refinement and Verification of Sewershed Delineations and Information

As described in Section 2 (Summary of Available Historical Data Collected from Phase 1 activities, the completed Phase 1 inventories and assessments confirmed that the existing archived sets of sanitary sewer collection system maps and drawings were sufficiently complete, up-to-date and reliable for outlying community sewershed areas. The availability and extent of Geographic Information System (GIS) coverage were also assessed. Few of the outlying communities were found to have integrated the sewer system information from their maps into GIS databases. Phase 2 activities included the verification and refinement of sewershed delineations and the corresponding sewershed areas and service populations.

As was previously described in Section 2.3 (Sewer System Data and GIS Coverages for Outlying Community Areas), the Philadelphia Water Department (Water Department) confirmed that all of the outlying communities that convey flow to the Water Department have maps of their sanitary sewer collection systems. Some communities also had other archived sewer system plans and drawings. Therefore, it was usually the information contained within these sewer maps that was collected and assessed for Phase 1 of the SSES to determine the age, completeness and reliability of available outlying community data. The sewer map information was typically superimposed over street system base maps and provided the locations of manholes and pipes, pipe sizes, direction of flow, and often the invert elevations of junction structures. They were then geo-referenced into the PA Southeast State Plane coordinate system so they could be viewed together and overlaid with other GIS data such as census population information. The resulting GIS database information for the outlying community service areas was subsequently integrated into the Water Department's GIS database. Doing this allowed the analyst to determine the collection sewer network tributary to each monitoring site, based upon the most up-to-date and reliable information.

Once the refined sewershed delineations were completed, the analysts utilized GIS tools to directly compute the polygon area for each of the delineated flow monitoring sewershed areas.

The verified sewershed areas were subsequently used in the wet weather flow characterization analyses described in Section 3.5 (Wet Weather Flow Characterization). The updated and refined sewershed area polygons were also applied to 2010 U.S. census block information to determine the updated tributary service populations. Previously, service populations for sewershed areas had been computed using simple polygon intersects between delineated sewershed polygons and census block polygons. The assumption was made that the population distribution and density were uniform over the census block. For the Phase 2 analyses, a more complex and accurate analysis method was employed.

The GIS database information includes the footprint area and roof height for each building in the City. The volume was calculated for each residential building, to coincide with the residential population data provided by the census. Within each census block area, the total census population was divided by the total residential building volume. The resulting average unit value was applied to each building volume to calculate approximate building populations. Utilizing building volume helped to distinguish between and account for single family residences, apartment buildings, and multi-story condominium complexes. The building populations were subsequently applied to the building footprint areas. The refined polygon intersects were implemented between the refined sewershed delineation polygons and the residential building footprint area populations. The resulting GIS analysis results provided a more refined and accurate estimate of sewershed service populations. The refined and verified sewershed service populations were used in the dry weather flow characterization analyses to calculate per-capita sewer flows (see Section 4.2 (Dry Weather Flow Analysis Results)).

Sewershed Information Verification Conclusions

The completed Phase 2 outlying community analysis activities were successful in verifying that the refined sewershed delineations were accurate and reliable, and that any apparent inconsistencies between the sewershed boundaries and the sewer collection system pipe network were adequately examined and rectified. The completed analysis activities were also successful in verifying that the corresponding sewershed areas and service populations were accurate and reliable.

3.2 Refinement and Verification of Sewershed Precipitation

Phase 1 outlying community analysis activities included a review and assessment of the available precipitation data. As discussed in Section 2.2 (Collected Precipitation Data), there are four primary sources of precipitation data used in the SSES. Section 2.2 describes in detail the Water Department's city-wide rain gage network and the calibrated radar rainfall system, while Section 4.1 (Precipitation Data Analysis Results) of this report provides an analysis of the historical data collected at the Philadelphia International Airport (PHL) rain gage and compares those results to the period of August 2007 through June 2014. The August 2007 through June 2014 analysis period coincides with the outlying communities flow monitoring activities supporting this report and the precipitation comparisons were used to determine if specific months or years were higher or lower than the historical norms.

The purpose of this section is to discuss the area-weighted sewershed precipitation data. Moreover, this section describes how the area-weighted sewershed precipitation was generated as well as the availability and usage of the data in subsequent analyses.

Generation of Area-Weighted Sewershed Precipitation Data

The generation of the area-weighted sewershed precipitation data for the outlying community SSES analyses was done using ArcGIS software. The ArcGIS software uses the ArcPy library which provides Python programming language access for geo-processing tools within ArcGIS. By using this library, a single Python program was written which imports the 15-minute calibrated radar rainfall data, the 1 km by 1 km radar rainfall pixel grid, and the flow monitors tributary sewershed polygon layers. The program then intersects the pixel grid and the shed polygons to determine the area from each pixel cell that falls within each shed polygon. Once these areas are derived, an area-weighted sewershed precipitation value is calculated for each time step. The weight for a given 1 km by 1 km pixel is calculated as the pixel area within the shed polygon divided by the total shed polygon area. The average or weighted rainfall is the sum of the product of the rainfall and the weight of each 1 km by 1 km pixel. The program then exports the output data in the form of a text (.txt) file and a United States Environmental Protection Agency Storm Water Management Model (SWMM) input (.inp) file.

Available Area-Weighted Sewershed Precipitation Data and Use in Wet Weather Flow Characterization Analyses

As discussed in Section 2.2 (Collected Precipitation Data), the calibrated radar rainfall data is currently available from January 2004 through the present. The datasets resulting from the process of calibrating the weather radar reflectivity data to the monitored precipitation gage data is known as gage adjusted radar rainfall (GARR.) The wet weather flow characterization analyses that were conducted on wastewater flow monitoring data collected from the outlying community billing meters from May 2007 onward were completed using the area-weighted sewershed precipitation data.

The completed Phase 2 outlying community analysis activities were successful in utilizing the available archived rain gage and GARR data and the sewershed delineations to create area-weighted sewershed precipitation. The generated area-weighted sewershed precipitation was successfully used for rainfall characterization and wet weather analyses.

3.3 Quality Assurance Reviews for Precipitation and Flow Monitoring Data

The June 2011 Consent Order and Agreement (COA) requires a flow monitoring quality assurance and quality control (QA/QC) plan to ensure that the data quality is sufficient for use in the development and validation of a hydraulic and hydrologic (H&H) model of the Water Department's service area. This section describes the QA/QC protocols that were utilized to ensure that the flow and precipitation monitoring data collected and used in Phase 2 analysis activities was reasonably reliable.

3.3.1 Quality Assurance Reviews for Precipitation Monitoring Data

The QA/QC reviews extended to the two primary sources of precipitation data used for the outlying communities Phase 2 SSES activities: data from the Water Department's network of precipitation gages, and data from the gage adjusted radar rainfall (GARR) system.

Water Department Precipitation Data Processing and QA/QC

The Water Department's raw 2.5-minute data were summed to fixed 15-minute intervals. QA/QC review of this data was performed on a monthly basis by visual comparison of the individual gage data across the network in order to identify and flag missing or questionable data. Flagged data were then filled with coincident data from the six nearest gages using an inverse distance squared weighting method. In addition to the visual inspections conducted by the Water Department, automated QA/QC reviews of the gage data were also conducted by the GARR contractor as described below.

GARR Data Processing and QA/QC

The professional services contractor that provided the high-resolution GARR data conducted the comprehensive QA/QC reviews on a monthly basis before the GARR data were submitted to the Water Department. During each month, radar and rain gage data were segmented into qualified storm periods for QA/QC and GARR processing. The QA/QC process involved three steps.

- Initial QA/QC review of the raw precipitation gage data
- Adjustment of the raw radar reflection data to produce GARR
- Final QA/QC review of the GARR data

Initial QA/QC review of the Precipitation Data

Rainfall data from as many as 51 gages were used to adjust the next generation (NEXRAD) Doppler radar. The City of Philadelphia provided coordinate locations and 2.5-minute precipitation data for the 35 rain gages in the Water Department network. In addition, rain gage data were obtained from ten United States Geological Survey (USGS) stations and six National Weather Service Automated Surface Observing System (ASOS) stations. The collected rain gage data were systematically reviewed, utilizing software developed by the GARR contractor, to identify gages that were not consistent with the radar or surrounding gages during both the qualified storm and inter-event periods. Qualified rainfall events were defined based on a storm definition where, for any given hour, at least 50% of all working gages reported an accumulation of 0.05 inches.

Reasons for quality flagging gage data and not using flagged gages in rainfall analysis included clogs, significant under- or over-reporting of rainfall, gages that stop reporting during rainfall, timing issues or a combination of these reasons. A list of possible reasons for not using a gage based on the completed analyses is shown in Table 3-1.

Table 3-1: QA/QC Criteria for not using a Gage for Storm Quantification

Reason	Explanation
Clog (C)	Gage appeared to be clogged
Zero (Z)	Gage did not report any rainfall while radar rainfall estimates reported significant rainfall
Stop (S)	Gage appeared to stop reporting rainfall while radar rainfall estimates reported significant rainfall
Over (O)	Gage appeared to significantly over-report rainfall as compared to radar rainfall estimates and surrounding gages (e.g. anomalously high rainfall values caused by field calibration, data transmission error, or switch malfunctions)
Under (U)	Gage appeared to significantly under-report as compared to radar rainfall estimates and surrounding gages (e.g. half-tipper)
Sync (SY)	Gage appeared to be reporting out-of-sync with the radar rainfall estimates
Frozen (F)	Gage not reporting properly due to frozen precipitation
Melt (M)	Gage not reporting properly due to melting precipitation
Other (T)	Combination of multiple reasons
No Data (ND)	Gage reported "no data" for a significant amount of time

Radar Data Adjustment and Refinement Methodology

In the production of GARR, radar reflection data were bias corrected through comparison with rain gage accumulations. The first step in the data refinement process was to perform a local bias review to adjust the radar rainfall. The local bias method used the ratio of gage to radar accumulations from surrounding gages with the closest gage having the most weight. By statistical comparison between the radar and rain gage accumulations during a calibration interval, outliers were identified. The approach distributed the variation of bias over the entire Water Department service area, and the computed bias adjustments were applied within each storm period. The calculated bias correction factors were applied to the radar reflection data to enhance the accuracy of the GARR for any accumulation period.

The statistical QA/QC reviews of the data made the radar rainfall measurements more accurate. Though generally small, differences between rain gage and radar rainfall accumulations still exist due to sampling differences or local meteorological conditions. Radar measures raindrop reflectivity above the ground, while rain gages measure precipitation close to the ground. Updrafts and downdrafts during storms can decrease or increase rainfall rates, respectively. The GARR system preserves the precipitation volumes measured at the gage sites and utilizes the spatial variability provided by the radar data. By adjusting the radar data with rain gage data, more accurate rainfall measurements were generated than either the radar or gages could produce alone.

Final QA/QC Review Methodology for the GARR

As a final QA/QC review measure, cumulative distribution plots (CDPs) were produced at each gage location showing gage, unadjusted radar, and GARR values for each qualified rainfall event. Rain gages that were not performing consistently with the radar or surrounding gages were visually identified in the CDP graphs. Figure 3-1 shows a representative example of rainfall accumulation at a gage during a storm as measured by the gage (green), unadjusted radar (blue), and gage-adjusted radar (red). Final statistical reviews of the data provided an indication of data quality. Calibrated average difference (CAD) values for individual events less than 10% were considered excellent, 10 to 20% were considered good, and 20 to 30% were considered fair.

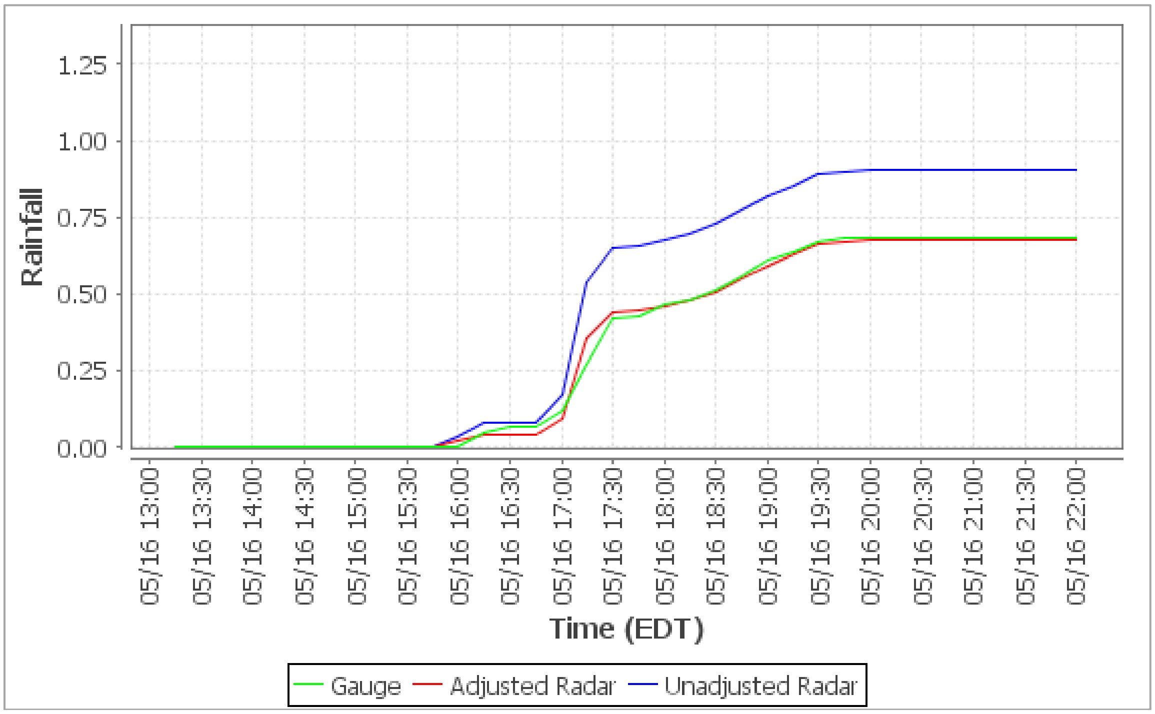


Figure 3-1: CDP Showing Rain Gage versus Unadjusted Radar versus GARR
(Source: Philadelphia Water Department (PWD) Radar Rainfall Analysis by Vieux, Inc.)

The final QA/QC process included an additional graphic comparison between the GARR and gage data. A representative example of a scatter plot that shows this comparison for a representative storm is provided in Figure 3-2. The QA/QC linear regression analysis verified that the GARR had been properly adjusted, because the adjusted pairs formed a linear relationship.

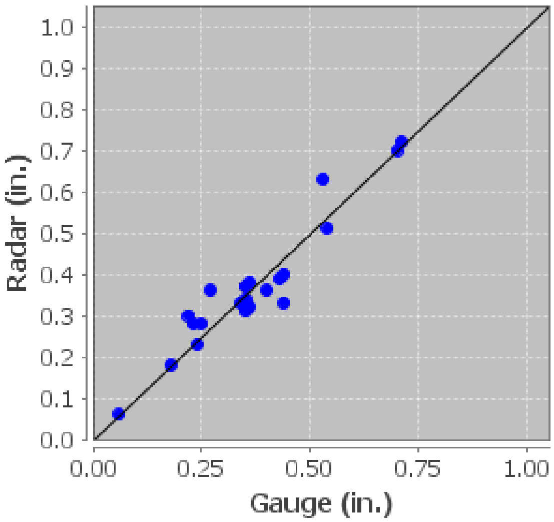


Figure 3-2: Scatter Plot of GARR versus Gage Pairs
(Source: PWD Radar Rainfall Analysis by Vieux, Inc.)

A representative example of a storm total plot for a storm where the GARR adjustment processes had been completed and the QA/QC reviews had been conducted is provided in Figure 3-3.

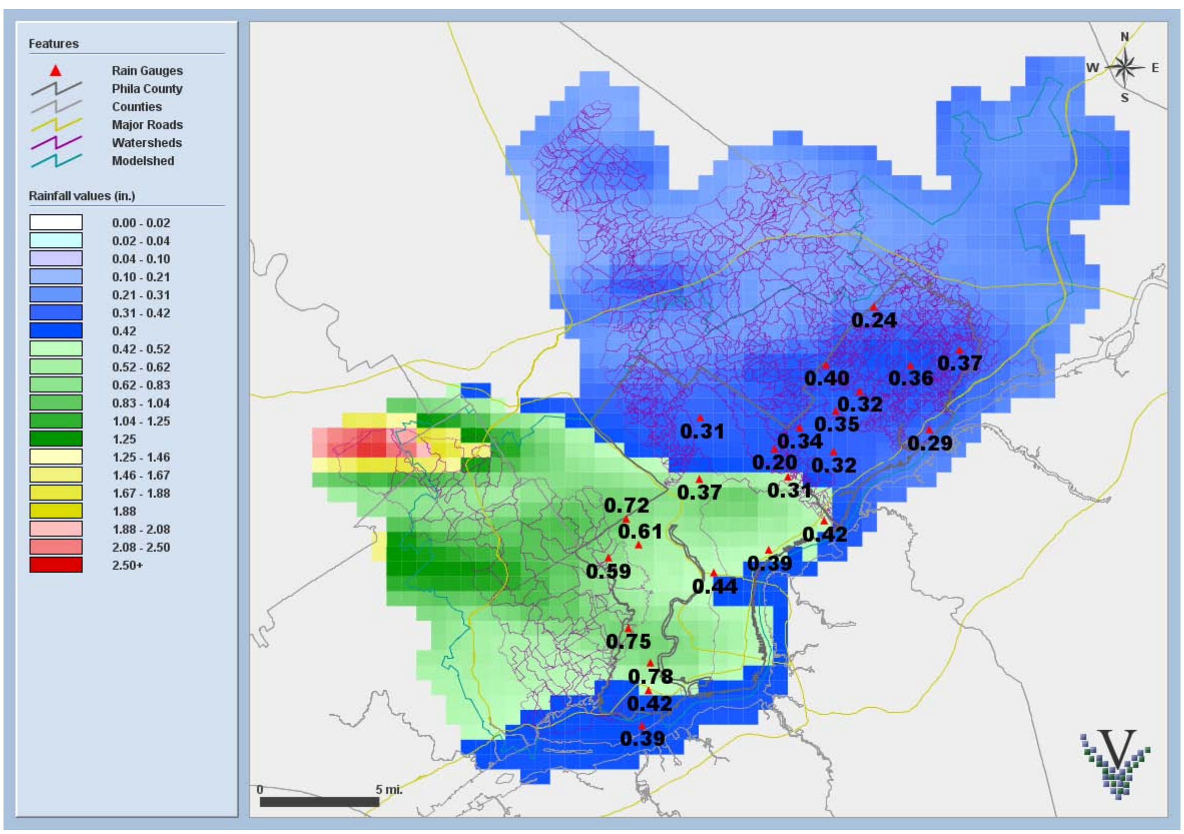


Figure 3-3: GARR Storm Total for an Example Event
(Source: PWD Radar Rainfall Analysis by Vieux, Inc.)

Precipitation Monitoring QA/QC Review Conclusions

The completed QA/QC reviews for the collected precipitation data from the regional rain gage network and the GARR system were able to confirm and verify that the archived precipitation data used to conduct the Phase 2 analyses were of sufficient quality and reliability. The completed QA/QC reviews were capable of detecting and identifying errant and unacceptable gage data and ensure that unreliable data were not incorporated into the SSES analyses. The existing available archived precipitation data were sufficient to quantify and characterize rainfall and snowfall over the outlying community's sewershed areas, quantify and characterize rainfall dependent infiltration and inflow (see report Section 3.5 (Wet Weather Flow Characterization)), and identify outlying community sewershed areas that contribute excessive extraneous flow to the Water Department conveyance and treatment system (see Section 4.3 (Wet Weather Flow Analysis Results)).

3.3.2 Quality Assurance Reviews for Flow Monitoring Data

Quality assurance (QA) refers to programmatic efforts to ensure the quality of monitored and field measured data. QA programs increase confidence in the validity of the reported analytical data. Quality control (QC), a subset of quality assurance, refers to the application of procedures designed to obtain prescribed standards of performance in monitoring. The QA/QC plan that the Water Department implemented for this outlying communities study is organized into two main categories: protocols for directing activities and procedures in the field, and protocols directing data verification in the office.

Protocols and Standards for Field Activities

Comprehensive protocols and standards for field activities are required elements to execute the flow monitoring program to maximize the collection of high quality data. Proposed outlying community billing meter sites were pre-screened, and field verification investigations were conducted to ensure conditions were conducive to accurate and reliable flow monitoring. An effective inspection and assessment process ensured proper selection of monitoring sites and equipment. The physical and hydraulic characteristics of each site were matched with technology selection and sensor placement that maximized the quality of collected data. All meter installations conformed to the flow monitoring equipment manufacturer's specifications.

Qualified field technicians routinely interrogated the data, maintained the monitoring equipment, performed as-needed sensor calibrations, and documented field procedures and observations. These routine field visits consisted of the field technician obtaining physical measured levels and velocities, comparing these measurements to the real-time metered readings and calibrating and/or cleaning the sensors when needed. These field measurements and activities were documented in field logs and were used by the data analysts in the QA/QC process, in order to ensure the quality of the collected data.

Protocols and Standards for Office Activities

The second category of required activities within the QA/QC process is data verification in the office. A data QA/QC system was implemented to standardize the format and file names associated with collected data from the selected flow monitoring sites. This system included a comprehensive review of collected data, the identification of data gaps, and the conversion of raw flow data into final quality-reviewed data sets.

Individual site files were generated for each monitoring site which contain either one month or three months (organized on a quarterly basis) of data. Also, monthly time-series and scatter plots of the monitored data were included in the site file. These time-series and scatter plots were prepared to assist in the data review process and verify the reliability and accuracy of the collected flow monitoring data.

Time-series plots were used to flag any inconsistencies in the monitored diurnal cycles that could not be attributed to precipitation or seasonal changes in groundwater levels, and also to flag inconsistencies due to equipment failures. Figure 3-4 illustrates an example time-series plot of raw data used in the QA/QC process. These plots have the flow and velocity plotted on the primary y-axis, the level(s) plotted on the secondary y-axis, and the precipitation data plotted in a separate smaller graph above this data. Field measured calibration points were superimposed over the monitored data to ensure the equipment was properly calibrated.

When redundant level sensors were utilized, their monitored depths were compared to one another to verify that they were internally consistent, thus adding confidence to the accuracy of the monitored levels. More importantly, the monitored levels needed to be confirmed by comparing them to independent field measurements. If the field measured readings were within an acceptable range of the monitored data recorded at the time of the field visit, the data was considered to be reasonably reliable. When the redundant levels were not tracking one another, the field logs were used to confirm which level was more reliable by comparing which one was closest and within the acceptable range of the field measured readings at that time.

Precipitation data, obtained from a nearby rain gage or the region's calibrated radar rainfall network, was also added to the time-series plots. This aided in confirming that increases in level, velocity, and corresponding flow rates throughout the monitoring period were attributed to precipitation events and not errant data.

In addition to the time-series plots, scatter plots were generated for each month of data collected displaying flow and/or velocity on the vertical axis versus monitored depth on the horizontal axis. Field measured calibration points were superimposed over the monitored data to ensure the equipment was properly calibrated. Scatter plots were used to review the quality of the data collected and verify that the equipment was properly calibrated. A depth-flow relationship with a consistent envelope curve and a minimal degree of scatter in the data typically is indicative that the equipment was functioning properly and the data was reasonably reliable. Figure 3-5 provides an example scatter plot of raw data used in the QA/QC process.

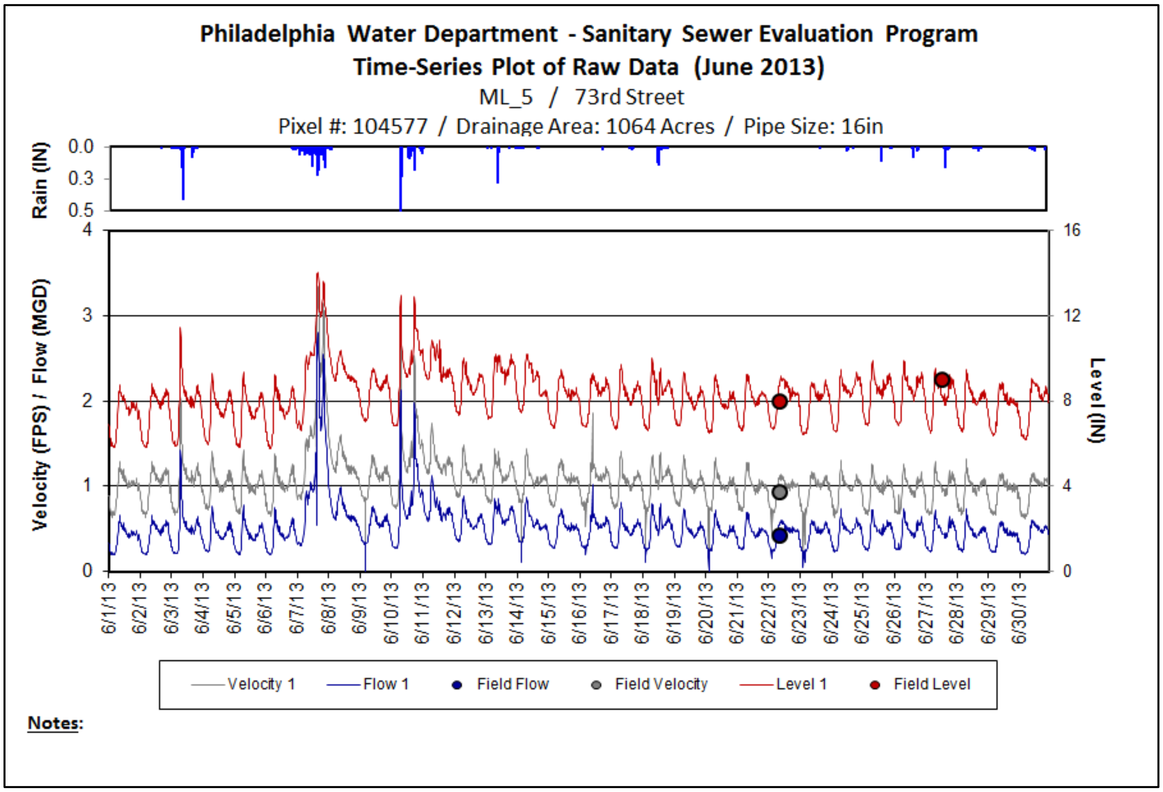


Figure 3-4: Example Time-Series Plot for Raw Data

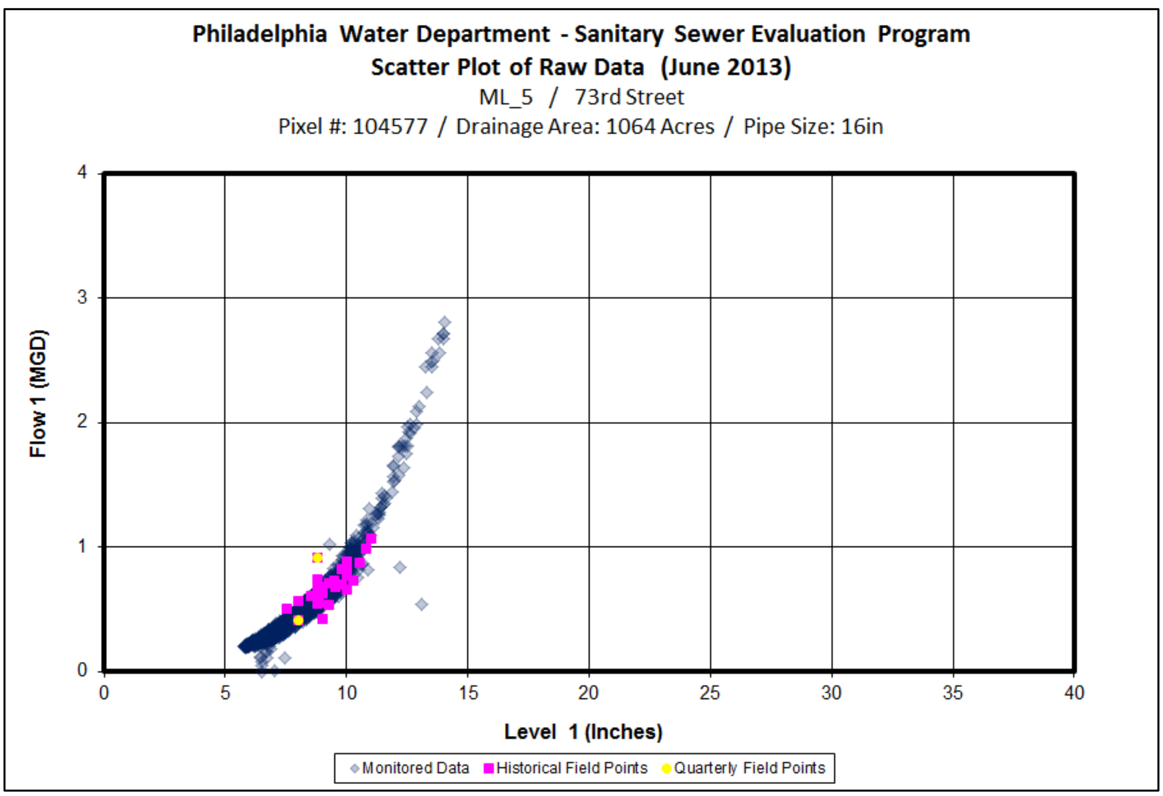


Figure 3-5: Example Scatter Plot for Raw Data

Two general categories of data errors were identified through the QA/QC process: short-term errors and long-term errors. Short-term errors are generally caused by temporary hydraulic conditions or intermittent sensor fouling lasting for a brief duration. Since these brief periods of errant data are surrounded by reliable data points, both depth and velocity errors could usually be corrected by interpolating between adjacent points. Long-term errors, on the other hand, are caused by ongoing hydraulic conditions, extended sensor fouling, improper equipment calibration and/or equipment failures and can last from several hours to several weeks in extreme cases. Errant data identified through the review process was either flagged as unusable in subsequent analyses, or corrected using approved techniques such as a rating curve (established depth-flow relationship developed based on reasonably reliable monitored data) or interpolation between adjacent reliable data points as mentioned above.

The final step in the QA/QC process was to take the final quality-reviewed 'corrected' datasets and plot them on time-series and scatter plots. These plots show only the quality-reviewed data and any necessary data quality comments. Figure 3-6 illustrates an example final quality reviewed time-series plot resulting from the QA/QC process. It displays the corrected level as a red line and the corrected flow as a dark blue line. Figure 3-7 illustrates an example final quality reviewed scatter plot produced resulting from the QA/QC process. It displays the corrected flow as dark blue points with the field measured calibration points (in pink) superimposed over the 'corrected' monitored data.

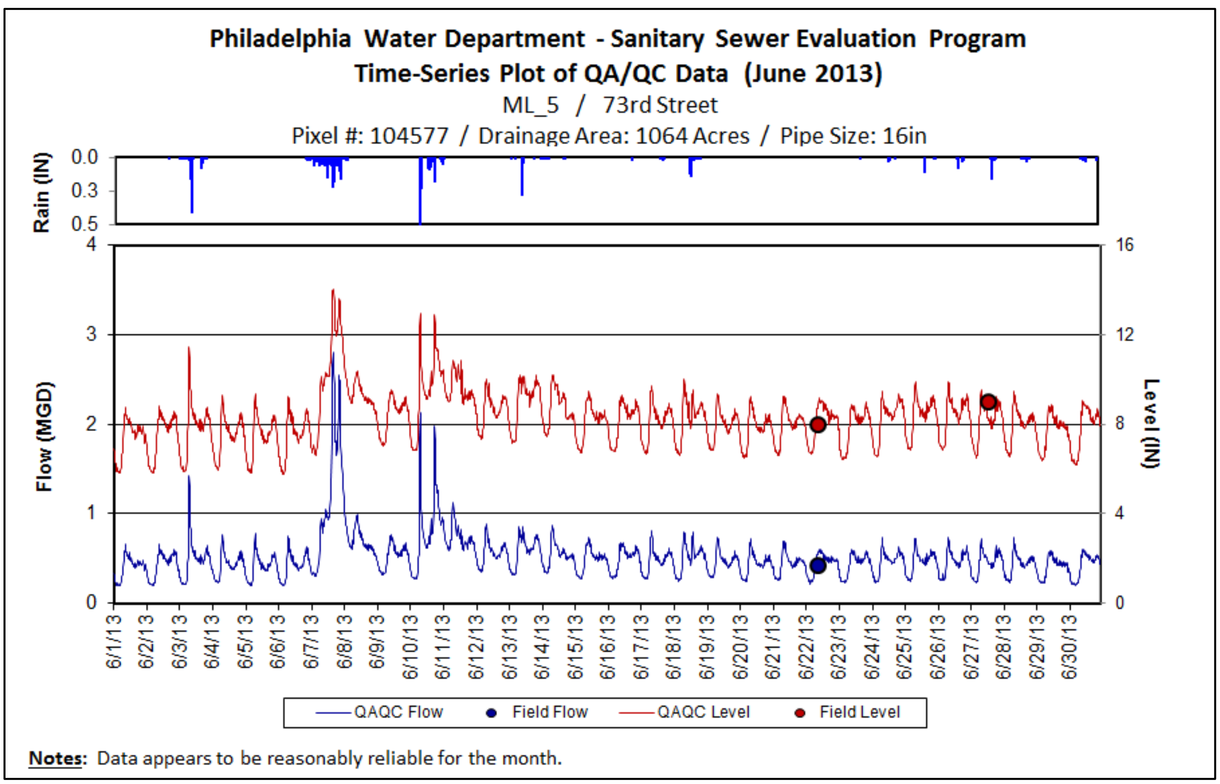


Figure 3-6: Example QA/QC'd Time-Series Plot

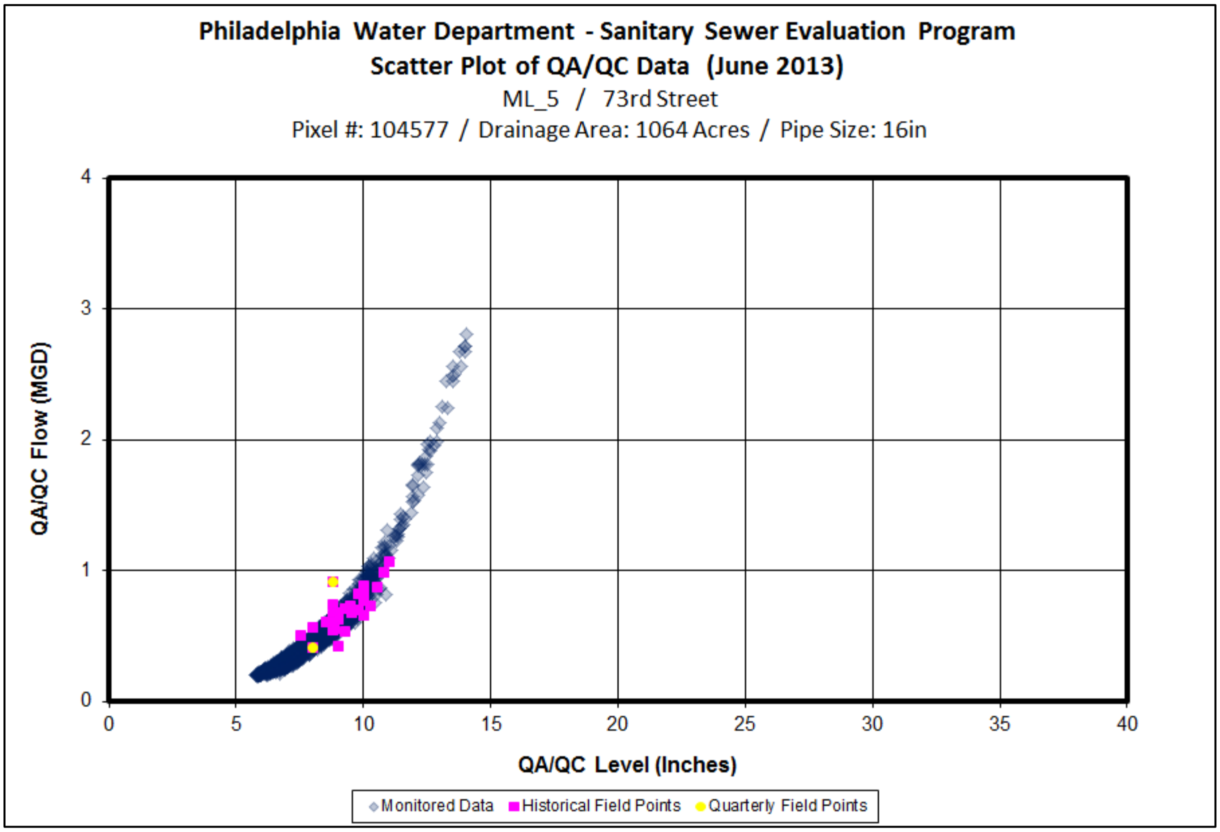


Figure 3-7: Example QA/QC'd Scatter Plot

Flow Monitoring QA/QC Review Conclusions

The completed QA/QC reviews for the collected flow monitoring data were able to confirm and verify that the data used to conduct the detailed Phase 2 analyses for this Outlying Communities Report was of sufficient reliability. The completed QA/QC reviews were also able to identify errant or unacceptable data and ensure that unreliable data was not incorporated into the Phase 2 analyses. The existing available wastewater flow monitoring information with acceptable data quality was sufficient to quantify and characterize dry and wet weather flow from outlying communities sewershed areas, quantify and characterize rainfall dependent infiltration and inflow, and identify outlying communities sewershed areas that convey relatively high wet weather flow to the Water Department conveyance system.

3.4 Dry Weather Flow Characterization

The Phase 2 activities for the outlying community service areas included a series of analyses that were conducted to quantify and characterize dry weather flow. For each of the monitoring sites, and corresponding sewershed areas located within the outlying community areas, dry weather flow periods were identified and corresponding monitored flows were analyzed to characterize dry weather hydrology. The dry weather flow analyses were conducted to quantify the total base wastewater flow (BWWF) and ground water infiltration (GWI) tributary to each of the monitoring sites. BWWF and GWI together comprise the DWF that occurs in a sanitary sewer system. Similar analyses for the sanitary sewered areas within the City were summarized and presented in the *Green City, Clean Waters Sewer System Evaluation Survey* which was submitted on June 1, 2014.

BWWF, often referred to as the base sanitary flow, represents the residential, commercial, institutional, and industrial flow that is discharged to a sanitary sewer system for collection and treatment. BWWF normally varies with water use patterns throughout a 24-hour period with higher flows occurring during the morning hours and lower flows during the night. GWI represents the infiltration of groundwater that enters the collection system through leaking pipes, pipe joints, and manhole walls. GWI varies throughout the year, often trending higher in late winter and spring as groundwater levels and soil moisture levels rise, and subsiding in late summer or after an extended dry period. For the Phase 2 outlying community analyses, the assumption was made that all of the monitored minimum nighttime flow was GWI. While this assumption is admittedly conservative, as there is usually some sanitary BWWF being conveyed in the early morning hours, the consistent use of this assumption for all analyzed monitoring data should not significantly bias the analysis results. Figure 3-8 below depicts a typical DWF hydrograph. The orange shading represents the BWWF component of DWF, while the blue shading represents the GWI component.

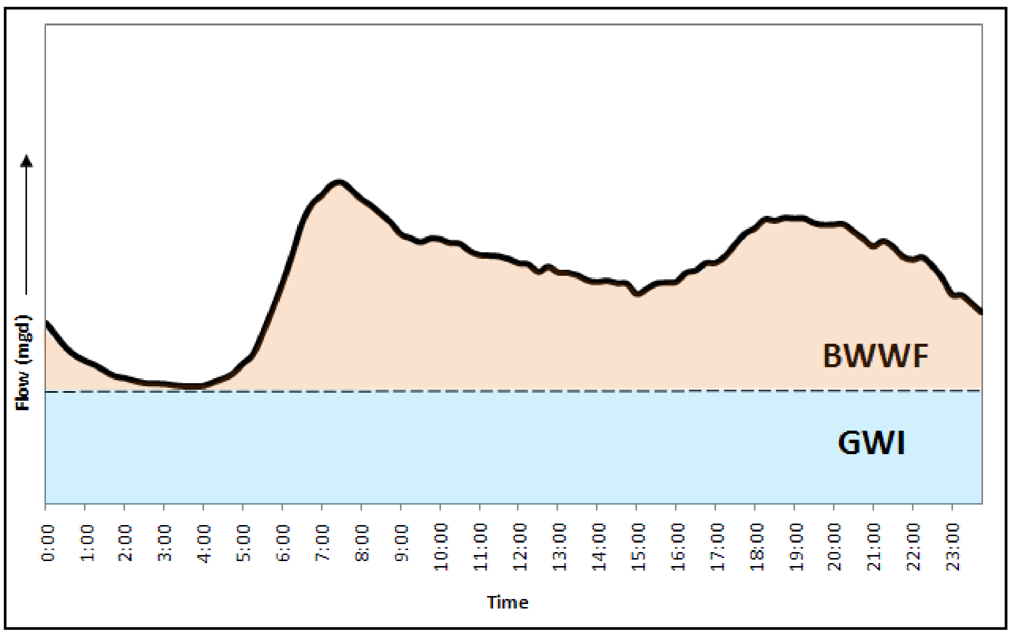


Figure 3-8: Components of Dry Weather Flow

3.4.1 Weekday and Weekend Dry Weather Flow Hydrographs

As part of the dry weather flow characterization process, weekday and weekend average daily dry weather flow hydrographs and corresponding flow summaries were produced using the Environmental Protection Agency (USEPA) Sanitary Sewer Overflow Analysis Program (SSOAP). Using this program, periods of dry weather flow with no recorded precipitation, no influence from prior storms, and consistent diurnal patterns were manually selected by the analyst. After these periods of dry weather flow were selected, the incremental flow data points for these days were then averaged together by SSOAP to produce average weekday and weekend dry weather flow hydrographs for each monitoring site. Weekdays and weekend days were evaluated independently because weekdays and weekends typically exhibit their own unique, repeatable flow patterns. In predominantly residential areas, there usually is a lag between the weekday and weekend hydrographs due to residents starting their day earlier during the week. In non-residential areas, the weekday and weekend patterns can differ greatly due to almost non-existent weekend populations. Plots of these hydrographs were produced showing flow on the vertical axis versus time on the horizontal axis. Figure 3-9 illustrates the difference between weekday and weekend hydrographs in a primarily residential area, while Figure 3-10 shows the difference between weekday and weekend hydrographs in a commercial/industrial area.

These average dry weather flow hydrographs were then summarized and the resulting average daily dry weather flow for each site, and the average maximum and minimum dry weather flows, were calculated and expressed in million gallons per day (mgd). The dry weather flow rates were also calculated in units of gallons per capita per day (gpcd). These average daily dry weather flow hydrograph plots, and corresponding dry weather flow summaries, can be found in Appendix B of this report. The appendix information is provided in digital format on the attached compact disc (CD).

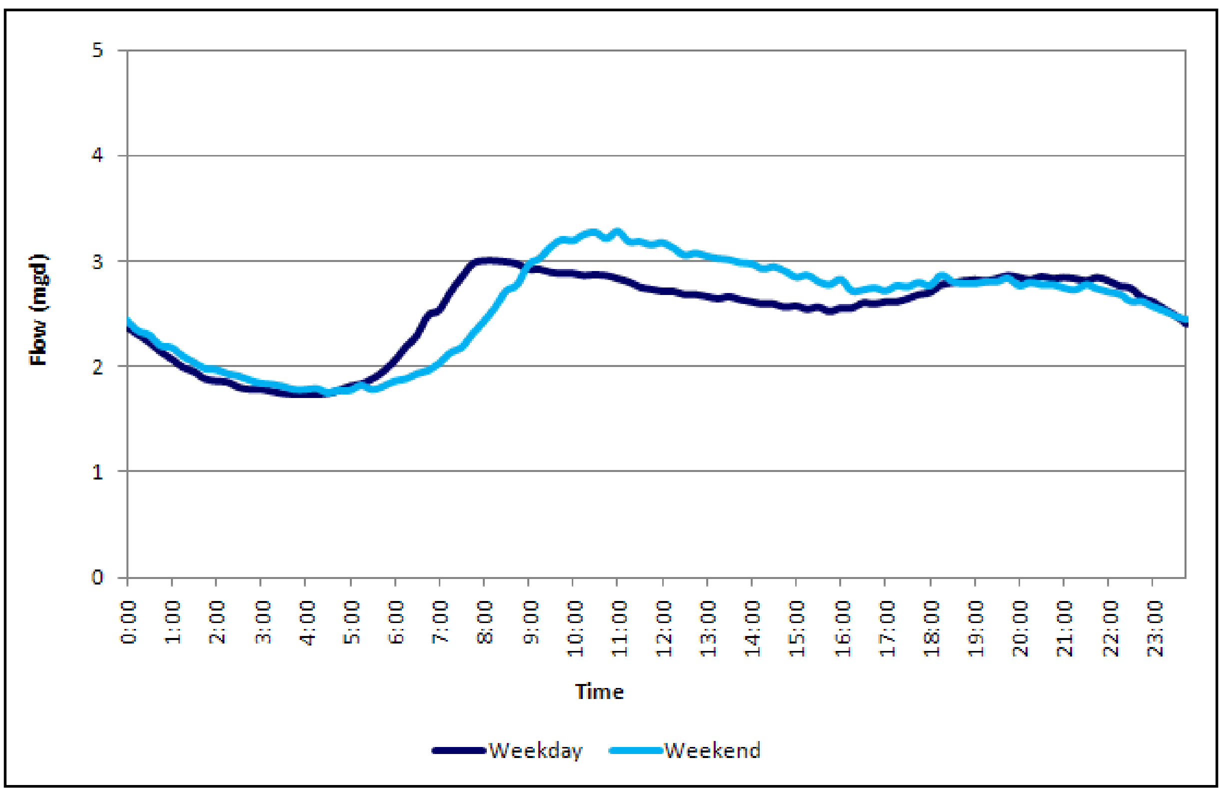


Figure 3-9: Example Weekday and Weekend Dry Weather Flow Hydrographs in a Residential Area

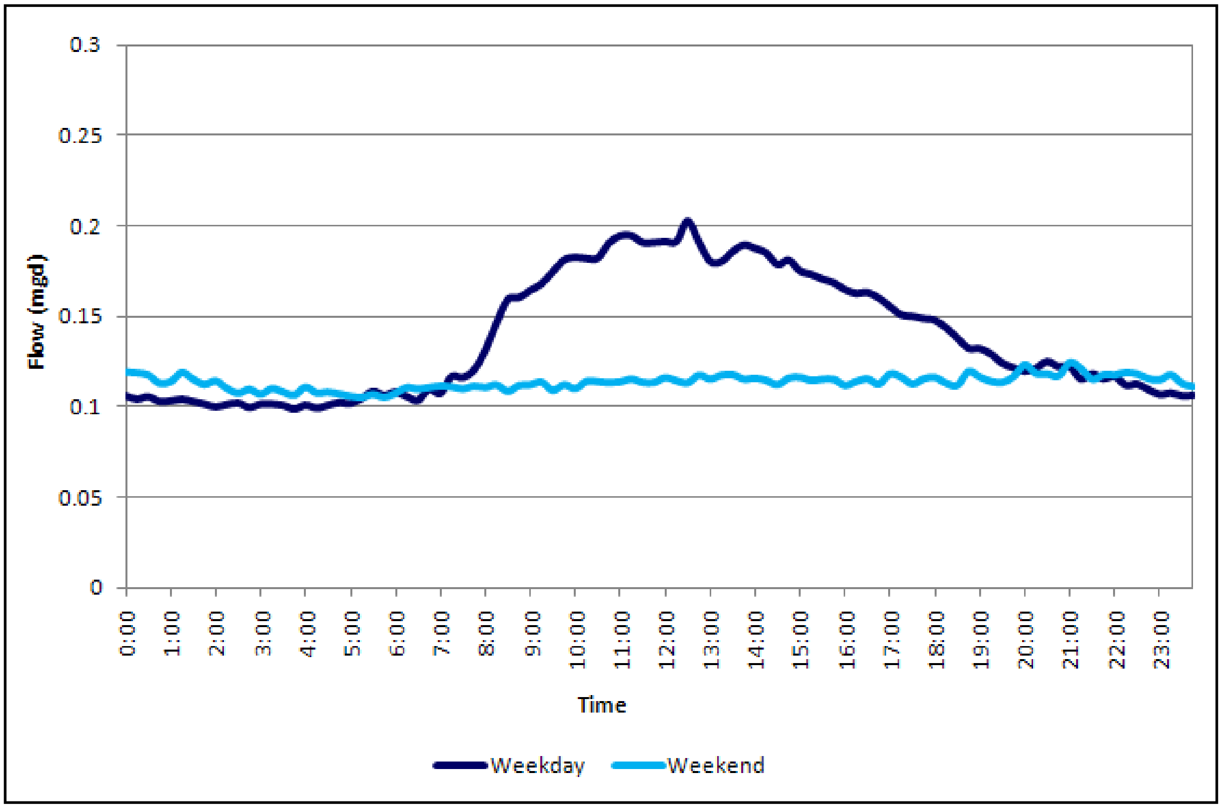


Figure 3-10: Example Weekday and Weekend Dry Weather Flow Hydrographs in a Commercial/Industrial Area

3.4.2 Ground Water Infiltration Ratios

The computed average daily maximum and minimum dry weather flows characterize the fluctuation seen in the dry weather diurnal flow pattern, while the average daily minimum flow was calculated to approximate the rate of extraneous groundwater infiltration, or GWI, entering the upstream collection system. Also computed as part of the dry weather flow analyses are the GWI ratios for each site. Assuming BWWF during minimum flow nighttime hours is negligible in tributary areas that are predominately residential, a ratio can be calculated to approximate the percentage of GWI observed in the total dry weather flow. These GWI ratios were calculated by dividing the average minimum dry weather flow by the average daily dry weather flow. If the GWI ratio is high, then it can be assumed that either the sewer is 'leaky', with a higher incidence of extraneous infiltration flow, or there may be nighttime flow from industrial or other round-the-clock operations.

An analysis was conducted to determine if there is a direct correlation between the GWI ratio and the percentage of the sewershed area comprised of industrial and commercial land-use areas. The results of that correlation analysis are provided in Figure 3-11. Of the two sewershed areas with the highest percentage of industrial/commercial land-use, one had a relatively high GWI value and the other had an average GWI value. Among the sewershed areas with minimal or no industrial/commercial areas, GWI values extend along the entire range from high to low values. Similarly, the Figure 3-11 plot shows that among sewershed areas with relatively higher GWI values, the percentage of industrial/commercial areas also extends along the entire range from high to low values. Therefore, the completed analysis demonstrates that there appears to be no significant correlation between GWI ratio and the percentage of the sewershed comprised by industrial and commercial land use areas.

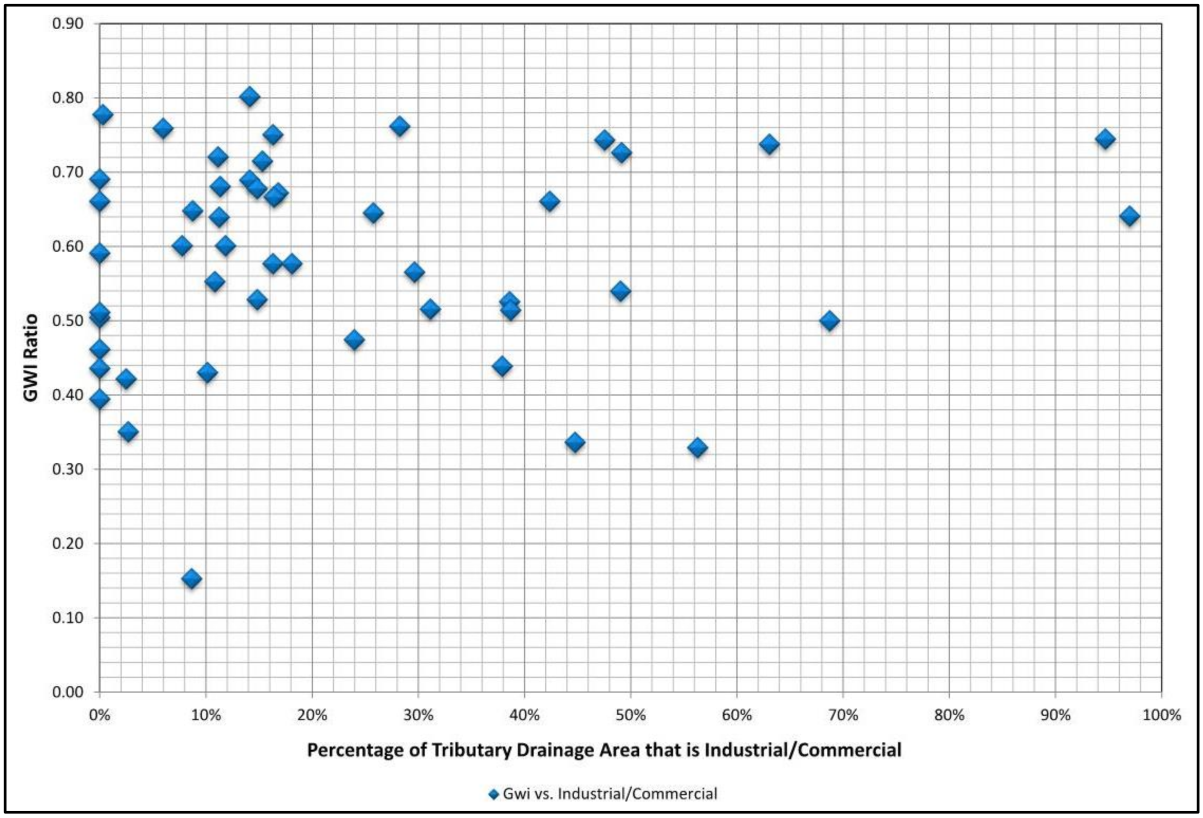


Figure 3-11: GWI Ratio versus Industrial/ Commercial Sewershed Area

3.4.3 Dry Weather Flow Analysis Results

The completed Phase 2 analyses were successful in quantifying and characterizing dry weather flow from separate sanitary sewershed areas within the outlying communities. Section 4.2 (Dry Weather Flow Analysis Results) provides various tables and graphics that summarize the dry weather flow analysis results.

The dry weather flow analysis results for the sanitary sewer system monitors located within the outlying communities can be found in Appendix B of this report. The appendix further details the following:

- The tributary drainage area and service population for each of the monitoring locations analyzed

- The resulting average weekday and weekend hydrographs for each site
- The average, maximum, and minimum dry weather flows
- The GWI ratio
- The number of days used in generating the dry weather flow statistics

3.5 Wet Weather Flow Characterization

In addition to the dry weather flow analyses described in Section 3.4 (Dry Weather Flow Characterization), wet weather flow analyses were conducted as part of Phase 2 activities for the outlying community service areas. For each of the sanitary sewer flow monitoring sites located within the outlying communities, wet weather flow periods were identified and corresponding monitored flows were analyzed to characterize wet weather hydrology. Analyses were conducted to quantify the total base wastewater flow (BWWF), ground water infiltration (GWI), and rainfall dependent inflow and infiltration (RDII) tributary to each of the monitoring locations. The understanding of each of these major flow components is essential to understanding the sources of flow into the sanitary sewer systems, the relative quantities of RDII in the systems, and whether the RDII is relatively high. Listed below are the analyses conducted as part of the wet weather flow characterization process. Each analysis is described in detail throughout the remainder of this section.

- Hydrograph Deconstruction and RDII Quantification
- Largest Monitored Event and Peaking Factor Summaries

As described in Section 3.4 (Dry Weather Flow Characterization), BWWF and GWI together comprise the dry weather flow that occurs in a sanitary sewer system. RDII is the rainfall-derived flow response in a sanitary system. In most systems, RDII is the major component of peak wastewater flows and is typically responsible for capacity issues, SSOs, and/or basement backups. Figure 3-12 depicts various pathways that RDII can enter into a sanitary sewer system.

Inflow is the water that enters the sanitary sewer system directly via leaky manhole lids and frames, roof drain connections, sump pumps, foundation drains, and cross-connections with storm sewers. Although direct connections such as downspouts, sump pumps, foundation drains, and areaway drains are no longer common design practices, they still exist and contribute to inflow in many older sanitary systems. Inflow typically occurs shortly after a rainfall event starts and is usually the major component of the peak RDII flow.

Rainfall-derived infiltration refers to rainfall runoff that filters through the soil before entering a sanitary sewer system through damaged pipe sections, leaky joints, etc. These defects can occur in both the public right-of-way portions of the sanitary sewer system or in individual service laterals on private property. Infiltration typically extends beyond the end of rainfall and takes some time to recede to zero after an event.

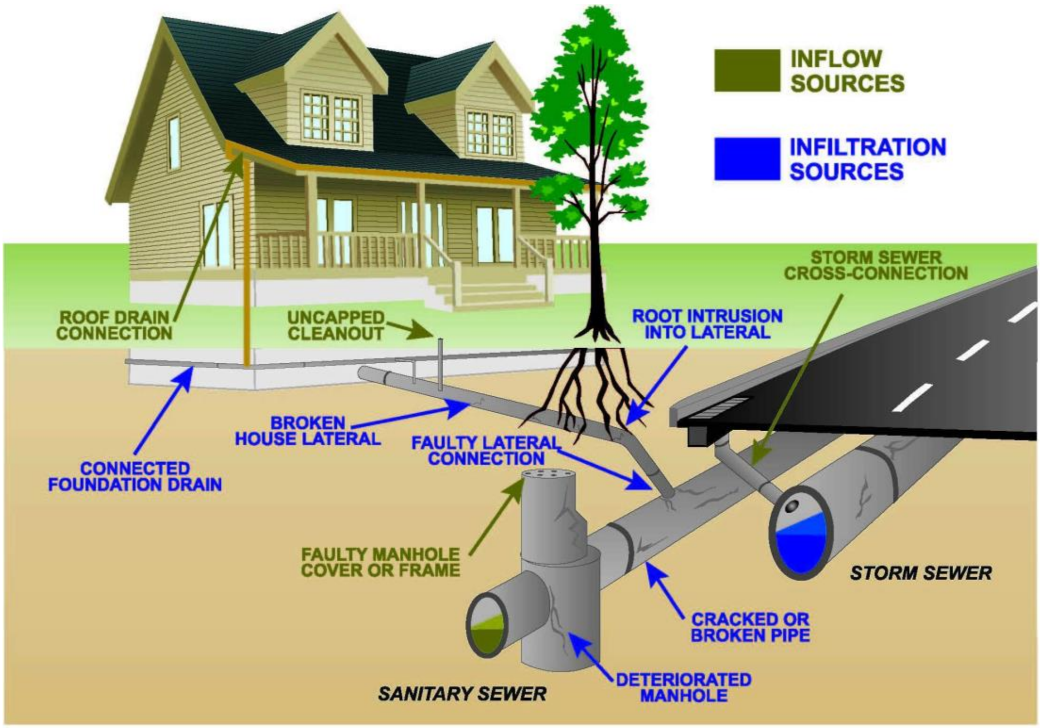


Figure 3-12: Causes for RDII in a Sanitary Sewer System
(Source: City of Oregon, OH)

3.5.1 Hydrograph Deconstruction and RDII Quantification

The United States Environmental Protection Agency's SSOAP toolbox was used to analyze the successfully collected and quality assurance-reviewed precipitation and flow monitoring data in order to develop an understanding of the system RDII characteristics. More specifically, the total monitored flows were deconstructed into their characteristic flow components of BWWF, GWI, and RDII. Figure 3-13 illustrates these components of the total monitored wastewater flow. The BWWF and GWI flows represent the dry weather flow component of the total flow, while the RDII component represents the rainfall-produced response in the sanitary sewer system.

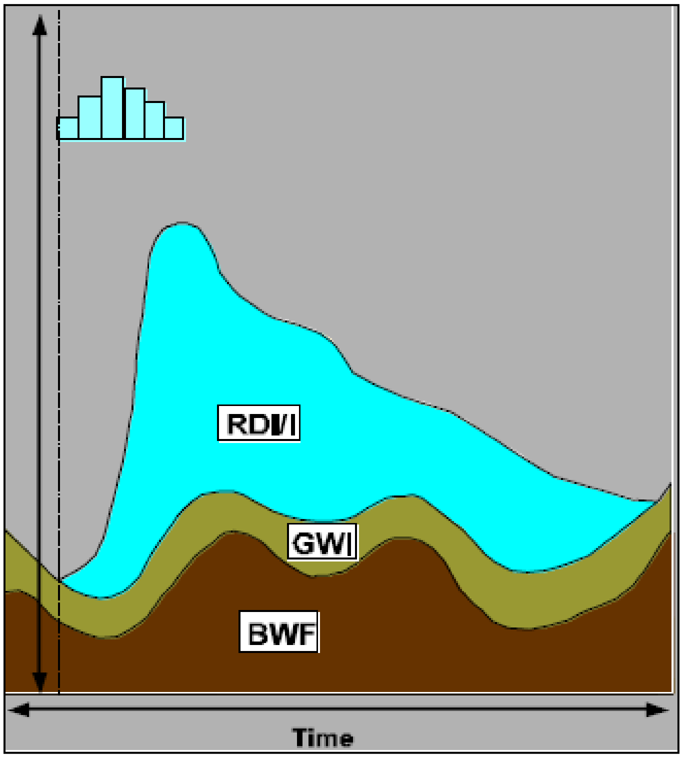


Figure 3-13: Components of Wet Weather Wastewater Flow
(Source: CDM SHAPE manual)

To conduct the SSOAP analyses, a graphical representation of the total monitored flow was generated for the entire monitoring duration. The analyst then took the typical weekday and weekend dry weather flow quantities and patterns, previously determined during the dry weather flow analyses, and superimposed them over the total monitored flow. The typical dry weather pattern of five weekdays and two weekend days was repeated as necessary to cover the entire duration of the monitoring period. For the hydrograph deconstruction process, SSOAP was used to address variability in the dry weather flow by accounting for the seasonal variations of GWI and ensure that the RDII flows were approximately equal to zero during dry periods not directly influenced by rainfall. This deconstruction of the total monitored flows was accomplished by adjusting the GWI flows to set the proper dry weather flow conditions prior to rainfall events to determine rainfall event specific RDII hydrographs.

After the GWI adjustments were made, the data analyst identified the start and end times of the individual RDII events during the period of record. Once individual events were defined, statistics were produced detailing each event's RDII volume, rainfall volume, total-R value, and the deconstructed components of total monitored flow.

The calculated volume of RDII for each storm was divided by the corresponding volume of rainfall over the sewershed area and expressed as a percentage, or R-value. This R-value represents the fraction of the rainfall that fell over the tributary sewershed area that entered the sanitary sewer system. For example, a computed R-value of 0.045 would indicate that 4.5% of the measured rainfall over the sewershed area "leaked" into the sewer system as monitored

RDII. Lower values typically indicate a tighter sewer system with less extraneous flow. On the contrary, higher values indicate higher quantities of extraneous flow originating from possible sources such as roof leader connections, foundation drain connections, connections with storm inlets or area drains, and leaking pipe joints. When the analysis was completed, the volume, duration and pattern of RDII flow were determined for each successfully monitored storm event.

An individual spreadsheet of results was prepared for each flow monitoring site that was analyzed and can be found in Appendix C of this report.

3.5.2 Largest Monitored Events and Peaking Factors

For each of the Water Department's outlying community monitoring locations, additional wet weather analyses were conducted to provide an understanding of the hydraulic capacity and system response during wet weather. For these analyses, the five independent wet weather events that produced the largest monitored peak 15-minute flow rates were identified for each monitoring location.

Largest Monitored Events

Once the five independent wet weather events were identified, the corresponding monitored peak hourly flows were calculated. In addition, the monitored peak 15-minute and hourly levels were identified for each event. In conjunction with monitored flow rates and flow depths, monitored precipitation data were examined to determine the total precipitation volume during the duration of the event, and the monitored peak 15-minute precipitation volume within the defined event. It is also important to note that events with missing and/or errant data during any part of the storm were not included in the largest monitored event analyses.

Peaking Factors

Along with the monitored flow rates, depths, and precipitation data that were examined for the five largest independent wet weather events, a flow rate peaking factor was also computed. The peaking factor was calculated by taking the monitored peak hourly flow during the event and dividing it by the calculated average daily dry weather flow for the monitored sewershed area. This peaking factor represents the magnitude of the increase of RDII flow through the monitored sewer pipes during large storms, compared to the magnitude of flow during typical dry weather conditions.

The results from the five largest monitored wet weather events, and corresponding peaking factors, were compiled into summary tables. These summaries can be found in Appendix B of this report. An example wet weather summary is provided in Table 3-2 below.

Table 3-2: Example Largest Monitored Events and Peaking Factor Summary Table

Philadelphia Water Department - Sanitary Sewer Evaluation Program
Wet Weather Flow Analysis Results
MA_2

General Information

Site:	**MA_2**
Description of Location:	Pine Road and Pennypack Creek
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	20"
Contract Community:	Abington
Drainage Area (Acres):	3,161
Service Population:	10,222

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.15	0.34	6.25	17.2	0.90	5.97	17.0	3.69
5/9/2014	1.28	0.31	5.33	16.9	0.87	4.95	16.5	3.06
6/7/2013	3.65	0.19	3.79	14.1	0.64	3.54	13.7	2.19
6/27/2013	1.37	0.34	3.78	14.6	0.75	3.52	14.1	2.17
5/10/2014	0.91	0.22	3.77	14.1	0.36	3.35	13.7	2.07
Five-Storm Average	**2.47**	**0.28**	**4.58**	**15.4**	**0.70**	**4.27**	**15.0**	**2.63**

3.5.3 Wet Weather Flow Analysis Results

The completed Phase 2 analyses were successful in quantifying and characterizing wet weather flow from separate sanitary sewershed areas within the outlying communities. Section 4.3 (Wet Weather Flow Analysis Results) summarizes the wet weather analysis results and conclusions for the wet weather characterization of the outlying communities that convey flow to the City sewer system.

The five largest monitored wet weather events and peaking factor summary tables can be found in Appendix B of this report that are provided in digital format on the enclosed compact disc (CD). For successfully monitored storms that resulted in pipe-full conditions and/or surcharging, these summary tables allow for the hydraulic capacity of the monitored sewers to be quantified and assessed. In addition, the peaking factors included in these summaries allow for an understanding of the relative quantities of RDII, as higher wet weather peaking factors are indicative of drainage areas that have relatively high wet weather flow.

Individual RDII analysis results spreadsheets were prepared for each flow monitoring site that was analyzed and can be found in Appendix C of this report, also provided in digital format on the enclosed CD. These results allow for an understanding of the relative sewershed 'leakiness', and can be used to guide further investigation of RDII sources.

4.0 Analysis Results

This section provides a summary of the completed Phase 2 analysis results and conclusions for the outlying communities that convey flow to the Philadelphia Water Department (Water Department) sewer system. The results of the precipitation characterization analyses for the long-term record gage data are provided and compared to the annual precipitation over the Water Department service area for each of the years that were included in the period of record used for the outlying community analyses. Dry weather flow characterization analysis results are presented using a series of summary tables, cumulative distribution function (CDF) curves, and color coded geographic information system (GIS) maps. The analyses allow for the identification of specific outlying community sewershed areas where the quantity of extraneous ground water infiltration (GWI) is relatively high. Similarly, wet weather characterization analysis results for each of the analyzed outlying community sewershed areas are provided. These completed analyses allow for the Water Department to identify specific outlying community areas where the quantity of extraneous rainfall dependent infiltration and inflow (RDII) is relatively high. Similar analyses for the quantification and characterization of dry and wet weather flow from the separate sanitary sewershed areas located within the City were provided in the *Green City, Clean Waters Sewer System Evaluation Survey* (SSES) that was submitted by the Water Department on June 1, 2014. This 2014 report identified specific sewershed areas within the City where the quantity of extraneous GWI and RDII were relatively high.

4.1 Precipitation Data Analysis Results

Accurate and reliable precipitation data are a vital component of any sanitary sewer evaluation study. The monitoring of the volume, intensity, duration, and distribution of precipitation is necessary to analyze sanitary sewer system responses to wet weather, validate computer simulation models, and identify and prioritize sewer rehabilitation activities. Adequate precipitation data should include regional long-term precipitation records as well as spatially distributed data. Because precipitation conditions can vary over short distances, regional gage data needs to be supplemented with data from a distributed network of local precipitation monitoring stations. Available precipitation data for the outlying communities study included long-term historical data from the Philadelphia International Airport (PHL) gage, data from the regional gage network, and high resolution spatially distributed data from the calibrated radar-rainfall system.

Section 2.2 of this Outlying Communities Report (Collected Precipitation Data) provides a summary of the available precipitation data within the City and outlying community areas, the various sources of these data, and how they were utilized in support of the Phase 2 efforts. Section 3.3 (Quality Assurance Reviews for Precipitation and Flow Monitoring Data) describes the quality assurance reviews conducted on these data. This section includes an analysis of the historical data set in order to establish long-term characteristics of precipitation over the Water Department service area as well as analysis of individual years that coincide with the flow monitoring activities conducted to characterize dry and wet weather flow conveyed from monitored outlying community areas.

4.1.1 Long-Term Historical Precipitation Analysis

The two criteria used in the Phase 2 activities for establishing long-term precipitation characteristics over the Water Department service area were the total volume of precipitation and the total number of precipitation events occurring during each calendar year. Comparing a particular year's precipitation to the long-term average allows for the determination of wetter- and dryer- than average years. Monthly totals and averages were also computed in the same way to examine seasonal differences. By examining these annual and monthly precipitation totals, the characteristics of precipitation over the service area for specific time periods could be evaluated.

Precipitation Volume Analysis Results

Figure 4-1 displays the annual precipitation volumes at the PHL gage from 1961 through 2013. The average annual precipitation volume of 41.71 inches is shown on the plot by a solid horizontal line and can be used as a bench mark for comparing a particular year's precipitation to the long-term annual average. The average annual precipitation volume plus and minus one standard deviation is shown as well (by dashed lines) and can be used to assess the range or extent of expected variability in the annual precipitation volumes. Figure 4-1 shows that the wettest and driest calendar years over the historical record were 2011 (64.33 in.) and 1965 (29.34 in.), respectively.

Figure 4-2 shows the average monthly precipitation volumes based upon the PHL historical record. Also depicted on the figure are the average monthly precipitation volumes plus and minus one standard deviation. Figure 4-2 can be used to assess the variability in the monthly precipitation volumes and identify the typically wetter and drier seasonal periods of the year. The figure shows that, on average, the summer months of July and August are the months of the year with the greatest precipitation volume while February is the month with the lowest.

Precipitation Event Analysis Method and Results

In addition to the annual and monthly volumetric statistics produced for the long-term period of record, characteristics of individual precipitation events were developed. Each event in the historical record was characterized by its duration, volume, peak intensity, and the time interval between successive events.

Prior to performing the event analysis, a minimum inter-event time (MIT) needed to be selected indicating the number of zero-rainfall hours that constitute an inter-event period. In other words, the number of consecutive dry hours encountered in the search must be equal to or greater than the MIT in order for the preceding wet period (made up of at least one non-zero precipitation value) to be considered a separate event. In order to be consistent with the MIT selected in the analysis included in Section 3.5 of the *Philadelphia Long Term Control Plan Update (LTCPU),* and other precipitation analyses conducted by the Water Department, a MIT of 6 hours was selected for this analysis.

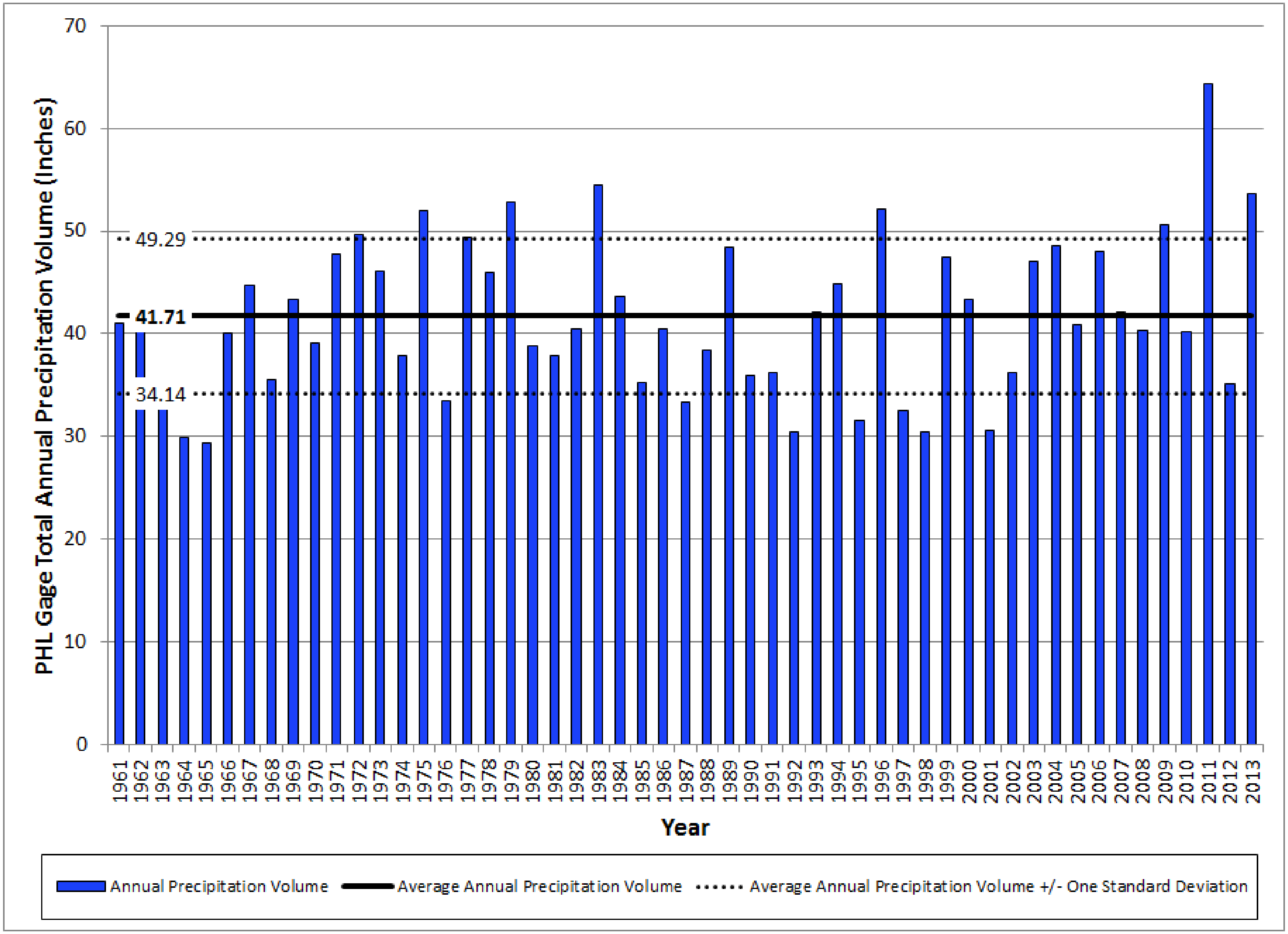
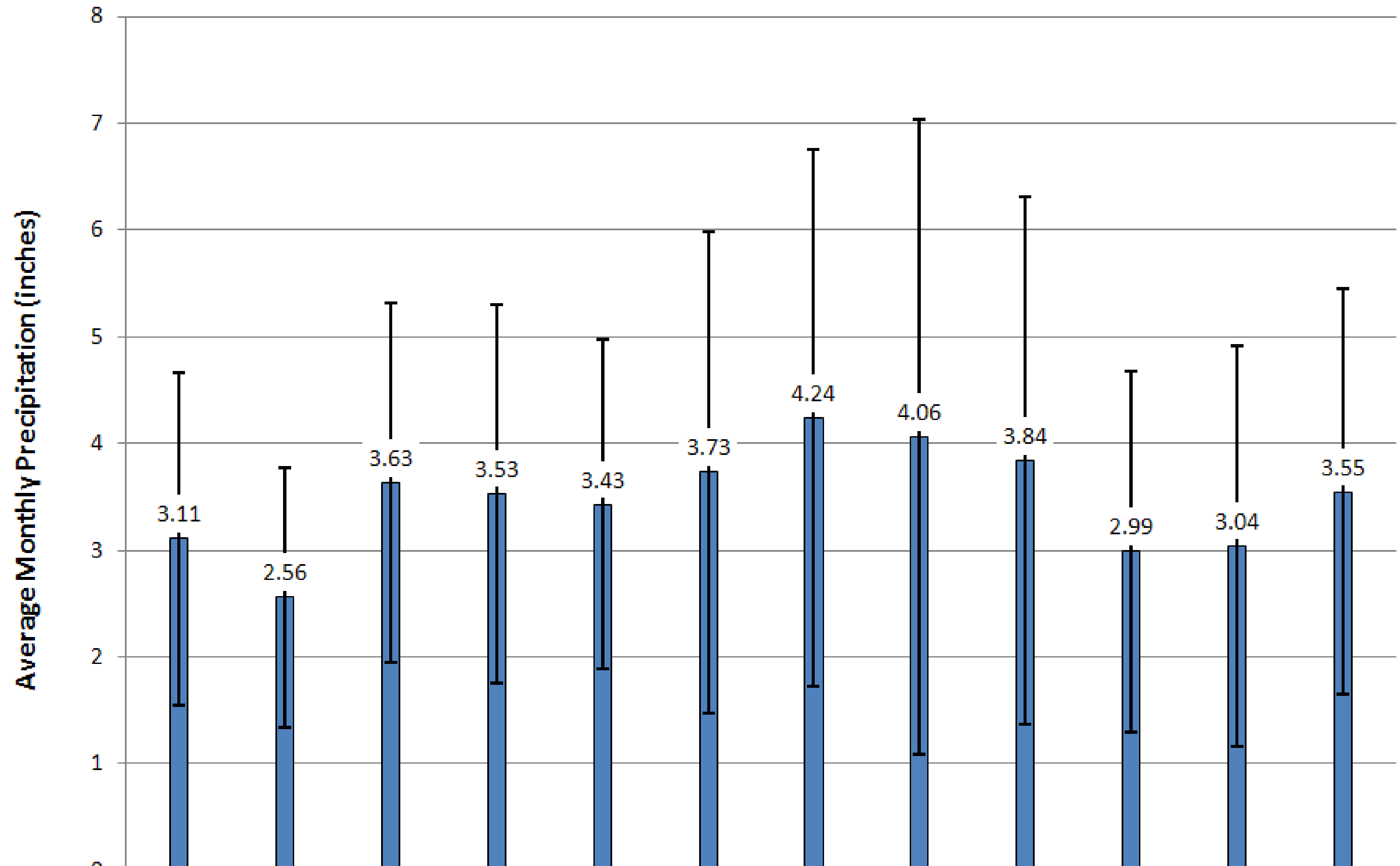


Figure 4-1: Annual Precipitation Volumes (PHL Historical Record)



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Average	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
Avg+1STDEV	4.67	3.77	5.31	5.30	4.97	5.98	6.75	7.04	6.31	4.68	4.92	5.45
Avg-1STDEV	1.55	1.35	1.95	1.76	1.89	1.48	1.73	1.08	1.37	1.30	1.16	1.65

Figure 4-2: Average Monthly Precipitation Volumes (PHL Historical Record)

In addition to selecting a MIT, a minimum precipitation depth was needed to define an event. For this historical precipitation analysis, it was important to differentiate between event precipitation that would contribute to RDII, and event precipitation that would be intercepted by vegetation above the ground and depression storage on the ground and would not be a cause of RDII in the outlying community sewers. Per the wet weather flow characterization analyses that are described in Section 3.5, (Wet Weather Flow Characterization) and presented in Section 4.3 (Wet Weather Flow Analysis Results), smaller event volumes of less than 0.10 inches were determined to have little to no impact on RDII from outlying community areas. As a result, event volumes greater than or equal to 0.10 inches were selected as the minimum precipitation depth for defining wet weather events.

Based on the wet weather event definition described above, information was developed on the characteristics of individual events from the PHL historical record. The sequence of hourly precipitation volumes were grouped into separate events and each storm was then characterized by its duration, volume, peak intensity, and time interval between successive events. The event data were analyzed using standard statistical procedures to determine the mean and standard deviations for various event parameters. A rainfall characteristics summary table for the PHL historical record is shown on Table 4-1.

Based upon the minimum inter-event time (6 hours) and minimum event volume (0.10 inches) selected, the average annual number of wet weather events in the Water Department service area, based on the historical record, is 62.

Table 4-1: Mean Precipitation Event Characteristics for Philadelphia, PA [a]

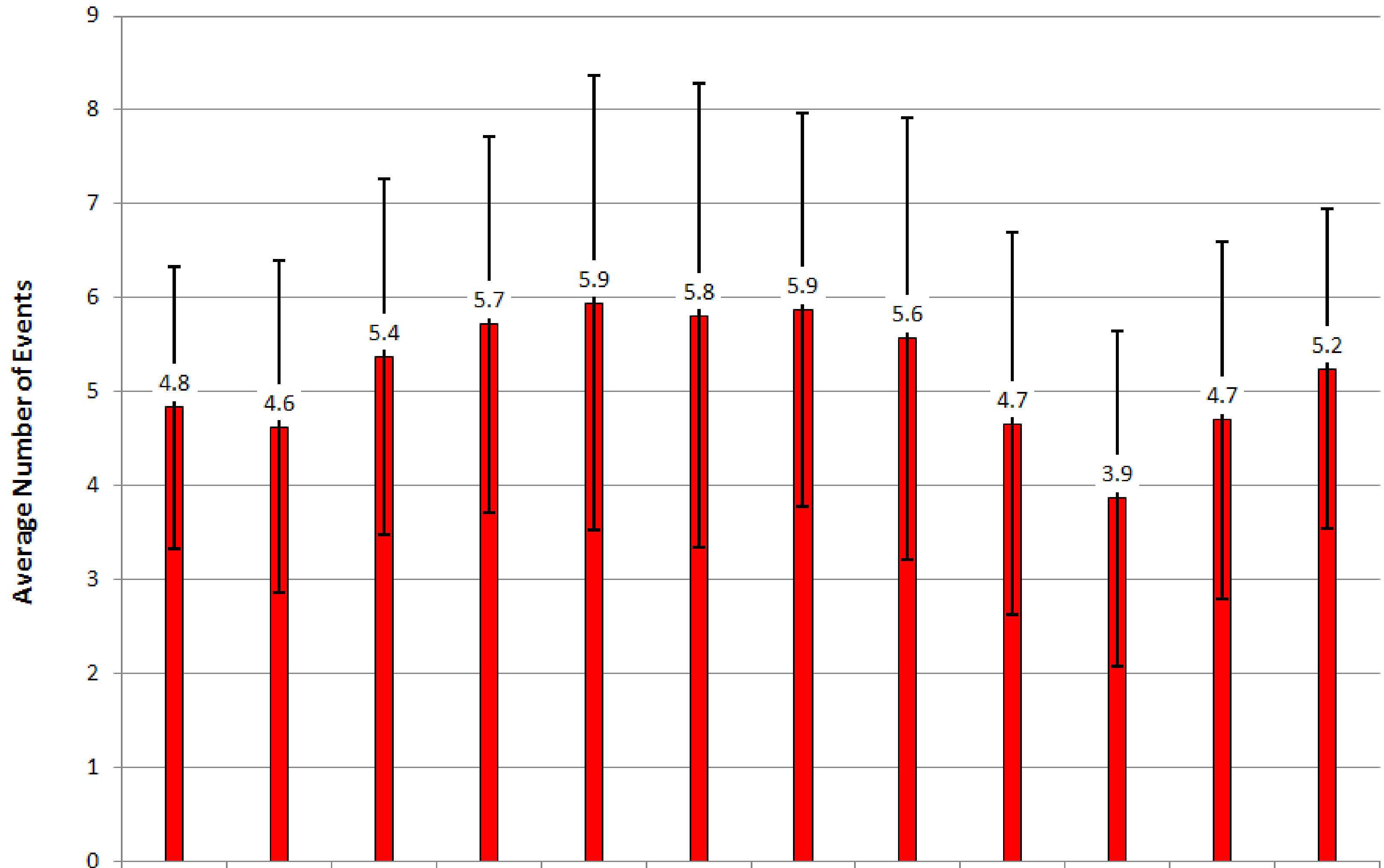
Total Number of Events [a]	Average Annual Number of Events [b]	Mean Event Rainfall Statistics [b]			
		Volume (inches)	Duration (hours)	Peak Intensity (inches/hour)	Delta [c] (days)
3,297	62	0.65	10.4	0.23	5.9

[a] Based upon 53 years of records at the Philadelphia International Airport, from 1961 through 2013

[b] Events greater than or equal to 0.10 inches with a minimum of 6 dry hours to separate events

[c] Delta is the average interval between the midpoint of events

Figure 4-3 shows the average monthly number of events based upon the PHL historical record. Also depicted on the figure is the average monthly number of events plus and minus one standard deviation. This figure can be used to assess the variability in the number of events occurring during each month of the year. Figure 4-3 shows that, on average, more events tend to occur during the summer months of May, June, and July while the fewest occur during the month of October.



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Average	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2
Avg+1STDEV	6.3	6.4	7.3	7.7	8.4	8.3	8.0	7.9	6.7	5.7	6.6	7.0
Avg-1STDEV	3.3	2.9	3.5	3.7	3.5	3.3	3.8	3.2	2.6	2.1	2.8	3.5

Figure 4-3: Average Monthly Number of Events (PHL Historical Record)

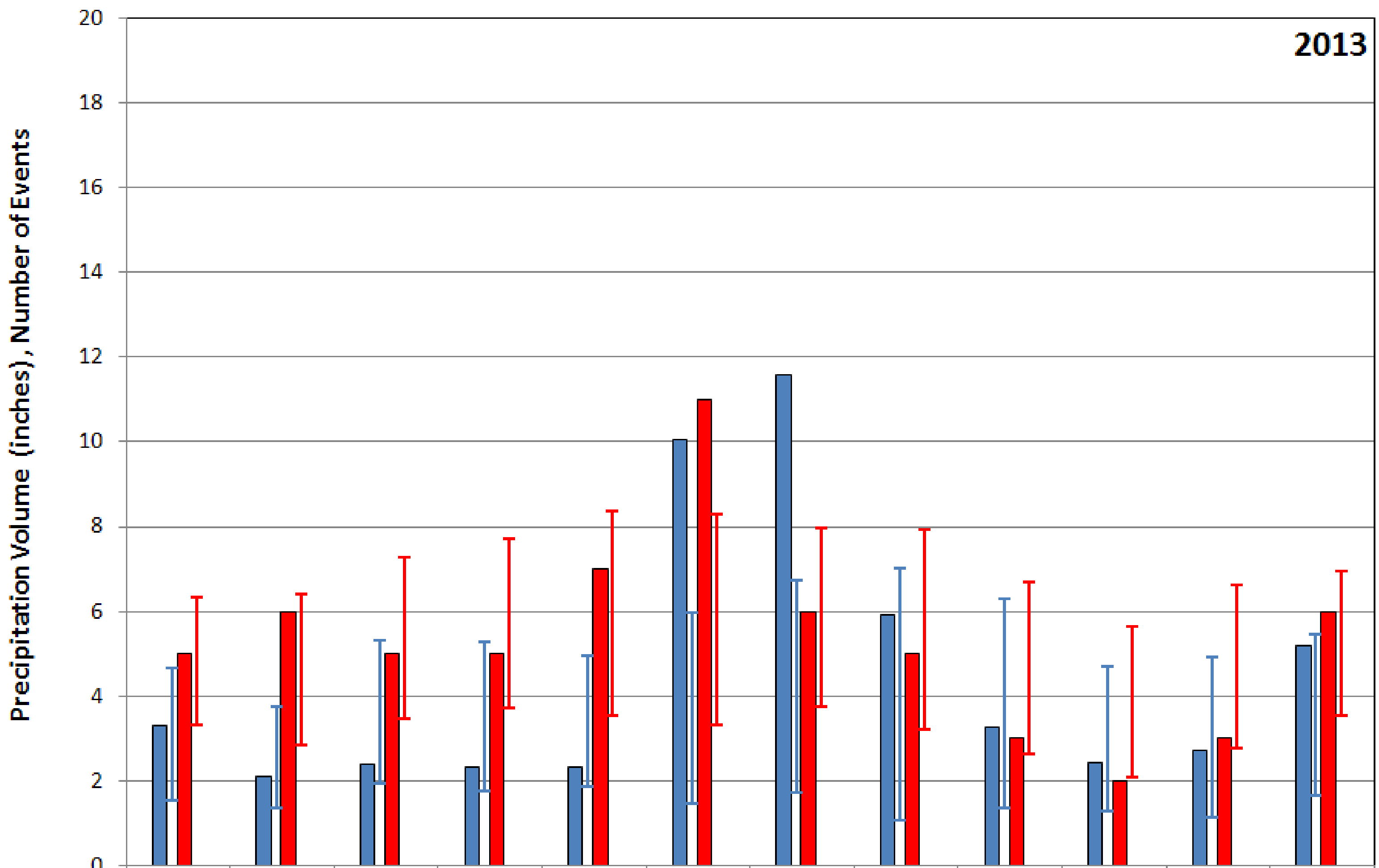
4.1.2 Precipitation Data Analysis (August 2007 through June 2014)

As described in Section 2.1, (Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Billing Meters) the extent of sewer monitoring activities of outlying community areas in support of this study spans the period of August 2007 through June 2014. To gain an understanding of the hydrologic characteristics during this period, and interpret the dry and wet weather flow characterizations of the monitored outlying community areas presented in Sections 4.2 (Dry Weather Flow Analysis Results) and 4.3 (Wet Weather flow Analysis Results), comparisons were made between the precipitation statistics that occurred during this period and historic norms.

Several steps were involved in analyzing the PHL rainfall that was collected during this time period. For each month, the total monthly volume of precipitation at the PHL was calculated. These monthly totals were computed to examine seasonal differences and were used as the basis for identifying atypical wet and dry periods coinciding with the outlying community sewer flow monitoring activities. The frequency (i.e. the number) of events that occurred during each month over the analysis period was another parameter that was used to assess how the precipitation data collected from August 2007 through June 2014 compared to "typical" historic norms. For each month, the total number of wet weather events at the PHL was identified. It is important to note that the same event definition that was used in the historic data analysis was applied to the event analysis for the August 2007 through June 2014 period of record. To reiterate, an event was defined as having a minimum rainfall volume of 0.10 inches and a minimum inter-event period of 6 hours.

The precipitation volumes and number of events occurring during each month were calculated, displayed, and analyzed. Annual plots were produced for each year during the analysis period. Shown on each are the monthly precipitation volume (in blue) and number of events (in red). These same monthly totals, as well as the historic monthly averages, are displayed on the table at the bottom of each plot. In order to assess the magnitude of these monthly values, the variability of the long-term historic averages was illustrated by plotting the historic average monthly volumes and event frequency plus and minus one standard deviation. These values are represented on the plot by typical range extent bars. These annual plots, for 2007 through June 2014, can be found in Appendix A of this report. Figure 4-4, showing the monthly precipitation volume and number of events for 2013, provides an example of the plots included in Appendix A. The appendix is provided in digital format on the attached compact disc (CD).

Table 4-2, which follows the figure, identifies atypical wet and dry months during the period of August 2007 through June 2014 coinciding with the outlying community flow monitoring activities. Months during which the monthly precipitation volume exceeded plus one standard deviation from the mean were identified as atypically wet (shown on the table as "Wet"). Months during which the monthly precipitation volumes were more than one standard deviation lower than the mean were identified as uncharacteristically dry (shown on the table as "Dry"). The wettest month during the analysis period was August 2011 (19.31 inches) while the driest was September 2007 (0.58 inches).



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2013 Volume	3.31	2.11	2.40	2.32	2.33	10.04	11.57	5.91	3.26	2.43	2.73	5.20
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2013 # Events	5	6	5	5	7	11	6	5	3	2	3	6
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2

Figure 4-4: 2013 Precipitation vs. Historical Long-Term Norms

Table 4-2: Identification of Wet and Dry Months (August 2007-June 2014)

YEAR	MONTH											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2007									Very Dry			
2008		Wet										Wet
2009		Dry	Dry					Wet		Wet		Wet
2010			Wet							Wet		
2011								Very Wet	Wet			
2012			Dry				Dry				Dry	
2013						Wet	Wet					
2014		Wet										

While it is understood that various other factors influence wet weather responses in sanitary sewer systems (e.g. depth to groundwater, number and size of defects, soil characteristics, etc.), these precipitation summaries serve as useful tools in understanding the hydrologic characteristics associated with the flow monitoring analysis results presented in Sections 4.2 (Dry Weather Flow Analysis Results) and 4.3 (Wet Weather Flow Analysis Results). The summaries provide the precipitation characteristics necessary in understanding the antecedent moisture conditions associated with the GWI levels and RDII characteristics computed over the course of the monitoring periods and for individual events.

4.2 Dry Weather Flow Analysis Results

Section 4.2 provides a summary of the completed Phase 2 SSES analysis results and conclusions for the characterization of dry weather flow for the outlying communities that convey flow to the City sewer system. After the Phase 1 data collection process had been completed, and the data quality review process had been performed, Phase 2 analyses were conducted on the monitored wastewater flows. Phase 2 analyses and results for this Outlying Communities Report were focused on monitored sewershed areas located within the satellite municipalities and authorities outside the City. A separate SSES report documenting the analysis results for monitored separate sanitary sewershed areas within the City was previously submitted on June 1, 2014. The dry weather flow characterization analysis process for the outlying community areas was described in Section 3.4 (Dry Weather Flow Characterization). This section provides and explains the results and conclusions from those completed analyses. The analyses enabled the Water Department to identify specific sewershed areas within the outlying communities where the quantity of GWI flow was relatively high. This could be an indication of a leaky wastewater collection system where localized rehabilitation of sanitary sewers tributary to the City of Philadelphia's combined sewer system could potentially reduce the frequency, duration and volume of combined sewer overflow (CSO) discharges.

The analyses were conducted on monitored wastewater flow data collected from the network of metering sites that are operated and maintained by the Water Department and are situated at major points of connection between the outlying community and City sewer systems. The collected data are used by the Water Department for purposes of sewer service billing. There are two categories of monitoring sites, permanent billing meter sites and portable or standardized billing meter sites. The monitoring equipment for permanent sites is installed within permanent monitoring structures. The equipment for the portable sites is installed on a temporary basis, rotating through the sites approximately every two to three years, in a standard sewer manhole for a monitoring duration of about three months at each site.

The results from the dry weather flow analyses completed for each successfully monitored outlying community sewershed area are summarized in Tables 4-3 and 4-4. Table 4-3 provides the analysis information for the permanent monitoring sites and Table 4-4 provides the information for the portable sites. The monitoring sites are identified by their billing meter site identification names and are grouped by the outlying community which conveys the monitored sewershed wastewater flow to the City sewer system. The tables provide the drainage area and service population for the sewershed areas tributary to the monitoring sites. It is important to note that the service populations were obtained from the U.S. Census and would include only the people living in the sewershed areas and would not include the people who work in commercial and/or industrial facilities located within the sewershed. The monitoring period and duration are also provided for each site. The tables provide the average daily dry weather flow, average maximum daily dry weather flow, and average minimum daily dry weather flow for the monitored sheds. For the portable monitoring sites (and three permanent billing meter sites) with multiple meter deployment periods, the analysis results for the duration of each individual monitor deployment period are shown on the tables, as well as the results for the entire multi-deployment monitoring duration. The analyses that were conducted to develop these values are described in Section 3.4 (Dry Weather Flow Characterization). These calculated values extend over the identified monitoring duration and deliberately exclude days in which significant rainfall occurred.

The average daily dry weather flow was broken down into its two components; base wastewater flow (BWWF) and GWI. The BWWF component consists of the household residential wastes, commercial and industrial wastes, and the industrial process flows that are discharged by customers into the sanitary sewer collection system. The remaining component is generally comprised mostly of GWI that enters the sewer system through cracks in the sewer pipes, open sewer pipe joints, and/or flow contributions from foundation drains.

For the Phase 2 outlying community analyses, the monitored average minimum daily dry weather flow was assumed to be entirely GWI. This assumption is conservative because even in sewershed areas that have a predominately residential land use, there is almost always some sanitary base wastewater flow (BWWF) being conveyed in the early morning hours. In some sewershed areas, the average minimum daily flow may also contain commercial/industrial flows from any round-the-clock hospitals, factories and other facilities located within the monitored sewershed area. The average daily BWWF values for each monitored sewershed area are provided in the tables. The average daily GWI values can be read directly from the average minimum daily dry weather flow columns in the tables. For the portable monitoring sites (and three permanent billing meter site) with multiple meter deployment periods, the characterization results for the duration of each monitor deployment period are shown on the tables, as well as the results for the entire multi-deployment monitoring duration. Additional dry weather flow characterization information, including average dry weather flow hydrograph plots for each successfully monitored sewershed area, is provided in Appendix B.

Finally, the Phase 2 outlying community analyses also included estimates of per capita and per acre average daily dry weather flow and BWWF rates as a potential means of comparing sewershed areas of differing sizes. Land use information was used to evaluate the results of the hydrologic analyses. As part of the dry weather flow analyses, the percentage of the monitored sewershed areas that had commercial and industrial land uses was calculated to assess the potential for bias from the use of this conservative assumption in the GWI analysis results. The results of the land use assessments for each monitored outlying community sewershed area were previously provided in Table 2-1 (For the permanent metering sites) and Table 2-2 (for the portable metering sites). The results of the per capita and per-acre analyses are provided in Tables 4-3 and 4-4.

Table 4-3: Summary of Dry Weather Flow (DWF) Analysis Results for Permanent Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End[1]	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio[2]
MA_2	Abington Township	3,161	10,222	4/1/12	6/30/14	27.0	1.69	2.21	1.03	166	536	0.667	65	211	0.60
MBE_1	Bensalem Township	241	879	4/1/12	6/30/14	27.0	0.188	0.265	0.099	214	781	0.089	101	369	0.53
MBE_2	Bensalem Township	212	1,894	4/1/12	6/30/14	27.0	0.265	0.344	0.152	140	1,250	0.114	60	536	0.58
MBE_3	Bensalem Township	90	554	3/15/14	6/30/14	3.5	0.139	0.182	0.087	251	1,540	0.052	94	579	0.63
MBE_3	Bensalem Township	90	554	1/1/12	8/26/12	7.8	0.110	0.151	0.056	199	1,219	0.054	97	594	0.51
MBE_3	Bensalem Township	90	554	2/24/10	12/31/10	10.2	0.102	0.135	0.058	184	1,130	0.044	80	490	0.57
MBE_3	Bensalem Township	Monitoring Duration Average[3]					0.108	0.144	0.061	195	1,198	0.047	85	521	0.57
MBE_4	Bensalem Township	193	1,377	4/1/12	6/30/14	27.0	0.16	0.21	0.069	114	814	0.087	63	454	0.44
MBE_5	Bensalem Township	1,024	2,563	4/1/12	6/30/14	27.0	0.768	0.930	0.562	300	750	0.206	80	201	0.74
MBE_6	Bensalem Township	742	4,567	4/1/12	6/30/14	27.0	0.388	0.533	0.178	85	522	0.210	46	283	0.47
MBE_7	Bensalem Township	204	2,110	4/1/12	6/30/14	27.0	0.185	0.251	0.100	88	908	0.086	41	419	0.53
MBE_8	Bensalem Township	230	1,318	4/26/14	6/30/14	2.1	0.551	0.725	0.253	418	2,395	0.298	226	1,295	0.46
MBE_8	Bensalem Township	230	1,318	1/1/10	12/31/10	12.0	0.724	0.933	0.380	549	3,147	0.344	261	1,495	0.52
MBE_8	Bensalem Township	Monitoring Duration Average[3]	0.71	0.912	0.367	536	3,072	0.339	258	1,475	0.51	0.339	258	1,475	0.51
MBE_9	Bensalem Township	290	2,023	4/5/14	6/30/14	2.8	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]
MBE_9	Bensalem Township	290	2,023	2/14/13	5/17/13	3.0	0.325	0.402	0.203	161	1,120	0.122	60	421	0.63
MBE_9	Bensalem Township	290	2,023	1/1/10	12/31/10	12.0	0.383	0.439	0.295	189	1,320	0.088	43	303	0.77
MBE_9	Bensalem Township	Monitoring Duration Average[3]	0.37	0.428	0.267	180	1,259	0.099	49	340	0.73	0.099	49	340	0.73
MBE_10	Bensalem Township	37	272	4/1/12	6/30/14	27.0	0.011	0.130	0.002	42	308	0.009	34	249	0.15
MBE_11	Bensalem Township	71	0	1/1/10	7/31/10	6.9	0.066	0.104	0.041	NA[4]	934	0.025	NA[4]	357	0.64
MBE_12	Bensalem Township	36	1,288	4/1/12	6/30/14	27.0	0.089	0.132	0.030	69	2,463	0.059	46	1,637	0.34
MBE_13	Bensalem Township	17	12	1/1/12	6/30/14	30.0	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]	NA[5]
MBE_14	Bensalem Township	15	30	7/1/12	6/30/14	24.0	0.023	0.032	0.015	761	1,518	0.008	254	507	0.66

Table 4-3: Summary of Dry Weather Flow (DWF) Analysis Results for Permanent Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End[1]	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio[2]
MBE_15	Bensalem Township	145	849	1/1/10	12/31/10	12.0	0.120	0.160	0.065	141	829	0.055	65	381	0.54
MBE_16	Bensalem Township	25	904	4/1/12	6/30/14	27.0	0.210	0.309	0.084	232	8,353	0.126	140	5,026	0.39
MB-1	Bucks County	24,992	96,028	1/1/12	6/30/14	30.0	16.1	19.6	11.1	167	643	4.96	52	198	0.69
MC_1	Cheltenham Township	203	3,533	4/1/12	6/30/14	27.0	0.545	0.682	0.351	154	2,684	0.194	55	955	0.65
MC_2	Cheltenham Township	8,444	64,742	4/1/12	11/25/13	19.8	8.18	9.72	5.44	126	969	2.74	42	325	0.67
MC_3	Cheltenham Township	139	1,208	4/1/12	6/30/14	27.0	0.348	0.406	0.264	288	2,501	0.084	69	601	0.76
MD_1	Delaware County	41,340	277,202	4/1/11	6/30/14	39.0	22.5	26.9	15.3	81	545	7.20	26	174	0.68
ML_1	Lower Merion Township	2,671	15,278	4/1/12	6/30/14	27.0	1.74	2.40	1.14	114	653	0.602	39	225	0.65
ML_3	Lower Merion Township	618	3,782	4/1/12	6/30/14	27.0	0.414	0.554	0.265	110	670	0.149	39	241	0.64
ML_4	Lower Merion Township	7,486	26,716	10/1/10	9/30/11	12.0	4.39	5.18	3.18	164	586	1.21	45	162	0.72
ML_5	Lower Merion Township	1,064	8,883	1/1/12	6/30/14	30.0	0.526	0.805	0.290	59	494	0.236	27	222	0.55
ML_6	Lower Merion Township	58	420	1/1/12	6/30/14	30.0	0.097	0.137	0.032	231	1,669	0.065	155	1,119	0.33
ML_7	Lower Merion Township	205	373	4/1/12	6/30/14	27.0	0.231	0.381	0.113	619	1,126	0.118	317	577	0.50
MLM_1	Lower Moreland Township	448	1,748	1/1/12	6/30/14	30.0	0.333	0.445	0.191	190	743	0.141	81	315	0.58
MLM_2	Lower Moreland Township	1,797	6,529	1/1/12	6/30/14	30.0	0.815	0.967	0.652	125	453	0.163	25	91	0.80
MSH_1	Lower Southampton Township	5,132	21,642	4/1/12	6/30/14	27.0	5.67	6.60	4.28	262	1,105	1.395	64	272	0.75
MS_2	Springfield Township	2,648	12,155	4/1/12	6/30/14	27.0	1.53	2.06	0.665	126	577	0.864	71	326	0.43
MS_3	Springfield Township	1,429	6,941	4/1/12	6/30/14	27.0	1.07	1.38	0.731	154	750	0.341	49	239	0.68
MS_6	Springfield Township	189	1,169	4/1/12	6/30/14	27.0	0.216	0.261	0.160	185	1,145	0.056	48	295	0.74
MUD_1	Upper Darby Township	7,668	100,393	1/1/11	6/30/14	42.0	8.1	9.9	5.4	81	1,060	2.73	27	356	0.67

(1) As of June 30, 2014.

(2) GWI ratios are calculated by dividing the average minimum dry weather flow by the average daily dry weather flow. The ratio signifies the approximate percentage of GWI observed in the total dry weather flow assuming the BWWF component during the minimum early morning flows is non-existent.

(3) Analysis results presented on this row reflect the data collected over the entire reported monitoring duration

(4) Analysis parameter is not applicable since there is no tributary census population and division by zero is not possible.

(5) Sites marked as "NA" were determined to have unreliable data for the entire monitoring period.

Table 4-4: Summary of Dry Weather Flow (DWF) Analysis Results for Portable Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End(1)	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio(2)
MA_1	Abington Township	32	169	2/13/13	5/16/13	3.0	0.014	0.026	0.007	84	448	0.008	45	240	0.46
MA_1	Abington Township	32	169	2/6/10	5/7/10	3.0	0.012	0.022	0.006	69	369	0.006	33	175	0.53
MA_1	Abington Township	32	169	8/28/07	11/16/07	2.6	0.006	0.011	0.002	36	193	0.004	24	126	0.34
MA_1	Abington Township	Monitoring Duration Average(3)					0.012	0.021	0.005	69	365	0.006	36	192	0.46
MA_3	Abington Township	353	3,456	2/13/13	3/7/14	12.7	0.319	0.380	0.225	92	903	0.094	27	266	0.70
MA_3	Abington Township	353	3,456	2/6/10	5/7/10	3.0	0.737	0.837	0.666	213	2,086	0.071	21	201	0.90
MA_3	Abington Township	353	3,456	8/29/07	11/17/07	2.6	0.434	0.590	0.233	126	1,229	0.201	58	569	0.54
MA_3	Abington Township	Monitoring Duration Average(3)					0.445	0.536	0.334	129	1,260	0.111	32	314	0.72
MA_4	Abington Township	120	432	2/13/13	5/16/13	3.0	0.064	0.098	0.030	148	530	0.033	77	278	0.48
MA_4	Abington Township	120	432	2/6/10	5/7/10	3.0	0.062	0.089	0.034	143	512	0.028	65	232	0.55
MA_4	Abington Township	120	432	8/31/07	11/17/07	2.6	0.027	0.058	0.006	62	224	0.021	49	176	0.21
MA_4	Abington Township	Monitoring Duration Average(3)					0.052	0.083	0.024	120	430	0.028	64	231	0.42
MBE_17	Bensalem Township	27	3	2/11/13	5/16/13	3.1	0.009	0.015	0.005	2,877	323	0.004	1,233	138	0.57
ML_2	Lower Merion Township	55	379	2/13/13	5/17/13	3.1	0.051	0.076	0.024	134	918	0.027	71	489	0.47
ML_2	Lower Merion Township	55	379	2/6/10	5/31/10	3.7	0.033	0.042	0.022	87	597	0.012	30	208	0.65
ML_2	Lower Merion Township	55	379	8/16/07	11/16/07	3.0	0.088	0.125	0.040	233	1,599	0.049	128	880	0.45
ML_2	Lower Merion Township	Monitoring Duration Average(3)					0.059	0.084	0.029	156	1,073	0.030	80	549	0.52

Table 4-4: Summary of Dry Weather Flow (DWF) Analysis Results for Portable Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End[1]	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio[2]
MLM_3	Lower Moreland Township	96	344	2/6/10	5/5/10	2.9	0.063	0.087	0.046	182	650	0.017	49	174	0.73
MLM_3	Lower Moreland Township	96	344	8/17/07	11/17/07	3.0	0.037	0.056	0.017	108	387	0.020	58	207	0.46
MLM_3	Lower Moreland Township	Monitoring Duration Average[3]					0.05	0.072	0.032	147	524	0.018	53	190	0.60
MLM_4	Lower Moreland Township	22	80	2/13/13	5/17/13	3.1	0.031	0.041	0.022	388	1,431	0.009	113	415	0.71
MLM_4	Lower Moreland Township	22	80	2/6/10	5/5/10	2.9	0.073	0.080	0.066	906	3,347	0.007	84	309	0.91
MLM_4	Lower Moreland Township	22	80	8/28/07	11/17/07	2.7	0.007	0.013	0.004	94	345	0.004	45	167	0.52
MLM_4	Lower Moreland Township	Monitoring Duration Average[3]					0.033	0.041	0.026	409	1,509	0.007	82	302	0.69
MLM_5	Lower Moreland Township	13	54	2/13/13	5/17/13	3.1	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]
MLM_5	Lower Moreland Township	13	54	2/6/10	5/5/10	2.9	0.0650	0.0689	0.0612	1,204	5,200	0.004	70	304	0.94
MLM_5	Lower Moreland Township	13	54	9/8/07	11/17/07	2.3	0.0879	0.126	0.037	1,628	7,032	0.051	950	4,104	0.42
MLM_5	Lower Moreland Township	Monitoring Duration Average[3]					0.08	0.100	0.048	1,432	6,184	0.029	543	2,346	0.66
MLM_6	Lower Moreland Township	17	79	2/11/13	5/16/13	3.1	0.024	0.036	0.009	304	1,402	0.015	187	865	0.38
MLM_6	Lower Moreland Township	17	79	2/6/10	5/5/10	2.9	0.005	0.008	0.003	68	314	0.003	35	163	0.48
MLM_6	Lower Moreland Township	17	79	8/28/07	11/17/07	2.7	0.009	0.012	0.006	114	526	0.003	35	162	0.69
MLM_6	Lower Moreland Township	Monitoring Duration Average[3]					0.014	0.020	0.006	175	808	0.008	95	440	0.50
MLM_7	Lower Moreland Township	23	87	2/13/13	5/16/13	3.0	0.035	0.051	0.020	407	1,553	0.016	180	689	0.56
MLM_7	Lower Moreland Township	23	87	2/6/10	5/5/10	2.9	0.028	0.045	0.013	326	1,246	0.015	176	671	0.46
MLM_7	Lower Moreland Township	23	87	8/16/07	11/17/07	3.1	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]	NA[4]
MLM_7	Lower Moreland Township	Monitoring Duration Average[3]					0.03	0.048	0.017	368	1,405	0.016	178	680	0.51

Table 4-4: Summary of Dry Weather Flow (DWF) Analysis Results for Portable Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End(1)	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio(2)
MSH_2	Lower Southampton Township	60	282	2/13/13	5/16/13	3.0	0.040	0.057	0.026	142	671	0.015	51	243	0.64
MSH_2	Lower Southampton Township	60	282	2/6/10	5/4/10	2.9	0.076	0.088	0.061	268	1,264	0.014	50	238	0.81
MSH_2	Lower Southampton Township	60	282	9/1/07	11/16/07	2.5	0.013	0.025	0.003	44	209	0.010	35	163	0.22
MSH_2	Lower Southampton Township	Monitoring Duration Average(3)					0.045	0.059	0.032	160	756	0.013	47	221	0.59
MS_1	Springfield Township	77	404	2/11/13	5/16/13	3.1	0.182	0.305	0.061	450	2,357	0.121	300	1,572	0.33
MS_1	Springfield Township	77	404	2/6/10	5/6/10	2.9	0.366	0.584	0.151	905	4,740	0.215	532	2,785	0.41
MS_1	Springfield Township	77	404	8/16/07	11/17/07	3.1	0.254	0.428	0.082	629	3,290	0.172	427	2,233	0.32
MS_1	Springfield Township	Monitoring Duration Average(3)					0.261	0.430	0.094	646	3,380	0.167	412	2,157	0.35
MS_4	Springfield Township	64	399	2/11/13	5/16/13	3.1	0.117	0.148	0.093	293	1,825	0.024	61	379	0.79
MS_4	Springfield Township	64	399	2/6/10	5/25/10	3.6	0.193	0.245	0.161	484	3,010	0.032	80	499	0.84
MS_4	Springfield Township	64	399	8/31/07	11/17/07	2.6	0.093	0.141	0.058	234	1,455	0.036	89	555	0.62
MS_4	Springfield Township	Monitoring Duration Average(3)					0.138	0.181	0.107	345	2,146	0.030	76	474	0.76
MS_5	Springfield Township	69	410	2/15/13	5/15/13	2.9	0.133	0.176	0.100	324	1,920	0.033	80	476	0.76
MS_5	Springfield Township	69	410	2/6/10	5/6/10	2.9	0.191	0.219	0.171	466	2,758	0.020	49	289	0.89
MS_5	Springfield Township	69	410	8/17/07	11/17/07	3.0	0.088	0.135	0.059	214	1,265	0.029	70	417	0.67
MS_5	Springfield Township	Monitoring Duration Average(3)					0.140	0.179	0.112	340	2,015	0.028	68	402	0.78
MS_7	Springfield Township	13	110	2/16/13	5/16/13	2.9	0.007	0.014	0.003	60	518	0.003	29	254	0.51
MS_7	Springfield Township	13	110	2/6/10	5/7/10	3.0	0.005	0.010	0.003	48	419	0.002	22	194	0.54
MS_7	Springfield Township	13	110	8/29/07	11/17/07	2.6	0.017	0.047	0.004	153	1,319	0.013	120	1,037	0.22
MS_7	Springfield Township	Monitoring Duration Average(3)					0.009	0.022	0.003	83	719	0.006	53	460	0.44

Table 4-4: Summary of Dry Weather Flow (DWF) Analysis Results for Portable Monitoring Sites

Billing Meter Site ID	Contract Community	Tributary Drainage Area (acres)	Tributary Service Population	Data Start	Data End[1]	Duration (months)	Average Daily DWF (mgd)	Average Daily Maximum DWF (mgd)	Average Daily Minimum DWF (mgd)	Per Capita Average Daily DWF (gpcd)	Per Acre Average Daily DWF (gal/acre/d)	Average Daily BWWF (mgd)	Per Capita Average Daily BWWF (gpcd)	Per Acre Average Daily BWWF (gal/acre/d)	GWI Ratio[2]
MS_8	Springfield Township	5	11	2/14/13	5/16/13	3.0	0.072	0.087	0.053	6,500	13,329	0.019	1,700	3,486	0.74
MS_8	Springfield Township	5	11	2/6/10	5/7/10	3.0	0.056	0.074	0.040	5,100	10,458	0.016	1,445	2,964	0.72
MS_8	Springfield Township	5	11	10/27/07	11/16/07	0.7	0.107	0.125	0.087	9,727	19,947	0.020	1,791	3,672	0.82
MS_8	Springfield Township	Monitoring Duration Average[3]					0.071	0.088	0.053	6,444	13,213	0.018	1,617	3,315	0.74

(1) As of June 30, 2014.

(2) GWI ratios are calculated by dividing the average daily minimum dry weather flow by the average daily dry weather flow. The ratio signifies the approximate percentage of GWI observed in the total dry weather flow assuming the BWWF component during the minimum early morning flows is non-existent.

(3) Analysis results presented on this row reflect the data collected over the entire reported monitoring duration

(4) Sites marked as "NA" were determined to have unreliable data for the entire monitoring period.

4.2.1 Identification of Sewershed Areas with Higher Levels of Infiltration

Additional dry weather flow quantification and characterization analyses were conducted to compare the monitored outlying community sewershed flows to each other and identify specific separate sanitary sewer collection systems where the quantity of GWI could be considered relatively high. Special analyses are needed to make these comparisons because high monitored flow quantities do not necessarily indicate a GWI problem or leaky sewer system. Larger sewershed areas with larger populations are expected to generate more wastewater flow. Small sewershed areas would also be expected to contribute high flow quantities if the service population density is high. There are three analysis methods that are were used to compare sewershed areas and identify relatively leaky sewershed areas: a GWI ratio analysis approach, a per capita analysis approach, and a per-acre analysis approach. An inch-mile approach is sometimes used, but the available information on the outlying community collection systems do not consistently include the size and/or length of every pipe in the sewer collection systems.

The first analysis method used for the outlying community Phase 2 SSES was a GWI ratio approach where, for each successfully monitored satellite sewershed area, the average minimum dry weather flow was divided by the total average daily dry weather flow. The resulting ratio signifies the approximate percentage of GWI that was monitored as a component of the total flow, assuming the monitored BWWF component was negligible during the minimum early morning period. The GWI ratios are provided in Tables 4-3 and 4-4 and allow sewershed areas of any size and/or service population to be directly compared. A cumulative distribution function (CDF) plot was prepared which includes the calculated total monitoring duration GWI ratios for each billing meter site. The GWI ratio values were placed in order from the lowest to the highest, and each sewershed area was assigned a cumulative percentile value. The percentile value was the percent of the sites with a GWI ratio value less than or equal to the value indicated on the horizontal axis. In general, sewershed areas with very high percentile values usually tend to have sewer collection systems that are most leaky, and sewershed areas with low percentile values usually tend to be the tightest.

The GWI ratio CDF plot is provided in Figure 4-5, and was color-coded to facilitate interpretation of the results. Sewershed areas with significantly high monitored GWI ratio values (above 0.85) would be color-coded red. A GWI ratio of 0.85 indicates that approximately 85 percent of the total monitored flow on dry weather days is attributable to GWI flow that enters the sewer system through cracks in the sewer pipes, open sewer pipe joints, and/or flow contributions from foundation drains. Conversely, approximately 15 percent of the monitored dry weather flow is attributable to BWWF from household residential wastes, commercial and industrial wastes, and industrial process flows. None of the outlying community sewershed areas were found to be in the red category. There was no clearly identified inflection point in the CDF curve, and no sewershed areas were found to have significantly higher GWI values than the other analyzed sewershed areas. Sewershed areas with high values (from 0.76 to 0.85) were color-coded orange, and areas with moderately high values (0.71 to 0.75) were color-coded yellow. Sewershed areas with average and low GWI ratios, and relatively tight sewer collection systems, were color-coded green and blue, respectively. As a basis for comparison, the median or middle GWI ratio value for all the monitored outlying community sewershed areas was 0.60. Figure 4-6 provides the same GWI ratio data as Figure 4-5, but as a bar chart, and also provides the corresponding sewershed names for each point along the CDF curve.

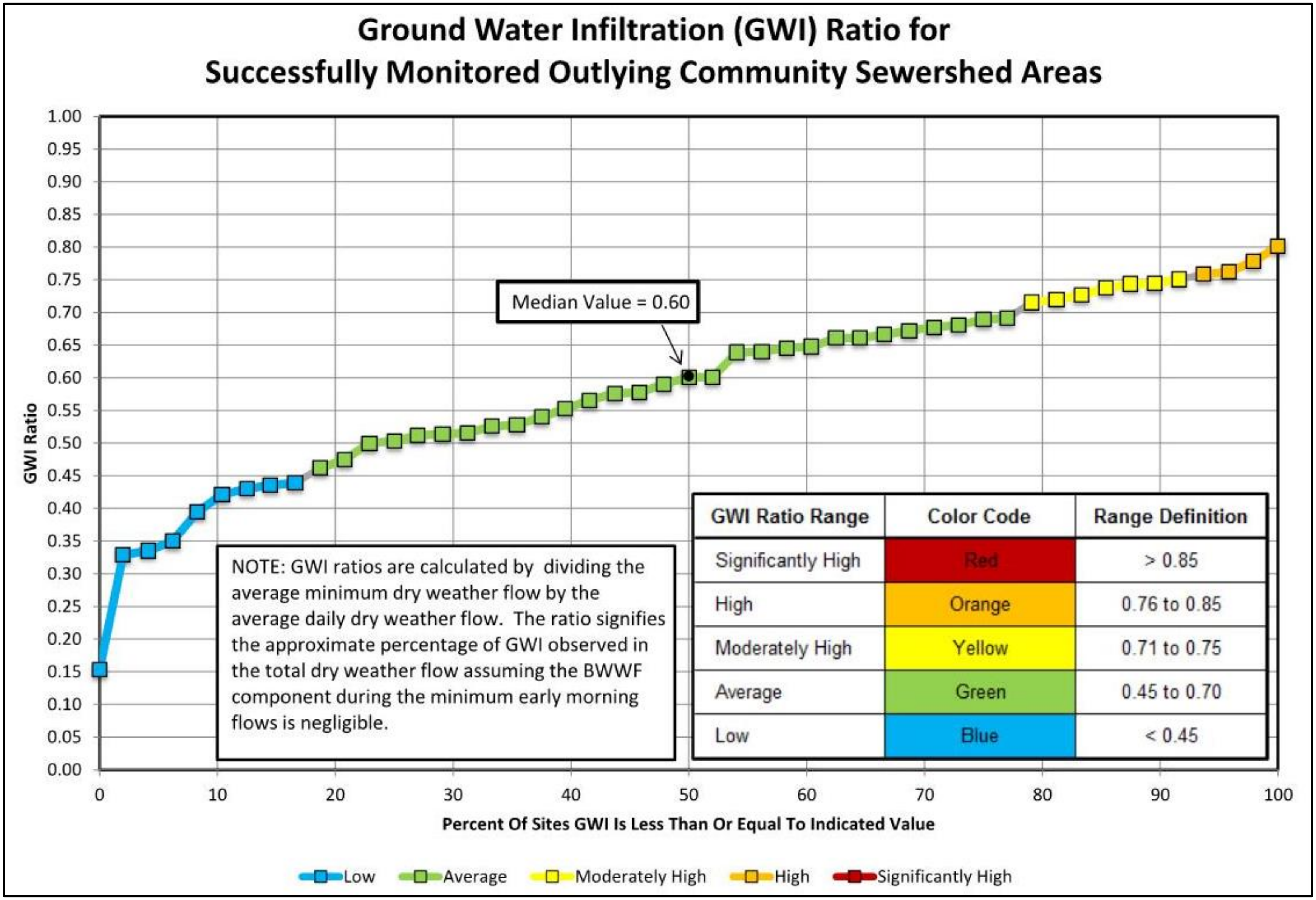


Figure 4-5: Cumulative Distribution Function for GWI Ratio

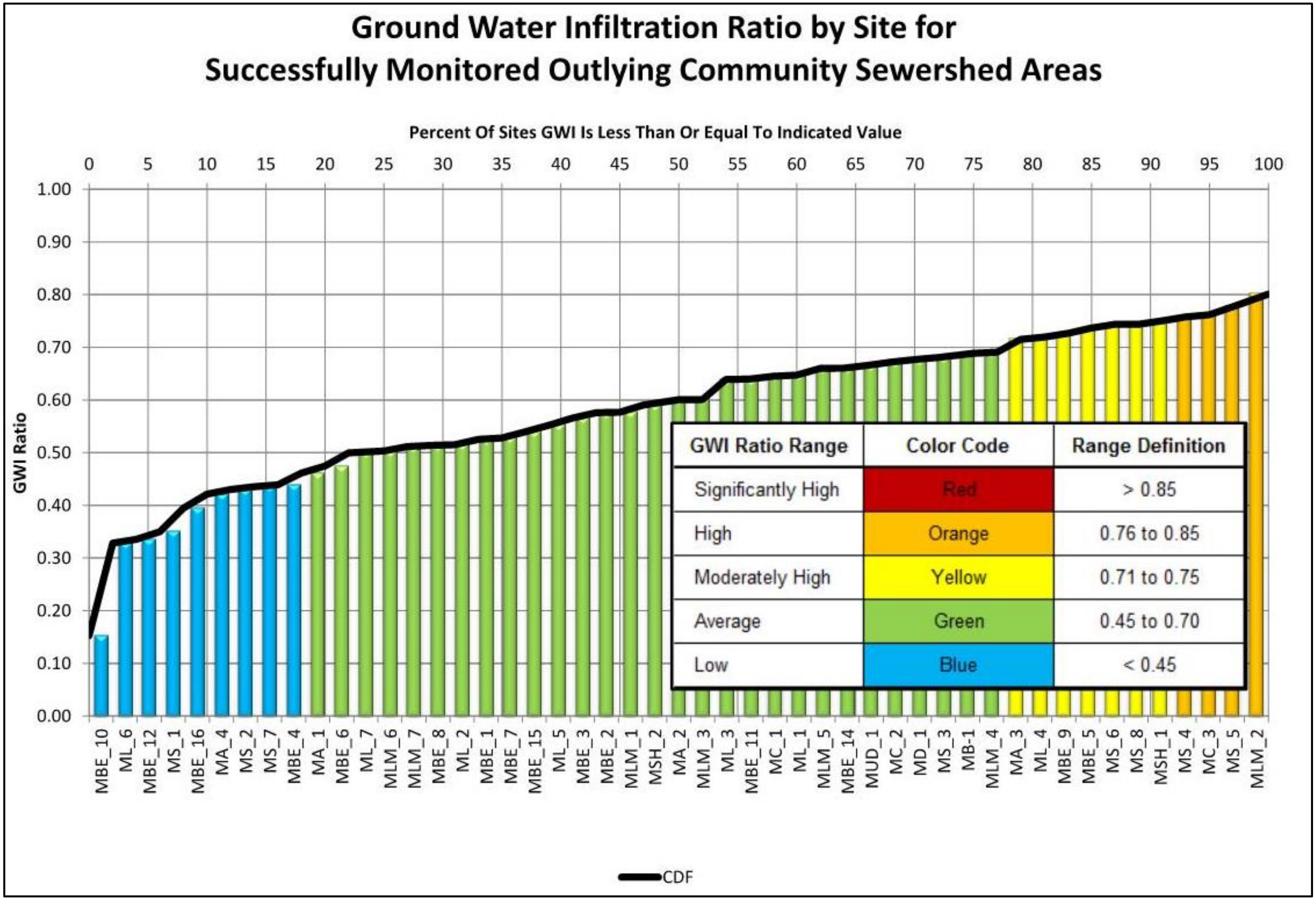


Figure 4-6: Bar Chart for GWI Ratio with Site Locations

The second analysis method is to take the monitored average daily dry weather flow and divide by the service population of the tributary sewershed area to derive per capita values by which sewershed areas of differing size and population density can be directly compared. Per capita average daily dry weather flow values were calculated for the Phase 2 outlying community analyses and are provided in Tables 4-3 and 4-4 for each successfully monitored outlying community sewershed area. A CDF plot was prepared which includes the per capita average daily DWFs calculated from each outlying community sewershed area. The per capita ADDWF plot is provided in Figure 4-7 and was color-coded to facilitate easier interpretation of the results. Sewershed areas with significantly high monitored per capita average daily dry weather flow values (above 700 gallons per capita per day (gpcd)) were color-coded red. The highest data point along the CDF curve (for Site MS_8) was deliberately not plotted to preserve an optimal viewing scale. Sewershed areas with high values (from 501 to 700 gpcd) were color-coded orange, and areas with moderately high values (301 to 500 gpcd) were color-coded yellow. Sewershed areas with average and low per capita average daily dry weather flow values, and relatively tight sewer collection systems, were color-coded green and blue, respectively. As a basis for comparison, the median value for all the monitored outlying community sewershed areas was 163 gpcd.

However, it should be understood that this analysis method generally needs to be limited to sewershed areas with a predominantly residential land use, because per capita average daily dry weather flow values can be misleading in areas with significant commercial and/or industrial land uses. This potential bias exists because the service populations were obtained from the U.S. Census and would include only the people living in the sewershed areas and would not include the people who work in commercial and/or industrial facilities located within the average daily dry weather flow. Some of the outlying community sewershed areas identified with high per capita average daily dry weather flow values also had significant portions of non-residential land uses, and the associated possibility for significant "uncounted" worker population. Also, the sewershed areas tributary to some of the portable monitoring sites are small and have small service populations. Dividing the monitored average daily dry weather flow by a small service population could produce a relatively high per capita number that may not accurately represent the leakiness of the sewer collection system. For these reasons, the GWI ratio analysis method was selected for providing the most reliable results for the Outlying Communities Report and used to identify relatively leaky sewershed areas. Further discussion and applications are provided in Section 4.2.2 (Dry Weather Flow Analysis Observations) below.

The third analysis method is to take the monitored average daily dry weather flow and divide by the area of the tributary sewershed to derive per acre values by which sewershed areas of differing size can be directly compared. Per acre average daily dry weather flow values were calculated for the Phase 2 outlying community analyses and are provided in Tables 4-3 and 4-4 for each successfully monitored outlying community sewershed area. A CDF plot was prepared which includes the per acre average daily dry weather flow calculated from each outlying community sewershed area. The per-acre average daily dry weather flow plot is provided in Figure 4-8 and was color-coded to facilitate easier interpretation of the results. Sewershed areas with significantly high monitored per capita average daily dry weather flow values (above 3,500 gallons per acre per day (gpad)) were color-coded red. The highest data point along the CDF curve (for Site MS_8) was deliberately not plotted to preserve an optimal viewing scale.

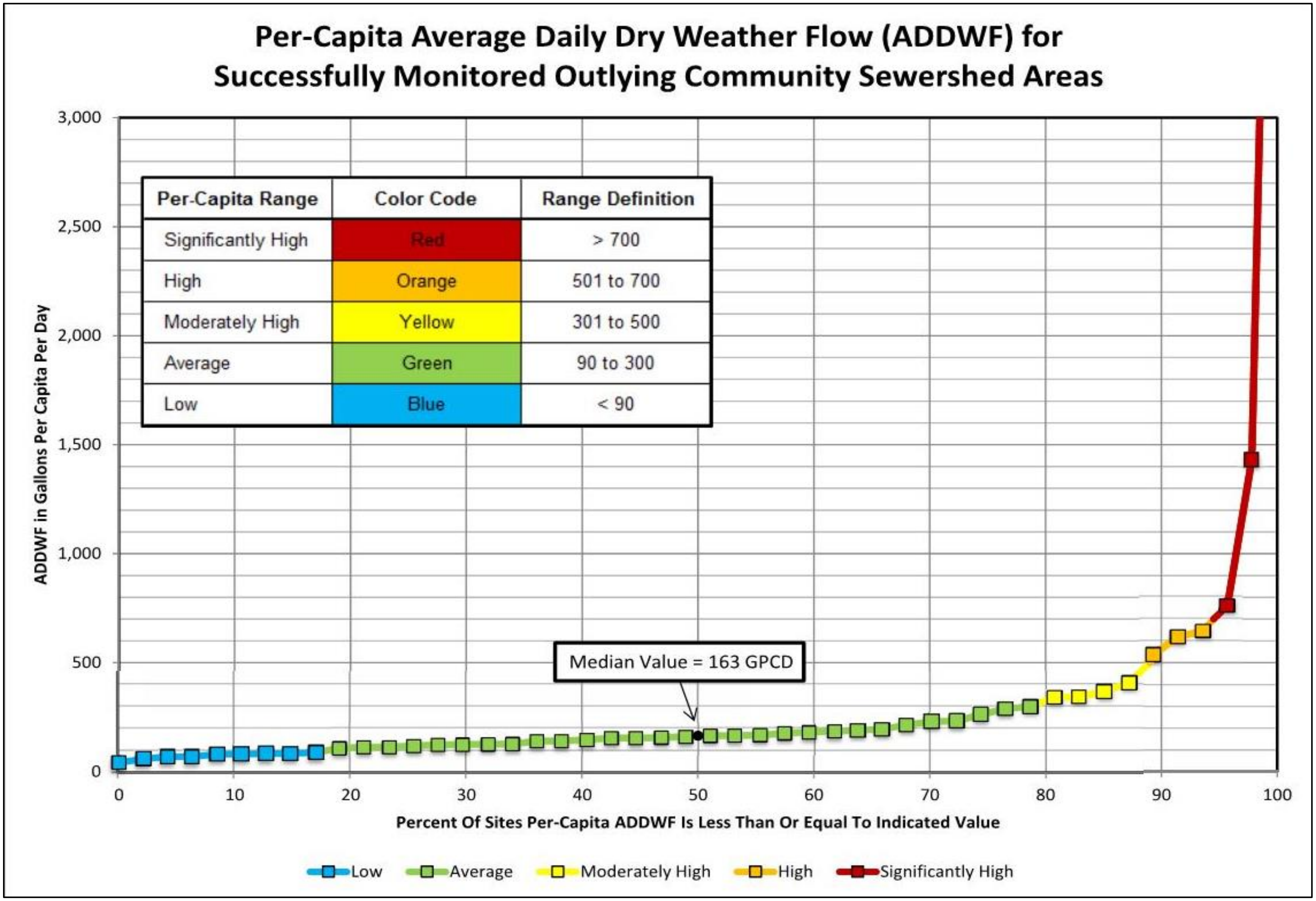


Figure 4-7: Per Capita Average Daily Dry Weather Flow

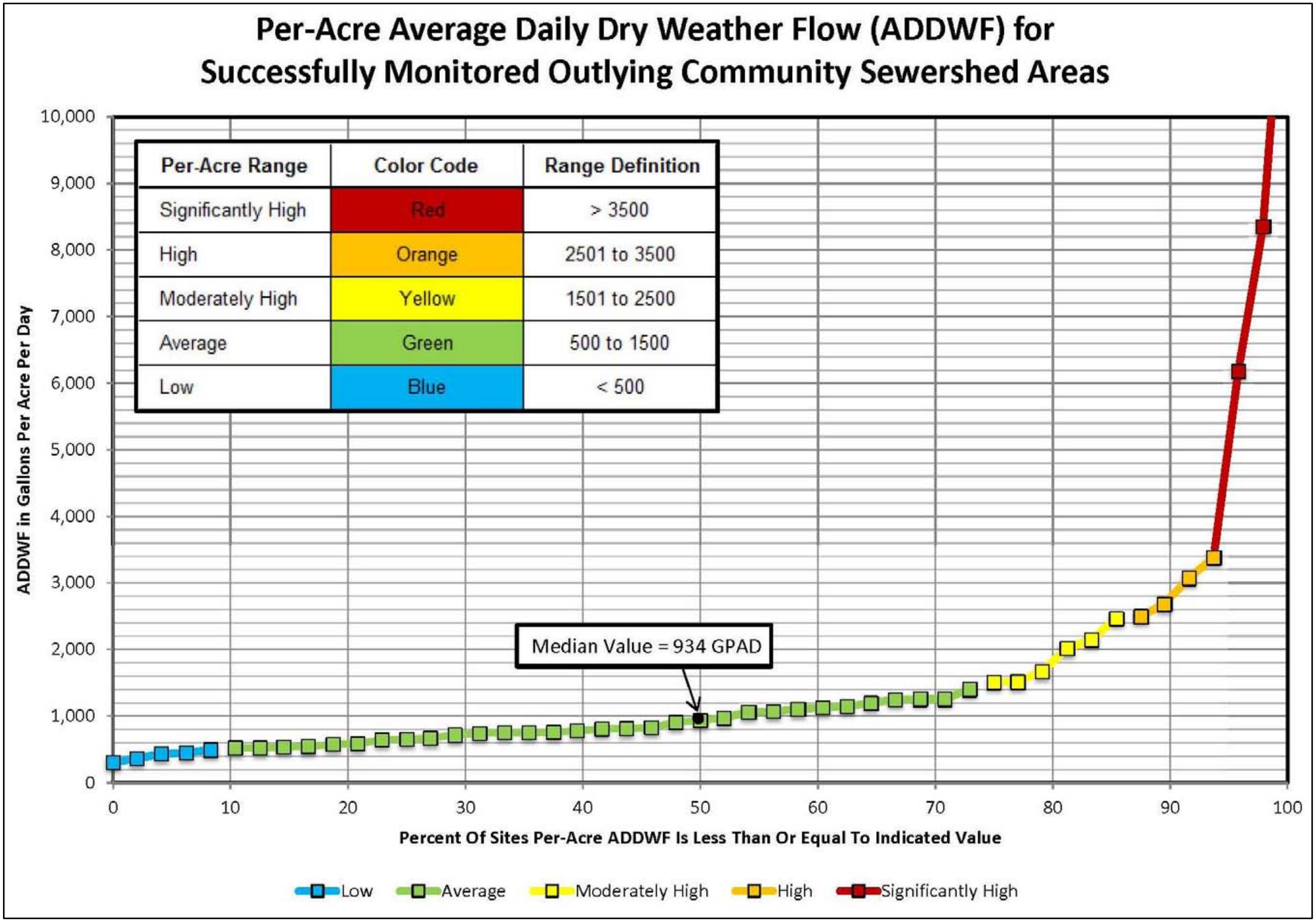


Figure 4-8: Per Acre Average Daily Dry Weather Flow

Sewershed areas with high values (from 2,501 to 3,500 gpad) were color-coded orange, and areas with moderately high values (1,501 to 2,500 gpcd) were color-coded yellow. Sewershed areas with average and low per acre average daily dry weather flow values, and presumably tighter sewer collection systems, were color-coded green and blue, respectively. As a basis for comparison, the median value for all the monitored outlying community sewershed areas was 934 gpad.

However, it should be understood that this analysis method could potentially generate biased results. Heavily developed sewershed areas would have relatively dense sewer collection systems with relatively higher service populations and with greater total lengths of sewer pipes that would provide greater opportunity for ground water to leak into the sewer system. The resulting per acre flow values would be biased high and may significantly over-predict the actual leakiness of the sewer collection system. Conversely, rural areas would have sewer systems with a relatively lower density, lower service populations, and less total lengths of sewer pipe, and would provide less opportunity for groundwater to enter. The resulting per acre flow values would be biased low and may significantly under-predict the actual leakiness of the sewer collection system. Also, the sewershed areas tributary to some of the portable monitoring sites are small. Dividing the monitored average daily dry weather flow by a small sewershed area could produce a high per acre number that does not accurately represent the leakiness of the sewer collection system. For these reasons, the GWI ratio analysis method was selected for providing the most reliable results for the Outlying Communities Report and used to identify relatively leaky sewershed areas. Further discussion and applications are provided in Section 4.2.2 below.

4.2.2 Dry Weather Flow Analysis Observations

The completed Phase 2 SSES analysis for the outlying communities was successful in identifying specific sewershed areas where the quantity of monitored GWI flow was relatively high. The GWI component of dry weather flow varies gradually with seasonal changes in the elevation of the groundwater table and generally does not respond rapidly to a single storm. These higher GWI ratios could potentially be an indication of a leaky wastewater collection system where the flow during dry weather conditions is relatively high and the elevation of the groundwater table is above the elevation of the sanitary sewer collection system for extended periods of time. For these sewershed areas, sewer rehabilitation could be considered and investigated as a means to potentially reduce GWI flow and reduce the frequency, duration and volume of sewer surcharge conditions and CSO discharges.

For these identified sewershed areas, the monitoring duration was taken into account to verify that there was sufficient data to examine seasonal variability. The monthly precipitation volumes and event frequencies during the monitoring periods were checked against the corresponding historical average values to see if there was potential bias (significantly wetter or drier than normal) that could impact the analysis results. The presence of significant commercial/industrial area was also checked to see if potential round-the-clock flow could bias the analysis results. The potential impacts of monitoring duration, precipitation volumes, and land use on the dry weather flow analyses are addressed below.

There were no outlying community sewershed areas where the GWI ratio, calculated from the monitored wastewater flow monitoring data, was greater than 0.85 and classified as very high (red range along the CDF curve.) When looking at the CDF curve in Figures 4-5 and 4-6, no clear inflection point can be seen. This indicates the GWI ratios for some outlying community sewershed areas may be moderately higher or higher than the others, but none could be considered to be significantly higher than the others.

There were four sewershed areas within the outlying communities where the GWI ratio was between 0.76 and 0.85 and was classified as high (orange range along the CDF curve.) The locations of these outlying community sewershed areas are identified on the Figure 4-9 through Figure 4-11 maps that are provided at the end of this report sub-section.

- **Billing Meter Site MLM_2** monitors a large 1,797 acre sewershed area from Lower Moreland Township that discharges wastewater flow to the City's Darlington Run sewer and then to the Pennypack Creek Interceptor. The flow is pumped to the City through the Welsh Road Pump Station, and the sewershed area is generally long and narrow. The permanent site's total monitoring duration was approximately 30 months, from January 2012 through June 2014. The monitoring periods included all four seasons, which provides sufficient data to characterize seasonal variations. During 24 of the 30 months in the monitoring period, the precipitation values were within the normal historical ranges. However, for the months of March, July and November of 2012, the monitored storm volumes were lower than the historical norm. The storm volumes during June and July of 2013 and during February 2014 were higher than average. Overall, the precipitation volumes during the monitoring duration were reasonably representative of historic norms and should not bias the analysis results.

  The land use analyses indicated that approximately 14 percent of the MLM_2 sewershed is classified as industrial and commercial land use area. There is a possibility that commercial and/or industrial facilities could discharge round-the-clock flow to the sewer system. If these flows were to be significant, they could increase the measured GWI ratio and potentially make the sewer collection system appear to be leakier than it really is. The analysis results provided previously in Figure 3-11 indicate there appears to be no significant correlation between GWI ratio and the percentage of the sewershed comprised by industrial and commercial land use areas. However, field investigations would need to be conducted to discern if nighttime commercial/industrial flows are present within the sewershed area.

  The per capita analyses indicated the sewershed area was in the average range and the per acre analyses indicated that the sewershed area was in the low range. This indicates that the GWI component of the monitored flow was high compared to total monitored flow, but not potentially not high considering the size and service population of the tributary sewershed area. The service population is large (6,529) and there is no concern for a potential bias in the per capita analysis results. Given the long and narrow shape of the tributary sewershed area, the associated hydrograph lagging, the additional lagging from the pump station operations, and the high percentage of commercial/industrial area, the analysis assumptions for GWI quantification may not all be met for this billing meter site, and the GWI ratio results should be used with caution.

- **Billing Meter Site MS_5** monitors a 69 acre sewershed area from Springfield Township that discharges wastewater flow to the City's Cresheim Valley Interceptor. The portable site's total monitoring duration was approximately 9 months, over 3 separate monitoring periods in 2007, 2010 and 2013. The monitoring periods included the late winter, spring and fall seasons which should provide sufficient data to characterize seasonal variations. During 7 of the 9 months in the monitoring period, the precipitation values were within the normal historical ranges. However, for the month of March 2010, the monitored storm volume was higher than the historical norm and the storm volume during September 2007 was significantly lower than average. Overall the precipitation volumes during the monitoring duration were reasonably representative of historic norms and should not bias the analysis results.

  The land use analyses indicated that there are no portions of the sewershed that are classified as industrial and commercial land use area. Therefore, there should not be any potential bias from round-the-clock flow to the sewer system.

  The per capita and per acre analyses both indicated that the sewershed area had moderately high unit flow values. This indicates that the GWI component of the monitored flow was high compared to total monitored flow, and was also high considering the size and service population of the tributary sewershed area. The tributary sewershed area (69 acres) and service population (410) should be sufficiently high to minimize any concern for a potential bias in the per capita or per acre analysis results. The three analysis methods confirm that this outlying community collection system could convey a higher than average quantity of GWI.

- **Billing Meter Site MC_3** monitors a 139 acre sewershed area from Abington and Rockledge Townships, which discharges wastewater flow through Cheltenham Township to the City's Tacony Creek High Level Interceptor. The permanent site's total monitoring duration was approximately 27 months, from April 2012 through June 2014. The monitoring periods included all four seasons, which provides sufficient data to characterize seasonal variations. During 21 of the 27 months in the monitoring period, the precipitation values were within the normal historical ranges. However, for the months of March, July and November of 2012, the monitored storm volumes were lower than the historical norm. The storm volumes during June and July of 2013 and during February 2014 were higher than average. Overall the precipitation volumes during the monitoring duration were reasonably representative of historic norms and should not bias the analysis results.

  Approximately 28 percent of the MC_3 sewershed is classified as industrial and commercial land use area. There is a possibility that commercial and/or industrial facilities could discharge round-the-clock flow to the sewer system. If these flows were to be significant, they could significantly increase the GWI ratio and potentially make the sewer collection system appear to be leakier than it really is. Completed analyses indicated there appears to be no significant correlation between GWI ratio and the percentage of the sewershed comprised by industrial and commercial land use areas. However, field investigations could be conducted to discern if nighttime commercial/industrial flows are present within the sewershed area.

The per capita analyses indicated the sewershed area was in the average range and the per acre analyses indicated that the sewershed area was in the moderately high range. This indicates that the GWI component of the monitored flow was high compared to total monitored flow, and considering the size of the tributary sewershed area, but not high considering the size of the service population. The tributary sewershed area (139 acres) and service population (1,208) should be sufficiently high to minimize any concern for a potential bias in the per capita or per acre analysis results.

- **Billing Meter Site MS_4** monitors a 64 acre sewershed area from Springfield Township that discharges wastewater flow to the City's Cresheim Valley Interceptor. The portable site's total monitoring duration was approximately 9 months, over 3 separate monitoring periods in 2007, 2010 and 2013. The monitoring periods included the late winter, spring and fall seasons which should provide sufficient data to characterize seasonal variations. During 7 of the 9 months in the monitoring period, the precipitation values were within the normal historical ranges. However, for the month of March 2010, the monitored storm volume was higher than the historical norm and the storm volume during September 2007 was significantly lower than average. Overall the precipitation volumes during the monitoring duration were reasonably representative of historic norms and should not bias the analysis results.

  Approximately 6 percent of the MS_4 sewershed is classified as industrial and commercial land use area. There is a possibility that commercial and/or industrial facilities could discharge round-the-clock flow to the sewer system. If these flows were to be significant, they could significantly increase the GWI ratio and potentially make the sewer collection system appear to be leakier than it really is. Field investigations would need to be conducted to discern if nighttime commercial/industrial flows are present within the sewershed area.

  The per capita and per acre analyses both indicated that the sewershed area had moderately high unit flow values. This indicates that the GWI component of the monitored flow was high compared to total monitored flow, and was also high considering the size and service population of the tributary sewershed area. The tributary sewershed area (64 acres) and service population (399) should be sufficiently high to minimize any concern for a potential bias in the per capita or per acre analysis results. The three analysis methods confirm that this outlying community collection system could convey a higher than average quantity of GWI.

It is important to note that just because a sewershed area was identified as having a relatively high GWI value does not indicate that additional field investigations, sewer system evaluations, or rehabilitation measures are necessarily recommended or required. A GWI ratio, computed as part of a comprehensive dry weather characterization analysis, is only one of several alternative analysis approaches that are used to determine if a sewershed area is contributing a relatively high quantity of extraneous flow. Wet weather analysis methods to quantify and characterize rainfall dependent infiltration and inflow (RDII) should also be considered, as explained in Section 4.3 (Wet Weather Analysis Results), when selecting candidate sewershed sites.

The outlying community analyses identified specific sewershed areas with GWI values that were relatively higher than the other analyzed sewershed areas. Being flagged in a sewershed characterization analysis does not assure that the GWI flow can be cost effectively removed from the sewershed collection system, and does not guarantee that if the flow was removed that there would be a significant impact on reducing the frequency, duration and volume of CSO and/or sanitary sewer overflow (SSO) discharges.

It also needs to be understood that if a sewershed is identified as having a relatively high GWI value, it does not indicate that all the collection sewers within the entire sewershed area tributary to the monitoring site are relatively leaky. Especially for larger sewershed areas, there may be a combination of some very leaky areas along with some acceptably tighter areas. Detailed field investigations and evaluations of subareas within the identified sewershed areas would need to be conducted by the outlying community to identify specific sections of the sanitary sewer collection system that could be targeted for opportunities to reduce extraneous flow and downstream CSOs. The investigations would also determine how much GWI is coming from private property versus public infrastructure in each area.

4.2.3 Dry Weather Flow Analysis Conclusions

There were no outlying community sewershed areas where the GWI ratio, calculated from the monitored wastewater flow monitoring data, was greater than 0.85 and classified as very high (red range along the CDF curve.) When looking at the CDF curves in Figures 4-5 and 4-6, no clear inflection points can be seen. This indicates the GWI ratios for some outlying community sewershed areas may be moderately high compared to others, but none could be considered clear outliers compared to all the others.

There were four sewershed areas within the outlying communities where the GWI ratio was between 0.76 and 0.85 and was classified as high (orange range along the CDF curve) when compared to the other monitored sewershed areas. The locations of these outlying community sewershed areas are identified on the Figure 4-9 through Figure 4-11 maps that are provided at the end of this report sub-section. For these sewershed areas, further investigations and evaluations of potential RDII reduction measures may be beneficial. These activities would be conducted by the respective outlying community.

- **Billing Meter Site MLM_2** monitors a large 1,797 acre sewershed area from Lower Moreland Township that discharges wastewater flow to the City's Poquessing Creek Interceptor. Approximately 80% of the average monitored daily dry weather flow volume was attributed to ground water infiltration while only 20% was attributed to residential and non-residential wastewater flow.

- **Billing Meter Site MS_5** monitors a 69 acre sewershed area from Springfield Township that discharges wastewater flow to the City's Cresheim Valley Interceptor. Approximately 78% of the average monitored daily dry weather flow volume was attributed to ground water infiltration while only 22% was attributed to residential and non-residential wastewater flow.

- **Billing Meter Site MC_3** monitors a 139 acre sewershed area from Abington and Rockledge Townships, which discharges wastewater flow through Cheltenham Township to the City's Tacony Creek High Level Interceptor. Approximately 76% of the average monitored daily dry weather flow volume was attributed to ground water infiltration while only 24% was attributed to residential and non-residential wastewater flow.

- **Billing Meter Site MS_4** monitors a 64 acre sewershed area from Springfield Township that discharges wastewater flow to the City's Cresheim Valley Interceptor. Approximately 76% of the average monitored daily dry weather flow volume was attributed to ground water infiltration while only 24% was attributed to residential and non-residential wastewater flow.

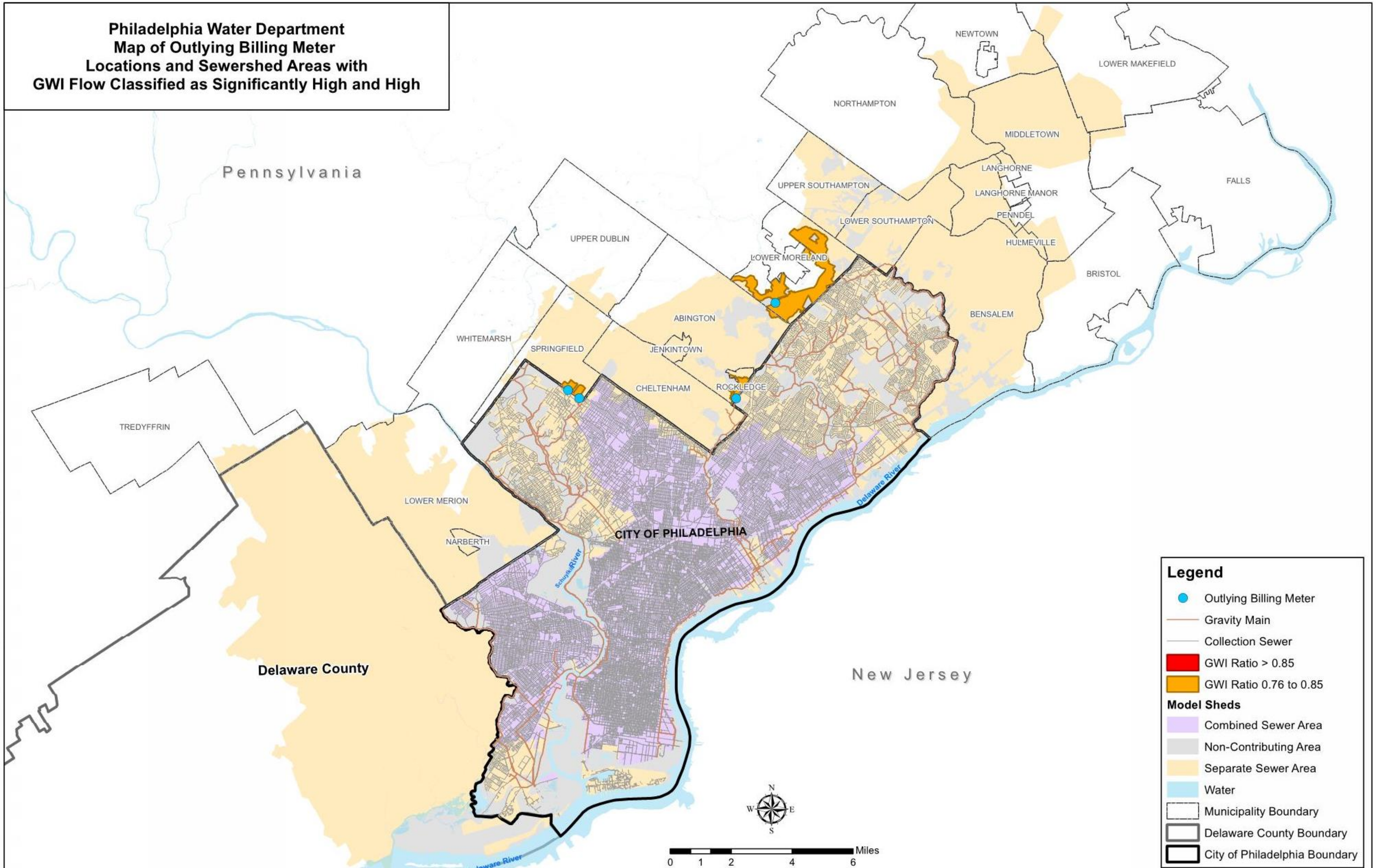


Figure 4-9: Identification of Outlying Community Sewershed Areas with High GWI (Entire Service Area)

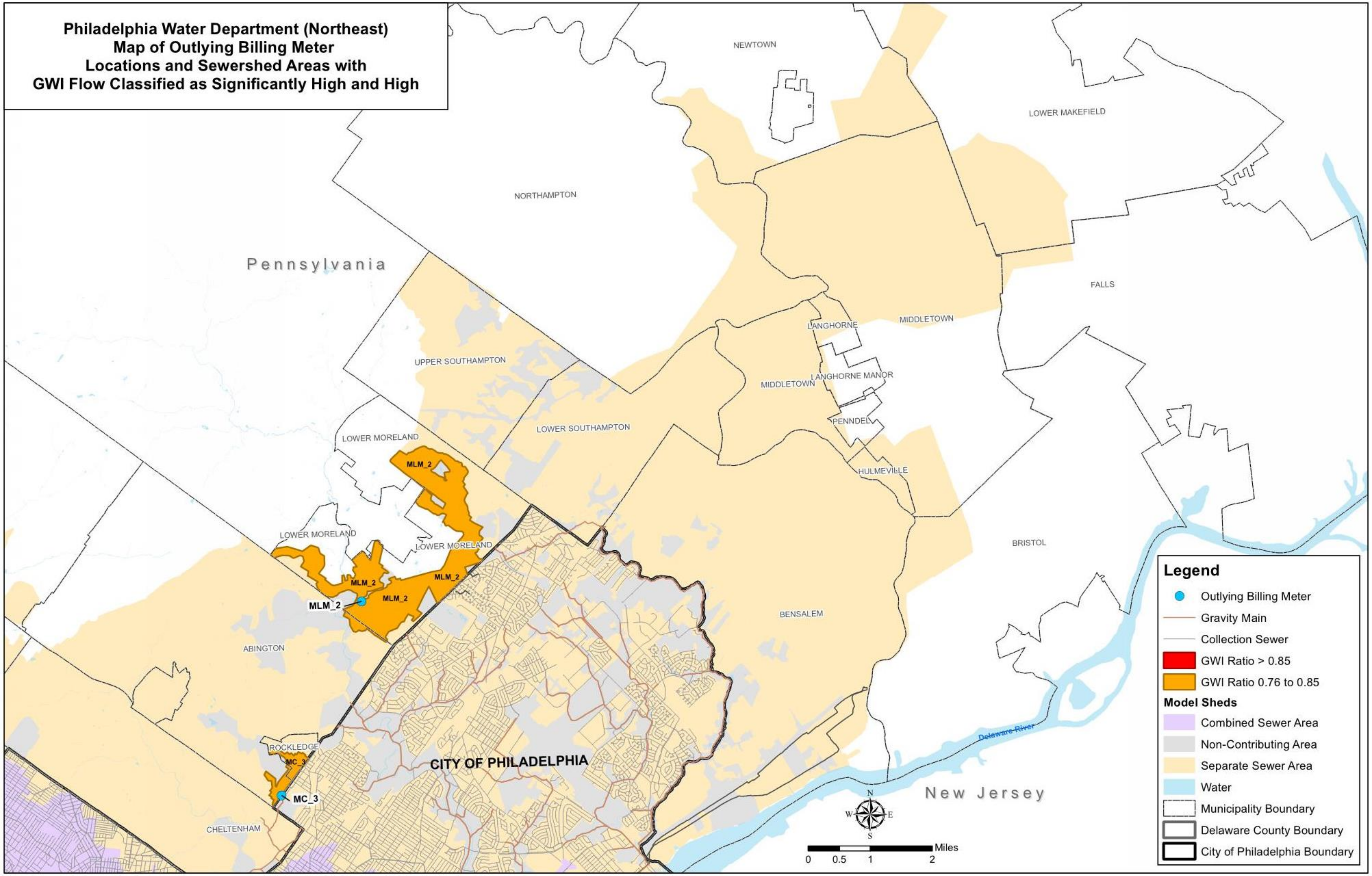


Figure 4-10: Identification of Outlying Community Sewershed Areas with High GWI (Northeast Area)

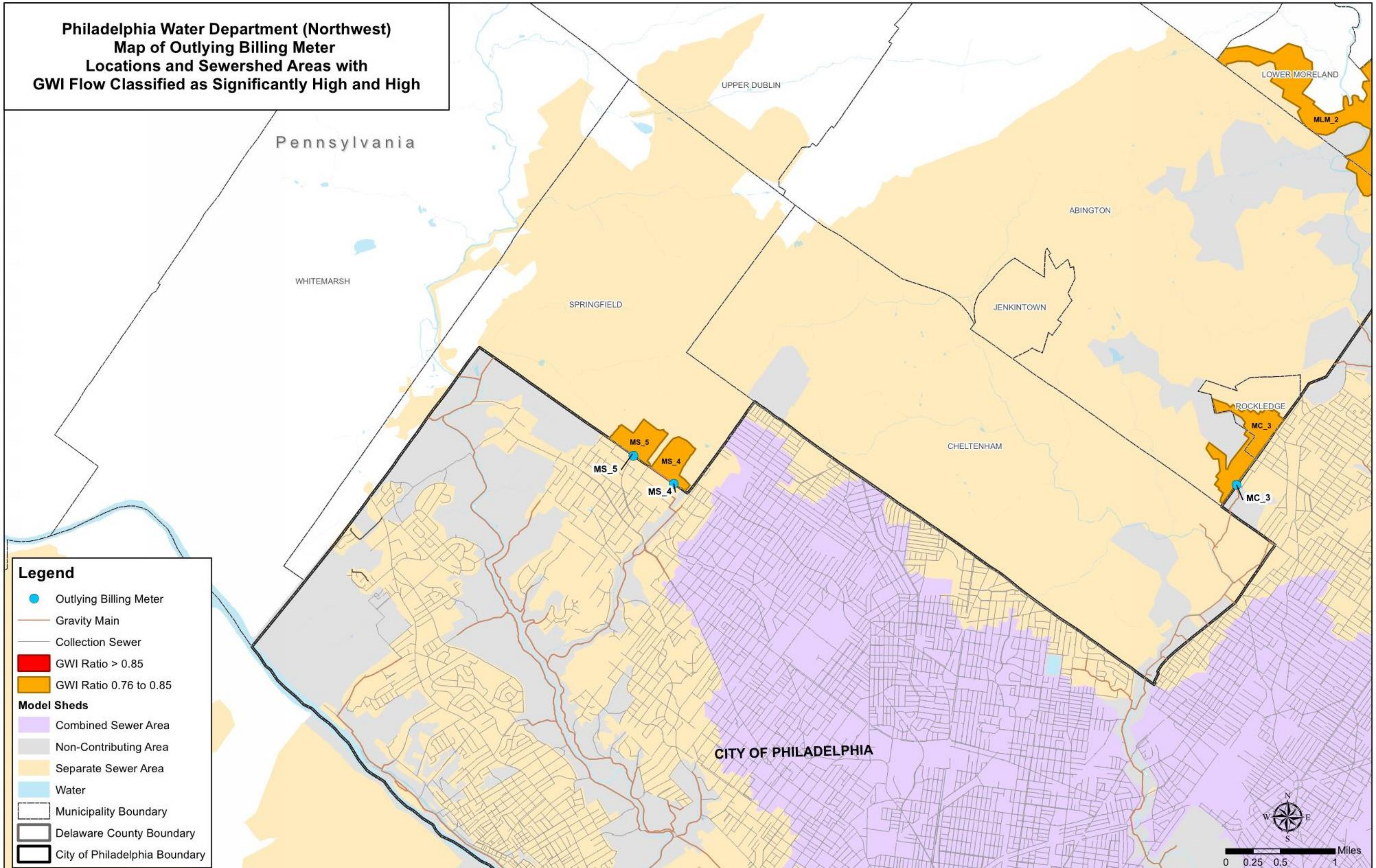


Figure 4-11: Identification of Outlying Community Sewershed Areas with High GWI (Northwest Area)

4.3 Wet Weather Flow Analysis Results

This section of the Outlying Communities Report provides a summary of the completed Phase 2 sewer system evaluation survey (SSES) analysis results and conclusions for the characterization of wet weather flow and rainfall derived infiltration and inflow (RDII) for the outlying communities that convey flow to the City sewer system. The analyses were conducted on monitored wastewater flow data collected from the network of metering sites that are operated and maintained by the Water Department and are situated at major points of connection between the outlying community and City sewer systems. The collected data are used by the Water Department primarily for purposes of sewer service billing. There are two categories of monitoring sites, permanent billing meter sites and portable or standardized billing meter sites. The monitoring equipment for permanent sites is installed within permanent monitoring structures. The equipment for the portable sites is installed on a temporary basis, at these sites simultaneously once every two to three years, in a standard sewer manhole for a monitoring duration of about three months.

After the Phase 1 data gathering process had been completed, SSES Phase 2 activities were conducted. The data quality review procedures were performed, the dry weather flow analyses were finished, and analyses were conducted to quantify and characterize wet weather flows from the separate sanitary sewer systems. The primary goal of the SSES is to address the infiltration and inflow (I/I) in the separate sanitary sewer areas tributary to the City's water pollution control plants by quantifying and characterizing monitored wastewater flows and identifying critical sewers with relatively high I/I volumes. The completed Phase 2 analyses were successful in quantifying and characterizing the wet weather flow from monitored outlying community sewershed areas. More detailed information on the wet weather flow analysis process can be found in Section 3.5 (Wet Weather Flow Characterization).

This section provides and explains the results and observations from those completed analyses. The analyses enabled the Water Department to identify specific sewershed areas within the outlying communities where the quantity of RDII flow and the magnitude of peak wet weather flow were relatively high. This could be an indication of a leaky wastewater collection system, or illicit connections which could be tracked down and corrected, where the flow is relatively high and sewer rehabilitation could potentially reduce the frequency, duration, and volume of CSO discharges downstream. The Phase 2 analyses and documentation of results for this Outlying Communities Report are focused on monitored sewershed areas located within the satellite municipalities and authorities outside the City. A separate SSES report documenting the analysis results for monitored separate sanitary sewershed areas within the City was previously submitted on June 1, 2014.

The system-wide results from the completed wet weather analyses are provided in the narrative and summary table within subsection 4.3.1. Subsection 4.3.2 provides descriptions of the parameters and indicator values that were selected for the wet weather flow analyses. Subsection 4.3.3 describes the four alternative analysis approaches that were used to quantify wet weather flow from the monitored sewershed data and to identify specific outlying community sewershed areas contributing wet weather flows that are noticeably higher relative to the rest of the sewershed areas. The narrative and CDF figures within subsection 4.3.4 identify specific outlying community sewershed areas that were identified as having relatively higher RDII flows than the other analyzed areas. Finally, the narrative and map figures within subsection 4.3.5 provide the conclusions from the completed wet weather flow analyses.

4.3.1 Overall Wet Weather Analyses Results

The results from the completed outlying community SSES Phase 2 wet weather flow analyses, along with background information for the monitoring sites, are summarized in Table 4-5, below. The monitoring sites are grouped by the outlying community which conveys the monitored sewershed wastewater flow to the City sewer system. For permanent billing meter sites, the site name is followed by (P), and for portable billing meter sites, the site name is followed by (p). The table provides relevant context information for each monitoring site, including the pipe size and the associated drainage area and service populations for the tributary sewershed areas. It is important to note that the service populations were obtained from the U.S. Census and therefore include only the people living in the sewershed areas and would not include those who work in commercial and/or industrial facilities located within the sewershed. The table also indicates the City receiving interceptor sewer which conveys the municipal wastewater flow for treatment. The table also provides the number of successfully monitored storms that were analyzed, and the number of seasons that could be characterized. A minimum of 4 successfully monitored and analyzed storms were required to characterize a season. Monitoring sites with more than 4 analyzed seasons had more than a year of available monitoring data. The total monitoring durations were previously provided in Tables 4-3 and 4-4 for the permanent and portable monitoring sites, respectively. Tables 2-1 and 2-2 in Section 2.1 (Sanitary Sewer Flow Monitoring Data Collected from Outlying Community Billing Meters) provided land use data for the tributary sewershed areas. The remaining four columns in Table 4-5 provide the summary results of the completed wet weather analyses and will be explained later in the narrative.

Additional wet weather flow characterization information, including the results of the wet weather event analyses, are included in Appendices B and C. It is important to remember that the analysis results presented in this Outlying Communities Report are based upon the monitored wastewater flow at each of the billing meters located at the points of connection between the municipal sewer collection systems and the Water Department sewers. If there were SSO discharges or other wastewater losses from the community collection systems during any of the monitored storm events, these flow volumes would not be quantified by the billing meters and would not be reflected in the analysis results.

Table 4-5: Summary of RDII Quantification Analysis Results

SITE ID	Contract Community	Water Department Receiving Interceptor	Pipe Size (Inches)	Tributary Drainage Area (Acres)	Tributary Service Population	Number of Storms Analyzed	Number of Seasons Analyzed	Average Maximum 5 Storm Total R	Maximum Seasonal Average Total R	Annual Average Total R	Average Maximum 5 Storm Peaking Factor
MA_1 (p)	Abington Township	Pennypack Creek	10	32	169	25	5	0.015	0.007	0.006	3.04
MA_2 (P)	Abington Township	Pennypack Creek	20	3,161	10,222	116	10	0.011	0.004	0.003	2.63
MA_3 (p)	Abington Township	Pennypack Creek	12	353	3,456	43	4	0.021	0.016	0.010	3.20
MBE_1 (P)	Bensalem Township	Poquessing Creek	12	241	879	96	10	0.019	0.010	0.006	4.31
MBE_2 (P)	Bensalem Township	Poquessing Creek	10	212	1,894	91	10	0.16	0.064	0.040	8.49
MBE_3 (P)	Bensalem Township	Poquessing Creek	12	90	554	50	9	0.050	0.020	0.014	2.65
MBE_4 (P)	Bensalem Township	Poquessing Creek	12	193	1,377	82	7	0.041	0.018	0.014	7.36
MBE_5 (P)	Bensalem Township	Poquessing Creek	24	1,024	2,563	102	10	0.034	0.013	0.009	4.59
MBE_6 (P)	Bensalem Township	Poquessing Creek	16	742	4,567	105	10	0.054	0.017	0.012	8.84
MBE_7 (P)	Bensalem Township	Poquessing Creek	12	204	2,110	116	10	0.042	0.018	0.011	4.02
MBE_8 (P)	Bensalem Township	Poquessing Creek	12	230	1,318	33	5	0.060	0.045	0.030	2.37
MBE_9 (P)	Bensalem Township	Poquessing Creek	10	290	2,023	35	5	0.018	0.009	0.007	2.61
MBE_10 (P)	Bensalem Township	Poquessing Creek	12	37	272	47	10	0.017	0.008	0.007	8.50
MBE_11 (P)	Bensalem Township	Poquessing Creek	8	71	0	15	3	0.086	0.076	0.043	6.72
MBE_12 (P)	Bensalem Township	Poquessing Creek	12	36	1,288	120	10	0.048	0.021	0.016	2.30
MBE_14 (P)	Bensalem Township	Poquessing Creek	8	15	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	12.7
MBE_15 (P)	Bensalem Township	Poquessing Creek	9.5	145	849	38	5	0.051	0.025	0.018	4.86
MBE_16 (P)	Bensalem Township	Poquessing Creek	12	25	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	3.08

Table 4-5: Summary of RDII Quantification Analysis Results

SITE ID	Contract Community	Water Department Receiving Interceptor	Pipe Size (Inches)	Tributary Drainage Area (Acres)	Tributary Service Population	Number of Storms Analyzed	Number of Seasons Analyzed	Average Maximum 5 Storm Total R	Maximum Seasonal Average Total R	Annual Average Total R	Average Maximum 5 Storm Peaking Factor
MB-1 (P)	Bucks County	Upper Delaware Low Level	42	24,992	96,028	101	11	0.035	0.017	0.011	2.75
MC_1 (P)	Cheltenham Township	Tacony Creek High Level	16	203	3,533	93	10	0.072	0.023	0.018	2.88
MC_2 (P)	Cheltenham Township	Tacony Creek High Level	36	8,444	64,742	83	7	0.021	0.013	0.008	2.12
MC_3 (P)	Cheltenham Township	Tacony Creek High Level	10	139	1,208	88	10	0.065	0.025	0.020	2.30
MD_1 (P)	Delaware County	Southwest Main Gravity	66	41,340	277,202	176	14	0.049	0.020	0.014	4.52
ML_1 (P)	Lower Merion Township	Southwest Main Gravity	24	2,671	15,278	70	6	0.024	0.016	0.011	2.39
ML_2(p)	Lower Merion Township	Southwest Main Gravity	8	55	379	33	5	0.038	0.030	0.020	3.62
ML_3 (P)	Lower Merion Township	Southwest Main Gravity	14	618	3,782	108	10	0.035	0.014	0.010	3.53
ML_4 (P)	Lower Merion Township	Cobbs Creek High Level	24	7,486	26,716	44	5	0.016	0.007	0.006	1.98
ML_5 (P)	Lower Merion Township	Cobbs Creek High Level	16	1,064	8,883	106	11	0.028	0.010	0.008	6.36
ML_6 (P)	Lower Merion Township	Southwest Main Gravity	8	58	420	45	5	0.034	0.019	0.014	2.69
ML_7 (P)	Lower Merion Township	Southwest Main Gravity	12	205	373	102	10	0.057	0.027	0.020	NA(2)
MLM_1 (P)	Lower Moreland Township	Poquessing Creek	10	448	1,748	98	11	0.050	0.023	0.017	3.34
MLM_2 (P)	Lower Moreland Township	Poquessing Creek	12	1,797	6,529	60	11	0.026	0.010	0.009	3.62
MLM_3 (p)	Lower Moreland Township	Poquessing Creek	8	96	344	19	4	0.015	0.011	0.007	2.30

Table 4-5: Summary of RDII Quantification Analysis Results

SITE ID	Contract Community	Water Department Receiving Interceptor	Pipe Size (Inches)	Tributary Drainage Area (Acres)	Tributary Service Population	Number of Storms Analyzed	Number of Seasons Analyzed	Average Maximum 5 Storm Total R	Maximum Seasonal Average Total R	Annual Average Total R	Average Maximum 5 Storm Peaking Factor
MLM_5 (p)	Lower Moreland Township	Pennypack Creek	8	13	54	NA(1)	NA(1)	NA(1)	NA(1)	NA(1)	1.74
MLM_6 (p)	Lower Moreland Township	Pennypack Creek	8	17	79	33	5	0.028	0.016	0.011	5.00
MLM_7 (p)	Lower Moreland Township	Pennypack Creek	10	23	87	22	4	0.025	0.020	0.016	2.40
MSH_1 (P)	Lower Southampton	Poquessing Creek	30	5,132	21,642	71	10	0.058	0.020	0.016	2.44
MSH_2 (p)	Lower Southampton	Poquessing Creek	8	60	282	16	4	0.029	0.023	0.014	1.42
MS_1(p)	Springfield Township	Wissahickon Low Level	12	77	404	12	4	0.077	0.069	0.055	NA(3)
MS_2 (P)	Springfield Township	Wissahickon Low Level	30	2,648	12,155	80	8	0.048	0.023	0.021	3.64
MS_3 (P)	Springfield Township	Wissahickon Low Level	20	1,429	6,941	90	10	0.040	0.019	0.011	3.67
MS_5 (p)	Springfield Township	Cresheim Valley	8	69	410	24	5	0.048	0.034	0.019	2.60
MS_6 (P)	Springfield Township	Cresheim Valley	12	189	1,169	112	10	0.073	0.025	0.018	6.09
MS_7 (p)	Springfield Township	Cresheim Valley	12	13	110	22	4	0.025	0.028	0.012	NA(3)
MS_8 (p)	Springfield Township	Wissahickon Low Level	10	5	11	14	3	0.088	0.076	0.059	NA(3)
MUD_1 (P)	Upper Darby Township	Cobbs Creek Low Level	24	7,668	100,393	150	15	0.048	0.019	0.014	3.81

A (P) in the Site ID column indicates a permanent billing meter site and a (p) indicates a portable billing meter site.

(1)Note: Monitored data quality was found to be insufficient to conduct wet weather sewershed characterization analyses for this site.

(2)Note: There is a pump station within this sewershed area that prevented a peaking factor analysis to be conducted.

(3)Note: Errant flow "spikes" from temporary sensor failures prevented a peaking factor analysis to be conducted.

4.3.2 Selected Analysis Parameters and Indicator Values

The primary analysis parameter utilized to conduct the outlying communities Phase 2 SSES wet weather assessment was rainfall dependent infiltration and inflow (RDII). RDII is the rainfall-derived flow response in a sanitary sewer system. In most systems, RDII is the major component of peak wastewater flows and is typically responsible for capacity issues, SSOs, and/or basement backups. Rainfall-derived infiltration refers to rainfall runoff that filters through the soil before entering a sanitary sewer system through damaged pipe sections, leaky joints, etc. Rainfall-derived inflow is the storm water that enters the sanitary sewer system directly via leaky manhole lids and frames, illicit roof drain connections, sump pumps, foundation drains, and cross connections with storm sewers and/or storm inlets. These defects can occur in both the public right-of-way portions of the sanitary sewer system or in individual service laterals on private property. Inflow typically occurs shortly after the start of a rainfall event. Infiltration typically extends beyond the end of rainfall and takes some time to recede to zero after an event. The methodology used to calculate the RDII component of the monitored wastewater flow is explained in Section 3.5 (Wet Weather Flow Characterization).

There were two categories of indicator values that were utilized in the SSES to represent the RDII flow for the analyzed sewershed areas: the total R-value and the peaking factor. Explanations for both of these indicator values and how they were calculated are provided in Section 3.5. To quantify the total R-value, the calculated RDII volume for each storm was divided by the corresponding rainfall volume over the sewershed area and expressed as a percentage. This R-value represents the fraction of the total rainfall volume over the tributary sewershed area that entered the sanitary sewer system. For example, a computed R-value of 0.035 would indicate that 3.5% of the monitored rainfall over the sewershed area “leaked” or entered into the separate sanitary sewers as monitored RDII. Low R-values typically indicate a tight sewer system with minimal extraneous flow and high values indicate a leaky sewer system with high quantities of extraneous flow. The peaking factor was calculated by taking the maximum hourly monitored flow during the storm event, and dividing it by the calculated average daily dry weather flow for the monitored sewershed area. This peaking factor represents the magnitude of the increase of RDII flow through the monitored sewer pipes during large storms, compared to the magnitude of flow occurring during typical dry weather conditions.

4.3.3 Four Alternative Analysis Approaches

Four alternative analysis approaches were used to quantify wet weather flow from the monitored sewershed data and to identify specific outlying community sewershed areas contributing wet weather flows that are noticeably higher relative to the rest of the sewershed areas. Three of the methods are based upon the calculated total R-values and the fourth is based upon a peaking factor approach. Though not an alternative analysis method, to provide an overall context from which to interpret the results from the other alternative analysis methods, a CDF analysis was prepared that encompassed each of the 2,919 individual storm events for which RDII analyses were conducted for the Phase 2 SSES.

Maximum 5 Storm Average Total R-Value by Site

The first RDII analysis approach was to calculate the average for the five monitored storms with the largest total R-value for each of the successfully monitored and analyzed outlying community sanitary sewershed areas. For the portable billing meter sites with multiple deployment periods, the analyses span and combine the entire monitoring record. This analysis alternative characterizes the sewershed areas under a worst case scenario; during the five storms with the largest magnitude of monitored flow. This approach assumes that the potential for surcharge conditions and losses from the sewer systems would be greatest during these five largest RDII events. Table 4-5 provides the maximum 5 storm average total R-value for each of the successfully monitored outlying community sanitary sewershed areas.

Maximum Seasonal Average Total R-Value by Site

The second alternative analysis approach was to calculate the average total R-value for all the successfully monitored storms over each of the four seasons of the year. This approach was used to quantify and characterize the RDII flow from sewershed areas not only for a worst case scenario during the largest storms, but extending over an entire 3 month period. For the portable billing meter sites with multiple deployment periods, the seasonal analyses span and combine the entire monitoring record (i.e. the spring season storms are averaged together regardless of the separate meter deployment periods. Table 4-5 provides the seasonal-average total R-value for the season with the highest monitored RDII flow. Most of the outlying community sewershed areas were seen to experience their largest monitored total R-values during the winter season (during the months of December, January and February). This is expected because the rainfall interception and evapotranspiration losses provided by trees and other vegetation were lowest during these months, and water table levels tend to be high. Other sewershed areas experienced their largest monitored values during the spring season (during the months of March, April and May).

Average Monitoring Duration Total R-Value by Site

The third analysis approach was to calculate the average total R-value for all successfully monitored storms over the entire monitoring period, including the individual deployment periods for the portable billing meter sites. For many of the monitoring sites, the monitoring duration was sufficient to quantify and characterize RDII flow over all four seasons. For monitoring sites where less than a year of monitoring data were available, the average included the available storm events occurring over the available seasons. The arithmetic mean was calculated for successfully monitored storms observed at each of the analyzed outlying community sewershed sites. Table 4-5 provides the average total R-value for the sewershed areas tributary to each of the reported monitoring sites.

Site Average Five Largest Storm Peaking Factor

The last alternative analysis approach was to determine the average of the calculated peaking factors for the five storms with the largest monitored hourly-peak flows. For the portable billing meter sites with multiple deployment periods, the analyses span and combine the entire monitoring record. This analysis alternative characterizes the sewershed areas under a worst case scenario, during the five storms with the largest magnitude of peak wet weather flow.

Table 4-5, in Section 4.3.1, provides the maximum five storm average peaking factor for each of the successfully monitored outlying community sewershed areas.

4.3.4 Identification of Sewershed Areas with Relatively High RDII

Additional wet weather flow quantification and characterization analyses were conducted to compare sewershed flows to each other and identify specific outlying community sanitary sewer collection systems where the quantity of extraneous RDII was found to be relatively high compared to the other monitored sewershed areas. For these sewershed areas, further investigations and evaluations for potential RDII reduction measures may be beneficial. A CDF plot was prepared for each of the alternative analysis approaches which included each of the calculated R-values and the peaking factor. The R-values or peaking factors were placed in order from the lowest to the highest, and each sewershed area is assigned a cumulative percentile value. The percentile value is the percent of the sewershed monitoring sites with an R-value or peaking factor less than or equal to the values indicated on the vertical axis. Sewershed areas with the highest percentile values have sewer collection systems that are most "leaky", and sewershed areas with the lowest percentile value are the tightest with the lowest wet weather flow contribution.

Total R-Value for Individual Storm Events

This analysis was not considered as being among the four alternative analysis methods for identifying sewershed areas with high RDII flow, but was done to provide an overall context from which to interpret the results from the alternative analysis methods. A CDF analysis was prepared for each of the 2,919 individual storm events for which RDII analyses were conducted for the Phase 2 outlying community analyses. The total R-values for each storm were placed in order, from the lowest value to the highest, irrespective of the sewershed area over which the storm occurred. The resulting plot is provided in Figure 4-12 and was color-coded to facilitate interpretation of the results. Individual storm events with significantly high monitored total R-values (above 0.10, where over 10% of the sewershed rainfall entered the sanitary sewer collection system) were color-coded red. Individual events with high values (from 0.051 to 0.10) were color-coded orange, and areas with moderately high values (0.026 to 0.050) were color-coded yellow. Individual events with average and low R-values, indicating relatively tight sewer collection systems, were color-coded green and blue, respectively. The median or 50th percentile total R-value over all the analyzed storm events was 0.010. A clear inflection point along the CDF line can be observed at the 0.050 total R-value. This inflection point indicates that individual storm events that produce a sewershed wet weather response with an R-value higher than 0.050 (the designated orange and red ranges) would be considered to have the highest relative volume of monitored RDII flow.

Maximum 5 Storm Average Total R-Value by Site

The CDF analyses were repeated for each of the alternative analysis methods, but this time the monitored storms and calculated R-values were grouped together over each of the individual outlying community sewershed areas. For this first alternative RDII analysis approach, a CDF analysis and plot were prepared for the average of the five monitored storms with the largest total R-value. All five storms were equally weighted, regardless of the rainfall volume. Each of the successfully monitored and analyzed outlying community sewershed areas was represented by a point along the curve, from the sewershed with the lowest average R-value (corresponding to the tightest sewer collection system) to the sewershed with the highest average R-value (corresponding to the "leakiest" sewer system.) The plot for this RDII analysis approach is provided in Figure 4-13 and was color-coded to facilitate interpretation of the results. Individual outlying community sewershed areas with significantly high monitored five-storm average total R-values (above 0.10, where over 10% of the sewershed rainfall entered the sanitary sewer collection system) were color-coded red. Sewershed areas with high values (from 0.071 to 0.10) were color-coded orange, and areas with moderately high values (0.051 to 0.070) were color-coded yellow. Sewershed areas with average and low R-values, and relatively tight sewer collection systems, were color-coded green and blue, respectively.

Figure 4-14 provides the same CDF curve values, but in a bar chart format, and indicates the corresponding sewershed names for each point along the curve. The median or 50th percentile maximum five storm average total R-value over all the analyzed outlying community sewershed areas was 0.040. An inflection point along the CDF line can be observed at the 0.07 total R-value. The inflection point indicates that under a worst case scenario, considering only the five storms with the largest magnitude of monitored extraneous flow, the outlying community sewershed areas that produce a sewershed wet weather response with a maximum five storm average total R-value greater than 0.070 (the designated orange and red ranges) would be considered to have the highest relative volume of monitored RDII flow.

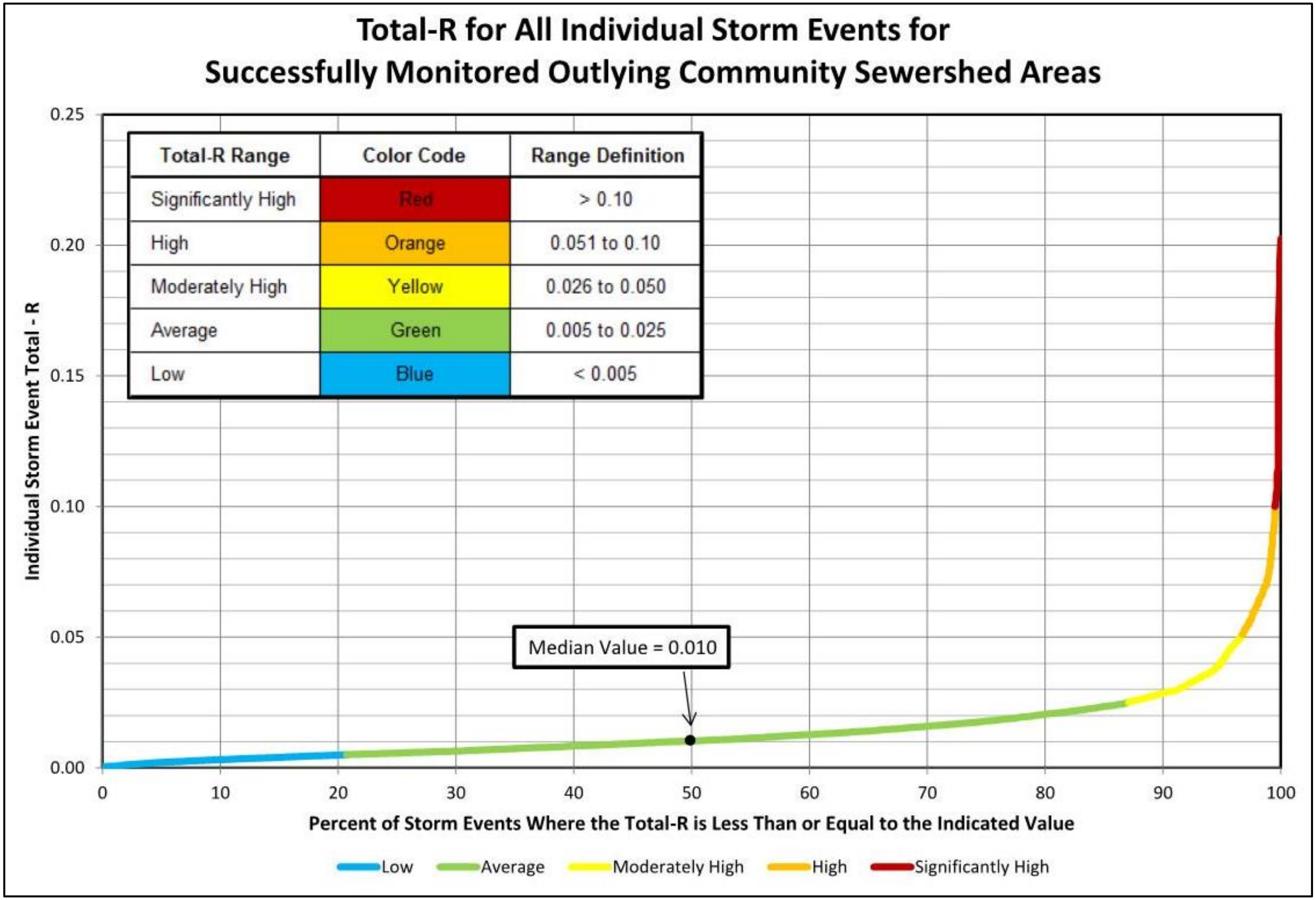


Figure 4-12: Total-R for Individual Storm Events

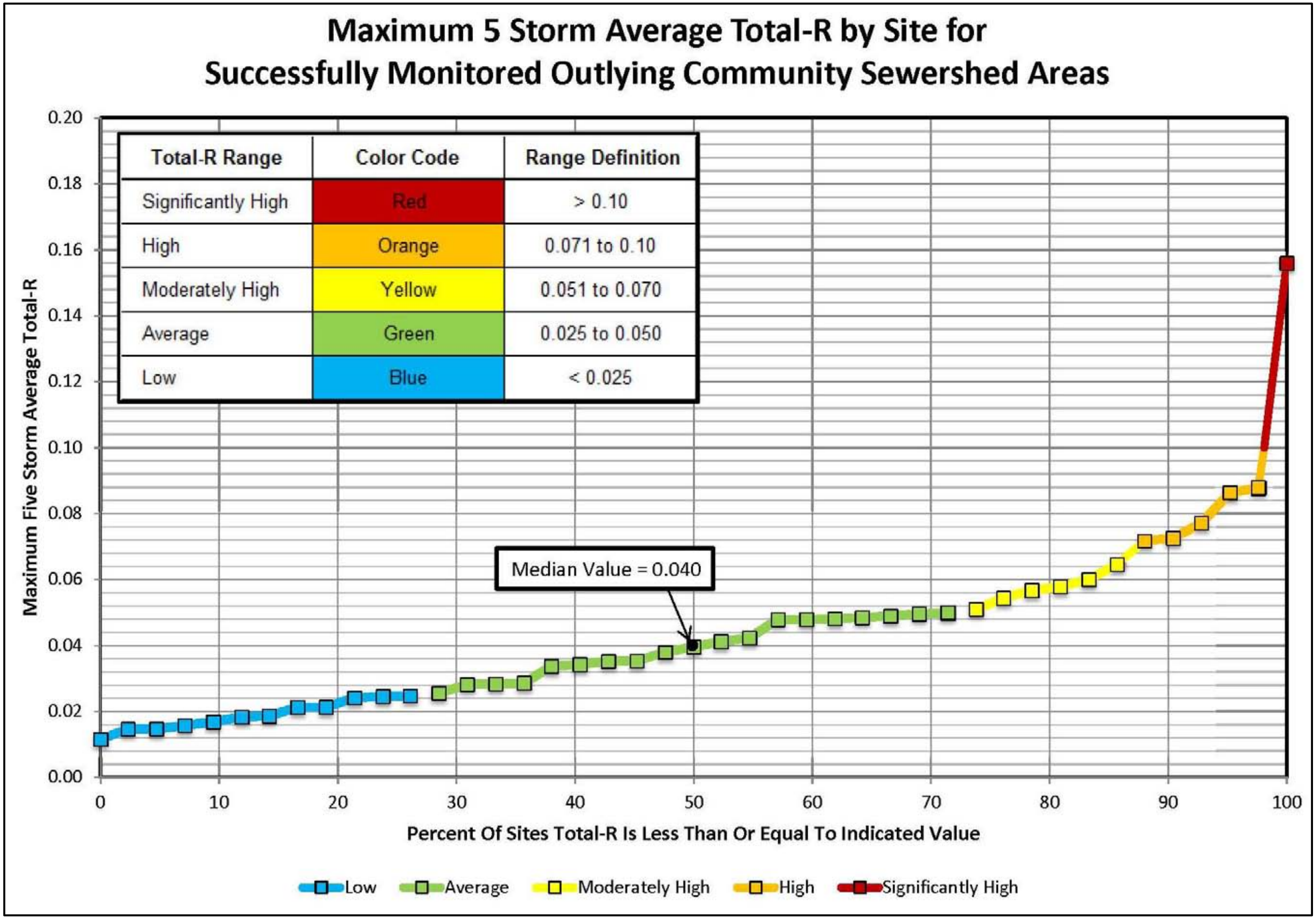


Figure 4-13: Maximum Five Storm Average Total-R by Site

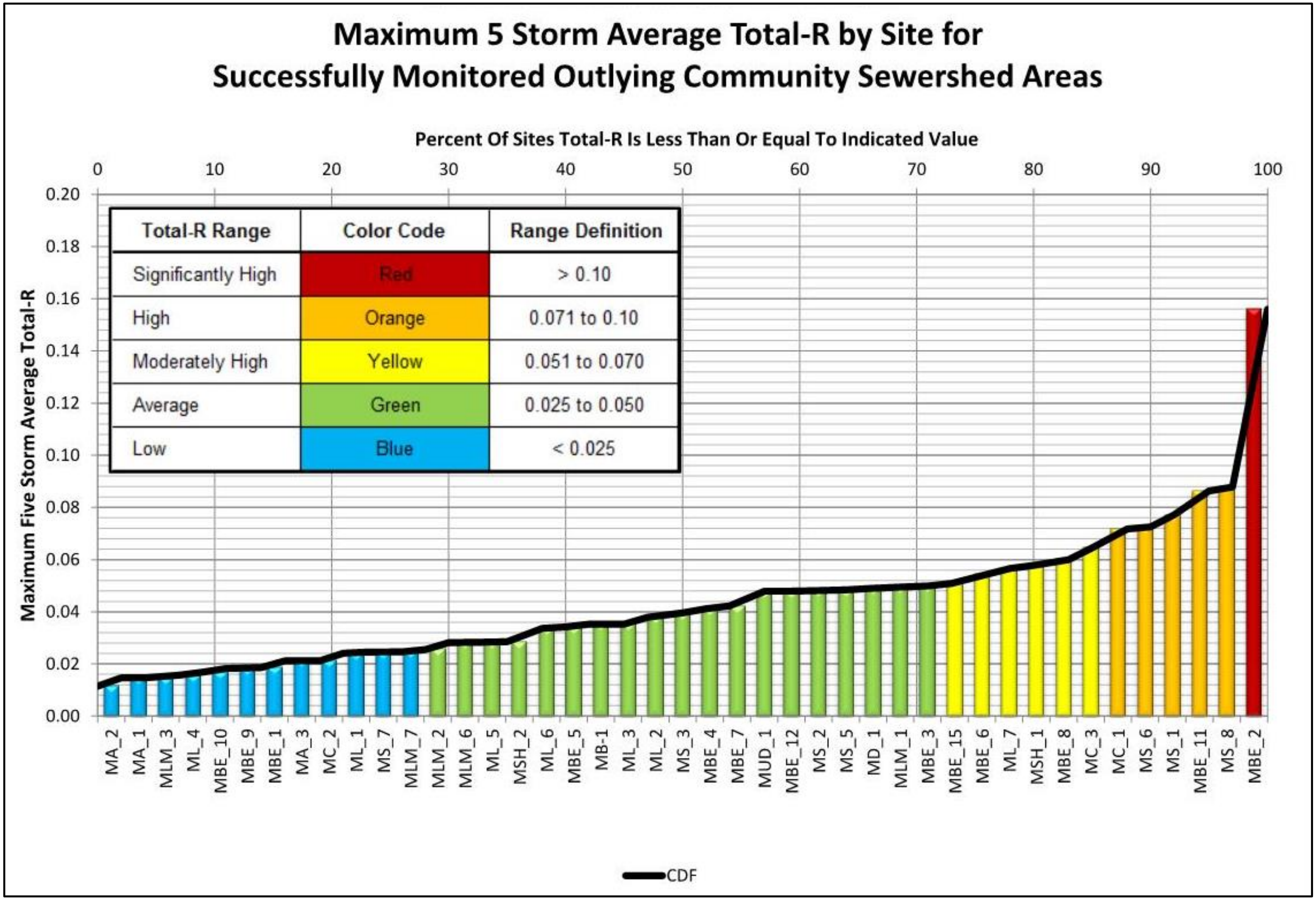


Figure 4-14: Maximum Five Storm Average Total-R by Site (identifying individual monitoring sites)

Maximum Seasonal Average Total R-Value by Site

For the second RDII analysis approach, a CDF analysis and plot were prepared for the average of all the successfully monitored storms and calculated R-values grouped together over each individual sewershed area and also grouped together by season. All storms were equally weighted, regardless of the rainfall volume. The three-month season (spring, summer, fall, or winter) with the highest average total R-value for each of the analyzed outlying community sewershed areas was represented by a point along the curve, from the sewershed with the lowest seasonal average R-value to the sewershed with the highest seasonal average R-value. The plot for this seasonal average RDII analysis approach is provided in Figure 4-15. Individual outlying community sanitary sewershed areas with significantly high monitored seasonal average total R-values (above 0.06, where more than 6% of the sewershed rainfall entered the sanitary sewer collection system) were color-coded red. Sewershed areas with high values (from 0.031 to 0.06) were color-coded orange, and areas with moderately high seasonal values (0.026 to 0.03) were color-coded yellow. Sewershed areas with average and low R-values, indicating relatively tight sewer collection systems, were color-coded green and blue, respectively.

Figure 4-16 provides the same CDF values, but in a bar chart format, and indicates the corresponding sewershed names for each point along the curve. The median or 50th percentile seasonal average total R-value over all the analyzed outlying community sewershed areas was 0.019. A clear inflection point along the CDF line can be observed at approximately the 0.03 total R-value. The inflection point indicates that when considering the largest magnitude of monitored extraneous flow, for all the successfully monitored storms extending over an entire three-month season, the sewershed areas with a maximum seasonal average total R-value higher than 0.030 (the designated orange and red ranges) would be considered to have the highest relative volume of monitored RDII flow.

Average Monitoring Duration Total R-Value by Site

For the third RDII analysis approach, a CDF analysis and plot were prepared based on the average R-value calculated for each site using all of the successfully monitored storms observed over the entire monitoring duration. The average monitoring duration total R-value for each of the analyzed outlying community sewershed areas was represented by a point along the curve, from the sewershed with the lowest average R-value to the sewershed with the highest average R-value. The plot for this RDII analysis approach is provided in Figure 4-17. The red range included the individual outlying community sewershed areas with significantly high monitored average total R-values (above 0.050, where over 5% of the sewershed rainfall entered the sanitary sewer collection system). The orange range was comprised of the sewershed areas with high values (from 0.026 to 0.050), and the yellow range encompassed sewershed areas with moderately high average values (0.021 to 0.025). Sewershed areas with average and low R-values, indicating relatively tight sewer collection systems, were color-coded green and blue, respectively. For a basis of comparison, the median or 50th percentile average total R-value over all the analyzed outlying community sewershed areas was 0.014. Figure 4-18 provides the same curve, but in a bar chart format, and indicates the corresponding sewershed names for each point along the curve.

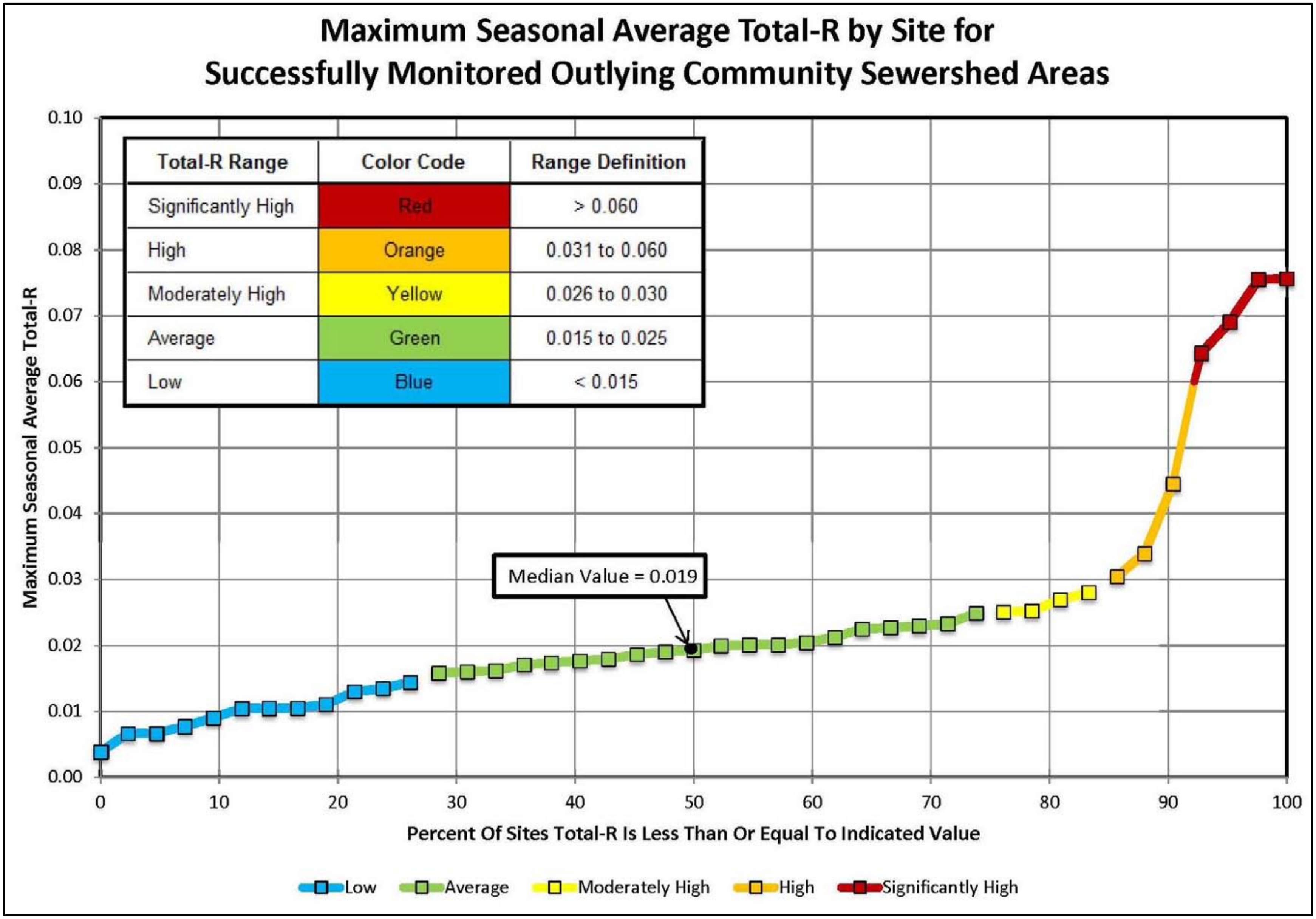


Figure 4-15: Maximum Seasonal Average Total-R by Site

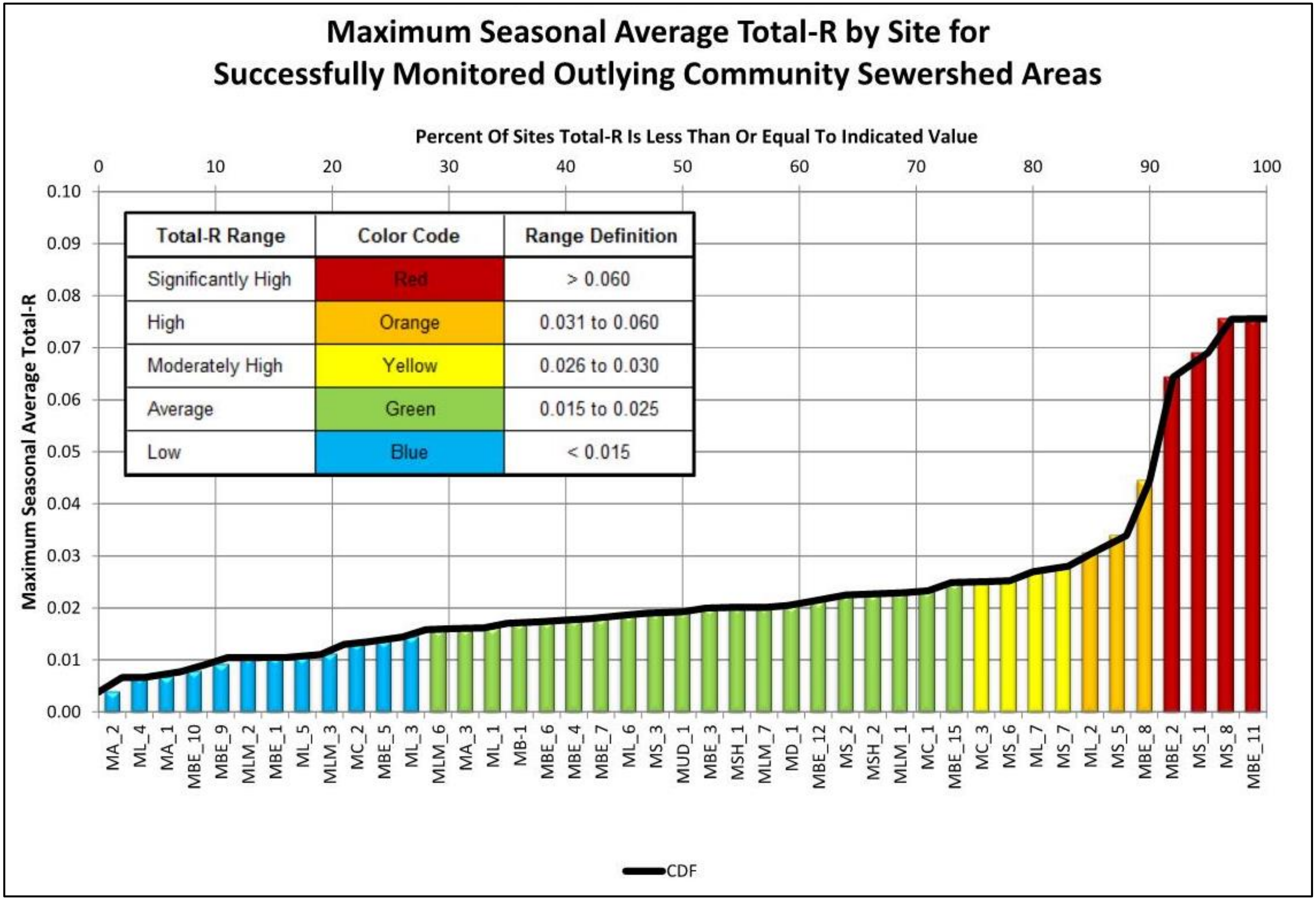


Figure 4-16: Maximum Seasonal Average Total-R by Site (identifying individual monitoring sites)

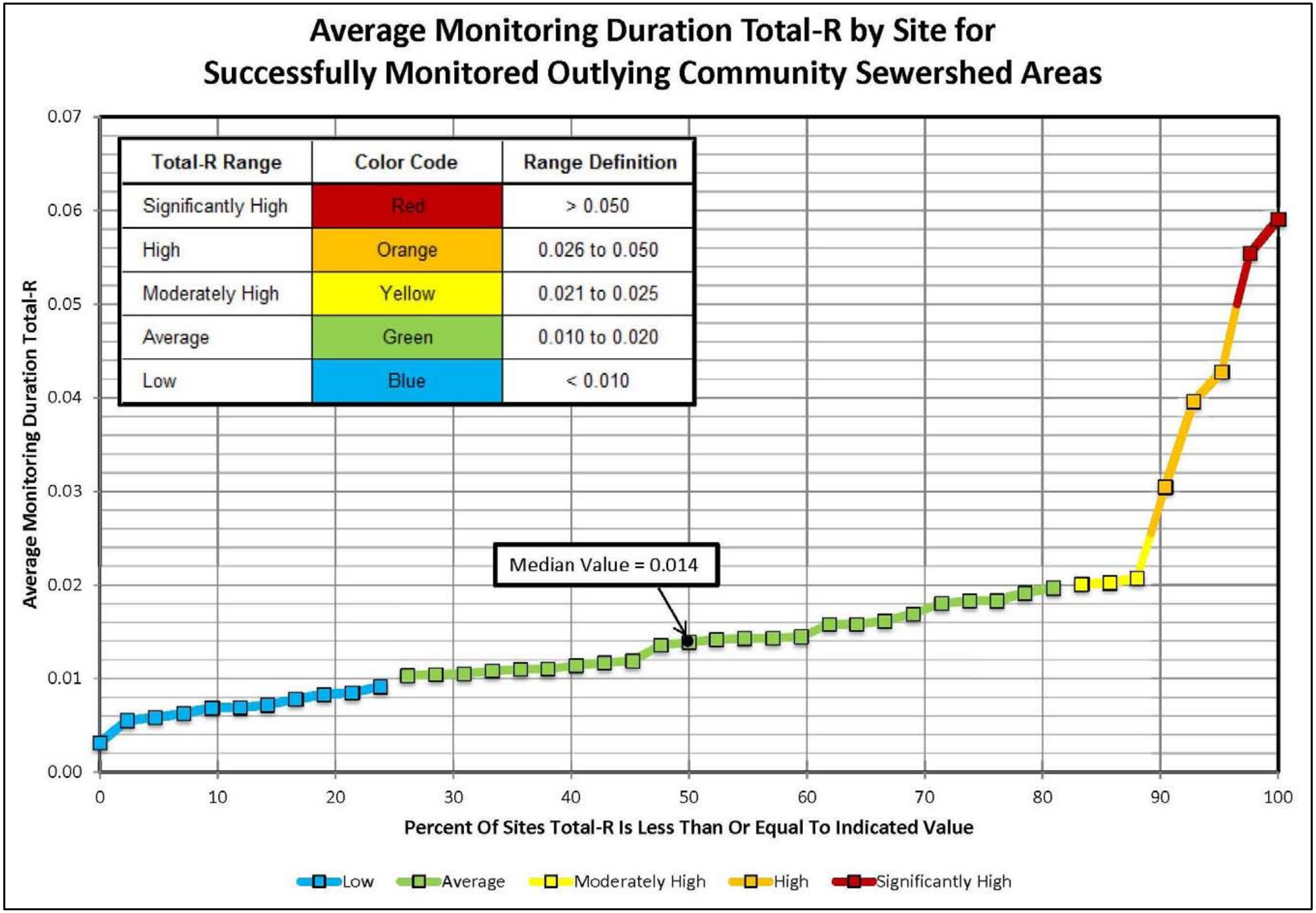


Figure 4-17: Average Monitoring Duration Total-R by Site

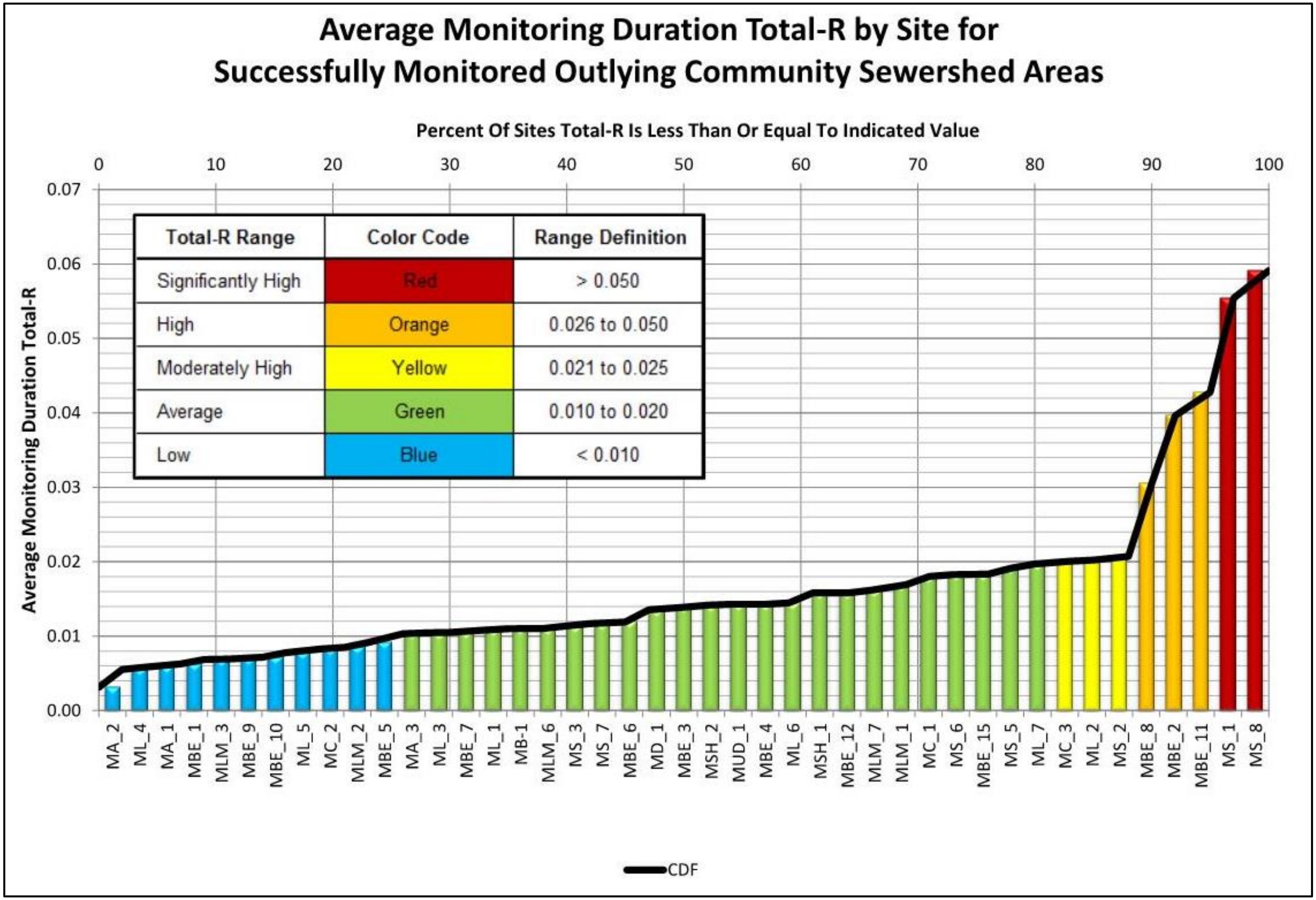


Figure 4-18: Average Monitoring Duration Total-R by Site (identifying individual monitoring sites)

A clear inflection point along the CDF line can be observed above the 0.025 total R-value based on the average R-value calculated for each site using all of the successfully monitored storms observed over the entire monitoring duration. The inflection point indicates that the sewershed areas with a maximum average total R-value of over 0.025, where over 2.5% of the sewershed rainfall entered the sanitary sewer collection system (the designated orange and red ranges), would be considered to have the highest relative volume of monitored RDII flow.

Site Average Five Largest Storm Peaking Factor

For the fourth and final RDII analysis approach, a CDF analysis and plot were prepared for the average of the calculated peaking factors for the five storms with the highest monitored peak flows, grouped together over each individual sewershed area. The peaking factor is the maximum hourly monitored flow during a storm event, divided by the average daily dry weather flow for the monitored sewershed area and represents the magnitude of the increase of RDII flow during large storms, compared to the magnitude of flow occurring during typical dry weather conditions. The five largest storm average peaking factor for each of the analyzed outlying community sewershed areas is represented by a point along the curve, from the sewershed with the lowest average peaking factor to the sewershed with the highest average peaking factor.

The plot for the peaking factor analysis approach is provided in Figure 4-19. The red range included the individual outlying community sanitary sewershed areas with significantly high monitored average peaking factors (above 8.0). The orange range was comprised of sewershed areas with high values (from 6.0 to 8.0), and the yellow range encompassed sewershed areas with moderately high peaking factors (4.0 to 5.9). Sewershed areas with average and low R-values, indicating relatively tight sewer collection systems, were color-coded green and blue, respectively. Figure 4-20 provides the same CDF curve, but in a bar chart format, and indicates the corresponding sewershed names for each point along the curve. The median or 50th percentile average five largest storm peaking factor over all the analyzed outlying community sewershed areas was 3.25.

This fourth and final alternative analysis approach differs from the other three in that it assesses the severity of RDII flow based upon a peak wet weather flow multiplier, rather than an RDII percentage. The analysts were careful to consider that the peaking factor can be dependent on the size of the tributary drainage area because storm peaks tend to be attenuated more in large sewershed areas due to channel and overbank routing and relative storm cell size. It should also be noted that for some of these large peaking storms, there may be losses along the municipal collection systems and not all the wet weather wastewater flow may be reaching the billing meter monitoring sites.

A clear inflection point along the CDF line can be observed at a peaking factor of approximately 6.0. The inflection point indicates that when considering the largest magnitude of monitored extraneous flow, for the five storms with the highest monitored peak flows, grouped together over each individual sewershed area, the sewershed areas with an average peaking factor of 6.0 or higher (the designated orange and red ranges) would be considered to have the highest relative volume of monitored RDII flow.

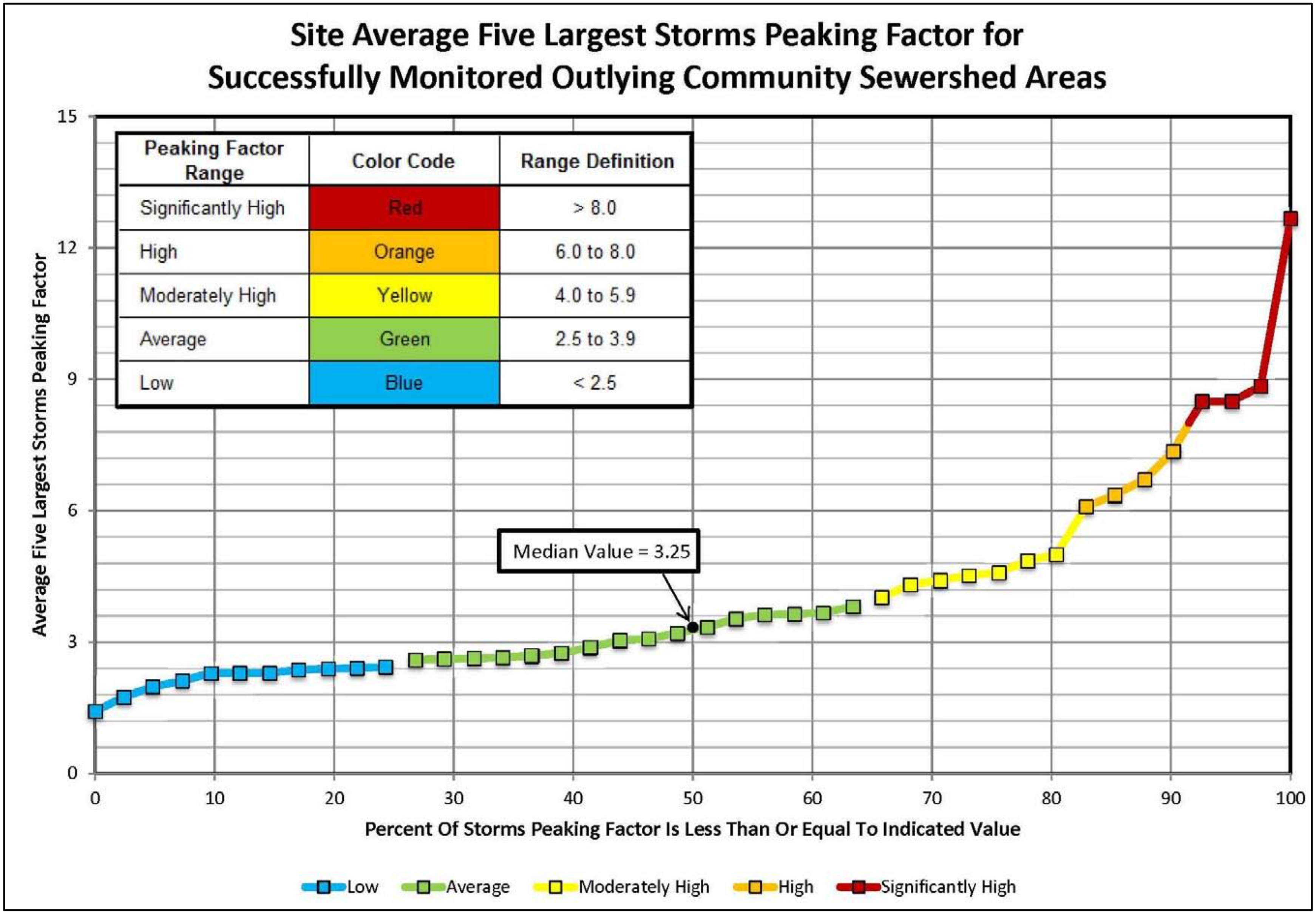
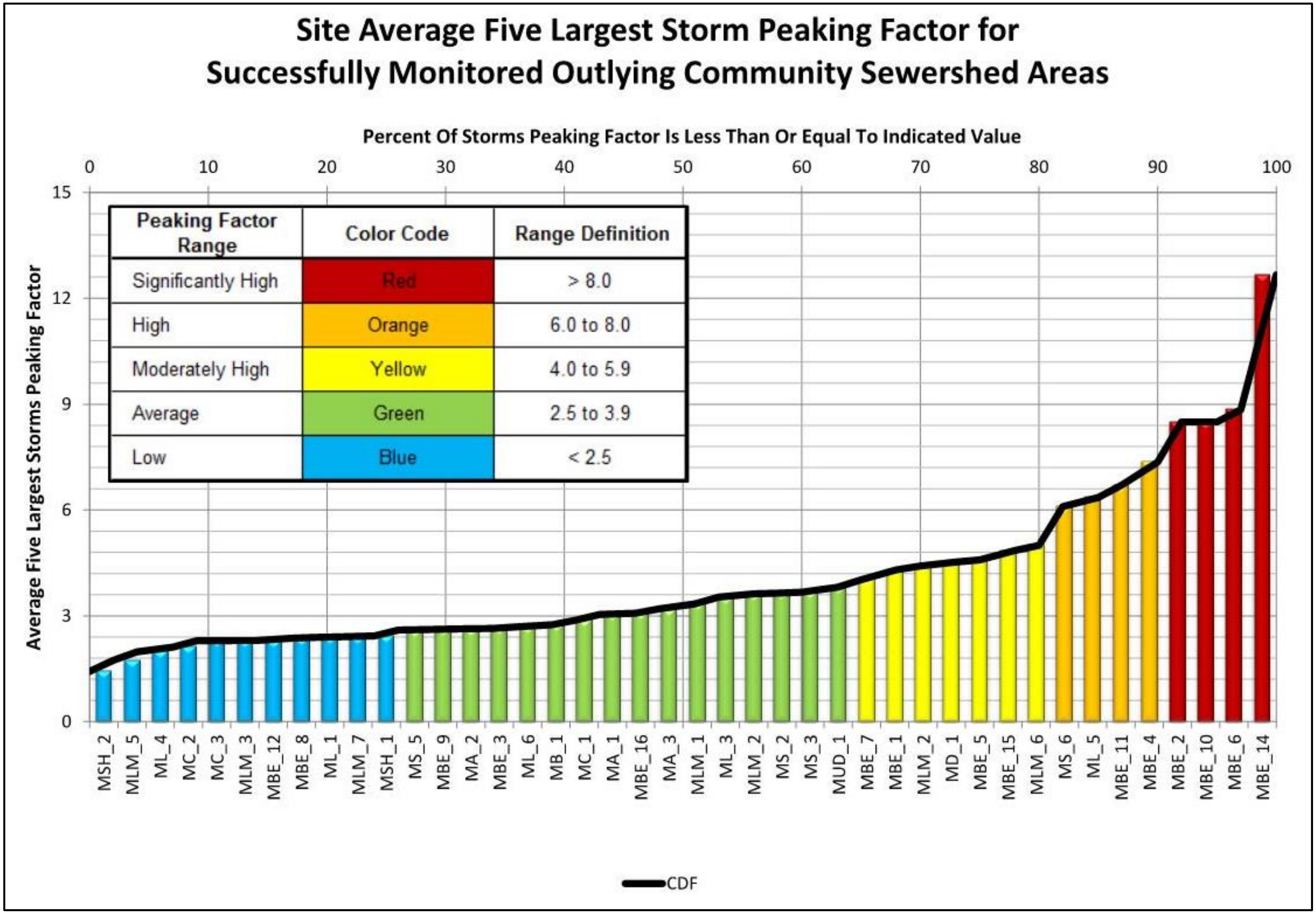


Figure 4-19: Site Average Five Largest Storms Peaking Factor



Peaking Factor Range	Color Code	Range Definition
Significantly High	Red	> 8.0
High	Orange	6.0 to 8.0
Moderately High	Yellow	4.0 to 5.9
Average	Green	2.5 to 3.9
Low	Blue	< 2.5

Figure 4-20: Site Average Five Largest Storms Peaking Factor (identifying individual monitoring sites)

4.3.5 Wet Weather Flow Analysis Conclusions

The completed outlying community Phase 2 SSES analysis was successful in identifying specific sanitary sewershed areas outside the City of Philadelphia where the quantity of rainfall dependent infiltration and inflow was classified as very high relative to the rest of the system. These very high RDII values could be an indication of a leaky wastewater collection system where RDII reduction efforts could result in significant benefits. Lists are provided below of the specific sewershed areas that were identified as being the leakiest by the application of each of the four alternative analysis methods that were utilized for the SSES. The sites are listed from the highest monitored RDII values to the lowest. Table 4-5 provides a summary of the analysis results produced by each of the completed wet weather analyses.

It is important to remember that the analysis results presented in this report are based upon the monitored wastewater flow at each of the billing meter sites at the points of connection between the municipal and Water Department sewer systems. If there were SSO discharges or other wastewater losses from the community collection systems during any of the monitored storm events, these flow volumes would not be quantified by the billing meters and would not be reflected in the analysis results.

Maximum Five Storm Average Total R-Value by Site

There is one separate sanitary sewershed area, MBE_2, within the outlying communities where the maximum five storm average total R-value, calculated from the monitored wastewater flow data, was greater than 0.10, (where more than 10% of the sewershed rainfall entered the sanitary sewer collection system,) and was classified as very high (red range along the CDF plot). The location of this outlying community sewershed is provided on the Figure 4-21 and 4-22 maps. Figure 4-21 provides an orientation map of the Water Department service area, including the outlying communities. Figure 4-22 provides a closer view of the northeast portion of the service area. The site had a total monitoring duration of approximately 27 months, which should provide sufficient data to characterize the sewershed area flow for all seasons of the year. Additional statistics for this site are given below:

- Bensalem Township sewershed MBE_2 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 90 storms were analyzed for all four seasons.

There were five separate sanitary sewershed areas within the outlying communities, MBE_11, MC_1, MS_1, MS_6, and MS_8, where the maximum five storm total R-value, calculated from the monitored wastewater flow data, was between 0.071 and 0.10 and classified as high (orange range along the plot) relative to other monitored areas. The locations of these five outlying community sewershed areas are provided on the Figure 4-21, 4-22 and 4-23 maps. Figure 4-21 provides an orientation map of the Water Department service area, including the outlying communities. Figure 4-22 provides a closer view of the northeast portion of the service area, while Figure 4-23 provides a closer view of the northwest portion of the service area. Two of the sites had monitoring durations of at least 12 months, which should provide sufficient data to characterize the sewershed area flow for all seasons of the year. For three of these sites, MBE_11, MS_1, and MS_8, the analysis results were based upon limited storm data, heavily influenced by winter storms and snow melt, and should be used with caution. Additional information on these sites is listed below:

- Bensalem Township sewershed MBE_11 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was approximately 7 months, and 15 storms were analyzed over three seasons.
- Cheltenham Township sewershed MC_1 that is tributary to the Tacony Creek High Level Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 90 storms were analyzed over all four seasons.
- Springfield Township sewershed MS_1 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was approximately 9 months, and 12 storms were analyzed for all four seasons.
- Springfield Township site MS_6 that is tributary to the Cresheim Valley Interceptor. The total monitoring duration for this permanent billing meter site was 27 months and over 110 storms were analyzed over all four seasons.
- Springfield Township site MS_8 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was 6.7 months and 14 storms were analyzed over two seasons.

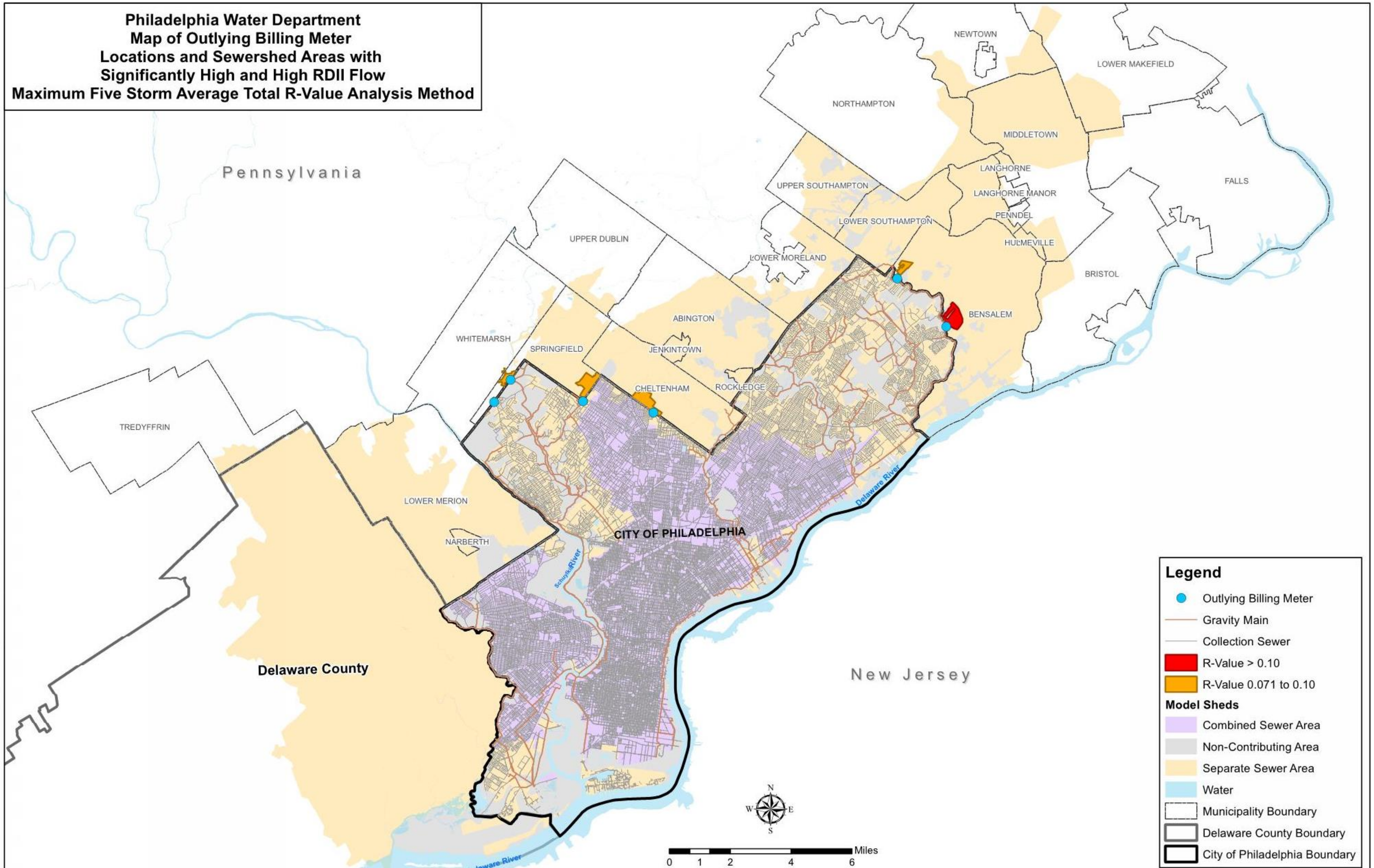


Figure 4-21: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Five Storm Average Total R-Value Analysis Method (Entire Service Area)

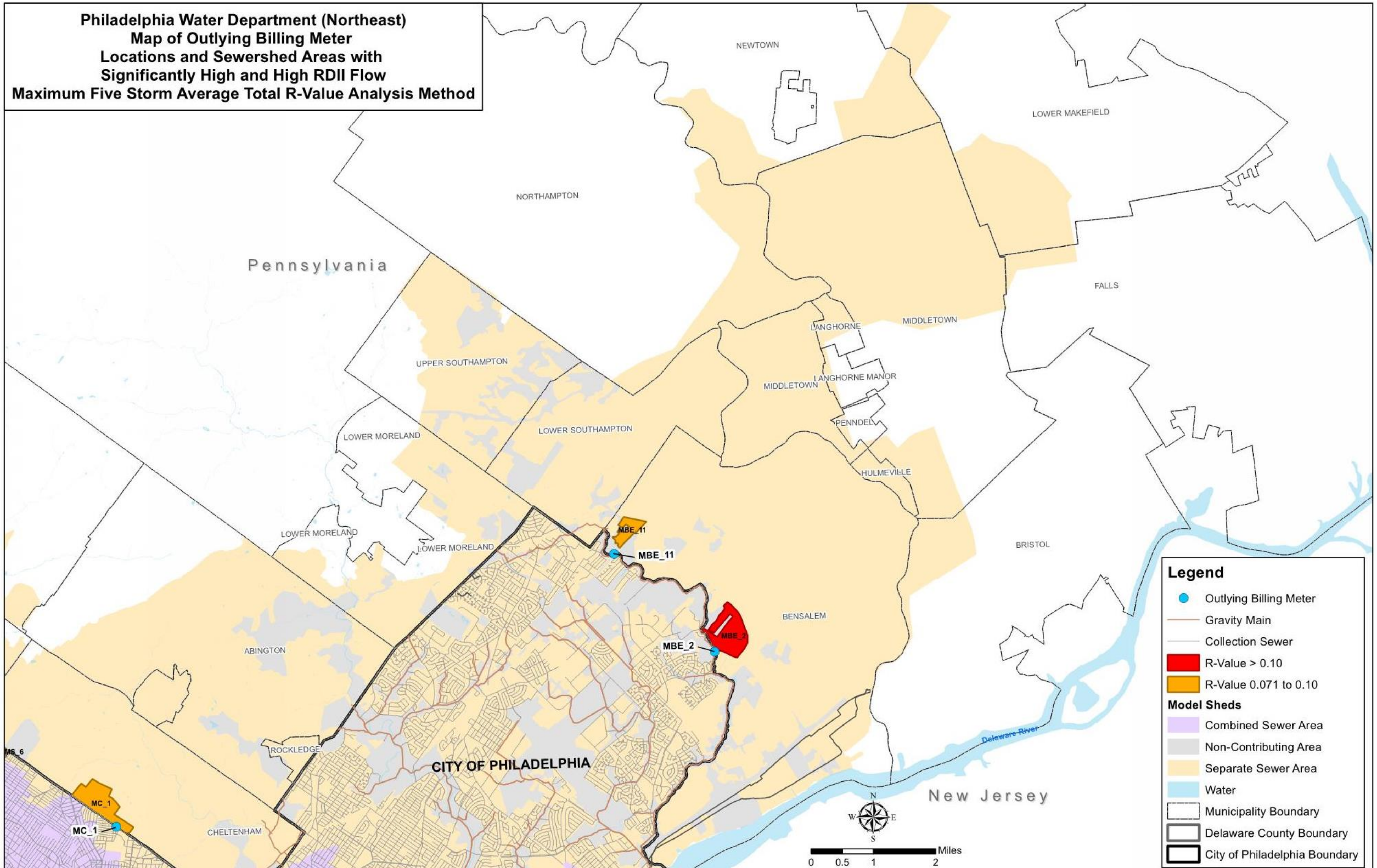


Figure 4-22: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Five Storm Average Total R-Value Analysis Method (Northeast Area)

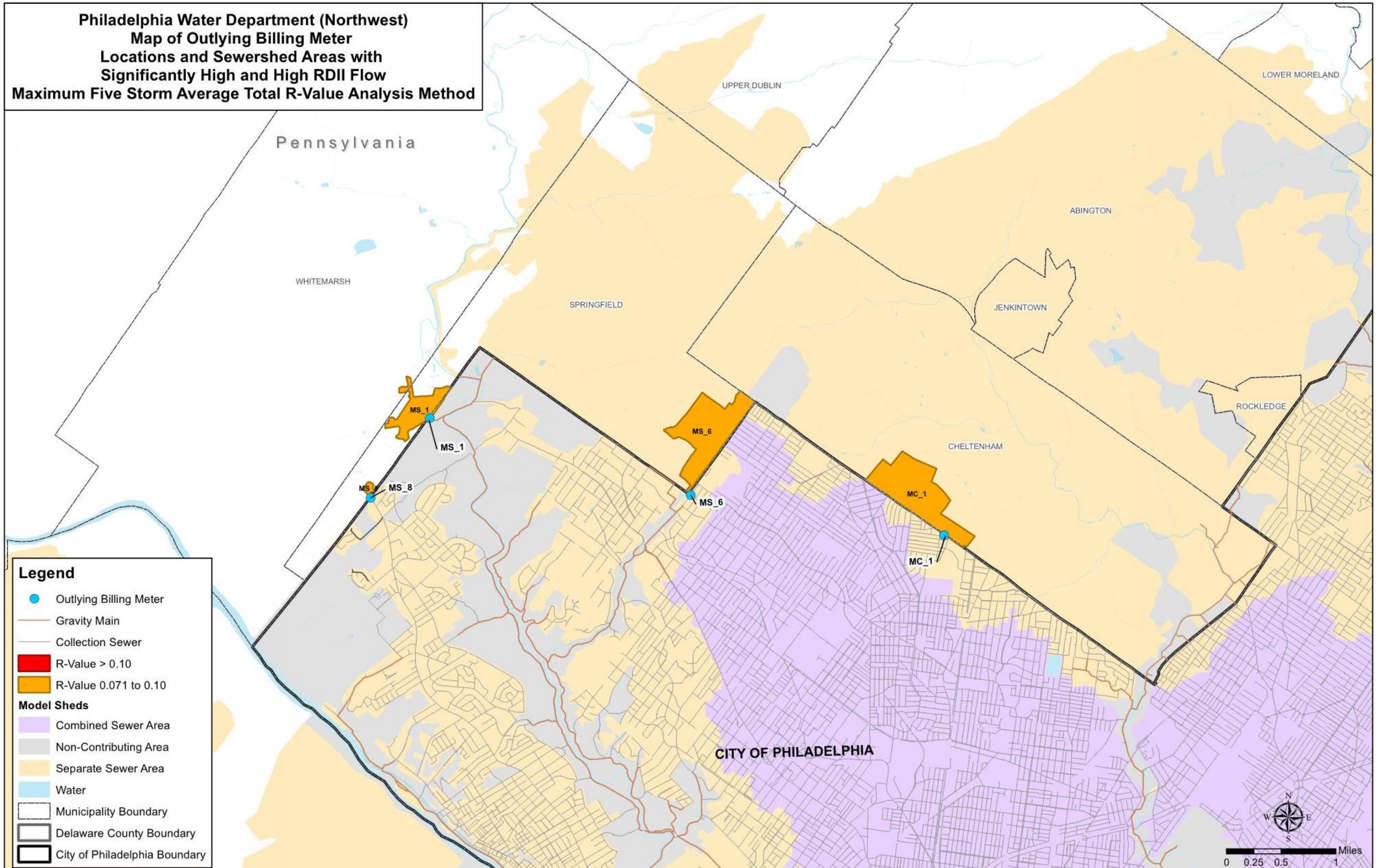


Figure 4-23: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Five Storm Average Total R-Value Analysis Method (Northwest Area)

Maximum Seasonal Average Total R-Value by Site

There were four separate sanitary sewershed areas within the outlying communities, MBE_2, MBE_11, MS_1, and MS_8, where the maximum seasonal average total R-value, calculated from the monitored wastewater flow data, was greater than 0.06, (where more than 6% of the sewershed rainfall entered the sanitary sewer collection system.) These areas were classified as very high (red range along the CDF plot) relative to other monitored sewershed areas. The locations of these 4 outlying community sewershed areas are provided on the Figure 4-24, 4-25, and 4-26 maps. Figure 4-24 provides an orientation map of the Water Department service area, including the outlying communities. Figures 4-25 and 4-26 provide a closer view of the northeast and northwest portions of the service area, respectively. All four of these sewershed areas were also identified as having high maximum five storm total R-values. For three of these sites, MBE_11, MS_1, and MS_8, the analysis results were based upon limited storm data, heavily influenced by winter storms and snow melt, and should be used with caution. Additional information about these sites is provided below:

- Bensalem Township sewershed MBE_2 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 90 storms were analyzed for all four seasons.
- Bensalem Township sewershed MBE_11 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was approximately 7 months, and 15 storms were analyzed over three seasons.
- Springfield Township sewershed MS_1 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was approximately 9 months, and 12 storms were analyzed for all four seasons.
- Springfield Township site MS_8 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was 6.7 months and 14 storms were analyzed over two seasons.

There were three separate sanitary sewershed areas within the outlying communities, MBE_8, ML_2, and MS_5, where the maximum seasonal average total R-value was between 0.031 and 0.06 and classified as high (orange range along the plot) relative to other monitored areas. The locations of these three sewershed areas are provided on the Figure 4-24, 4-25, 4-26, and 4-27 maps. Figure 4-24 provides an orientation map of the Water Department service area, including the outlying communities. Figures 4-25, 4-26 and 4-27 provide a closer view of the northeast, northwest, and southwest portions of the service area, respectively. One of these sewershed areas, site MBE_8, was also identified as having a high maximum five storm total R-value. All three of the sites had sufficient monitoring durations and storm events to reliably characterize the sewershed area flow. Additional information about these sites is given below:

- Bensalem Township sewershed MBE_8 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 14 months, and over 30 storms were analyzed for all four seasons.

- Lower Merion Township sewershed ML_2 that is tributary to the Southwest Main Gravity Interceptor. The total monitoring duration for this portable billing meter site was 9.8 months and over 30 storms were analyzed for all four seasons.
- Springfield Township site MS_5 that is tributary to the Cresheim Valley Interceptor. The total monitoring duration for this portable billing meter site was 8.8 months and 24 storms were analyzed over three seasons.

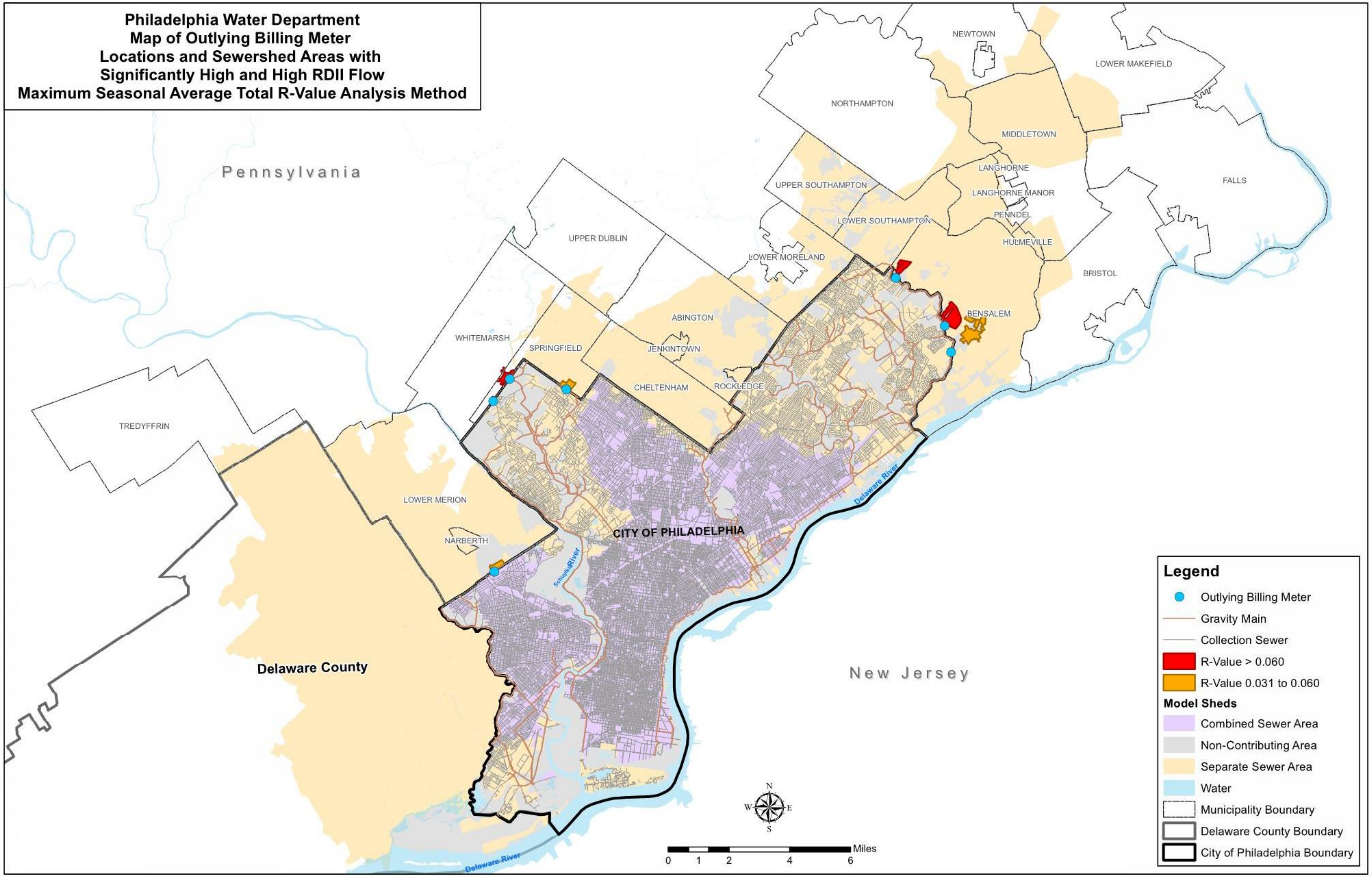


Figure 4-24: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Seasonal Average Total R-Value Analysis Method (Entire Service Area)

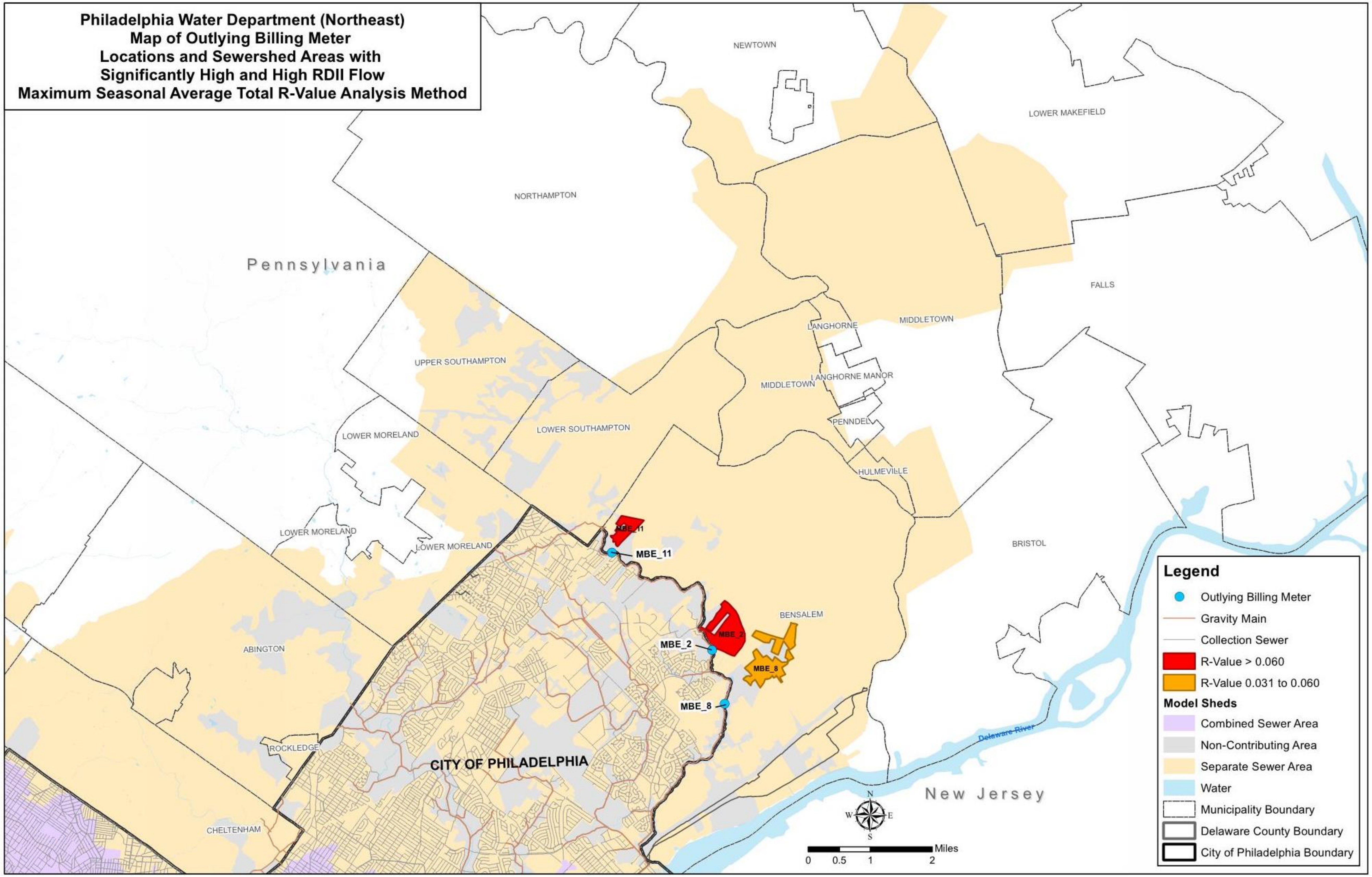


Figure 4-25: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Seasonal Average Total R-Value Analysis Method (Northeast Area)

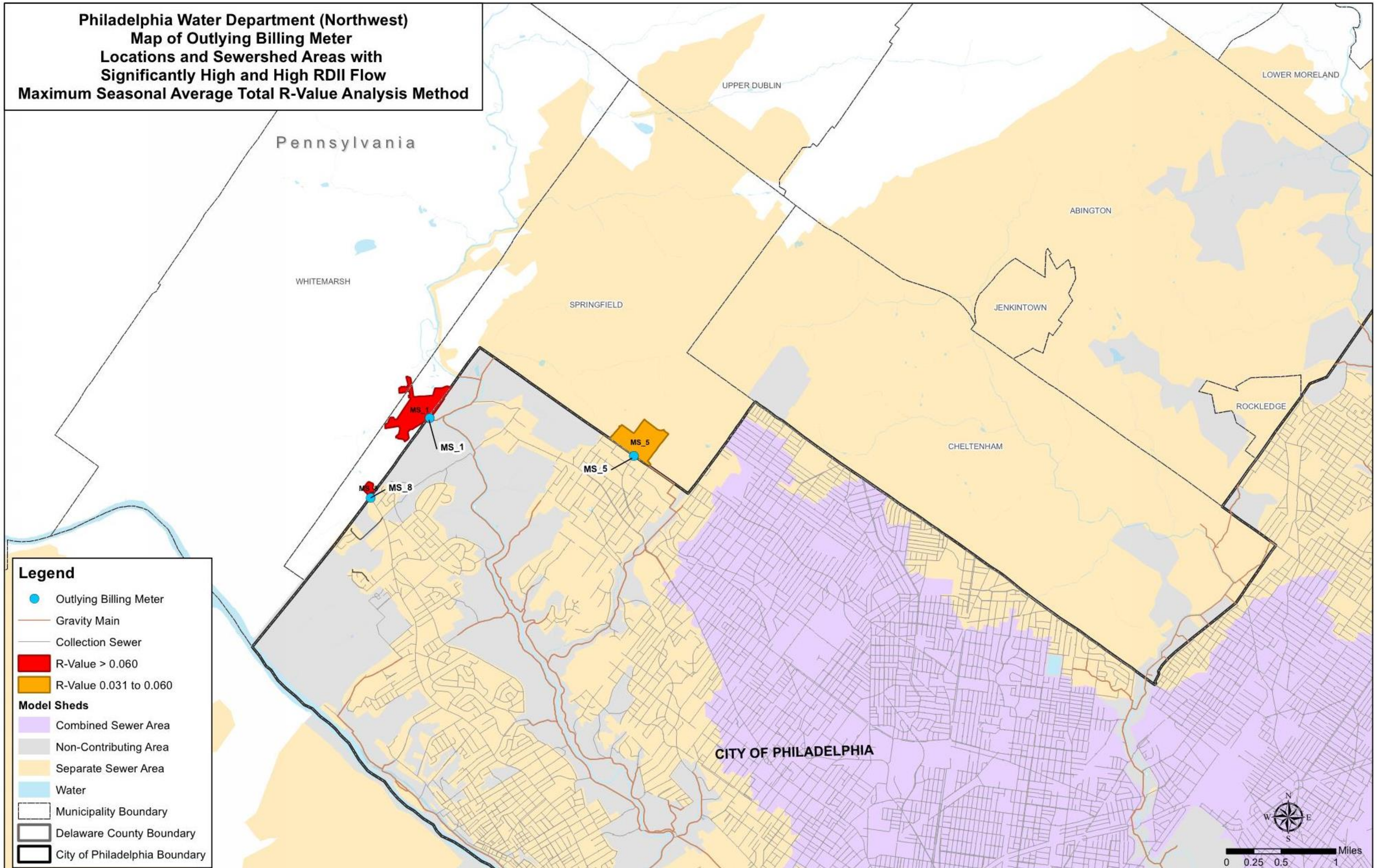


Figure 4-26: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Seasonal Average Total R-Value Analysis Method (Northwest Area)

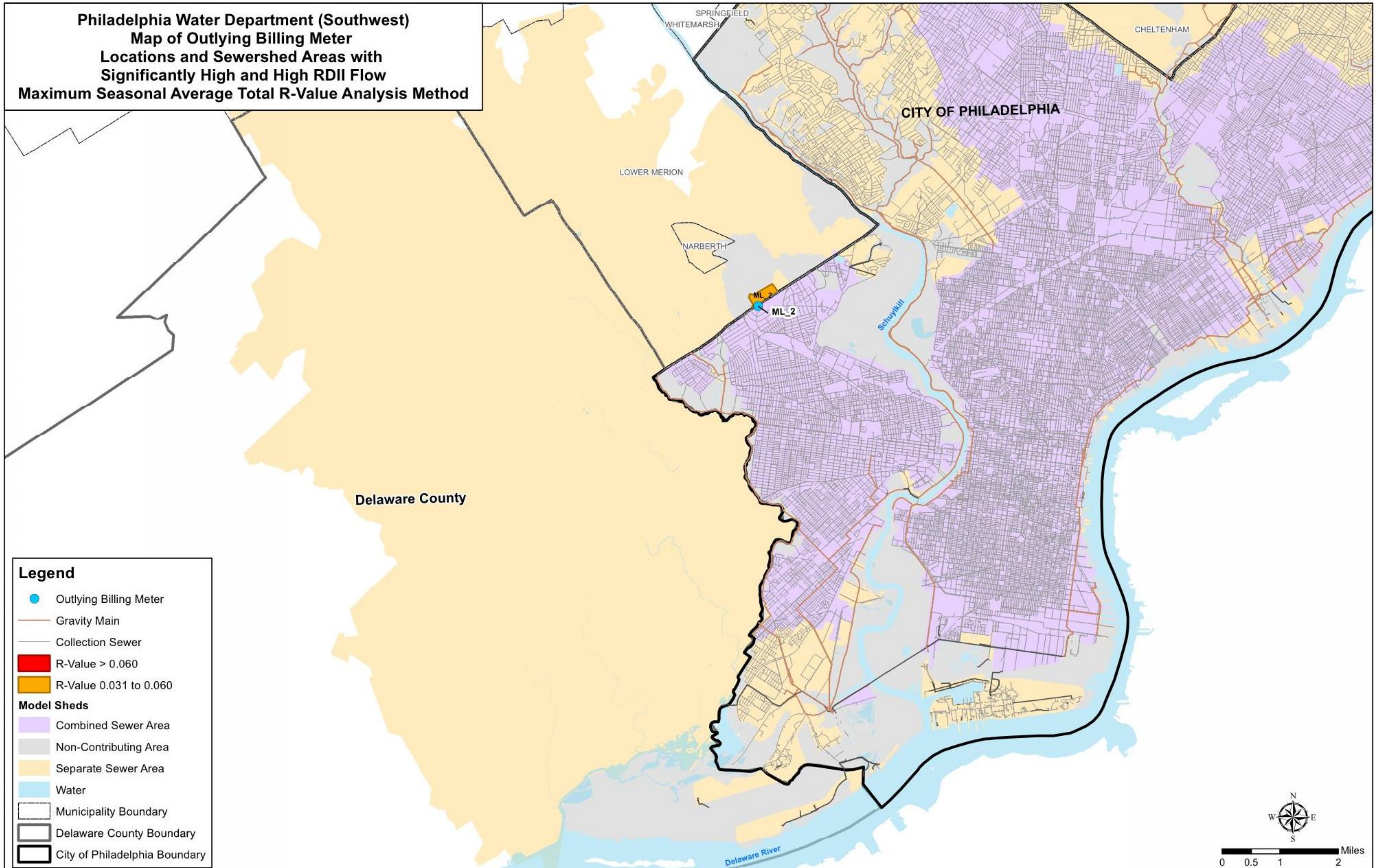


Figure 4-27: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Maximum Seasonal Average Total R-Value Analysis Method (Southwest Area)

Monitoring Duration Average Total R-Value by Site:

There were two separate sanitary sewershed areas within the outlying communities, MS_1 and MS_8, where the average total R-value over the duration of the monitoring period was greater than 0.05 and classified as very high (red range along the CDF plot) relative to other monitored sites. The locations of these three sewershed areas are provided on the Figure 4-28, and 4-30 maps. Figure 4-28 provides an orientation map of the entire Water Department service area, including the outlying communities. Figure 4-30 provides a closer view of the northwest portion of the service area. Both of these sewershed areas were also identified as having both a maximum five storm average total R-value and a seasonal average total R-value that were considered to be either high or very high. This confirms that both of these identified sewershed areas contribute relatively high RDII flow to the sanitary sewer system, irrespective of the alternative analysis method that was utilized. However, for both of these sites, the analysis results were based upon limited storm data and should be used with caution. Additional information on these sites is given below:

- Springfield Township sewershed MS_1 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was approximately 9 months, and 12 storms were analyzed for all four seasons.

- Springfield Township site MS_8 that is tributary to the Wissahickon Creek Low Level Interceptor. The total monitoring duration for this portable billing meter site was 6.7 months and 14 storms were analyzed over two seasons.

There were three separate sanitary sewershed areas within the outlying communities, MBE_2, MBE_8, and MBE_11, where the average total R-value, calculated from the monitored wastewater flow data, was between 0.026 and 0.050 and classified as high (orange range along the plot) relative to other monitored areas. The locations of these three sewershed areas are provided on the Figure 4-28, 4-29, and 4-30 maps. Figure 4-28 provides an orientation map of the entire Water Department service area, including the outlying communities. Figures 4-29 and 4-30 provide a closer view of the northeast and northwest portions of the service area, respectively. All three of these sites were also identified as being potentially problematic using the two other alternative wet weather analysis methods. This confirms that these three identified sewershed areas contribute relatively high RDII flow to the sanitary sewer system, irrespective of the alternative analysis method that was utilized. Two of the sites had sufficient monitoring durations and storm events to reliably characterize the sewershed area flow. However, for site MBE_11, the analysis results were based upon limited storm data, heavily influenced by winter storms and snow melt, and should be used with caution.

- Bensalem Township sewershed MBE_2 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 90 storms were analyzed for all four seasons.

- Bensalem Township sewershed MBE_8 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 14 months, and over 30 storms were analyzed for all four seasons.

- Bensalem Township sewershed MBE_11 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site (limited due to equipment failures and vandalism) was approximately 7 months, and 15 storms were analyzed over three seasons.

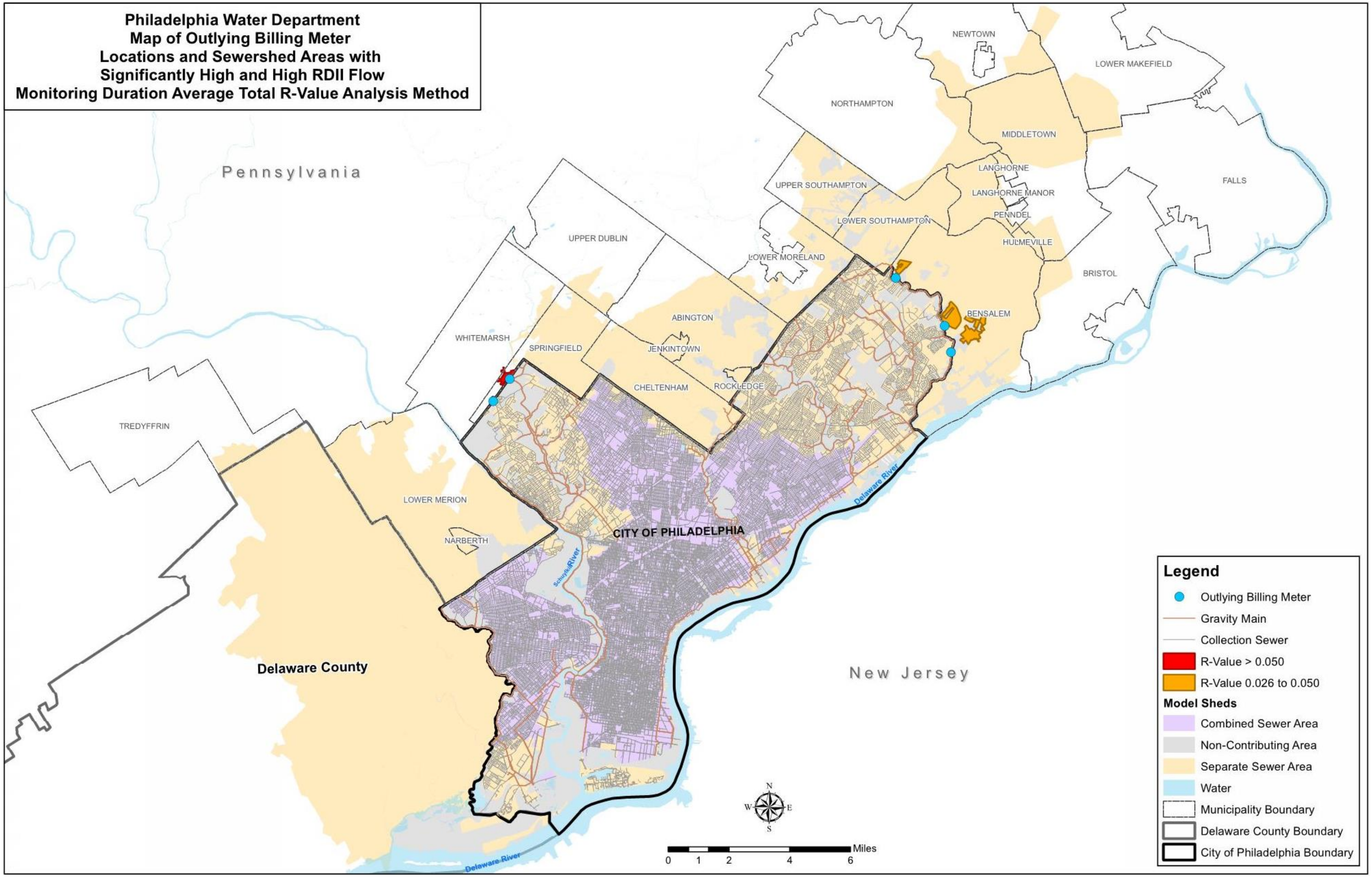


Figure 4-28: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Average Monitoring Duration Total R-Value Analysis Method (Entire Service Area)

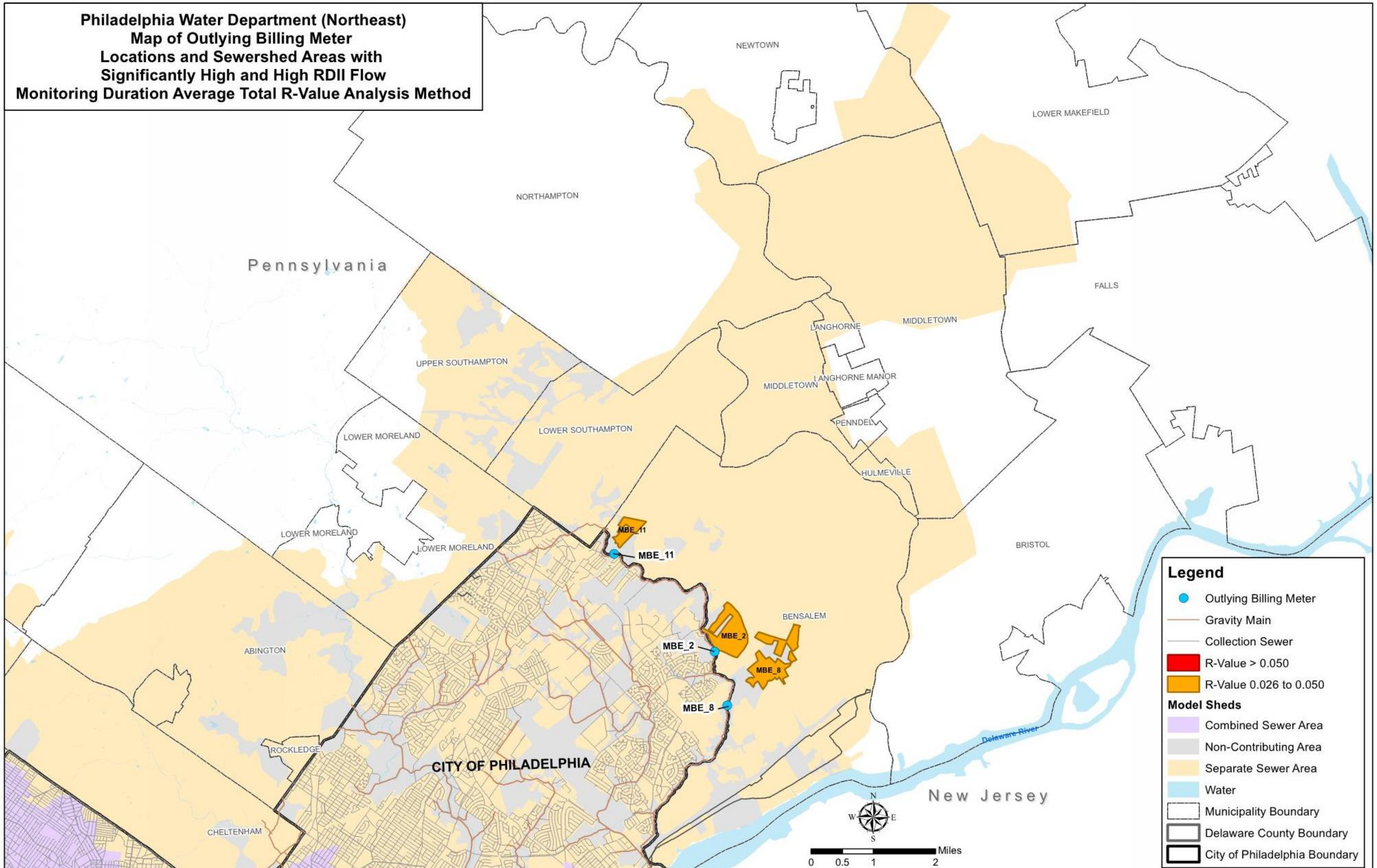


Figure 4-29: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Average Monitoring Duration Total R-Value Analysis Method (Northeast Area)

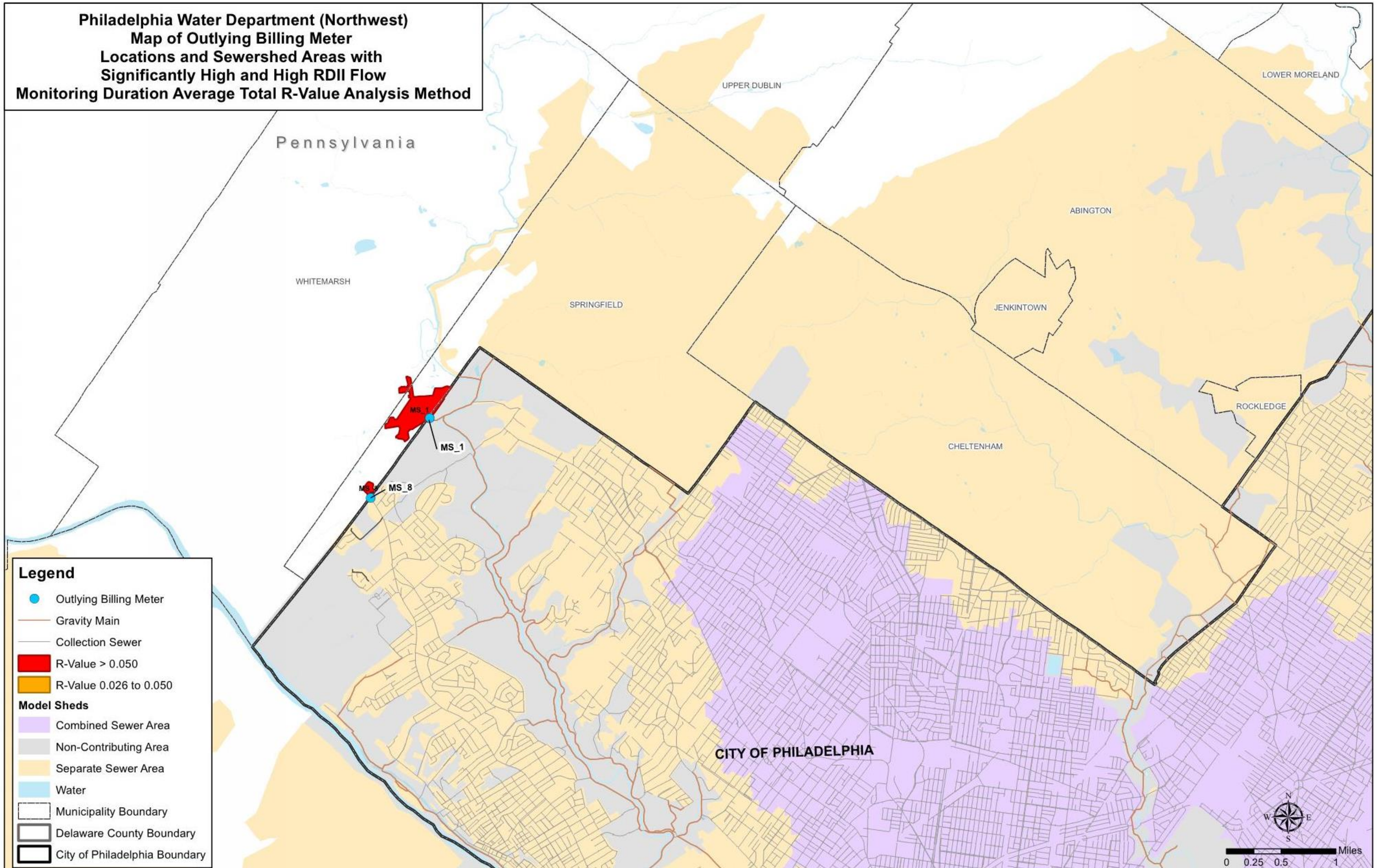


Figure 4-30: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Average Monitoring Duration Total R-Value Analysis Method (Northwest Area)

Site Average Five Largest Storms Peaking Factor

There were four separate sanitary sewershed areas within the outlying communities, MBE_2, MBE_6, MBE_10, and MBE_14, where the average five largest storm peaking factor, calculated from the monitored wastewater flow data, was greater than 8.0 and classified as very high (red range along the CDF plot) relative to other monitored areas. The locations of these four outlying community sewershed areas are provided on the Figure 4-31 and 4-32 maps. Figure 4-31 provides an orientation map of the Water Department service area, including the outlying communities. Figure 4-32 provides a closer view of the northeast portion of the service area. Three of the sites had sufficient monitoring durations and storm events to reliably characterize the sewershed area flow for all seasons of the year. However, for site MBE_14, the analysis results were based upon limited storm data and should be used with caution.

The analysts were careful to consider that the peaking factor can itself be dependent on the size of the tributary drainage area. Two the four identified sewershed areas (MBE_10 and MBE_14) have relatively small tributary areas, ranging from 15 acres to 37 acres. Higher storm peaks are expected because they tend to be attenuated less in smaller sewershed areas. Two of the sewershed areas (MBE_2 and MBE_6) have relatively large sewershed areas of 212 acres and 742 acres, respectively. Despite the natural attenuation processes due to channel and overbank routing and relative storm cell size, these two sewershed areas still produced the largest observed peaking factors. These potential concerns were considered acceptable because peaking factors were only one of several analysis methods for identifying sewershed areas with high RDII flows. Leaky sewershed areas were also identified using the R-value analysis method, which is not area biased.

Three of these four sites were not previously identified from the other three alternative analysis methods as being sewershed areas contributing relatively high RDII volumes. This would indicate that while the total volume of extraneous RDII is not relatively high when compared with other outlying community sewershed areas, the peak wet weather flows during large storms are significantly high when compared with their average dry weather flows. These high storm peaks can cause surcharge conditions along municipal and City sewers and potentially increase the frequency, duration and volume of CSO or SSO discharges. However, the MBE_2 sewershed area was also identified as having both a maximum five storm average total R-value, a maximum seasonal average total R-value, and a total monitoring duration total R-value that were considered to be high. This confirms that this sewershed area contributes relatively high RDII flow volumes and peaks to the sanitary sewer system, irrespective of the alternative analysis method that was utilized.

It is also important to remember that the analysis results are based upon the monitored wastewater flow at the billing meters located at the points of connection between the municipal sewer collection systems and the Water Department sewers. If there were SSO discharges or other wastewater losses from the community collection systems during any of the monitored storm events, these flow volumes would not be quantified by the billing meters and would not be reflected in the analysis results.

Additional information on these sites is provided below:

- Bensalem Township sewershed MBE_2 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 90 storms were analyzed for all four seasons.
- Bensalem Township sewershed MBE_6 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 100 storms were analyzed for all four seasons.
- Bensalem Township sewershed MBE_10 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and 47 storms were analyzed for all four seasons.
- Bensalem Township sewershed MBE_14 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 24 months, but because of data quality concerns only the five largest storms were analyzed.

There were four separate sanitary sewershed areas within the outlying communities, MBE_4, MBE_11, ML_5, and MS_6, where the average five largest storm peaking factor, calculated from the monitored wastewater flow data, was between 6.0 and 8.0 and classified as high (orange range along the plot) relative to the other monitored areas. The locations of these four outlying community sewershed areas are provided on the Figure 4-31 through 4-34 maps. Figure 4-31 provides an orientation map of the Water Department service area, including the outlying communities. Figures 4-32 through 4-34 provide a closer view of the northeast, northwest and southwest portions of the service area, respectively. Three of the four sites had monitoring durations over 12 months, which should provide sufficient data to characterize the sewershed area flow for all seasons of the year. However, for site MBE_11, the analysis results were based upon limited storm data and should be used with caution. Two of these four sites were not previously identified as relatively high RDII areas in the other three alternative analysis methods. However, the MBE_11 sewershed area was also identified as having a maximum five storm average total R-value, a maximum quarter total R-value and an average annual total R-value that were all considered to be high or very high. This confirms that this sewershed area contributes relatively high RDII flow to the sanitary sewer system, irrespective of the alternative analysis method that was utilized. The MS_6 sewershed area was also identified as having a maximum five storm average total R-value and a maximum quarter total R-value that were considered to be high or moderately high.

Additional information on these sites is provided below:

- Bensalem Township sewershed MBE_4 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration for this permanent billing meter site was 27 months, and over 80 storms were analyzed for all four seasons.
- Bensalem Township sewershed MBE_11 that is tributary to the Poquessing Creek Interceptor. The total monitoring duration was approximately 7 months, and 15 storms were analyzed over three seasons.

- Lower Merion Township sewershed ML_5 that is tributary to the Cobbs Creek High level Interceptor. The total monitoring duration for this permanent billing meter site was 30 months, and over 100 storms were analyzed for all four seasons.
- Springfield Township sewershed MS_6 that is tributary to the Cresheim Valley Interceptor. The total monitoring duration was 27 months, and over 110 storms were analyzed for all four seasons.

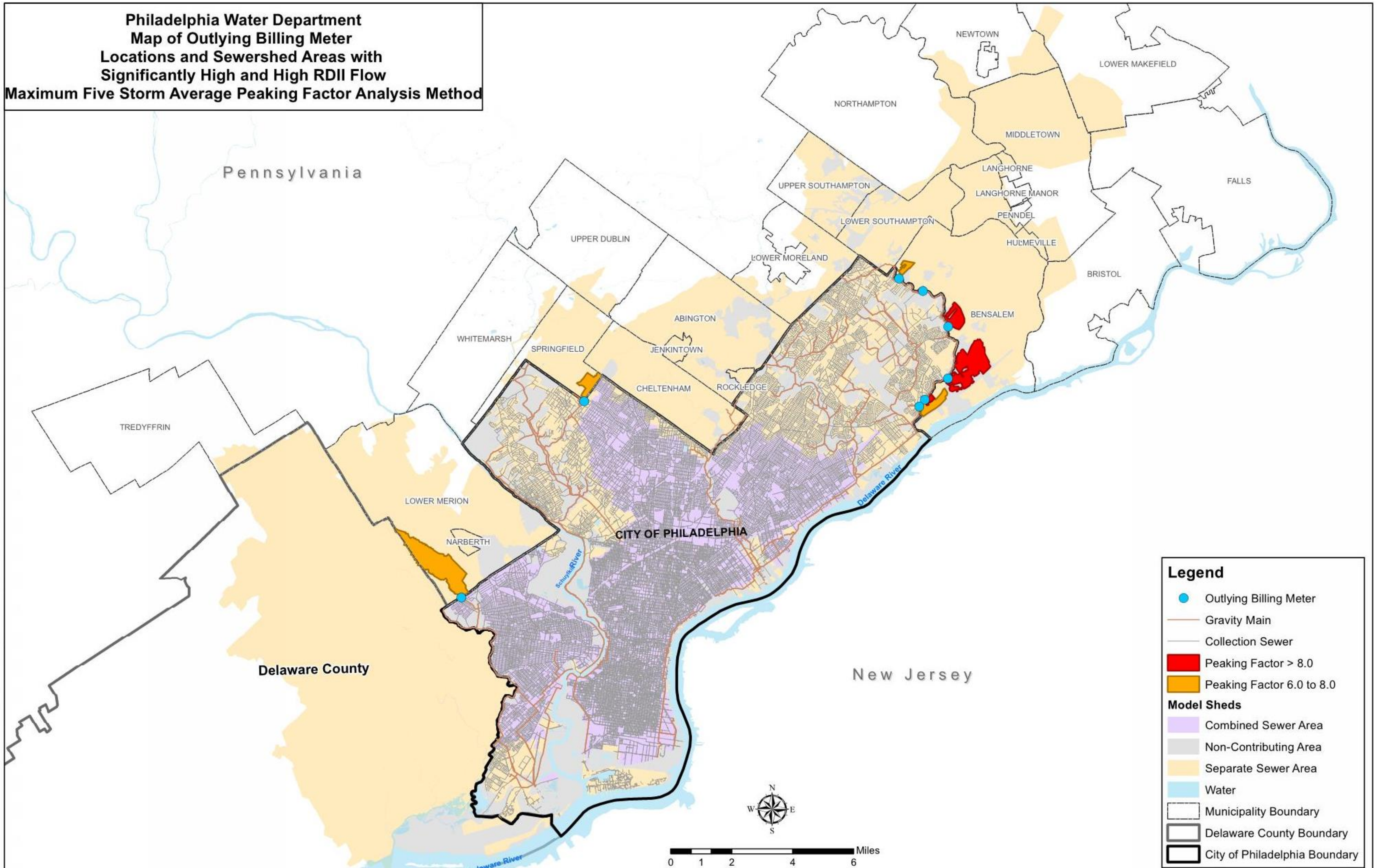


Figure 4-31: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Site Average Five Largest Storm Peaking Factor Analysis Method (Entire Service Area)

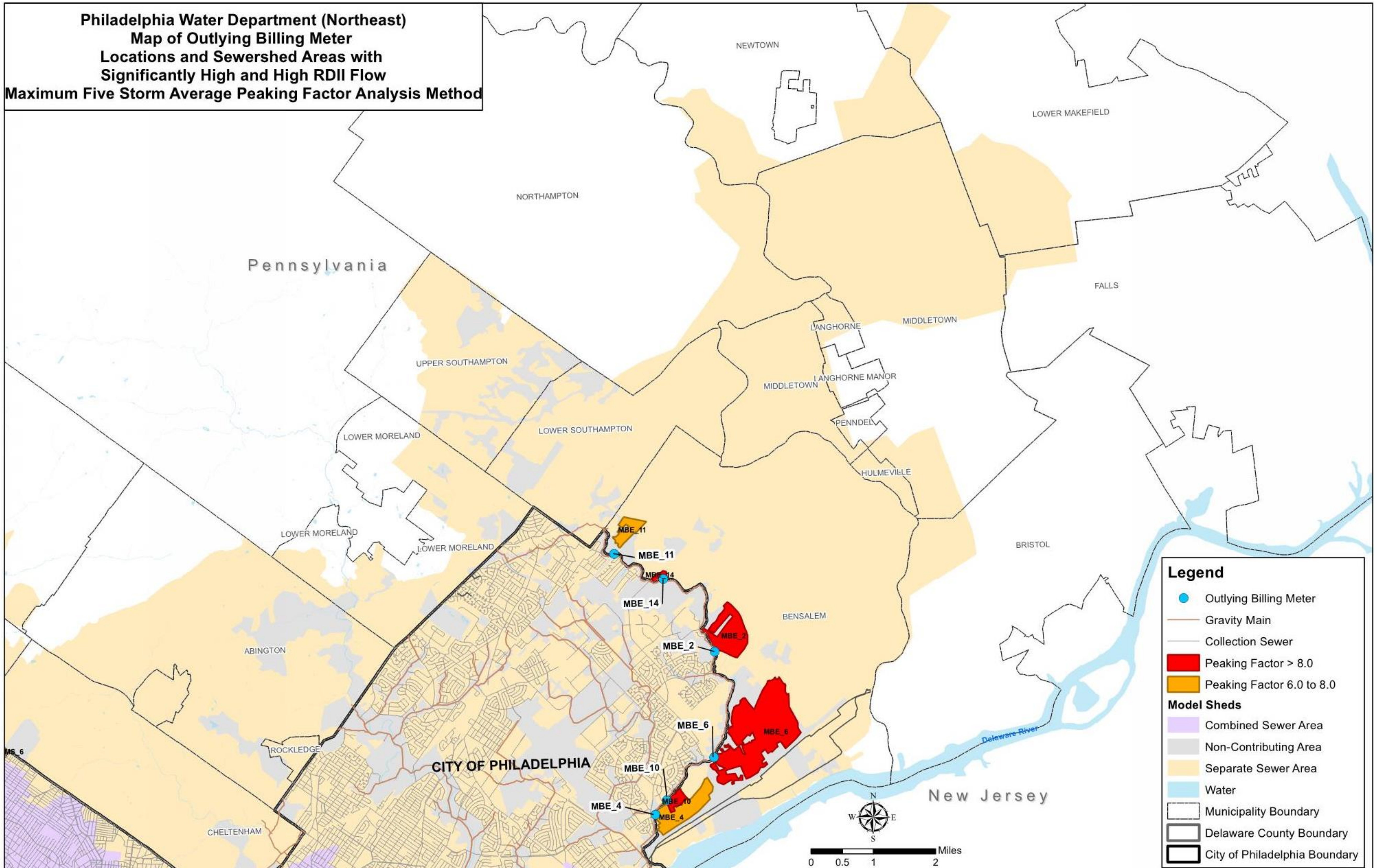


Figure 4-32: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Site Average Five Largest Storm Peaking Factor Analysis Method (Northeast Area)

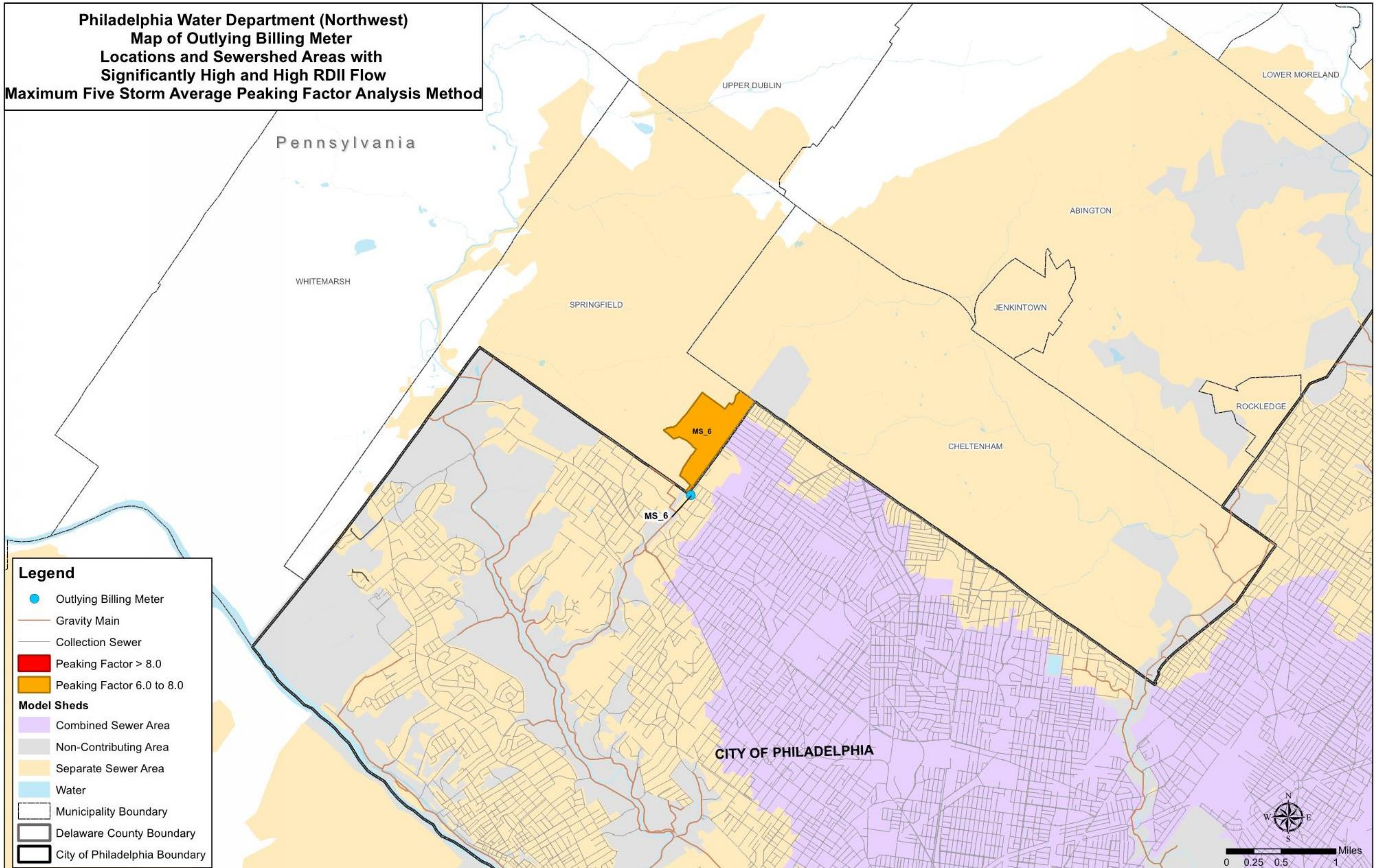


Figure 4-33: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Site Average Five Largest Storm Peaking Factor Analysis Method (Northwest Area)

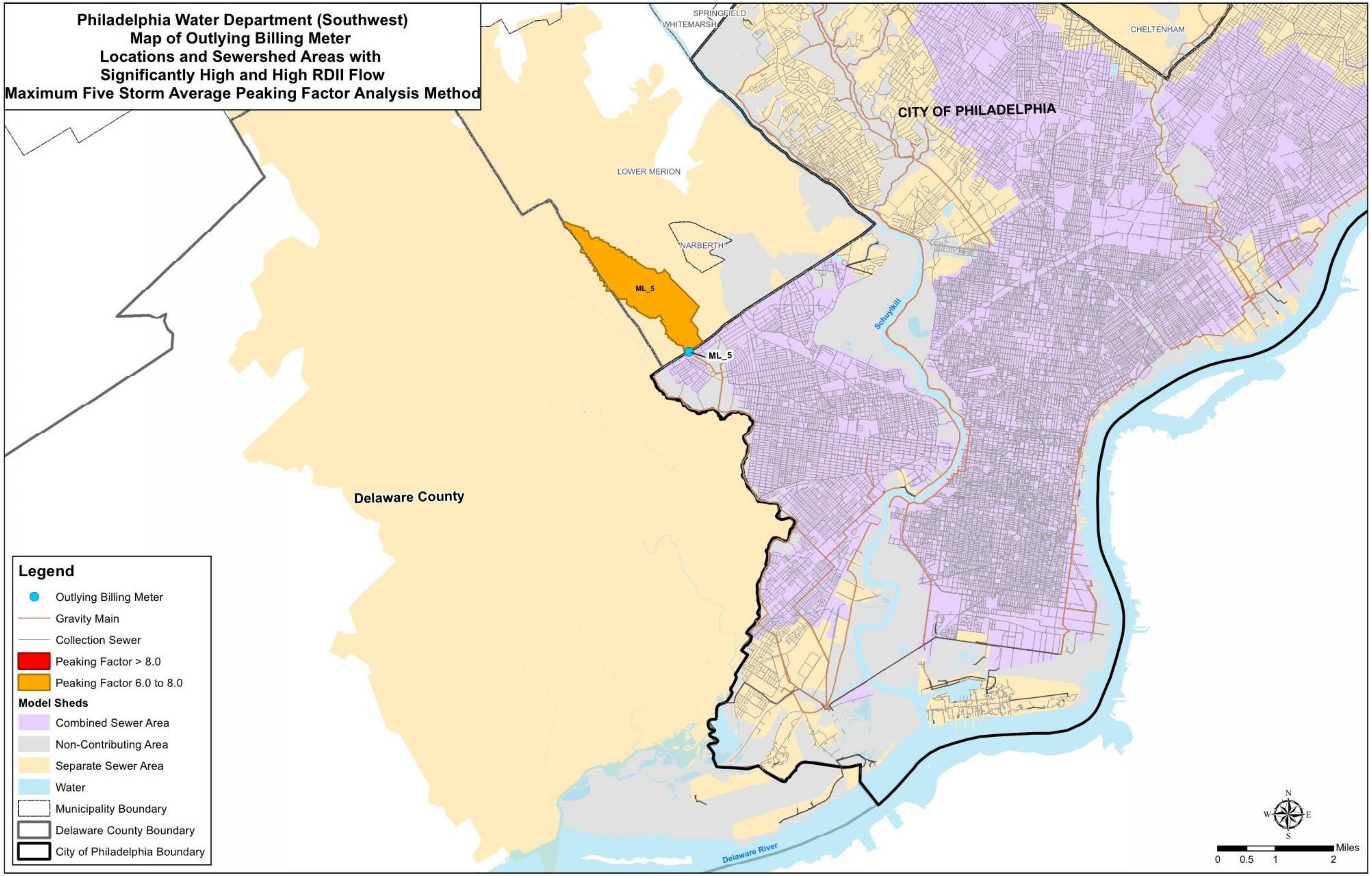


Figure 4-34: Identified Sanitary Sewershed Areas with the Highest RDII Flow – Site Average Five Largest Storm Peaking Factor Analysis Method (Southwest Area)

4.4 Flow Characterization Analysis Results and Conclusions

This section presents the results of the completed outlying community SSES Phase 2 flow characterization analyses that were conducted for the successfully monitored sewershed areas outside the City. Table 4-6, (located at the end of this section), provides a summary overview of the individual outlying community separate sanitary sewershed areas that were identified, using the four alternative wet weather flow analysis methods and one dry weather flow analysis method (described previously in Sections 3.5 (Wet Weather Flow Characterization) and 3.4 (Dry Weather Flow Characterization.)) A numeric ranking system was implemented in order to incorporate all 5 of the completed analysis methods into the process of identifying the outlying community sewershed areas contributing the greatest amounts of extraneous rainfall dependent infiltration and inflow and groundwater infiltration. A point system was applied to each of the CDF plot ranges.

- 5 points: very high RDII, peaking factor or GWI; red range along the CDF curve
- 4 points: high RDII, peaking factor or GWI; orange range along the CDF curve
- 3 points: moderately high RDII; peaking factor or GWI, yellow range along the CDF curve

Points were not assigned when the sewershed RDII, peaking factor or GWI value was determined to be average (green range along the CDF curve) or low (blue range along the CDF curve.) For a sewershed area to be included in the table, it must have been identified as being in the yellow, orange, or red ranges in at least two analysis categories. The total points from each alternative analysis method were added together for each of the identified outlying community sewershed areas. The sewershed areas are listed in order from those with the highest assessment score (and the leakiest sewer collection systems) to those with the lowest score (and the relatively less leaky sewer systems). The point system gives 80% weighting to RDII quantities/rates and 20% weighting to GWI quantities. The rationale behind this weighting was that RDII reductions in outlying communities would generally be expected to have a more significant impact on reducing the frequency, duration and volume of Water Department CSO discharges.

Table 4-6 provides the number of storms that were successfully monitored and analyzed in each of the sewershed areas and the total monitoring duration. This information indicates the relative amounts of analysis data that were available to make the determination that sewers in the sewershed were leaky. The table provides the size of the municipal sewer at the billing meter site as well as the tributary sewershed areas and service populations. The sewershed area is significant because peaking factors can be dependent on the size of the tributary drainage area and the hourly averaging process for quantifying peak flow would have a greater effect on smaller sewershed areas than larger ones. It is important to note that the service populations were obtained from the U.S. Census and therefore include only the people living in the sewershed areas and would not include those who work in commercial and/or industrial facilities located within the sewershed.

It is also important to remember that the analysis results presented in this Outlying Communities Report are based upon the monitored wastewater flow at each of the billing meters located at the points of connection between the municipal sewer collection systems and the Water Department sewers. If there were sanitary sewer overflow discharges or other wastewater losses from the community collection systems during any of the monitored storm events, these flow volumes would not be quantified by the billing meters and would not be reflected in the analysis results.

It is important to note that just because a sewershed area was identified as conveying a relatively high RDII and/or GWI volume does not necessarily indicate that sewer rehabilitation is required or recommended. The respective outlying communities may conduct additional field investigations and evaluations, determine the associated costs for alternative sewer rehabilitation measures, and consider these costs against the relative cost and effectiveness of other wet weather source reduction or control measures.

It also needs to be understood that if a sewershed is identified as having relatively high RDII and/or GWI volumes, it does not indicate that all the collection sewers within the entire sewershed area tributary to the billing meter site would need to be rehabilitated. There may be a combination of some very leaky subareas along with some acceptably tighter areas. The respective outlying communities may conduct detailed evaluations of subareas within the identified sewershed areas in the future to identify specific sections of the sanitary sewer collection system that can be targeted for rehabilitation or other capital improvements to reduce peak wastewater flow and downstream CSO discharges. The investigations would also determine how much GWI is coming from private property versus public infrastructure in each subarea.

A similar SSES report and the associated results and recommendations were previously prepared for the separate sanitary sewershed areas within the City of Philadelphia. This report, identified as the *Sewer System Evaluation Survey*, was submitted to the regulatory agencies on June 1, 2014. The report quantified and characterized dry and wet weather flow from City sewershed areas and identified any sewershed areas that contribute a relatively high amount of extraneous RDII or GWI flow.

Table 4-6: Identification and Ranking of Outlying Community Sewershed Areas with the Highest Monitored RDII and GWI

Sewershed Name	Contract Community	Water Department Receiving Interceptor	Pipe Size (inches)	Tributary Sewershed Area (acres)	Tributary Service Population	Monitoring Data Duration (months)	Number of Storms Analyzed	Wet Weather Analysis Method 1 Maximum 5 Storm Average Total R-Value	Wet Weather Analysis Method 2 Maximum Seasonal Average Total R-Value	Wet Weather Analysis Method 3 Average Annual Total R-Value	Wet Weather Analysis Method 4 Site Average 5 Largest Storms Peaking Factor	Dry Weather Analysis Method GWI Ratio	Total Composite RDII and GWI Score
MBE_2	Poquessing Creek	Bensalem	10	212	1,894	27	91	**5**	**5**	**4**	**5**		**19**
MS_8	Wissahickon Low Level	Springfield	10	5	11	6.7	14	**4**	**5**	**5**		**3**	**17**
MBE_11	Poquessing Creek	Bensalem	8	71	0	6.9	15	**4**	**5**	**4**	**4**		**17**
MS_6	Cresheim Valley	Springfield	12	189	1,169	27	112	**4**	**3**		**4**	**3**	**15**
MS_1	Wissahickon Low Level	Springfield	12	77	404	9.1	12	**4**	**5**	**5**			**14**
MC_3	Tacony Creek High Level	Cheltenham	10	139	1,208	27	88	**3**	**3**	**3**		**4**	**13**
MBE_8	Poquessing Creek	Bensalem	12	230	1,318	14.1	33	**3**	**4**	**4**			**11**
MS_5	Cresheim Valley	Springfield	8	69	410	8.8	24		**4**			**4**	**8**
MBE_6	Poquessing Creek	Bensalem	16	742	4,567	27	105	**3**			**5**		**8**
ML_2	Southwest Main Gravity	Lower Merion	8	55	379	9.8	33		**4**	**4**			**8**
MLM_2	Poquessing Creek	Lower Moreland	12	1,797	6,529	30	60				**3**	**4**	**7**
MSH_1	Poquessing Creek	Lower Southhampton	30	5,132	21,642	27	71	**3**				**3**	**6**
MBE_15	Poquessing Creek	Bensalem	9.5	145	849	12	38	**3**			**3**		**6**
MBE_5	Poquessing Creek	Bensalem	24	1,024	2,563	27	102				**3**	**3**	**6**
MD_1	Southwest Main Gravity	Delaware County	66	41,340	277,202	39	176				**3**	**3**	**6**
ML_7	Southwest Main Gravity	Lower Merion	12	205	373	27	102	**3**	**3**				**6**
MS_2	Wissahickon Low Level	Springfield	30	2,648	12,155	27	80		**3**	**3**			**6**

5.0 Future Efforts and Actions Taken to Date to Limit Extraneous Flows

5.1 Actions Taken to Date

The Pennsylvania Department of Environmental Protection (PADEP) has approved Consent Order and Agreements (COAs), Corrective Action Plans (CAPs), and Connection Management Plans (CMPs) to construct wet weather control facilities, implement various sewer remediation projects, and limit new connections to the sewer system. The outlying communities have prepared and have been implementing their individual sewer system evaluation programs, infiltration and inflow (I/I) reduction programs, and connection management plans to limit the wastewater flow conveyed by the municipal sewer collection systems to the City sewer system.

Consent Order and Agreement Activities

PADEP approved a COA with the City for two specific planning areas. In conjunction with a Corrective Action Plan for the Poquessing Interceptor, the City and PADEP have entered into a Consent Order and Agreement (COA) to mitigate sanitary sewer overflows (SSOs) at Manhole PC-30 on the Poquessing Interceptor. The COA directed the City to construct a parallel relief sewer within the City of Philadelphia to capture and convey peak wet weather flows. A COA was also approved as part of a CAP to mitigate hydraulic overloading along the Upper Schuylkill East Side sewer and wet weather overflows at relief structure R-20 located near Main Street and Shurs Lane. The COA directed the City to construct the 3 million gallon Venice Island storage and flow equalization facility along the Manayunk Canal. PADEP has also approved COAs from some individual outlying communities to construct control facilities to mitigate the overloading of municipal trunk sewers and eliminate accompanying SSO discharges.

The COAs require the City and the outlying municipalities to submit quarterly or semiannual progress reports that document activities and status summaries for required tasks such as relief sewer or control facility construction, closed circuit television (CCTV) inspections, sewer segment rehabilitation, and efforts made to abate I/I in the sanitary sewer collection systems within the City and by the tributary municipalities. The reports also provide updates on approved planning modules.

Corrective Action Plans and Connection Management Plans

The PADEP has approved CAPs and CMPs from the City and some of the outlying communities to address extraneous wet weather flows. The CAPs require some of the outlying communities to prepare and implement individual sewer system evaluation programs and I/I reduction programs to limit the wastewater flow conveyed by the municipal sewer collection systems to the City sewer system. The CAPs also require the outlying communities to develop and implement connection management plans to identify planned or projected new development, along with estimated build-out schedules. The additional wastewater flow generated from this potential new development was quantified and the available capacities of downstream municipal and City sewers were checked to verify that the additional flow could be safely and reliably conveyed through the City interceptor system for treatment.

Sewer System Evaluation Programs

The outlying community sewer system evaluation programs generally consisted of the following elements.

- CCTV inspections have been conducted to check the condition of the collection sewers and identify any significant structural problems or specific sources of excessive ground water infiltration (GWI) and/or rainfall derived infiltration and inflow (RDII) along sanitary sewers and service lateral connections.
- Manhole inspection programs were implemented to identify manhole walls, riser sections, and/or casting seals with excessive I/I flow.
- Pump station inspection and analysis programs were implemented to identify any facilities where pump settings would need to be adjusted to maximize the hydraulic performance of the pump stations.
- Smoke and dye testing was conducted to identify specific sources of I/I into the municipal collection systems.

As a result of implementing the sewer system evaluation programs, sewer maintenance activities such as sewer cleaning, fat/oil/grease control programs, and root removal programs were implemented by the outlying communities to ensure the proper operation of the sewer collection systems. If the municipal Sewer System Evaluation Program was implemented as part of a COA or CAP, quarterly progress reports were submitted to PADEP and to the City to communicate and track planned and completed activities.

Infiltration and Inflow Reduction Programs

The I/I reduction programs developed and implemented by the outlying communities generally consisted of the following elements. Quarterly progress reports were submitted to the City to communicate and track planned and completed activities.

- Spot repairs such as the grouting of sewer joints, the installation of saddle liners at service lateral connections, and the installation of waterproof couplings have been implemented to mitigate specific problem areas identified during the CCTV inspections.
- Sewer lining was implemented along entire sewer segments, manhole to manhole, where significant I/I sources were observed along an entire sewer segment.
- Manholes were lined and castings were sealed where excessive I/I was observed during the manhole inspection programs.
- Rainspout connection inspection programs have been implemented and any illicit connections between roof leaders and the sanitary sewer system were disconnected and the stormwater flow was redirected.

- Sump pump inspection programs were implemented to identify any sump pumps that were connected to the sewer system, and the necessary corrections were subsequently made to redirect the groundwater flow.
- Slotted sewer lateral cleanout lids were replaced with solid caps and low-lying lateral vents were raised to prevent rainwater from entering the sanitary sewer laterals.

5.2 Potential Future Actions

Outlying Community Activities

As required by CAPs and CMPs, sewer system evaluation program activities will continue to be conducted, and CCTV inspections along sanitary sewers and manhole inspections will continue to be performed. As ordered by PADEP, I/I reduction program activities will continue to be implemented and the resulting sewer rehabilitation needs that are identified will continue to be constructed. Semiannual or quarterly reports will continue to be prepared and submitted to communicate planned and completed activities.

In 2014, the Bucks County Water and Sewer Authority submitted a CAP to mitigate the reported condition that portions of the Neshaminy sewer system were in a state of hydraulic overload and there was a hydraulic overload at the Totem Road Pump Station. The Authority will continue to implement the CAP and submit required progress reports.

Philadelphia Water Department Activities

The Water Department will continue to operate and maintain the network of permanent and portable billing meters to monitor wastewater flow. The Water Department will utilize the collected information from the Phase 1 Sewer System Evaluation Survey (SSES) activities, and the results from the completed Phase 2 analysis efforts within and outside the City, to update and refine the existing hydrologic and hydraulic (H&H) models of the Water Department service area, for sewershed areas both within and outside the City. The models will be used to quantify and characterize any potentially significant reduction in RDII volumes/rates as well as any potentially significant reductions in the frequency, duration and volume of CSO discharges that can be expected if sewer remedial measures were to be implemented in identified priority sewershed areas.

The City will continue to implement the remaining activities required by the two sanitary sewer COAs. The relief sewer along the Poquessing Interceptor and the Venice Island storage facility along the Upper Schuylkill East Side Interceptor are both complete and fully operational, and the City will continue to use the facilities to control peak wet weather flow. SSO discharge monitoring will continue to verify that wet weather flows are adequately controlled. New connections to the interceptors will continue to be managed.

As described in the COA, the Department will assess identified sources of extraneous flows from sanitary sewered areas for their potential to affect combined sewered overflow volumes. If opportunities are identified to significantly reduce CSO volumes through the implementation of I&I reduction remedial actions, the Department will develop and submit by June 1, 2016, a strategy for the implementation of flow reductions to reduce CSOs. This strategy, for any sanitary sewersheds identified within or outside of the City that offer opportunities for significant CSO reduction, will include an implementation plan for the specific sewer reaches targeted for remedial measures.

The strategy, if and where appropriate, will integrate and incorporate the completed sewer inspection and corrective actions activities that have been documented and described in the SSES reports for the in-City and outlying community portions of the service area. Also, if necessary for identified areas, additional field investigations may be proposed to better inform the planning and design of remedial action capital projects. The specific locations and methods of any field investigations will be determined based upon an evaluation of the available data collected from completed Phase 1 and 2 investigations. System infrastructure attributes such as sewer age, size, material and location relative to surface water, groundwater table, or subsurface streams will be considered in determining the location and method of such field investigations if they need to be performed. The scope of work for the sub-sewershed field investigations could also include additional short-term flow monitoring activities.

Appendix A

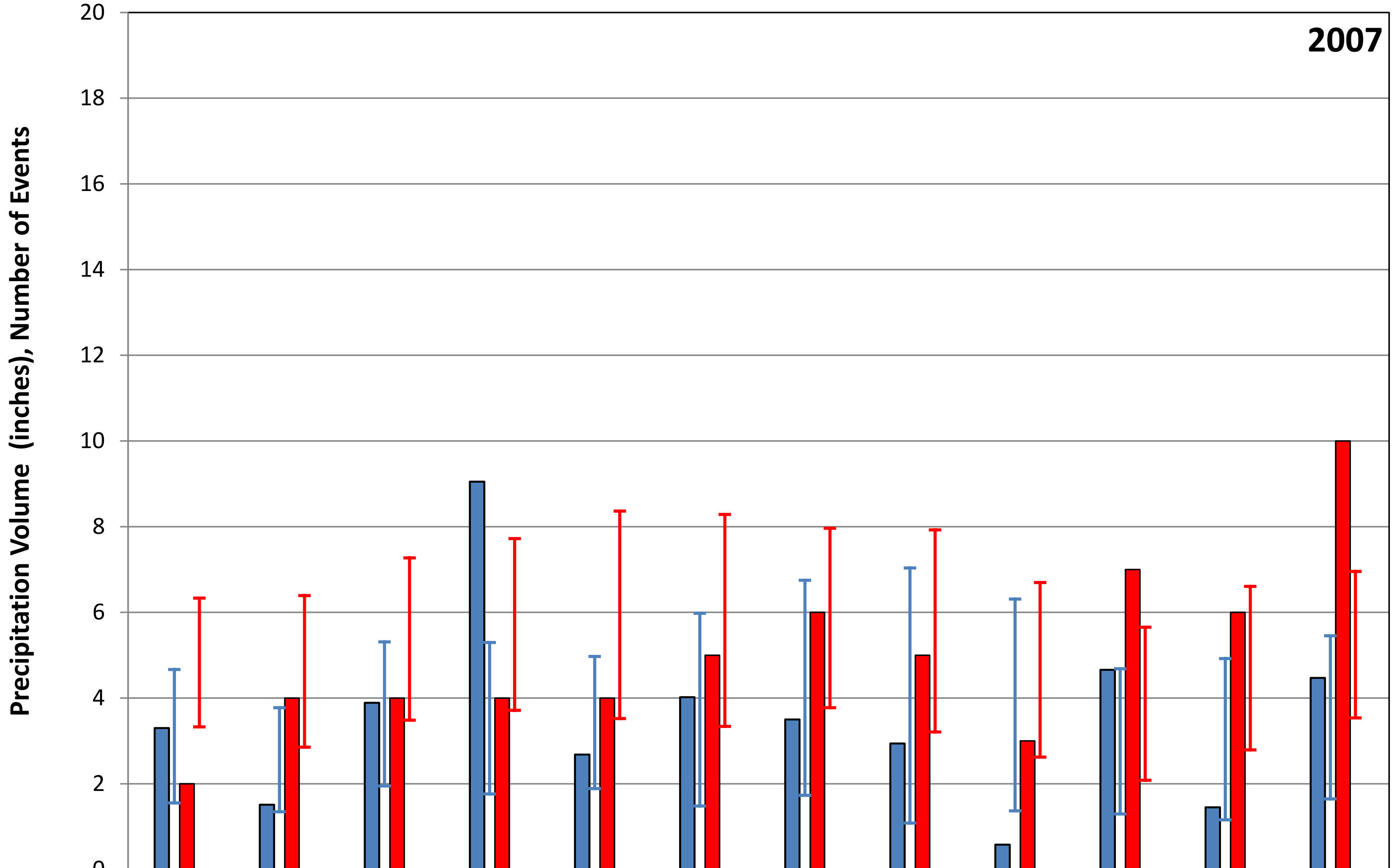
Precipitation Analysis Summaries

Appendix A
Precipitation Analysis Summaries

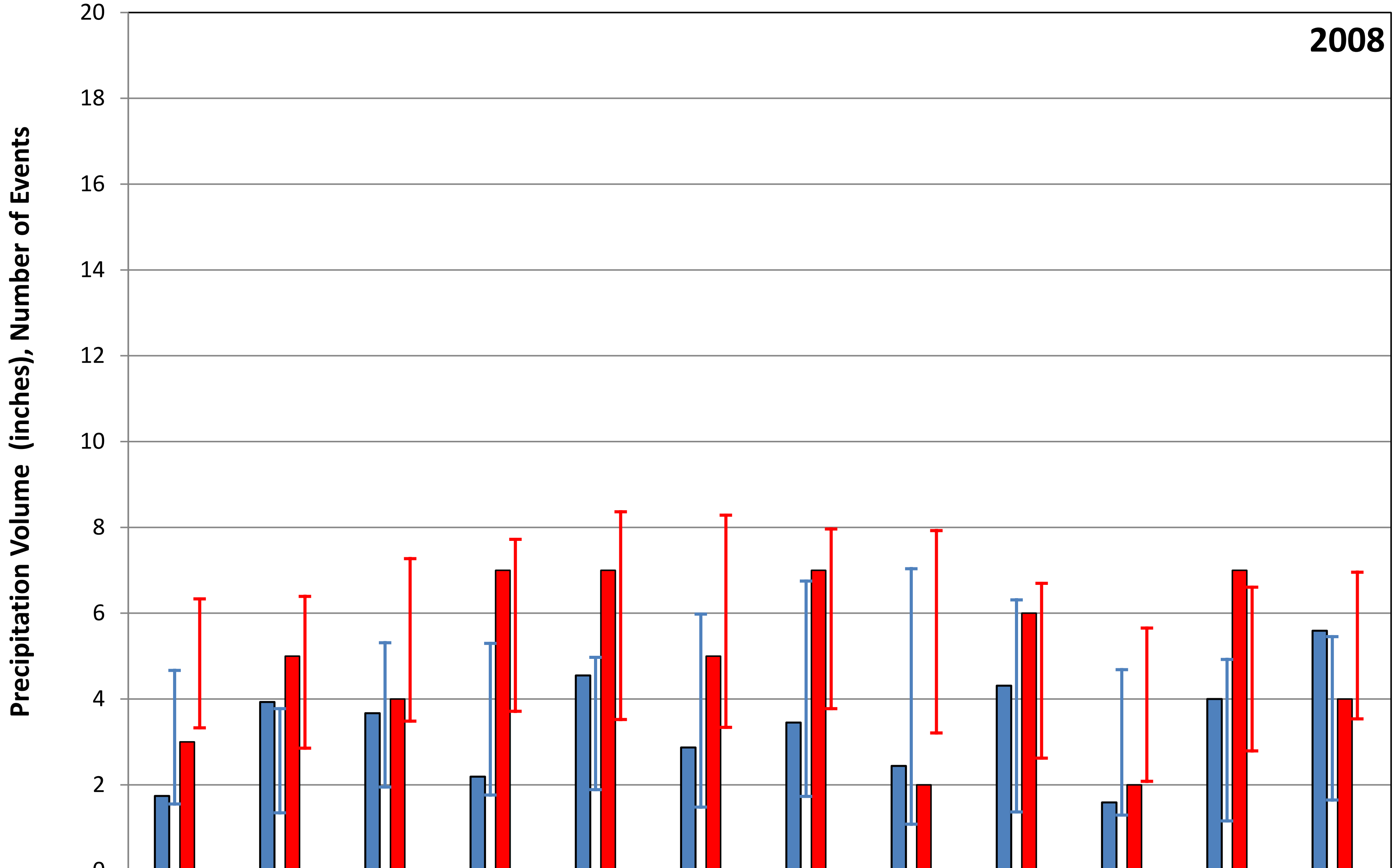
This appendix includes summaries of precipitation analysis results coinciding with the separate sanitary sewer flow monitoring data utilized in support of this Outlying Communities Report. Specifically, provided are plots that show the monthly precipitation volume and number of events during the period from January 2007 through June 2014 compared to historical norms. These historical norms, or "typical" values, were determined from an analysis of the long-term record gage data from the Philadelphia International Airport (PHL) and can be used as a benchmark for comparing a particular month's precipitation to the corresponding long-term average. These summaries are intended to serve as a tool in understanding the hydrologic characteristics during this period, and interpret the dry and wet weather flow characterizations of the monitored outlying community separate sewer areas.

Included are plots showing precipitation analysis results for each year that was analyzed. Shown on each plot are the monthly precipitation volume (blue columns) and number of events (red columns). These same monthly totals, as well as the historic monthly averages, are displayed in numeric form on the table at the bottom of each plot. In order to assess the magnitude of these monthly values, the variability of the long-term historic averages was illustrated by plotting the historic average monthly volumes and event frequency plus and minus one standard deviation. These values are represented on the plot by typical range extent bars and can be used to assess the expected variability in the monthly precipitation volumes and event frequencies. The blue range extent bars display the typical variability of monthly precipitation volume and red range extent bars show the typical variability for the number of monthly events.

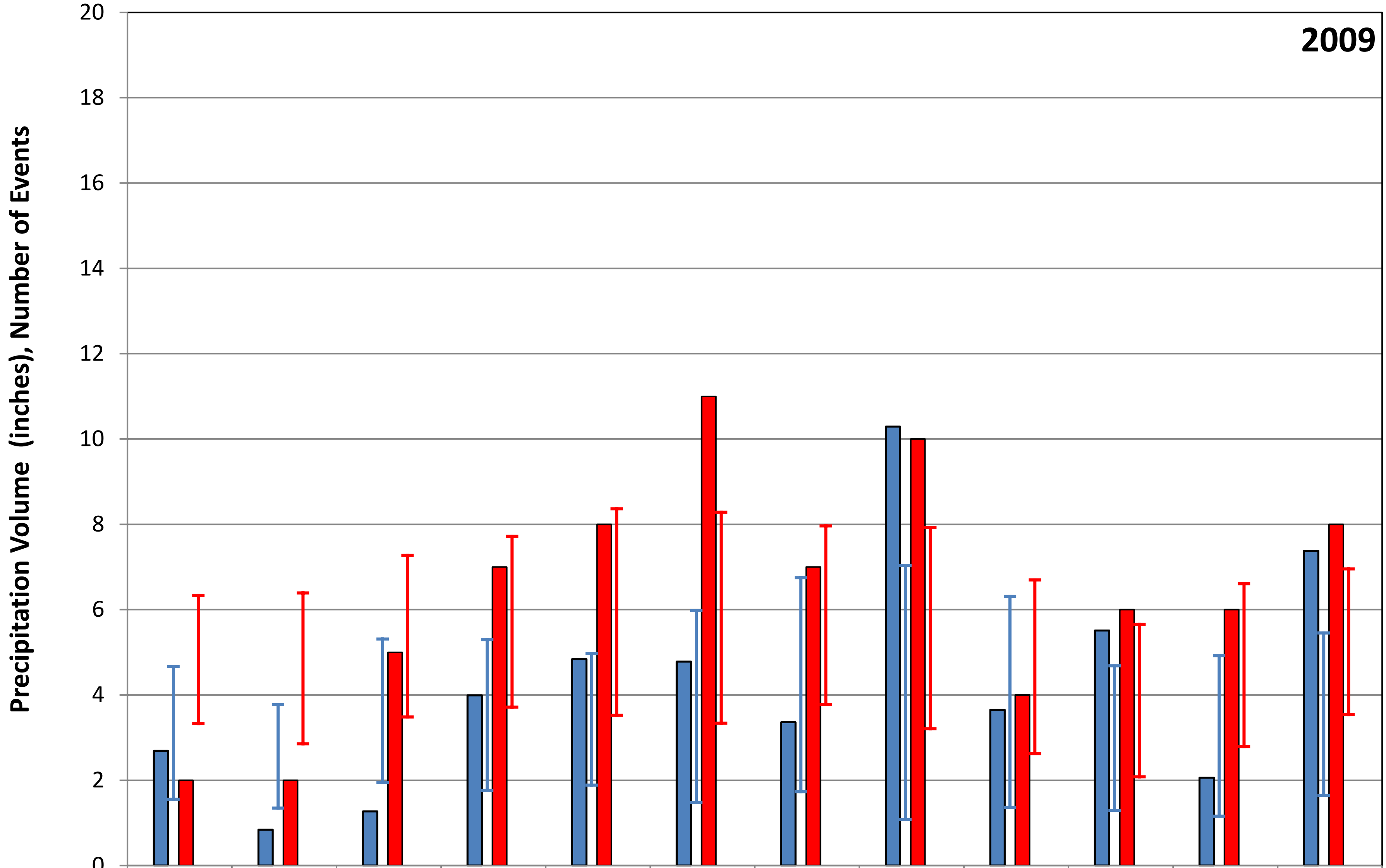
For further information on the long-term historical precipitation analysis approach and results, as well as the analysis conducted for the period of January 2007 through June 2014, please refer to Section 4.1 (Precipitation Data Analysis Results) of this document.



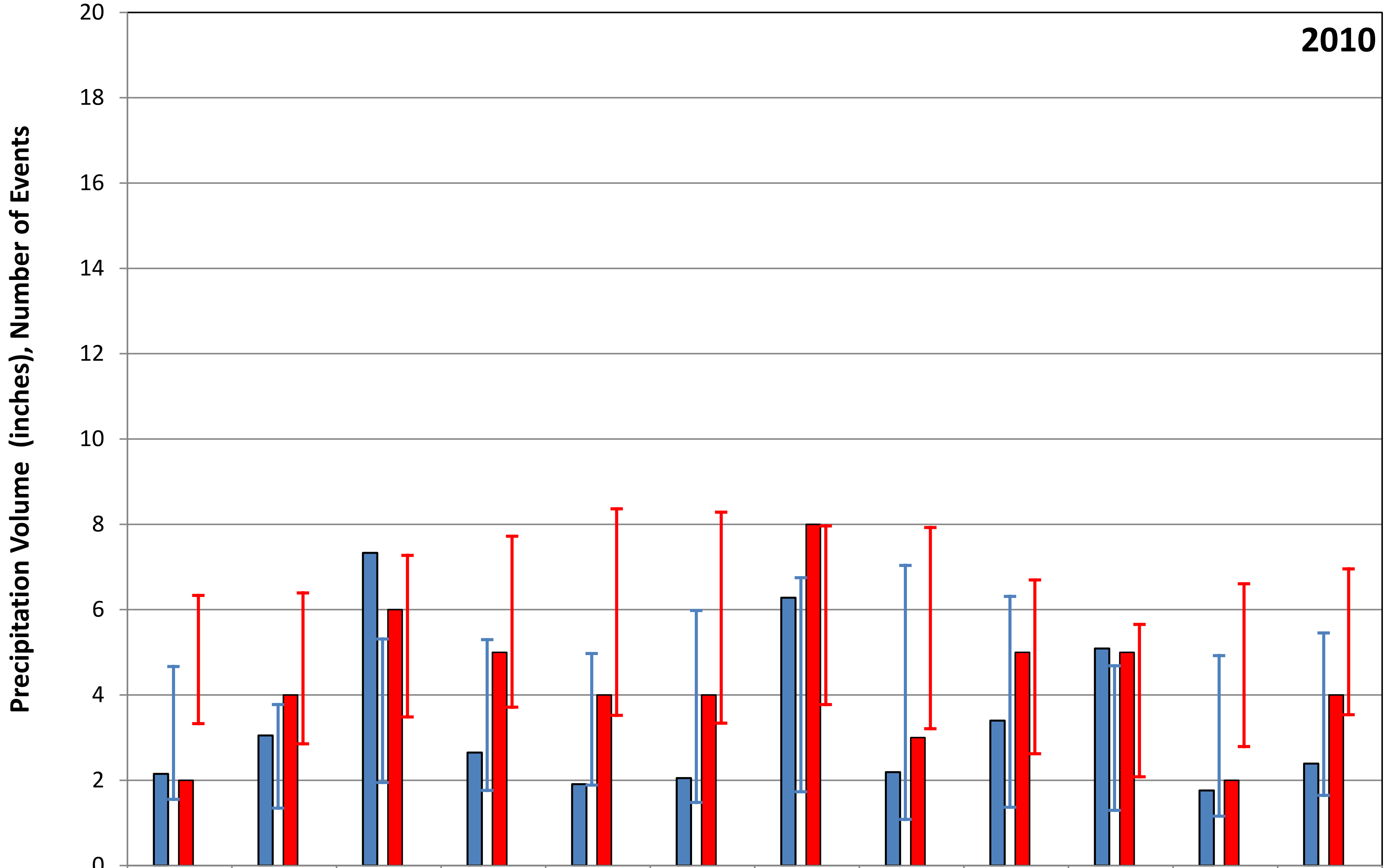
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2007 Volume	3.30	1.51	3.89	9.05	2.68	4.02	3.50	2.94	0.58	4.66	1.45	4.47
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2007 # Events	2	4	4	4	4	5	6	5	3	7	6	10
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



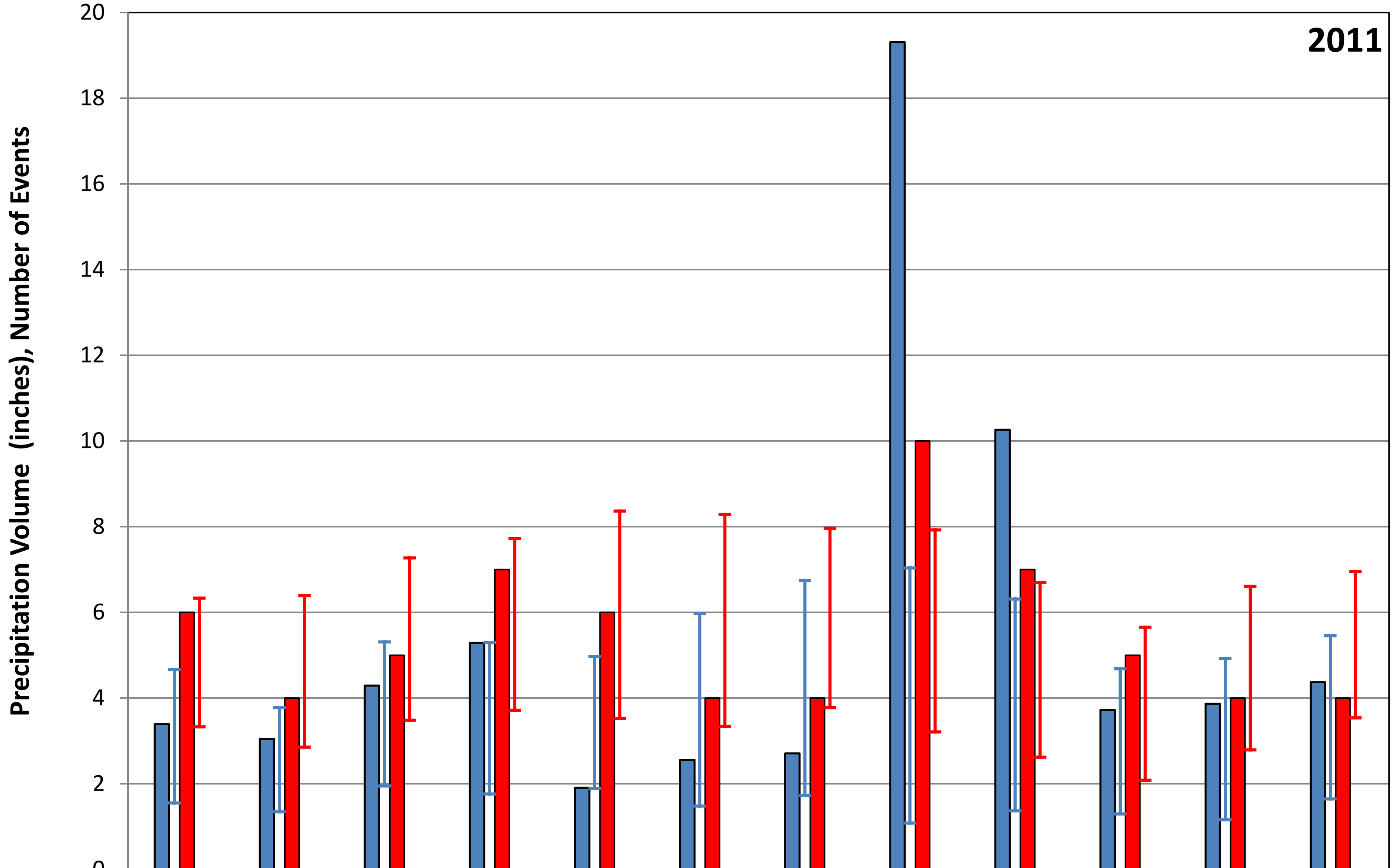
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2008 Volume	1.74	3.93	3.67	2.19	4.55	2.87	3.45	2.44	4.31	1.59	4.00	5.59
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2008 # Events	3	5	4	7	7	5	7	2	6	2	7	4
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



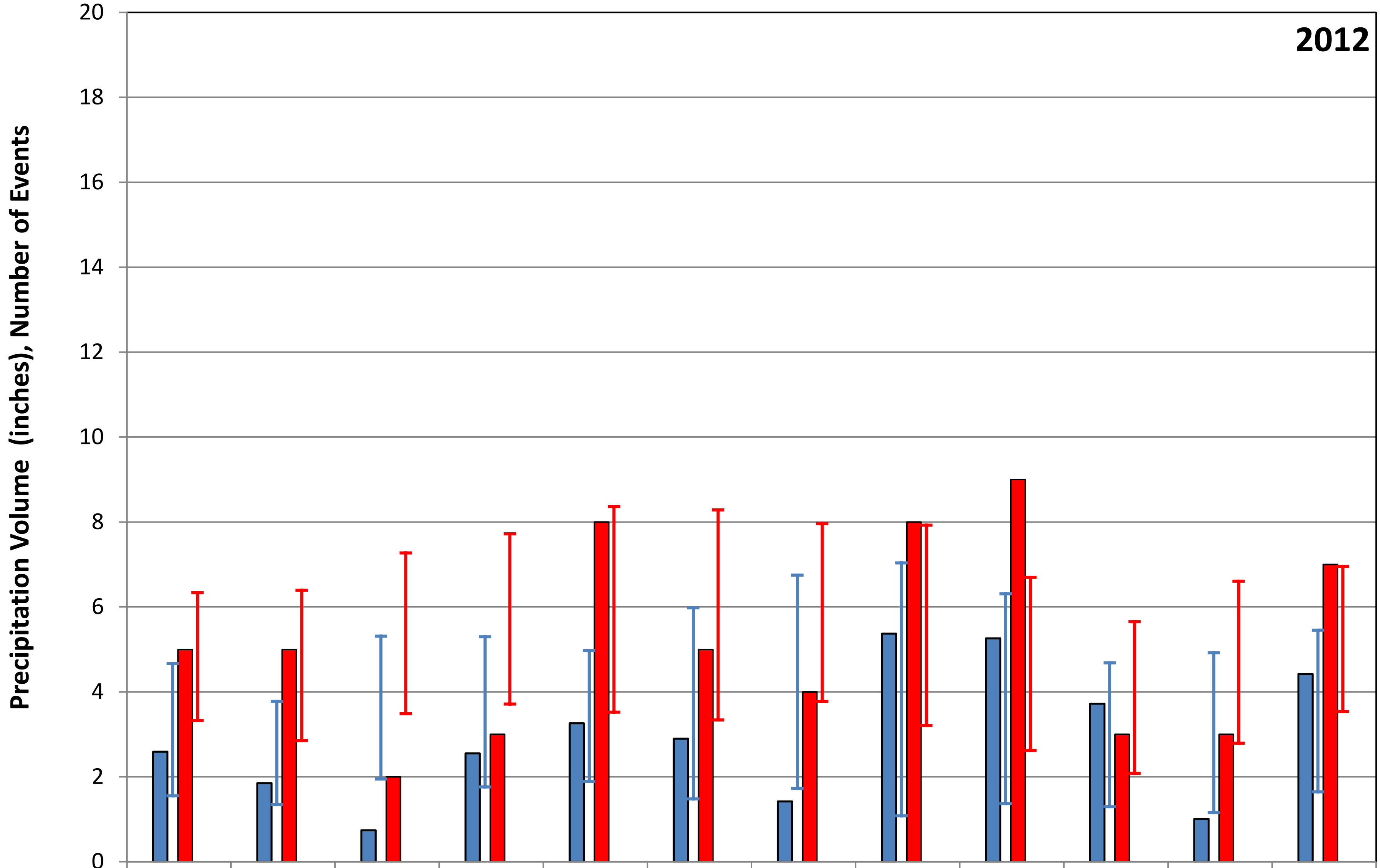
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2009 Volume	2.69	0.84	1.27	3.99	4.84	4.78	3.36	10.29	3.65	5.51	2.06	7.38
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2009 # Events	2	2	5	7	8	11	7	10	4	6	6	8
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



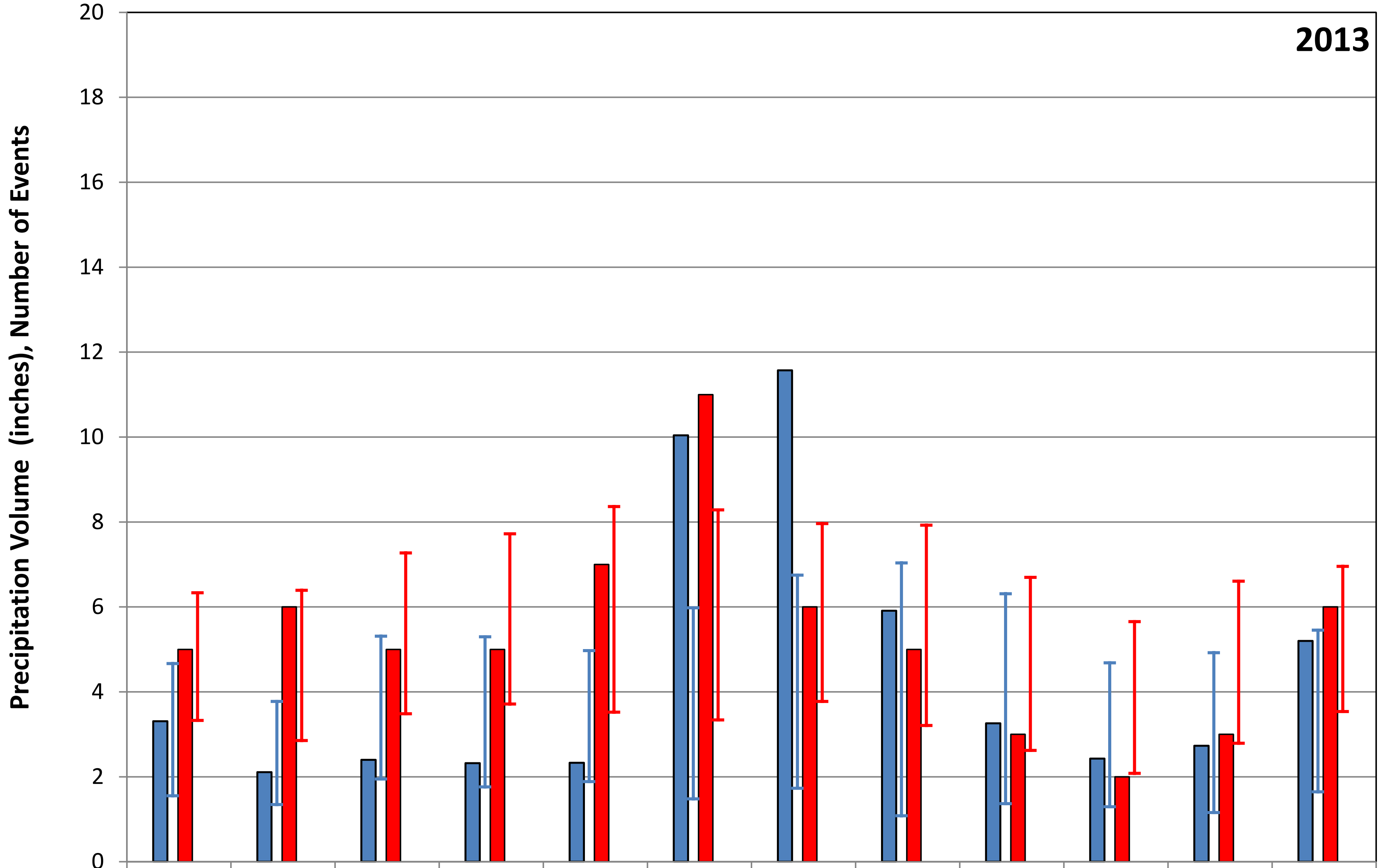
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2010 Volume	2.15	3.05	7.33	2.65	1.91	2.05	6.28	2.19	3.40	5.09	1.76	2.39
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2010 # Events	2	4	6	5	4	4	8	3	5	5	2	4
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



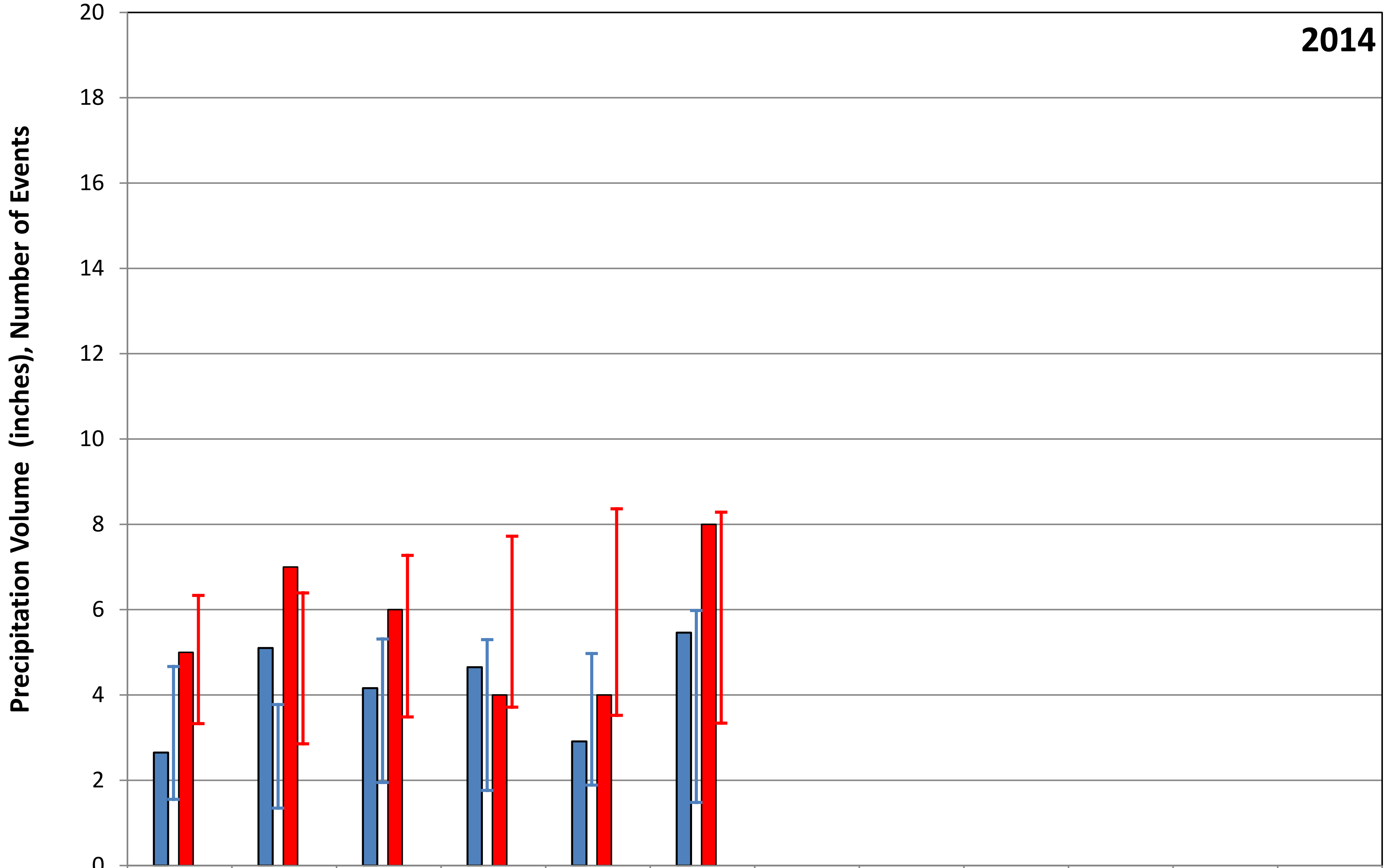
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2011 Volume	3.39	3.05	4.29	5.29	1.91	2.56	2.71	19.31	10.26	3.72	3.87	4.37
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2011 # Events	6	4	5	7	6	4	4	10	7	5	4	4
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2012 Volume	2.59	1.85	0.74	2.55	3.26	2.90	1.42	5.37	5.26	3.72	1.01	4.42
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2012 # Events	5	5	2	3	8	5	4	8	9	3	3	7
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2013 Volume	3.31	2.11	2.40	2.32	2.33	10.04	11.57	5.91	3.26	2.43	2.73	5.20
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73	4.24	4.06	3.84	2.99	3.04	3.55
2013 # Events	5	6	5	5	7	11	6	5	3	2	3	6
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8	5.9	5.6	4.7	3.9	4.7	5.2



	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2014 Volume	2.65	5.10	4.16	4.65	2.91	5.46						
Avg Volume	3.11	2.56	3.63	3.53	3.43	3.73						
2014 # Events	5	7	6	4	4	8						
Avg # Events	4.8	4.6	5.4	5.7	5.9	5.8						

Appendix B

Dry Weather and Wet Weather Flow Summaries

Appendix B
Dry Weather and Wet Weather Flow Summaries

This appendix includes a series of summaries that provide both dry weather and the wet weather flow analysis results for monitoring sites with acceptable data quality. An individual dry weather and wet weather summary was prepared for each monitoring site.

For the dry weather flow summaries, both weekday and weekend dry weather days that were not influenced by precipitation and exhibited typical diurnal patterns were identified and selected. Permanent monitoring sites with multiple years of data will have multiple summaries. Each of the summaries are approximately one year in duration. Portable sites with multiple meter deployments will have an individual summary for each deployment. Within each summary, a total of two different average daily dry weather flow hydrographs were produced for each to represent weekdays and weekends respectively. In addition to the hydrographs, the dry weather flow summaries include the following information.

- Average daily dry weather flow in million gallons per day (mgd) and gallons per capita per day (gpcd)
- Average daily maximum dry weather flow in mgd and gpcd
- Average daily minimum dry weather flow in mgd and gpcd
- Groundwater infiltration (GWI) ratio (calculated by dividing the average daily minimum dry weather flow by the average daily dry weather flow)
- Number of days analyzed in generating the average dry weather flow hydrographs and corresponding dry weather flow statistics.

For the wet weather summaries, the monitored peak flow rates from the five largest successfully monitored events were identified and listed accordingly. Unlike the dry weather summaries, there only is one summary for each monitoring site irrespective of monitoring duration or number of deployments. For portable monitors, it should be noted that some of the wet weather data was determined to be unsuitable for the analysis; therefore the corresponding monitoring dates will not be listed at the top of the wet weather summary and may differ from the monitoring dates in the respective dry weather summaries. Along with the top flow rates, the wet weather summaries include the following.

- Date of the event in which the peak flow rate occurred
- Total volume of precipitation that occurred during the event
- Monitored peak 15 minute precipitation intensity;
- Monitored peak 15 minute level;
- Monitored peak hourly precipitation intensity;
- Monitored peak hourly flow rate;

- Monitored peak hourly level; and
- Event's peaking factor, calculated as the monitored peak hourly flow rate divided by the average daily dry weather flow.

The individual site summaries are organized and grouped by the outlying community which conveys the flow to the Water Department's system. A listing of the analyzed sewershed monitoring sites for each outlying community is provided.

Appendix B
List of Dry and Wet Weather Flow Summaries

Abington Township

- MA_1
- MA_2
- MA_3
- MA_4

Bensalem Township

- MBE_1
- MBE_2
- MBE_3
- MBE_4
- MBE_5
- MBE_6
- MBE_7
- MBE_8
- MBE_9
- MBE_10
- MBE_11
- MBE_12
- MBE_13
- MBE_14
- MBE_15
- MBE_16
- MBE_17

Bucks County Water and Sewer Authority

- MB_1

Cheltenham Township

- MC_1
- MC_2
- MC_3

Delaware County Regional Water Quality Control Authority (DELCORA)

- MD_1

Lower Merion Township

- ML_1
- ML_2
- ML_3
- ML_4
- ML_5
- ML_6
- ML_7

Lower Moreland Township

- MLM_1
- MLM_2
- MLM_3
- MLM_4
- MLM_5
- MLM_6
- MLM_7

Lower Southampton Township

- MSH_1
- MSH_2

Springfield Township

- MS_1
- MS_2
- MS_3
- MS_4
- MS_5
- MS_6
- MS_7
- MS_8

Upper Darby Township

- MUD_1

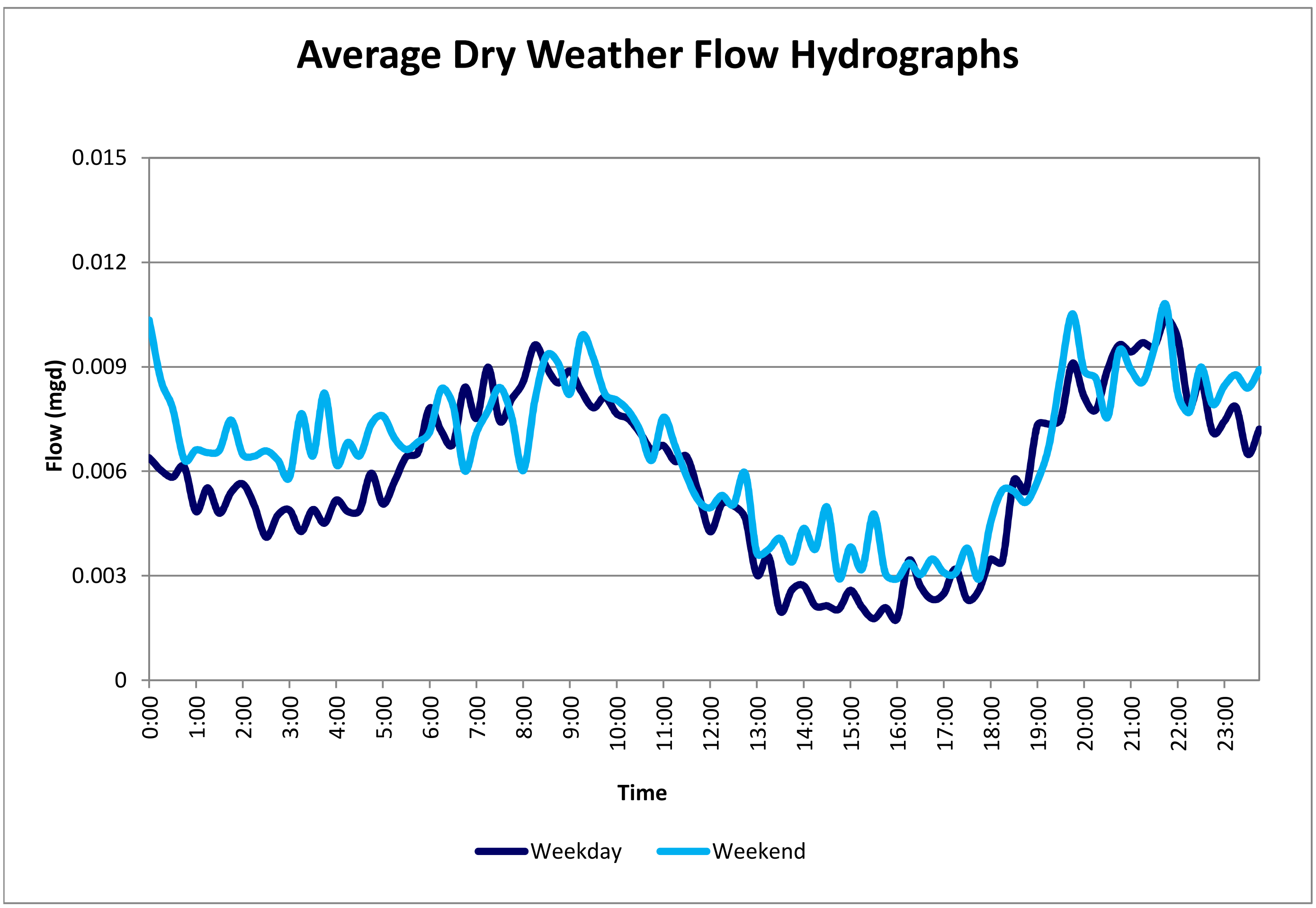
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_1

General Information

Site:	MA_1
Description of Location:	Pine Road
Data Range:	8/28/2007 to 11/16/2007
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	32
Service Population:	169

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.006	35	0.010	61	0.002	10	0.30	25
Weekend	0.007	39	0.011	64	0.003	17	0.44	11
Total	**0.006**	**36**	**0.011**	**62**	**0.002**	**13**	**0.34**	**36**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

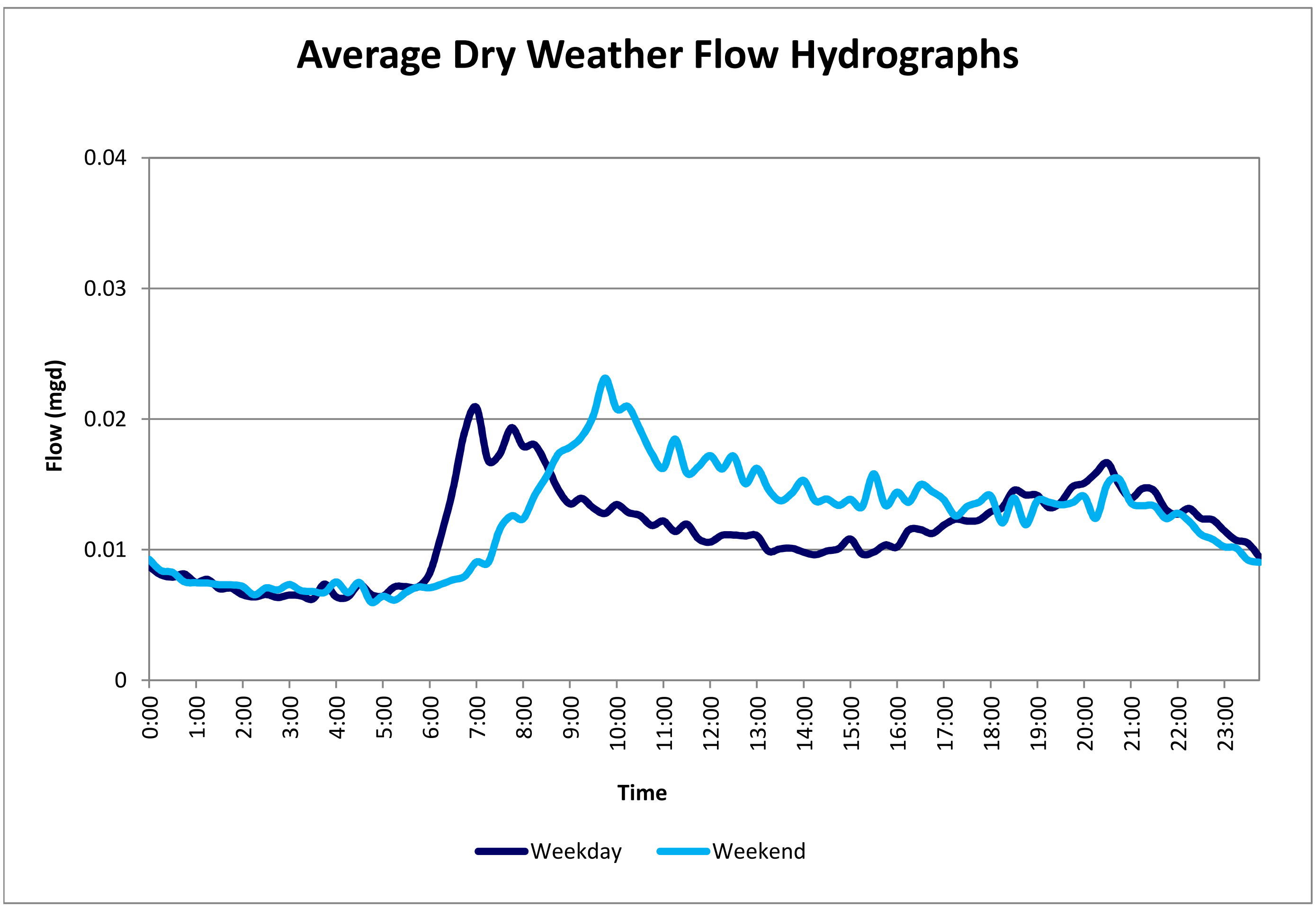
MA_1

General Information

Site:	MA_1
Description of Location:	Pine Road
Data Range:	2/6/2010 to 5/7/2010
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	32
Service Population:	169

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.011	67	0.021	124	0.006	37	0.55	46
Weekend	0.012	73	0.023	137	0.006	35	0.49	20
Total	**0.012**	**69**	**0.022**	**128**	**0.006**	**36**	**0.53**	**66**



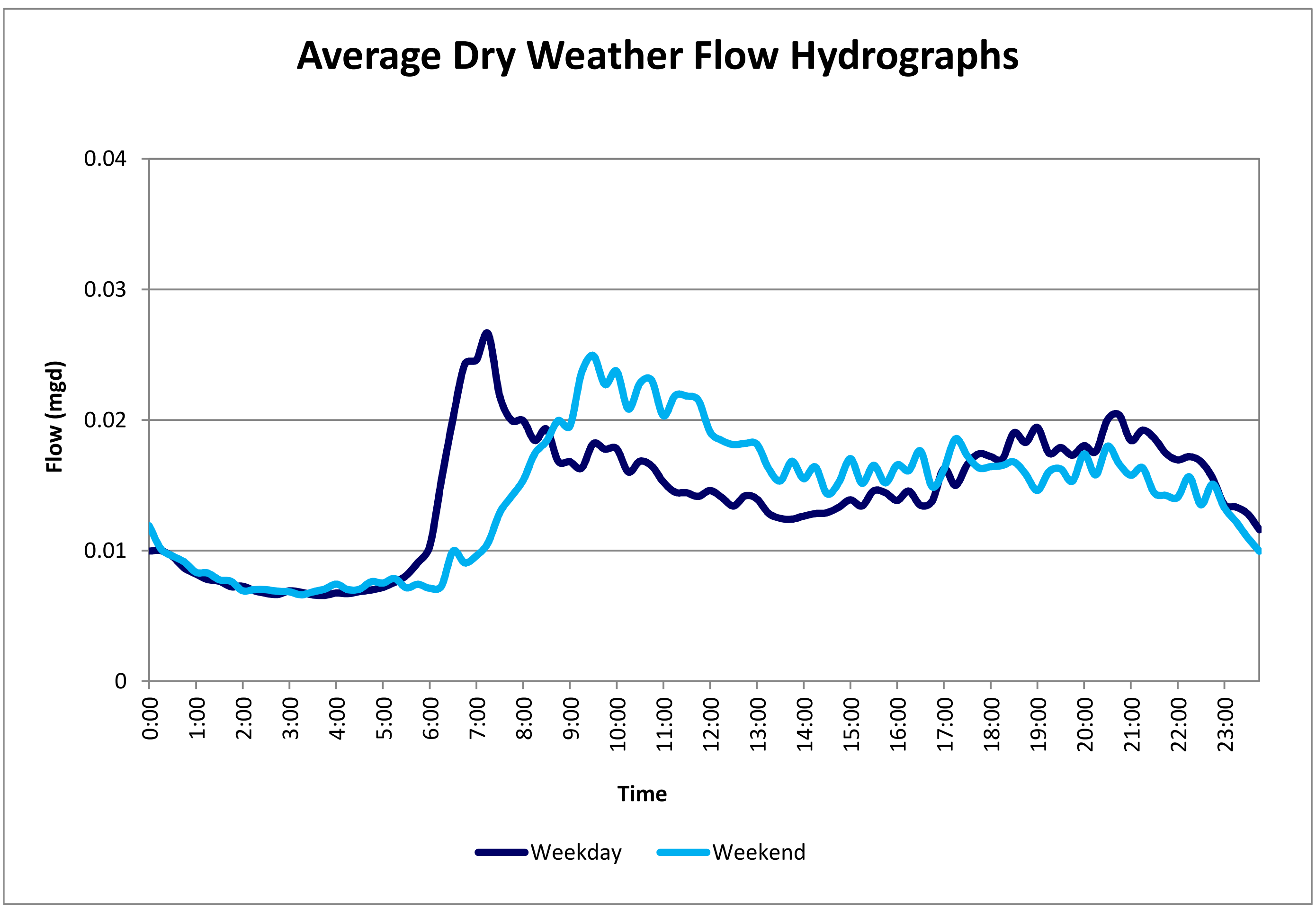
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_1

General Information

Site:	MA_1
Description of Location:	Pine Road
Data Range:	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	32
Service Population:	169

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.014	84	0.027	157	0.007	39	0.46	55
Weekend	0.014	84	0.025	148	0.007	39	0.47	17
Total	**0.014**	**84**	**0.026**	**155**	**0.007**	**39**	**0.46**	**72**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MA_1

General Information

Site:	MA_1
Description of Location:	Pine Road
Data Range:	2/6/2010 to 5/7/2010
	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	32
Service Population:	169

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/14/2010	0.30	0.08	0.054	1.76	0.19	0.047	1.68	3.99
4/19/2013	0.51	0.06	0.051	1.96	0.17	0.022	1.33	1.55
3/13/2010	3.13	0.16	0.051	1.81	0.56	0.043	1.62	3.71
3/15/2010	0.26	0.05	0.050	1.75	0.13	0.044	1.61	3.79
5/9/2013	0.89	0.09	0.040	1.69	0.27	0.031	1.53	2.16
Five-Storm Average	**1.02**	**0.09**	**0.049**	**1.79**	**0.26**	**0.037**	**1.55**	**3.04**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

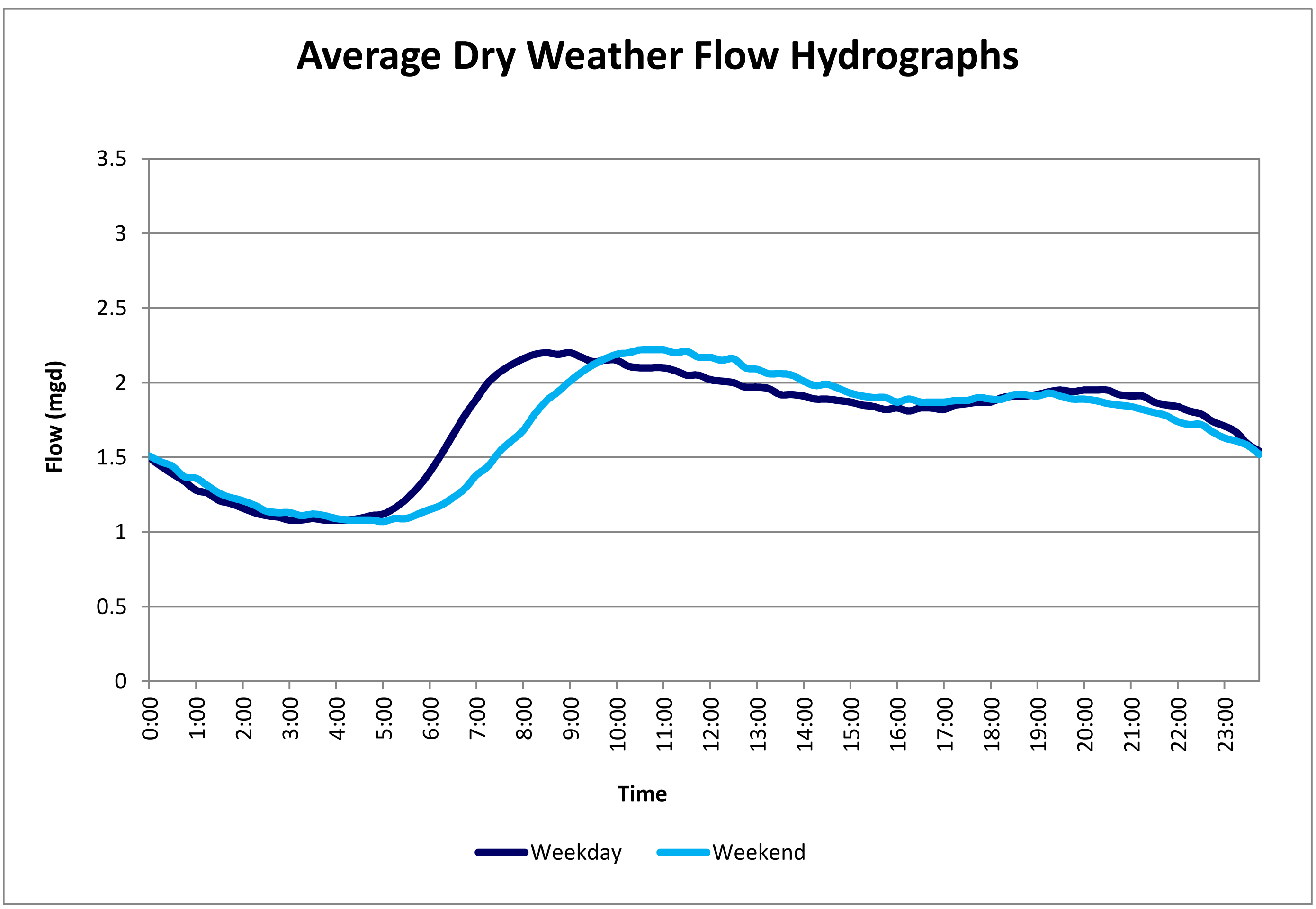
MA_2

General Information

Site:	MA_2
Description of Location:	Pine Road and Pennypack Creek
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	20"
Contract Community:	Abington
Drainage Area (Acres):	3,161
Service Population:	10,222

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.74	170	2.20	215	1.08	106	0.62	218
Weekend	1.70	167	2.22	217	1.07	105	0.63	96
Total	**1.73**	**169**	**2.21**	**216**	**1.08**	**105**	**0.62**	**314**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

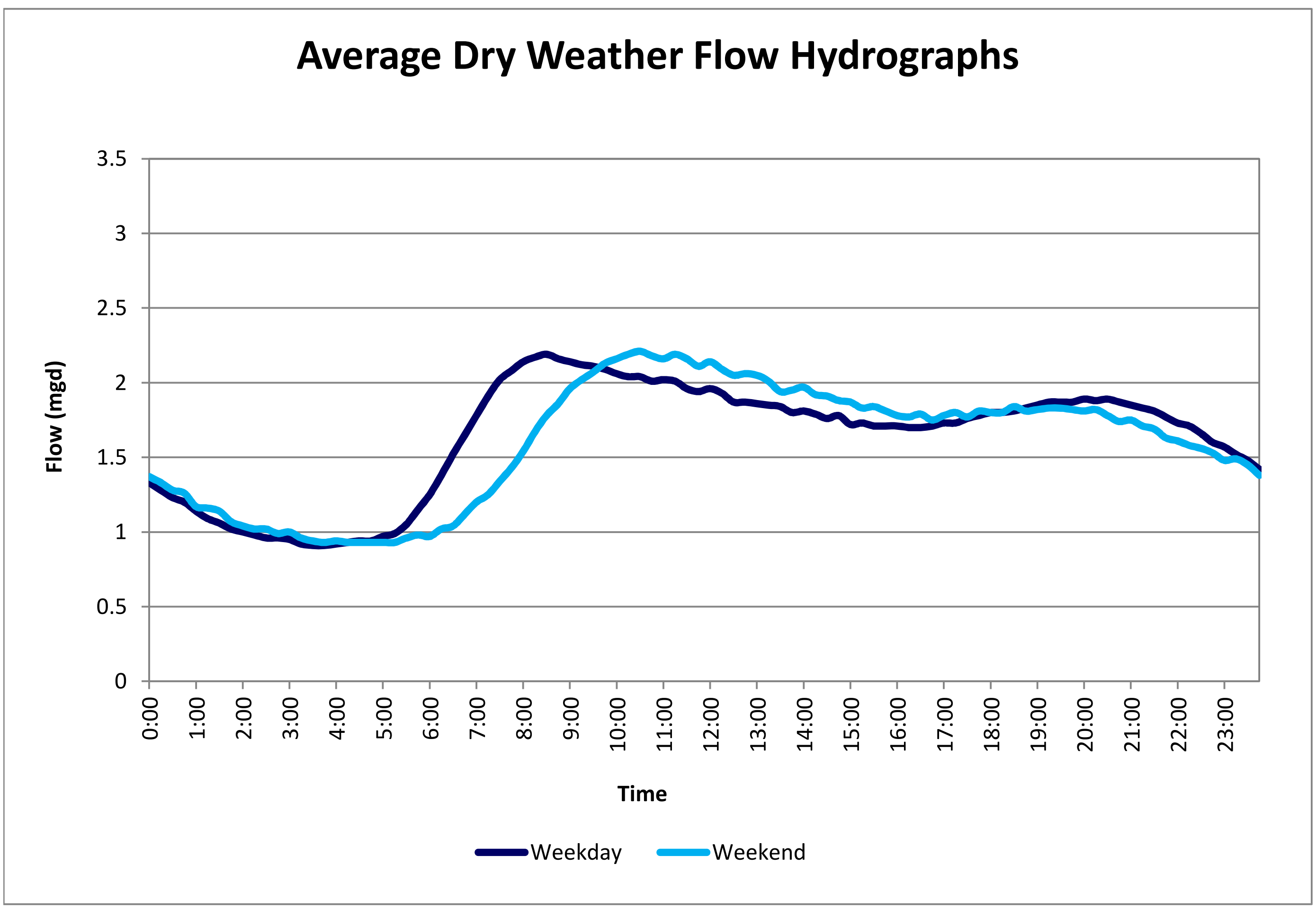
MA_2

General Information

Site:	MA_2
Description of Location:	Pine Road and Pennypack Creek
Data Range:	4/1/2013 to 6/30/14
Pipe Diameter:	20"
Contract Community:	Abington
Drainage Area (Acres):	3,161
Service Population:	10,222

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.63	160	2.19	214	0.910	89	0.56	107
Weekend	1.59	156	2.21	216	0.930	91	0.58	41
Total	**1.62**	**159**	**2.20**	**215**	**0.916**	**90**	**0.56**	**148**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MA_2

General Information

Site:	MA_2
Description of Location:	Pine Road and Pennypack Creek
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	20"
Contract Community:	Abington
Drainage Area (Acres):	3,161
Service Population:	10,222

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.15	0.34	6.25	17.2	0.90	5.97	17.0	3.69
5/9/2014	1.28	0.31	5.33	16.9	0.87	4.95	16.5	3.06
6/7/2013	3.65	0.19	3.79	14.1	0.64	3.54	13.7	2.19
6/27/2013	1.37	0.34	3.78	14.6	0.75	3.52	14.1	2.17
5/10/2014	0.91	0.22	3.77	14.1	0.36	3.35	13.7	2.07
Five-Storm Average	**2.47**	**0.28**	**4.58**	**15.4**	**0.70**	**4.27**	**15.0**	**2.63**

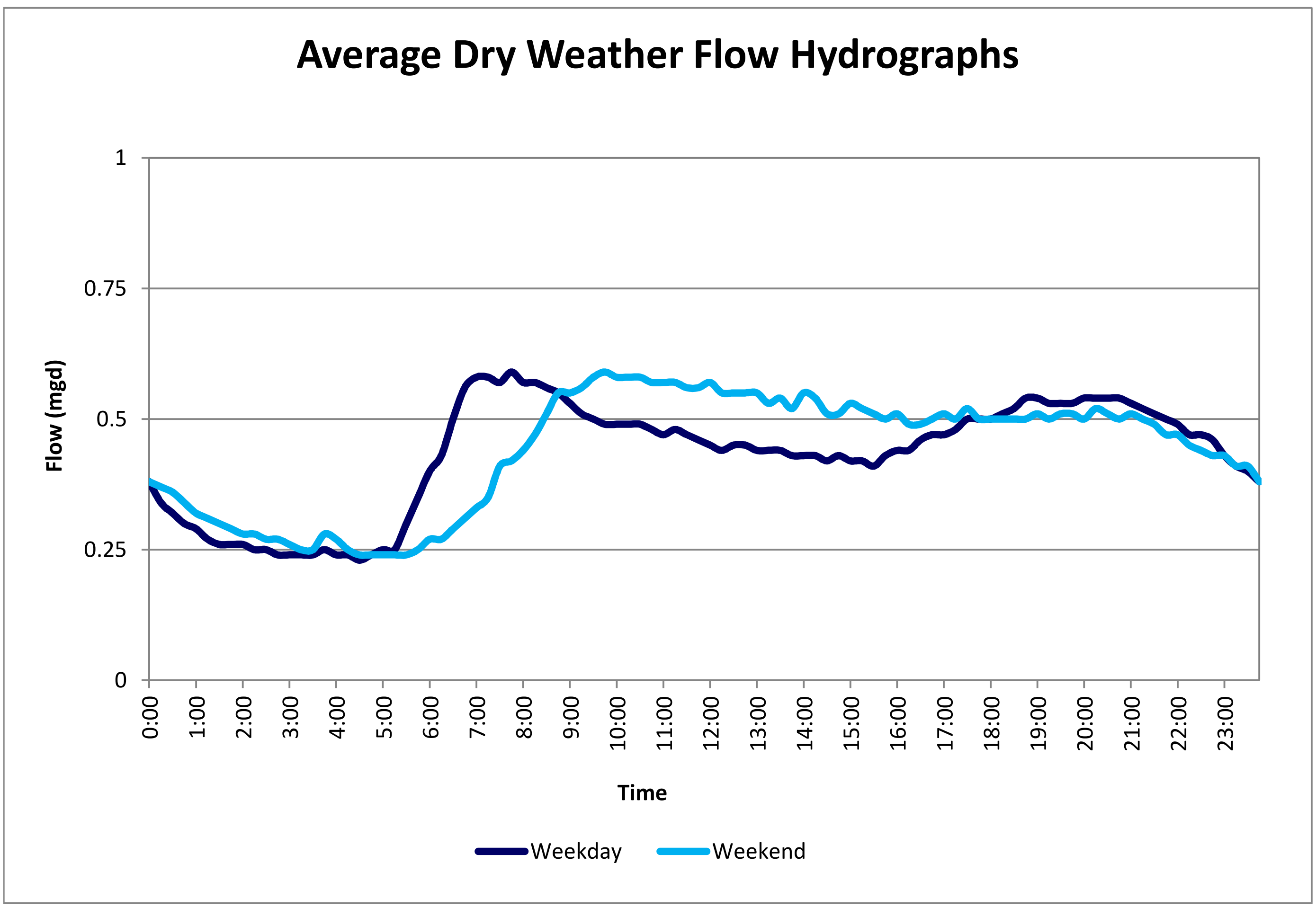
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_3

General Information

Site:	MA_3
Description of Location:	Shady Lane
Data Range:	8/29/2007 to 11/17/2007
Pipe Diameter:	12"
Contract Community:	Abington
Drainage Area (Acres):	353
Service Population:	3,456

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.432	125	0.590	171	0.230	67	0.53	52
Weekend	0.440	127	0.590	171	0.240	69	0.55	21
Total	**0.434**	**126**	**0.590**	**171**	**0.233**	**67**	**0.54**	**73**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

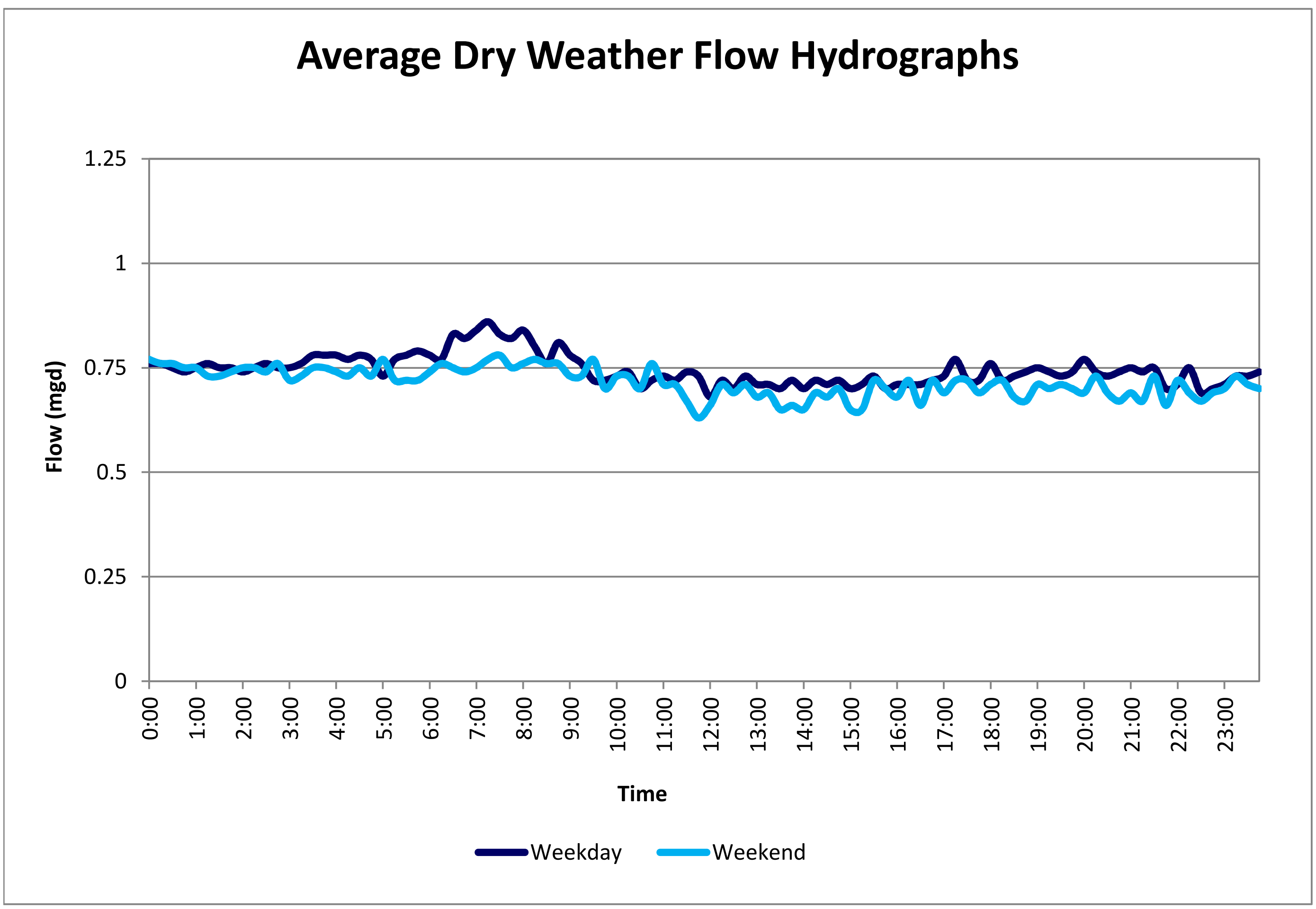
MA_3

General Information

Site:	MA_3
Description of Location:	Shady Lane
Data Range:	2/6/2010 to 5/7/2010
Pipe Diameter:	12"
Contract Community:	Abington
Drainage Area (Acres):	353
Service Population:	3,456

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.745	216	0.860	249	0.680	197	0.91	61
Weekend	0.716	207	0.780	226	0.630	182	0.88	24
Total	**0.737**	**213**	**0.837**	**242**	**0.666**	**193**	**0.90**	**85**



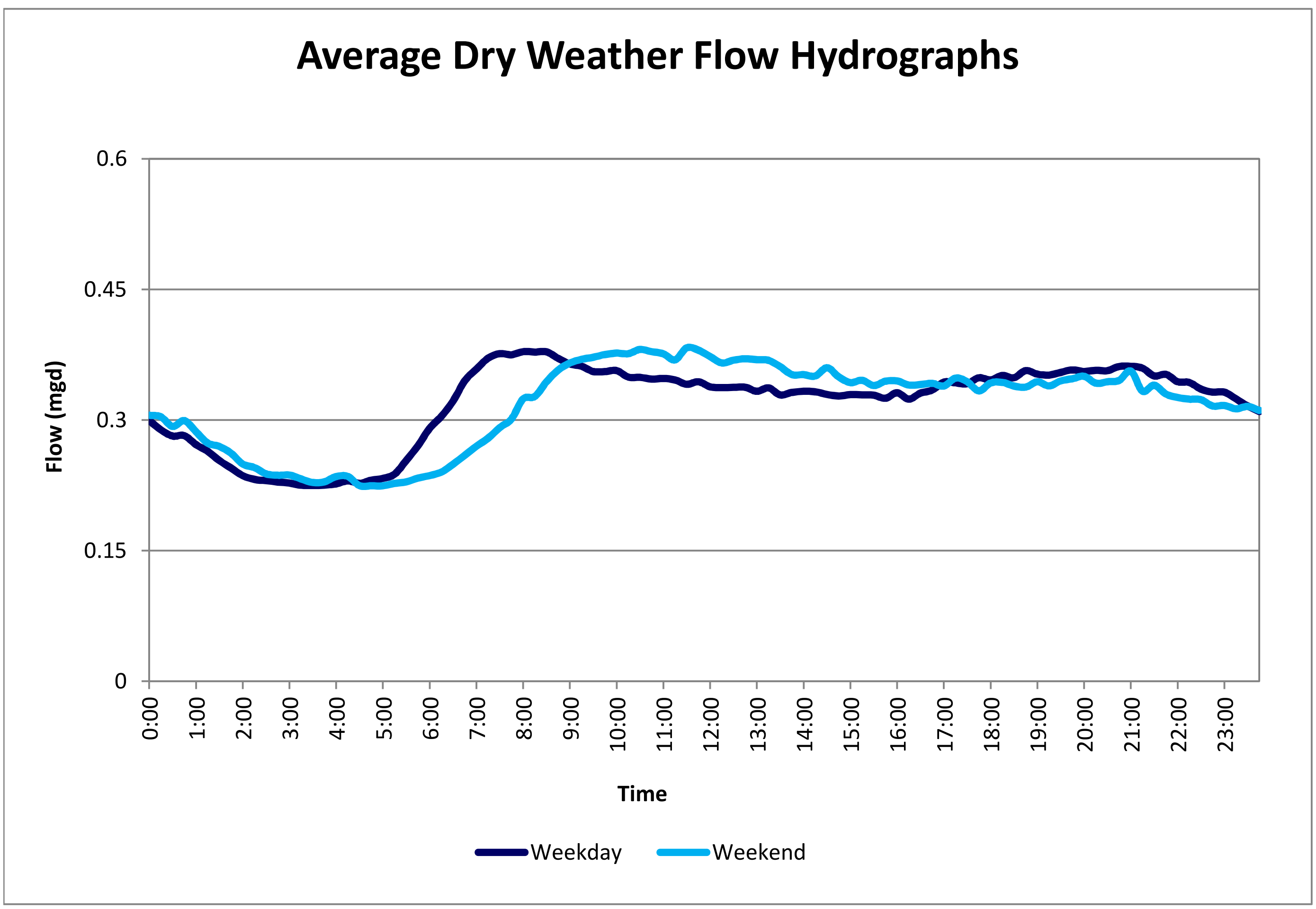
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_3

General Information

Site:	MA_3
Description of Location:	Shady Lane
Data Range:	2/13/2013 to 3/6/2014
Pipe Diameter:	12"
Contract Community:	Abington
Drainage Area (Acres):	353
Service Population:	3,456

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.320	93	0.378	110	0.225	65	0.70	131
Weekend	0.317	92	0.383	111	0.224	65	0.71	59
Total	**0.319**	**92**	**0.380**	**110**	**0.225**	**65**	**0.70**	**190**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MA_3

General Information

Site:	MA_3
Description of Location:	Shady Lane
Data Range:	8/29/2007 to 11/17/2007
	2/13/2013 to 3/7/2014
Pipe Diameter:	12"
Contract Community:	Abington
Drainage Area (Acres):	353
Service Population:	3,456

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/7/2013	3.94	0.23	1.35	10.5	0.68	1.19	10.4	3.72
6/10/2013	1.93	0.29	1.33	10.3	0.60	1.25	10.0	3.92
8/13/2013	2.26	0.76	1.25	8.65	1.55	1.09	7.32	3.41
7/1/2013	0.51	0.30	0.957	9.19	0.37	0.857	8.96	2.69
7/9/2013	0.21	0.17	0.945	7.28	0.19	0.728	7.12	2.28
Five-Storm Average	**1.77**	**0.35**	**1.17**	**9.16**	**0.68**	**1.02**	**8.76**	**3.20**

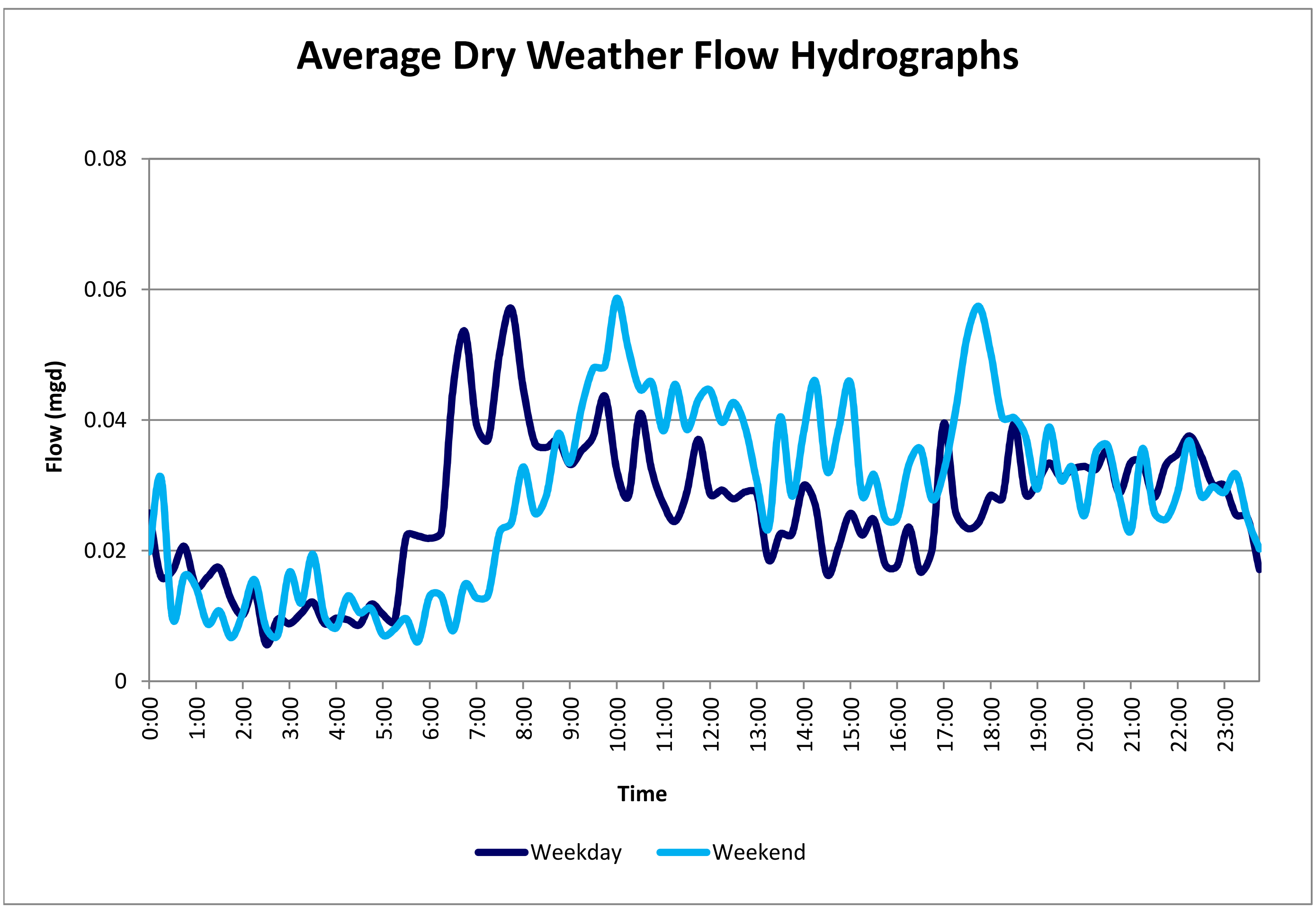
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_4

General Information

Site:	MA_4
Description of Location:	Pine Road
Data Range:	8/31/2007 to 11/17/2007
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	120
Service Population:	432

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.026	61	0.057	132	0.006	13	0.21	49
Weekend	0.028	66	0.059	136	0.006	14	0.21	20
Total	**0.027**	**62**	**0.058**	**133**	**0.006**	**13**	**0.21**	**69**



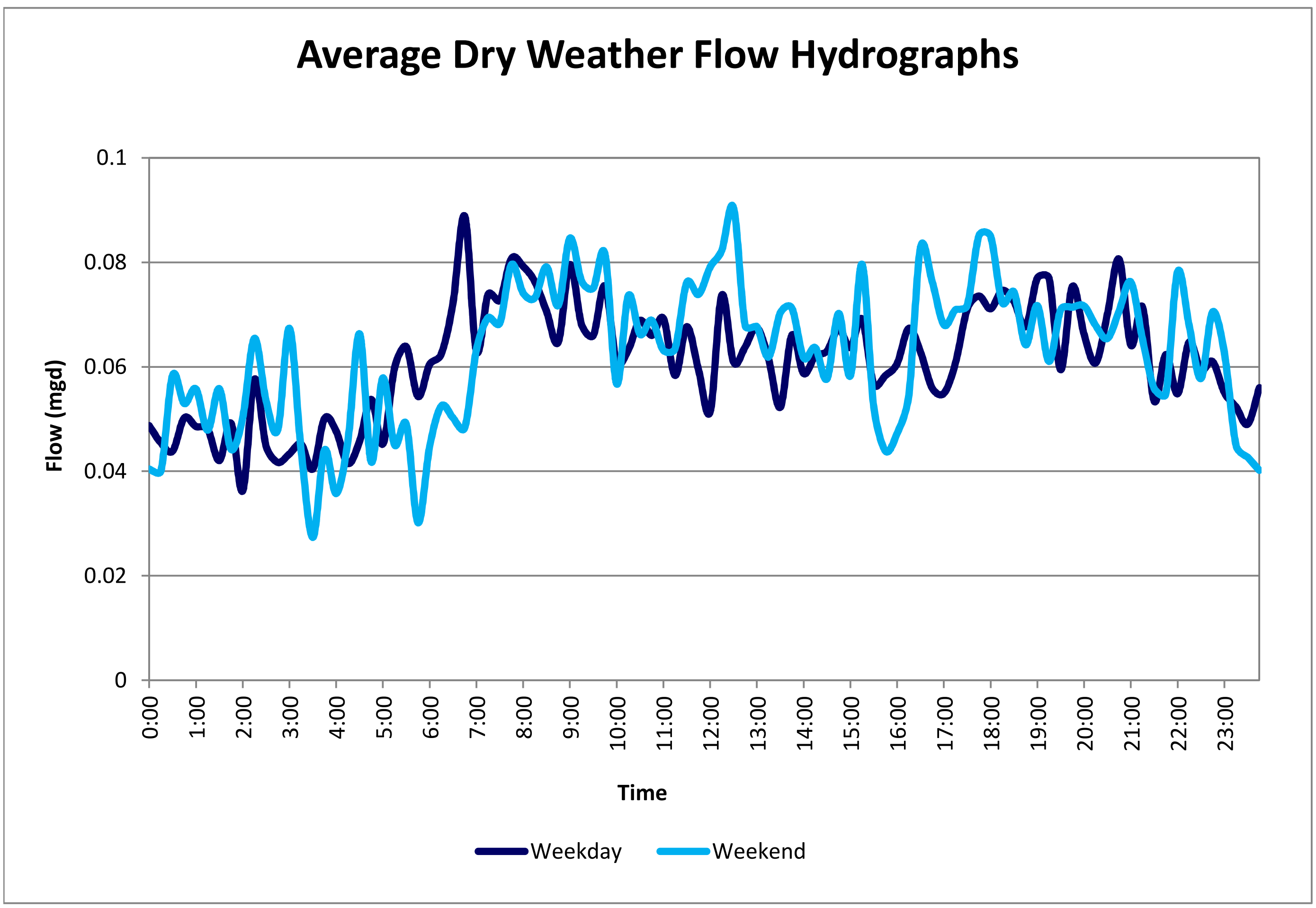
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MA_4

General Information

Site:	MA_4
Description of Location:	Pine Road
Data Range:	2/6/2010 to 5/7/2010
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	120
Service Population:	432

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.061	142	0.089	206	0.036	84	0.59	55
Weekend	0.062	145	0.090	209	0.027	63	0.44	22
Total	**0.062**	**143**	**0.089**	**207**	**0.034**	**78**	**0.55**	**77**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

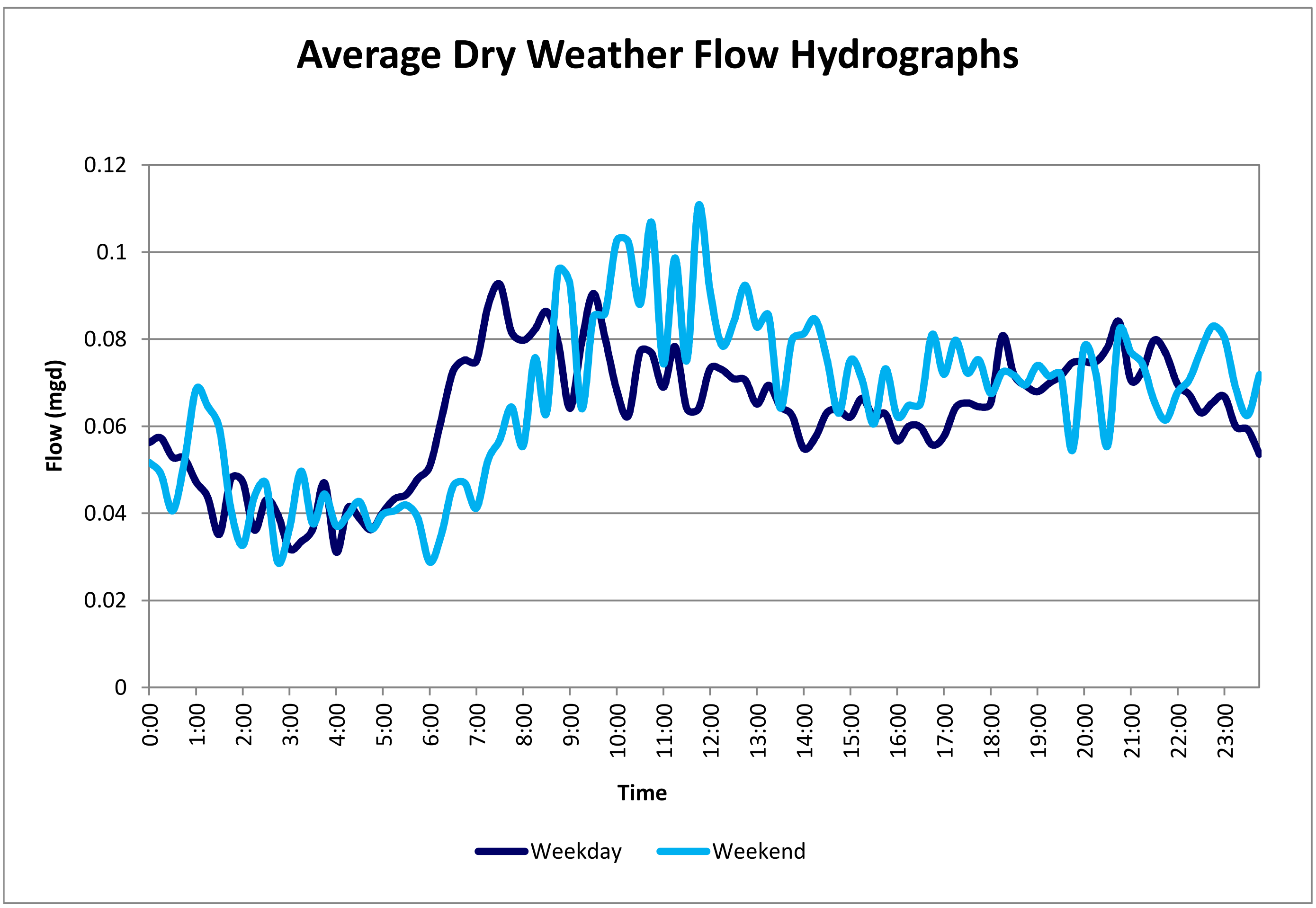
MA_4

General Information

Site:	MA_4
Description of Location:	Pine Road
Data Range:	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	120
Service Population:	432

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.063	146	0.093	214	0.031	72	0.49	56
Weekend	0.066	153	0.111	256	0.029	67	0.44	24
Total	**0.064**	**148**	**0.098**	**227**	**0.030**	**70**	**0.48**	**80**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MA_4

General Information

Site:	MA_4
Description of Location:	Pine Road
Data Range:	8/31/2007 to 11/17/2007
	2/6/2010 to 5/7/2010
	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Abington
Drainage Area (Acres):	120
Service Population:	432

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	

It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

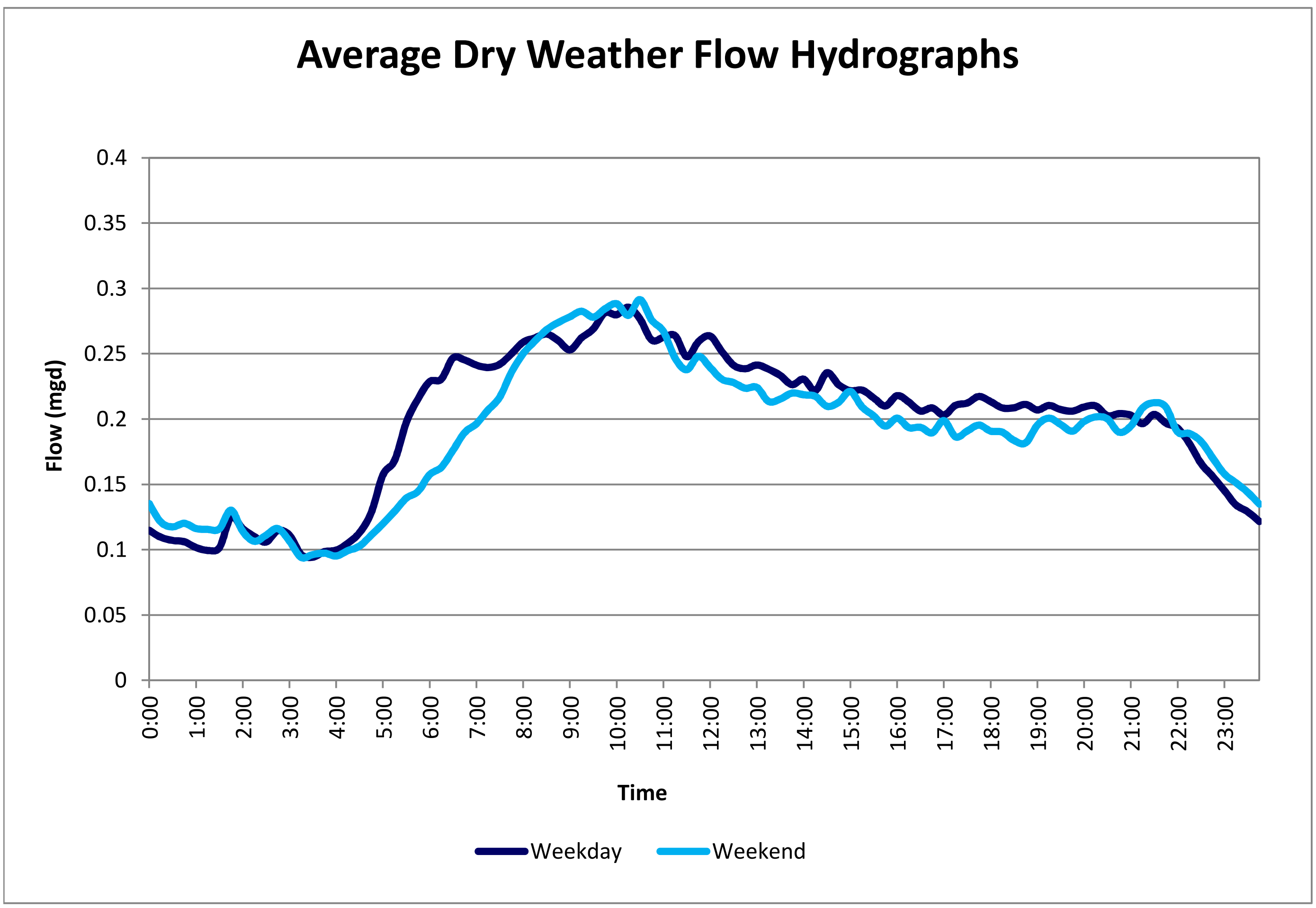
MBE_1

General Information

Site:	MBE_1
Description of Location:	End of Iterplex Drive, Kay & Poquessing Creek
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	241
Service Population:	879

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.198	225	0.286	325	0.0943	107	0.48	126
Weekend	0.189	214	0.291	332	0.0941	107	0.50	54
Total	**0.195**	**222**	**0.287**	**327**	**0.0942**	**107**	**0.48**	**180**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

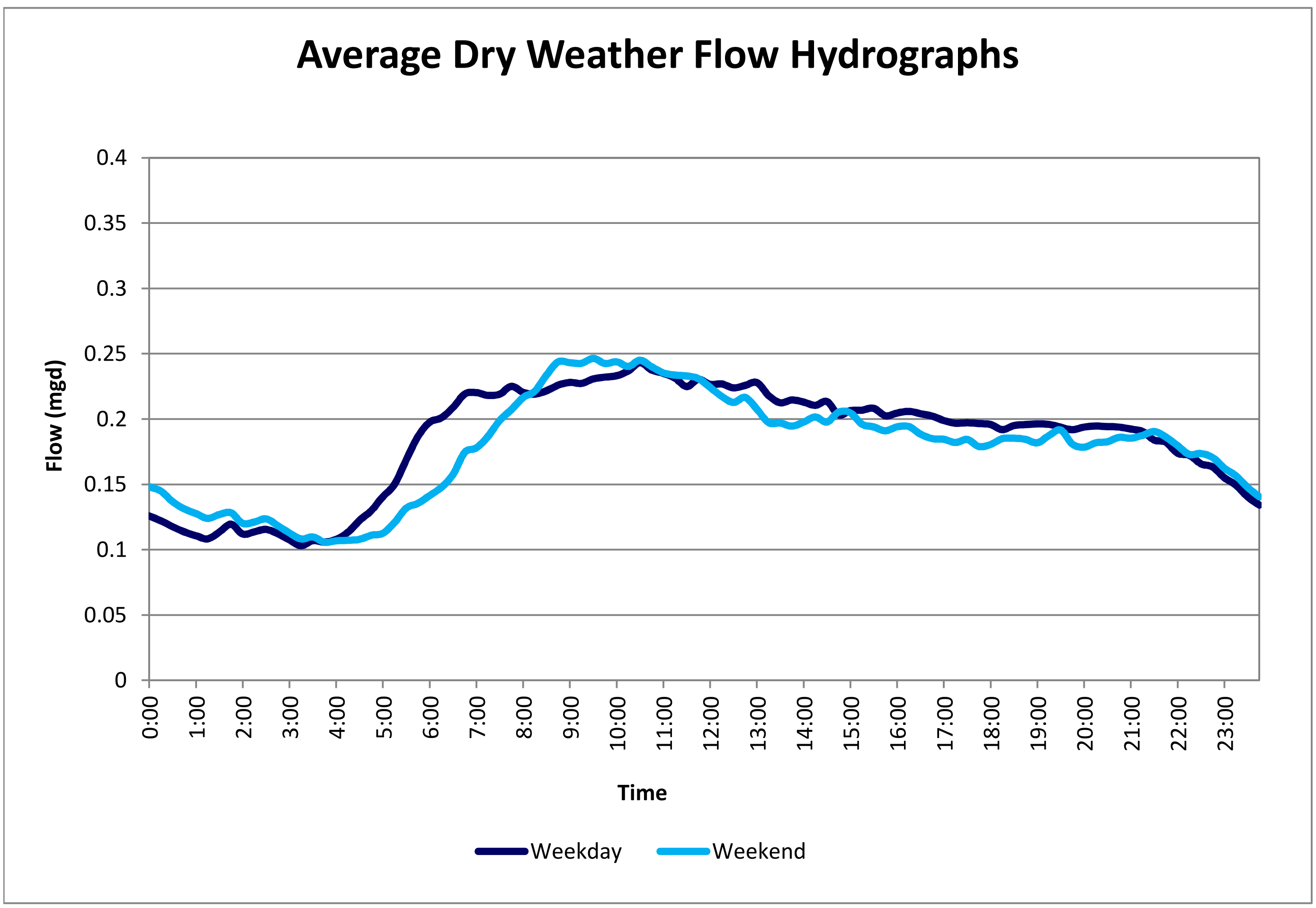
MBE_1

General Information

Site:	MBE_1
Description of Location:	End of Iterplex Drive, Kay & Poquessing Creek
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	241
Service Population:	879

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.184	210	0.243	277	0.103	117	0.56	128
Weekend	0.178	203	0.246	280	0.106	120	0.59	58
Total	**0.182**	**208**	**0.244**	**278**	**0.104**	**118**	**0.57**	**186**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_1

General Information

Site:	MBE_1
Description of Location:	End of Iterplex Drive, Kay & Poquessing Creek
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	241
Service Population:	879

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.22	0.17	1.32	27.7	0.62	1.32	23.2	7.25
9/4/2012	2.02	0.29	0.985	6.05	0.55	0.880	5.95	4.51
7/15/2012	1.17	0.50	0.861	5.78	0.97	0.590	4.91	3.03
5/16/2012	1.33	0.27	0.856	5.63	0.76	0.610	5.05	3.13
8/13/2013	2.30	0.77	0.751	6.96	1.51	0.660	6.51	3.63
Five-Storm Average	**2.41**	**0.40**	**0.955**	**10.4**	**0.88**	**0.812**	**9.12**	**4.31**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

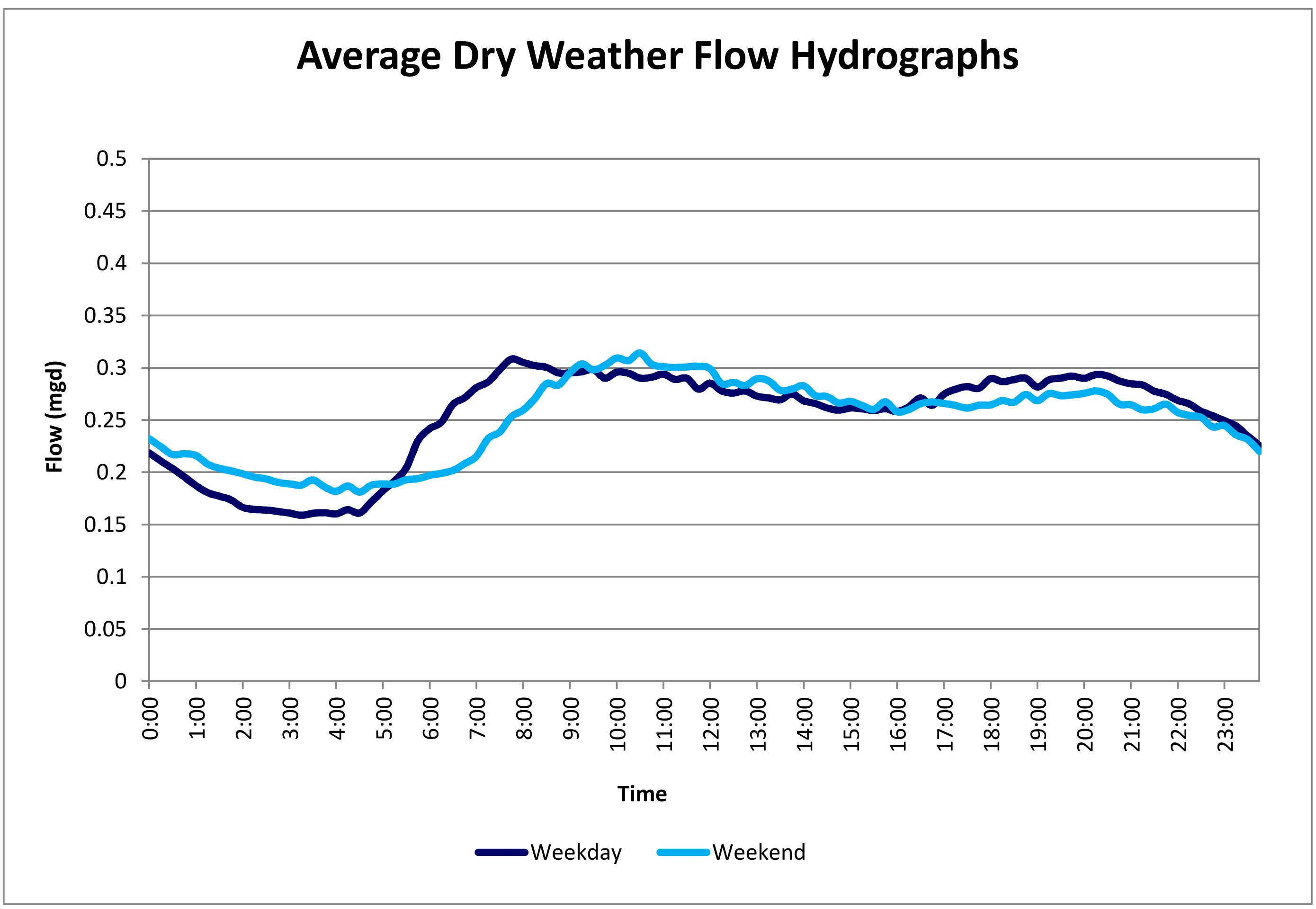
MBE_2

General Information

Site:	MBE_2
Description of Location:	Dunks Ferry Road and Mechanicsville Road
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	212
Service Population:	1,894

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.253	134	0.308	163	0.159	84	0.63	72
Weekend	0.250	132	0.314	166	0.181	96	0.72	51
Total	**0.252**	**133**	**0.311**	**164**	**0.168**	**89**	**0.67**	**123**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

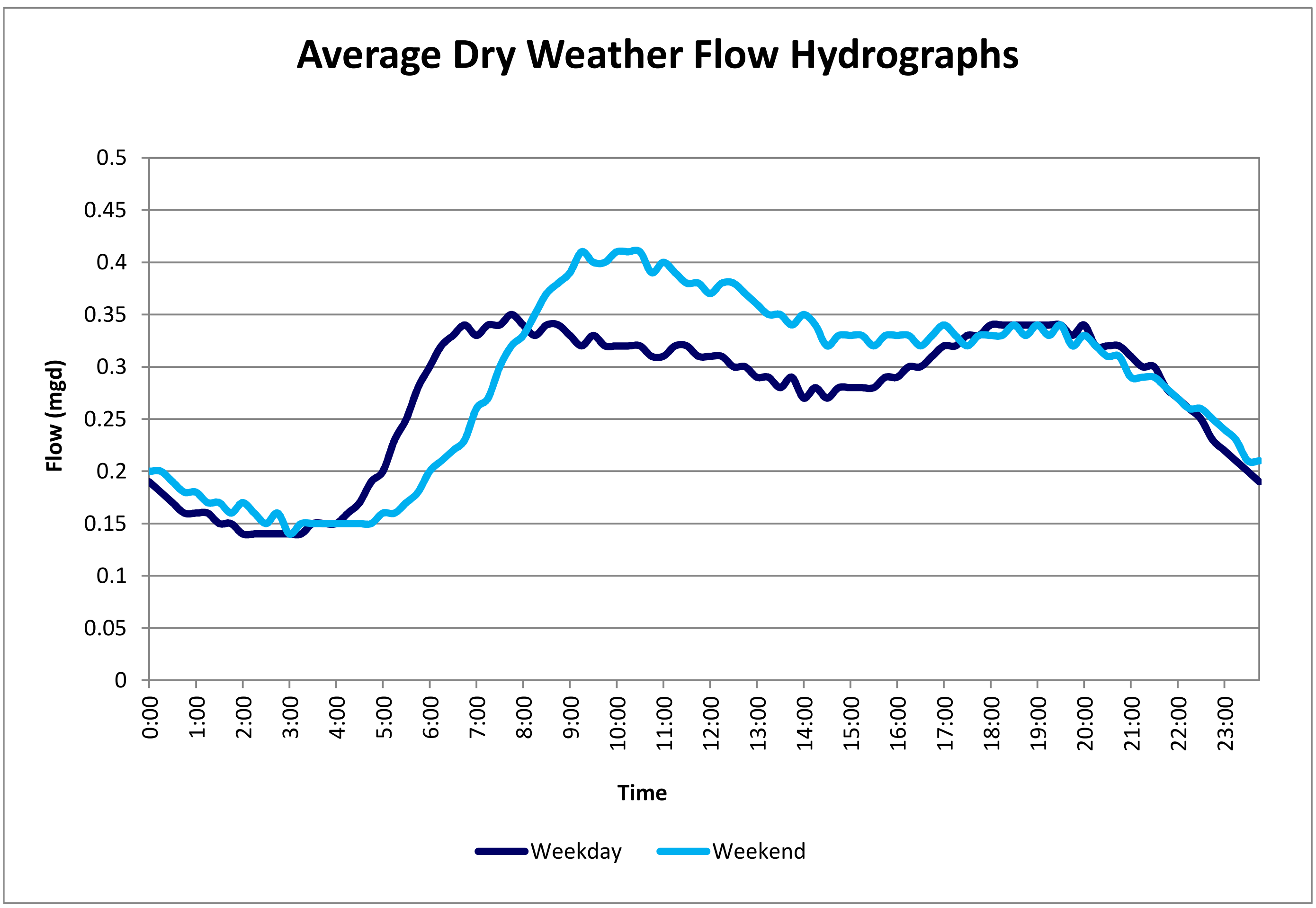
MBE_2

General Information

Site:	MBE_2
Description of Location:	Dunks Ferry Road and Mechanicsville Road
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	212
Service Population:	1,894

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.271	143	0.350	185	0.140	74	0.52	121
Weekend	0.285	150	0.410	216	0.140	74	0.49	53
Total	**0.275**	**145**	**0.368**	**194**	**0.140**	**74**	**0.51**	**174**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_2

General Information

Site:	MBE_2
Description of Location:	Dunks Ferry Road and Mechanicsville Road
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	212
Service Population:	1,894

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
8/13/2013	2.12	0.70	3.94	90.4	1.46	2.96	86.8	10.8
6/10/2014	2.37	1.20	2.90	12.7	2.35	2.62	10.2	9.53
3/29/2014	1.65	0.12	2.49	8.57	0.36	2.12	8.13	7.71
5/1/2014	5.24	0.20	2.21	143	0.67	2.10	143	7.64
2/21/2014	0.19	0.08	2.07	8.35	0.19	1.88	8.11	6.84
Five-Storm Average	**2.31**	**0.46**	**2.72**	**52.6**	**1.01**	**2.34**	**51.2**	**8.49**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

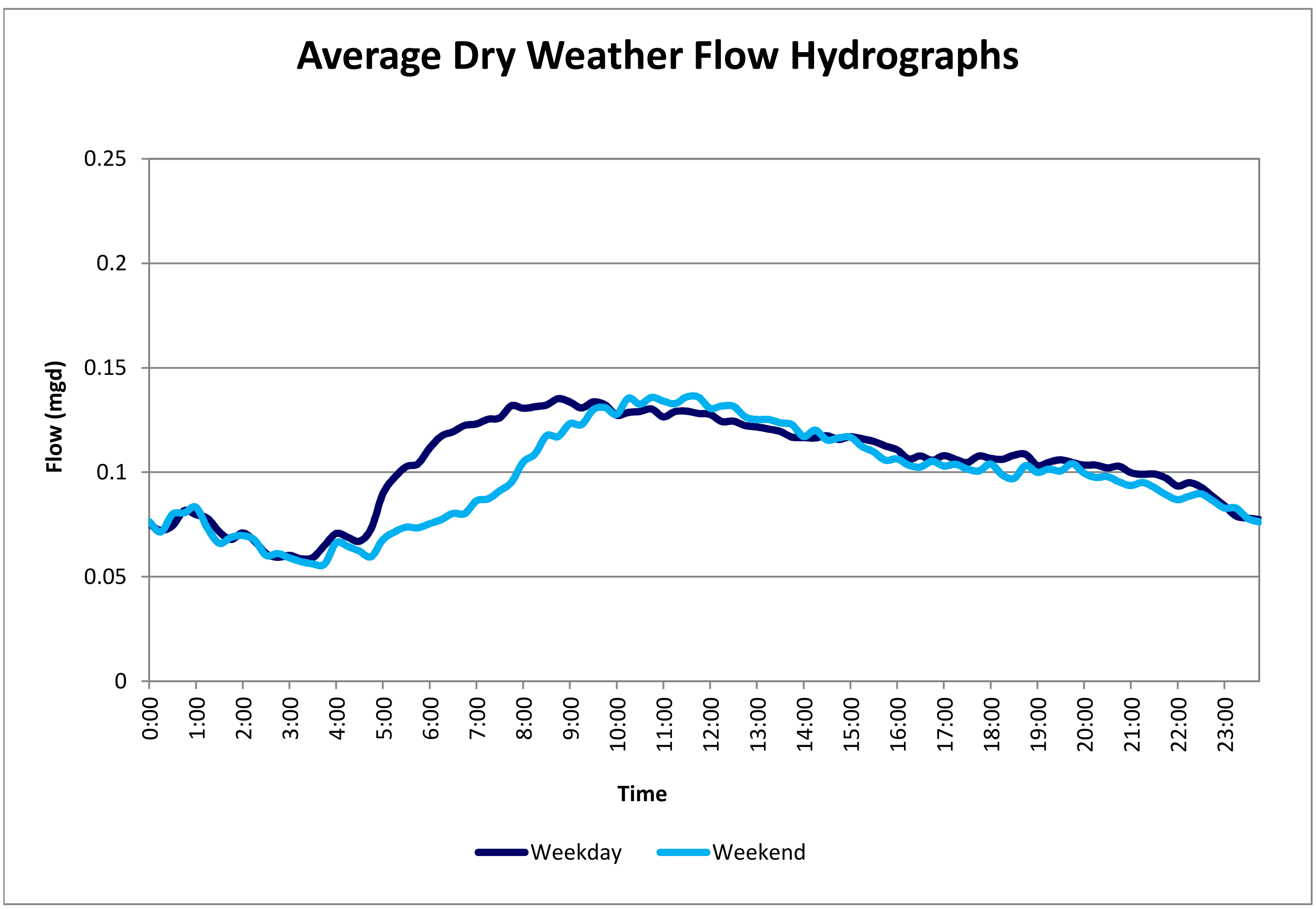
MBE_3

General Information

Site:	MBE_3
Description of Location:	Emerson Lane and Evelyn Avenue
Data Range:	2/24/2010 to 12/31/2010
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	90
Service Population:	554

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.104	187	0.135	244	0.059	106	0.57	144
Weekend	0.097	175	0.136	246	0.056	101	0.58	64
Total	**0.102**	**183**	**0.135**	**245**	**0.058**	**104**	**0.57**	**208**



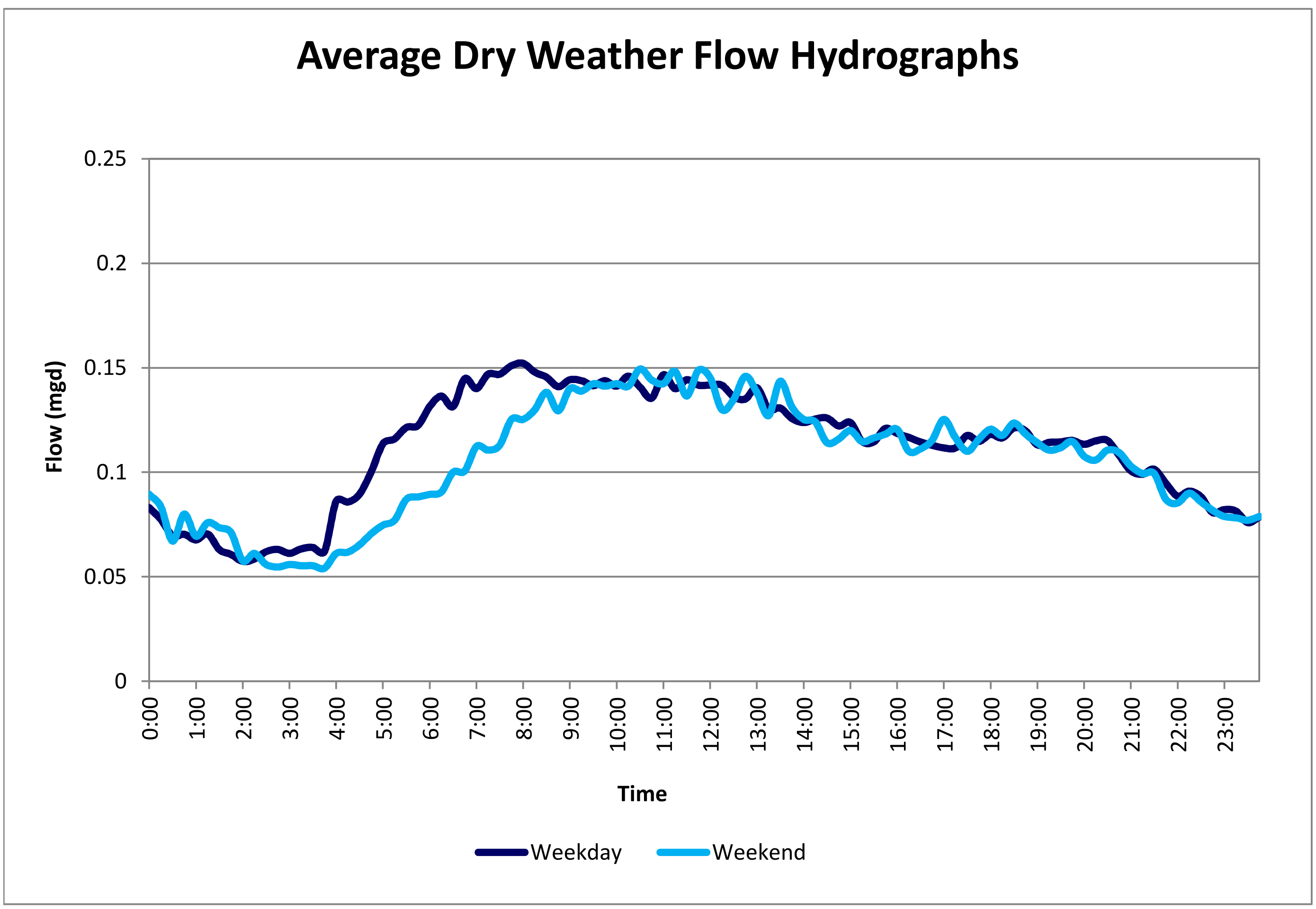
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_3

General Information

Site:	MBE_3
Description of Location:	Emerson Lane and Evelyn Avenue
Data Range:	1/1/2012 to 8/26/12
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	90
Service Population:	554

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.112	202	0.152	275	0.057	104	0.51	42
Weekend	0.105	190	0.149	270	0.054	98	0.51	17
Total	**0.110**	**198**	**0.151**	**273**	**0.056**	**102**	**0.51**	**59**



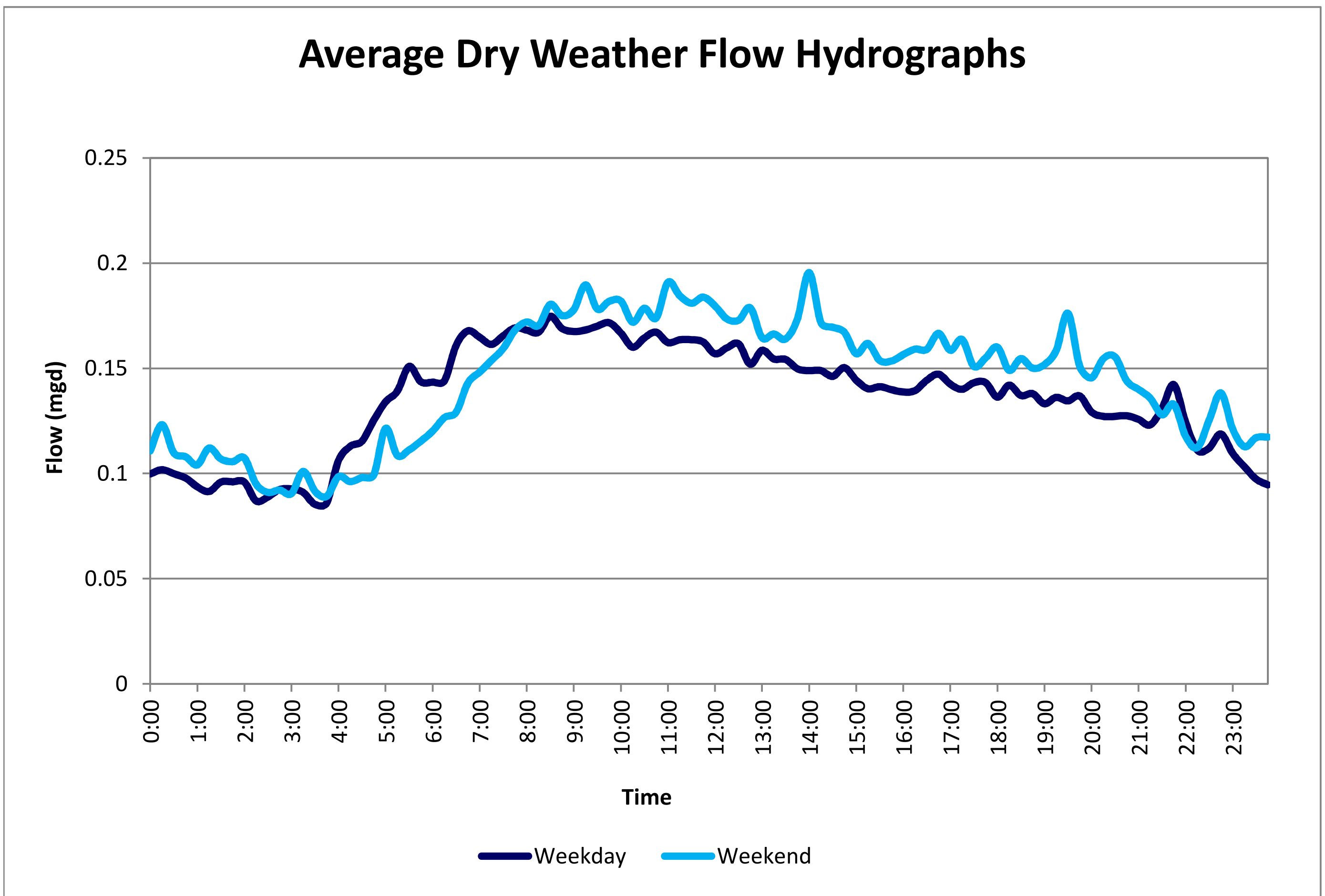
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_3

General Information

Site:	MBE_3
Description of Location:	Emerson Lane and Evelyn Avenue
Data Range:	3/15/2014 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	90
Service Population:	554

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.136	245	0.175	315	0.085	154	0.63	24
Weekend	0.144	260	0.196	353	0.089	161	0.62	14
Total	**0.139**	**250**	**0.182**	**329**	**0.087**	**157**	**0.63**	**38**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_3

General Information

Site:	MBE_3
Description of Location:	Emerson Lane and Evelyn Avenue
Data Range:	2/24/2010 to 12/31/2010
	1/1/2012 to 8/26/2012
	3/15/2014 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	90
Service Population:	554

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/10/2014	1.36	0.54	0.701	8.19	1.22	0.511	7.35	3.68
3/30/2014	0.84	0.09	0.618	38.9	0.26	0.331	37.8	2.38
5/9/2012	0.27	0.05	0.490	7.16	0.13	0.233	5.53	2.12
10/1/2010	4.75	0.59	0.433	9.11	1.57	0.260	7.00	2.55
7/13/2010	1.25	0.43	0.367	8.85	1.15	0.256	6.95	2.51
Five-Storm Average	**1.69**	**0.34**	**0.522**	**14.4**	**0.86**	**0.318**	**12.9**	**2.65**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

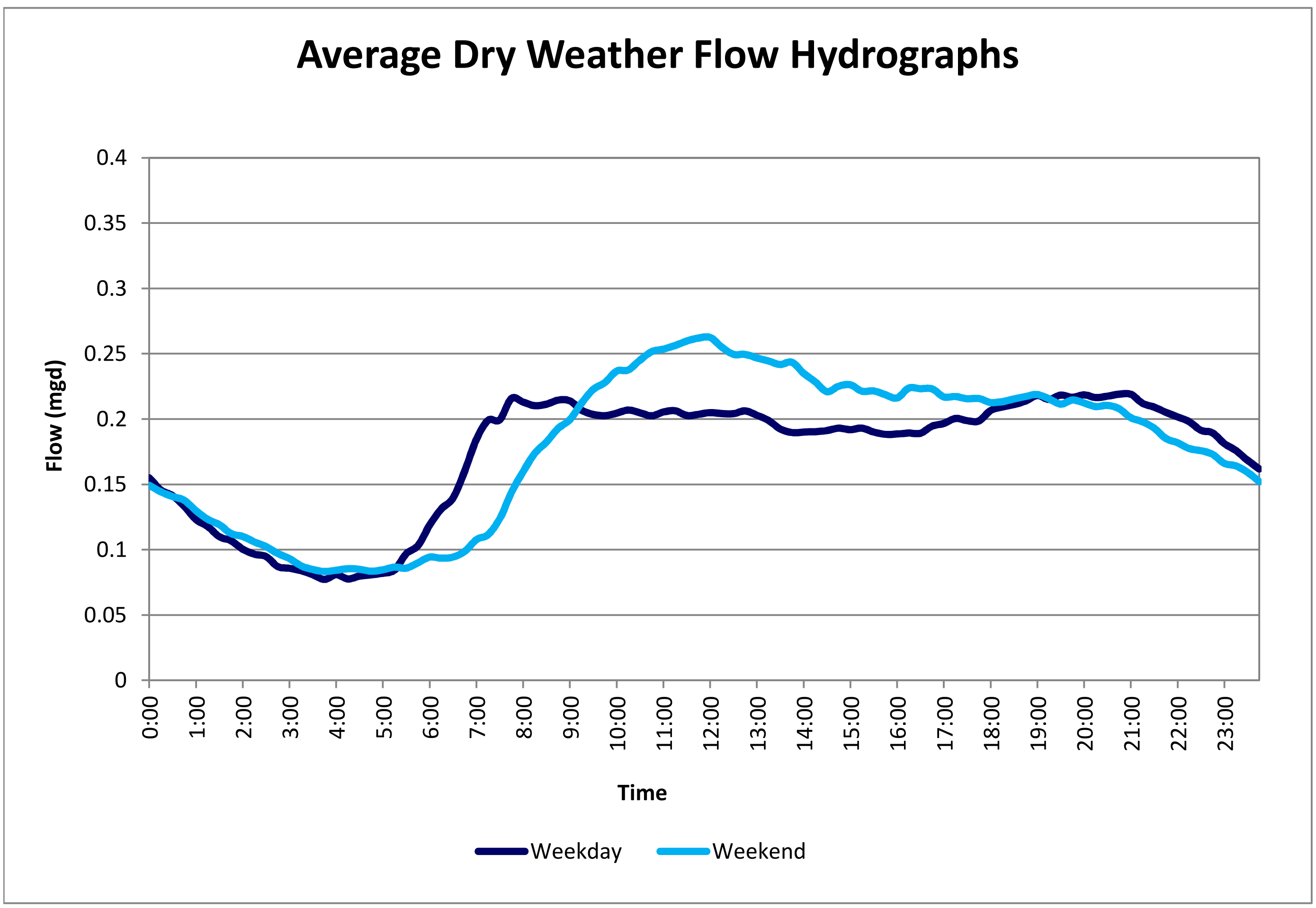
MBE_4

General Information

Site:	MBE_4
Description of Location:	Red Lion Road and Frankford Avenue
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	193
Service Population:	1,377

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.174	126	0.219	159	0.077	56	0.44	120
Weekend	0.179	130	0.262	191	0.083	61	0.47	63
Total	**0.175**	**127**	**0.234**	**170**	**0.079**	**58**	**0.45**	**183**



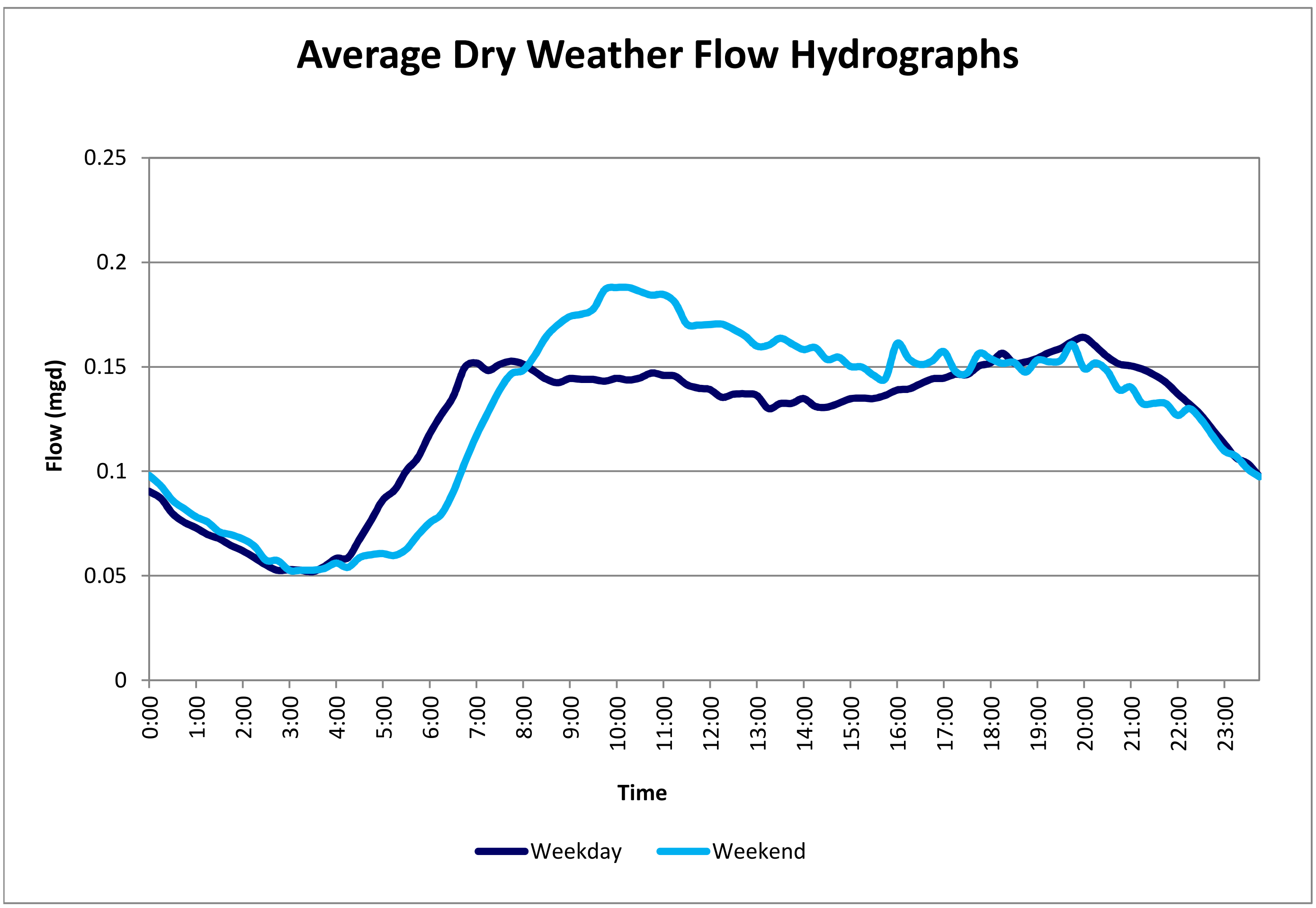
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_4

General Information

Site:	MBE_4
Description of Location:	Red Lion Road and Frankford Avenue
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	193
Service Population:	1,377

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.123	90	0.164	119	0.052	38	0.42	78
Weekend	0.128	93	0.188	137	0.053	38	0.41	27
Total	**0.125**	**90**	**0.170**	**124**	**0.052**	**38**	**0.42**	**105**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_4

General Information

Site:	MBE_4
Description of Location:	Red Lion Road and Frankford Avenue
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	193
Service Population:	1,377

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/10/2013	2.35	0.29	1.39	93.5	0.80	1.21	89.6	9.68
7/23/2013	1.87	0.82	1.30	69.7	1.43	0.801	58.8	6.41
7/13/2013	0.87	0.63	1.14	9.30	0.77	0.891	7.09	7.13
6/7/2013	3.56	0.30	1.10	117	0.79	1.05	112	8.40
9/4/2012	2.10	0.28	1.01	119	0.77	0.904	113	5.17
Five-Storm Average	**2.15**	**0.46**	**1.19**	**81.7**	**0.91**	**0.971**	**76.1**	**7.36**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

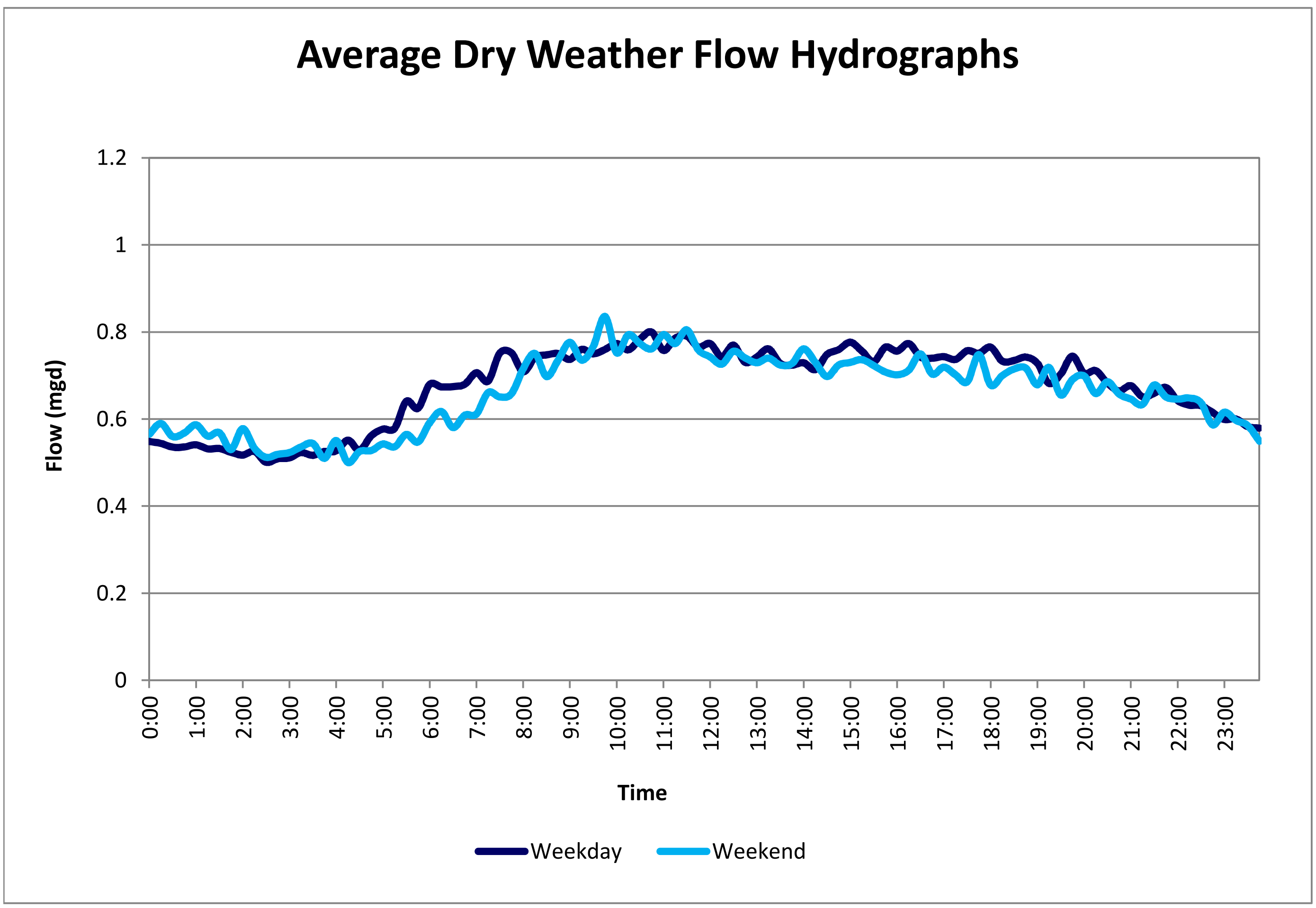
MBE_5

General Information

Site:	MBE_5
Description of Location:	Grant Avenue and James Street
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	24"
Contract Community:	Bensalem
Drainage Area (Acres):	1,024
Service Population:	2,563

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.676	264	0.800	312	0.501	195	0.74	151
Weekend	0.661	258	0.836	326	0.500	195	0.76	54
Total	**0.672**	**262**	**0.809**	**316**	**0.501**	**195**	**0.75**	**205**



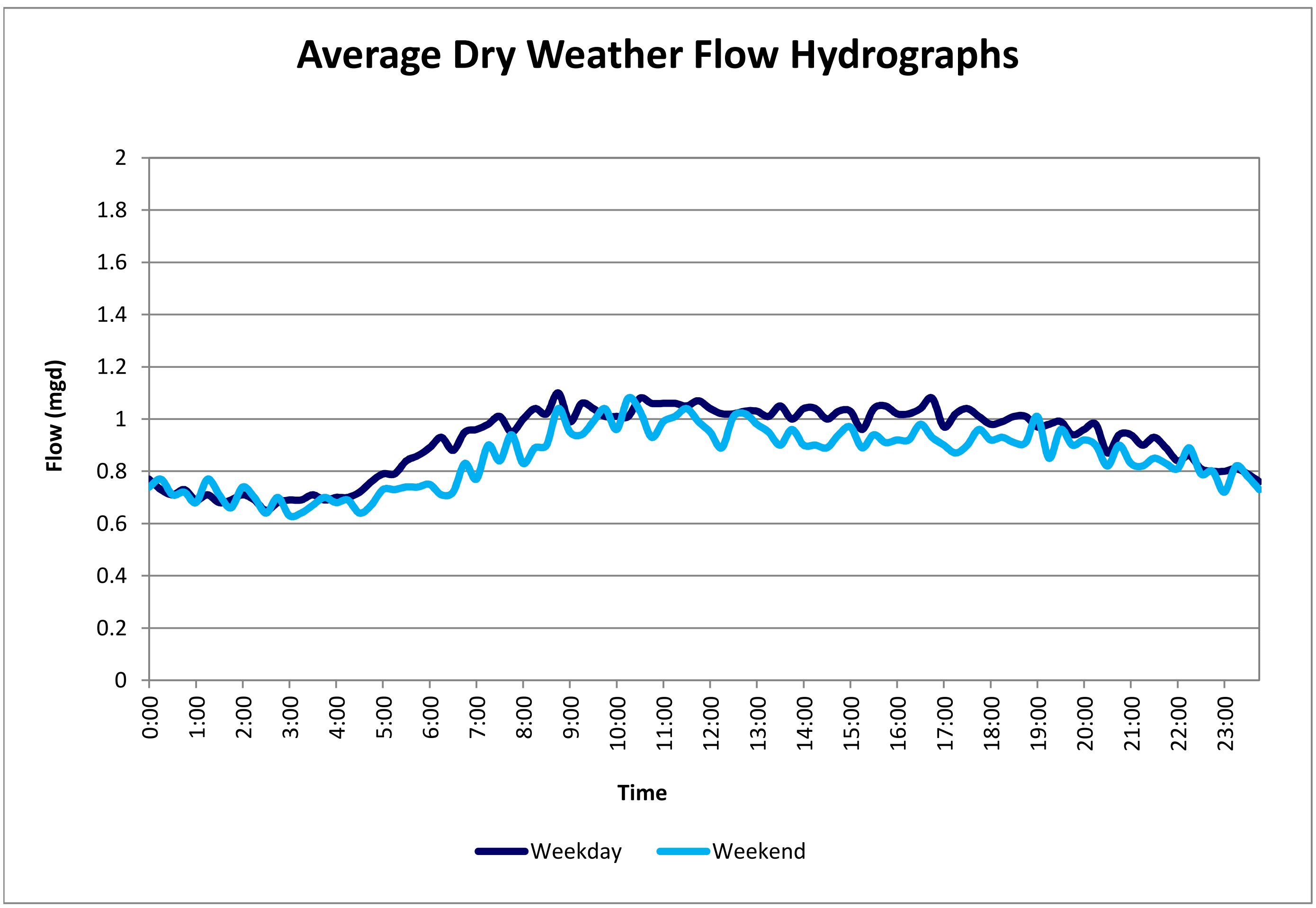
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_5

General Information

Site:	MBE_5
Description of Location:	Grant Avenue and James Street
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Bensalem
Drainage Area (Acres):	1,024
Service Population:	2,563

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.916	357	1.10	429	0.650	254	0.71	106
Weekend	0.853	333	1.08	421	0.630	246	0.74	48
Total	**0.896**	**350**	**1.09**	**427**	**0.644**	**251**	**0.72**	**154**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_5

General Information

Site:	MBE_5
Description of Location:	Grant Avenue and James Street
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Bensalem
Drainage Area (Acres):	1,024
Service Population:	2,563

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/30/2014	0.81	0.10	10.5	56.8	0.27	5.32	55.7	5.94
6/10/2013	2.15	0.29	4.76	66.6	0.69	3.79	65.6	4.23
6/13/2013	0.29	0.13	4.69	13.9	0.26	2.66	11.9	2.97
8/13/2013	1.42	0.47	4.46	79.4	0.93	3.91	78.5	4.36
10/29/2012	2.29	0.12	4.25	67.8	0.35	3.65	65.4	5.43
Five-Storm Average	**1.39**	**0.22**	**5.73**	**56.9**	**0.50**	**3.87**	**55.4**	**4.59**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

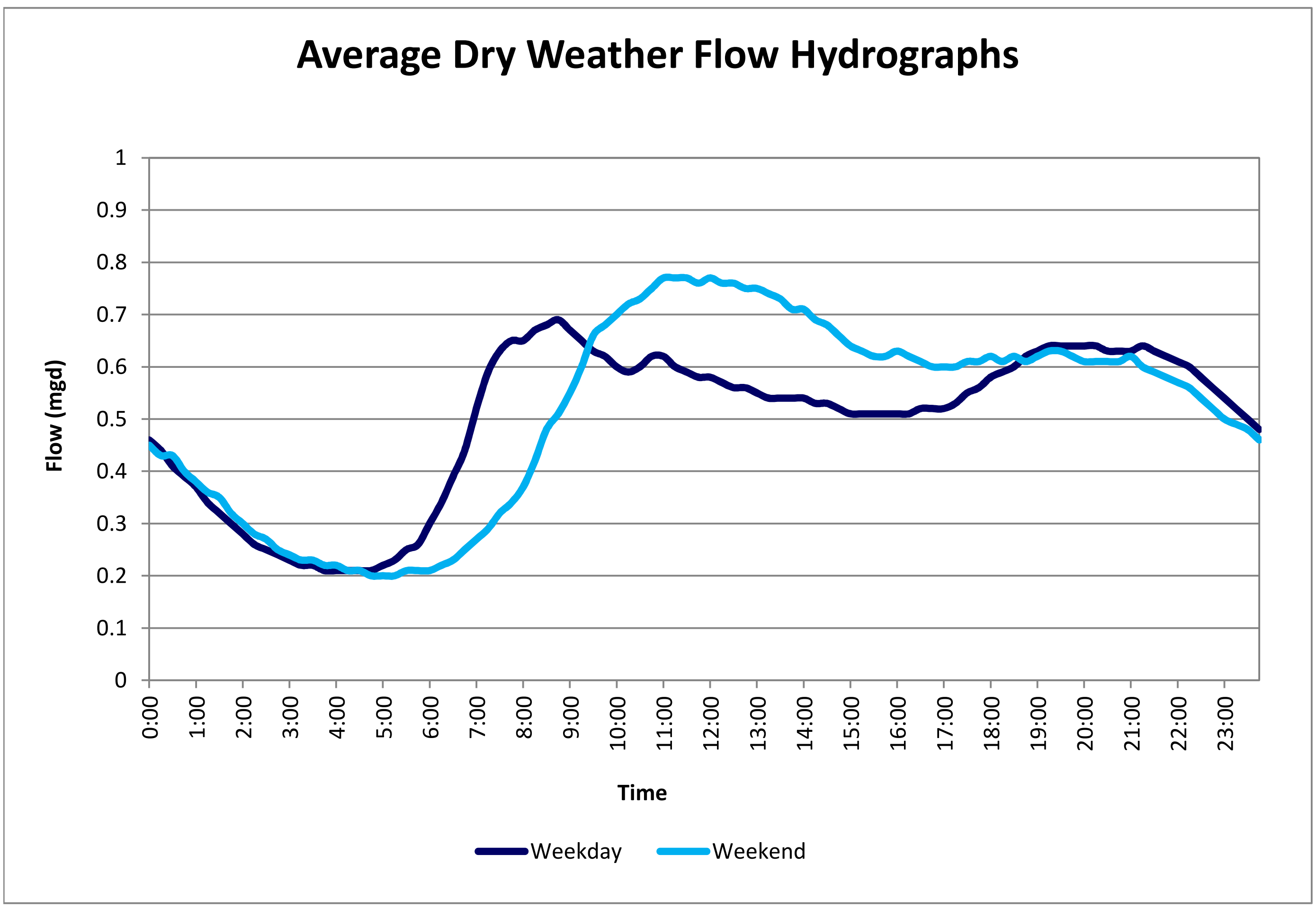
MBE_6

General Information

Site:	MBE_6
Description of Location:	Gravel Pike at Poquessing Creek
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	16"
Contract Community:	Bensalem
Drainage Area (Acres):	742
Service Population:	4,567

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.499	109	0.690	151	0.210	46	0.42	82
Weekend	0.512	112	0.770	169	0.200	44	0.39	35
Total	**0.503**	**110**	**0.714**	**156**	**0.207**	**45**	**0.41**	**117**



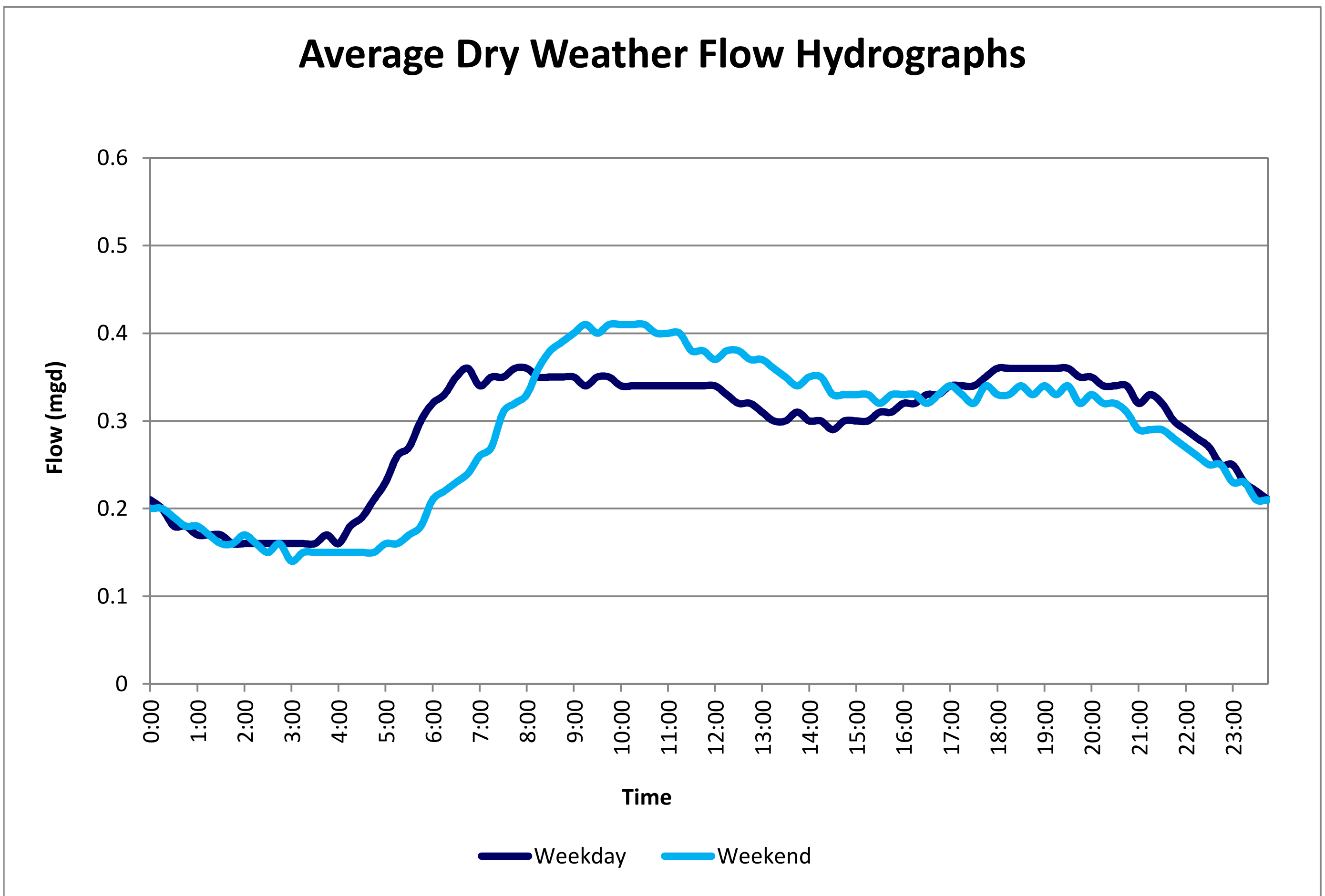
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_6

General Information

Site:	MBE_6
Description of Location:	Gravel Pike at Poquessing Creek
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	16"
Contract Community:	Bensalem
Drainage Area (Acres):	742
Service Population:	4,567

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.291	64	0.360	79	0.160	35	0.55	87
Weekend	0.286	63	0.410	90	0.140	31	0.49	50
Total	**0.289**	**63**	**0.378**	**83**	**0.153**	**33**	**0.53**	**137**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_6

General Information

Site:	MBE_6
Description of Location:	Gravel Pike at Poquessing Creek
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	16"
Contract Community:	Bensalem
Drainage Area (Acres):	742
Service Population:	4,567

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/10/2014	2.03	0.70	3.89	13.4	1.85	3.78	13.1	13.1
4/30/2014	4.97	0.22	3.76	123	0.72	3.70	122	12.8
9/4/2012	2.32	0.49	3.10	59.6	0.95	2.98	56.0	5.92
5/16/2012	1.11	0.16	2.54	13.5	0.52	2.35	13.4	4.67
3/29/2014	1.71	0.11	2.42	13.4	0.35	2.23	13.2	7.72
Five-Storm Average	**2.43**	**0.34**	**3.14**	**44.6**	**0.88**	**3.01**	**43.5**	**8.84**

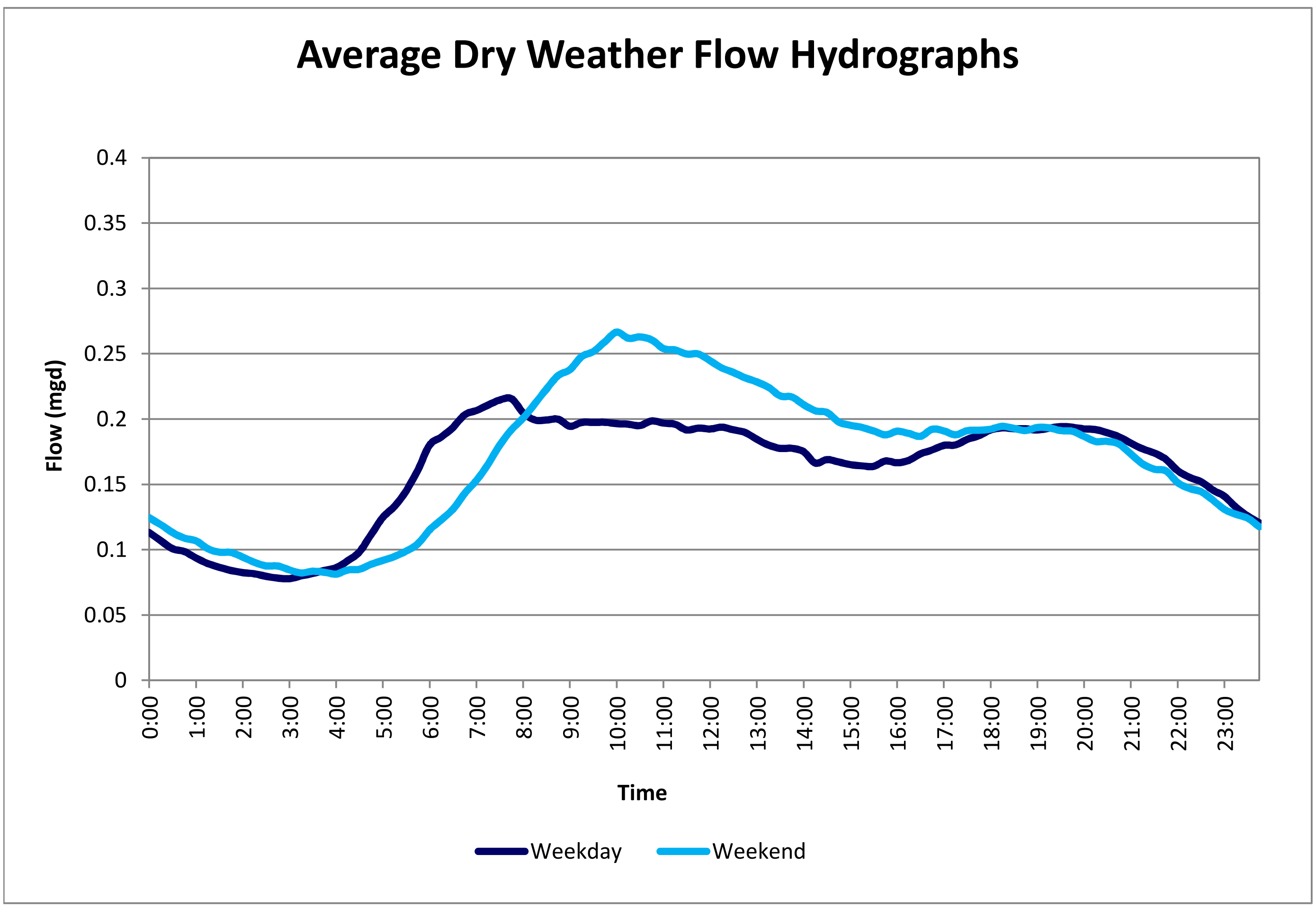
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_7

General Information

Site:	MBE_7
Description of Location:	Morrow Drive and Bellview Drive
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	204
Service Population:	2,110

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.162	77	0.216	102	0.078	37	0.48	138
Weekend	0.171	81	0.267	126	0.081	39	0.48	60
Total	**0.164**	**78**	**0.231**	**109**	**0.079**	**37**	**0.48**	**198**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

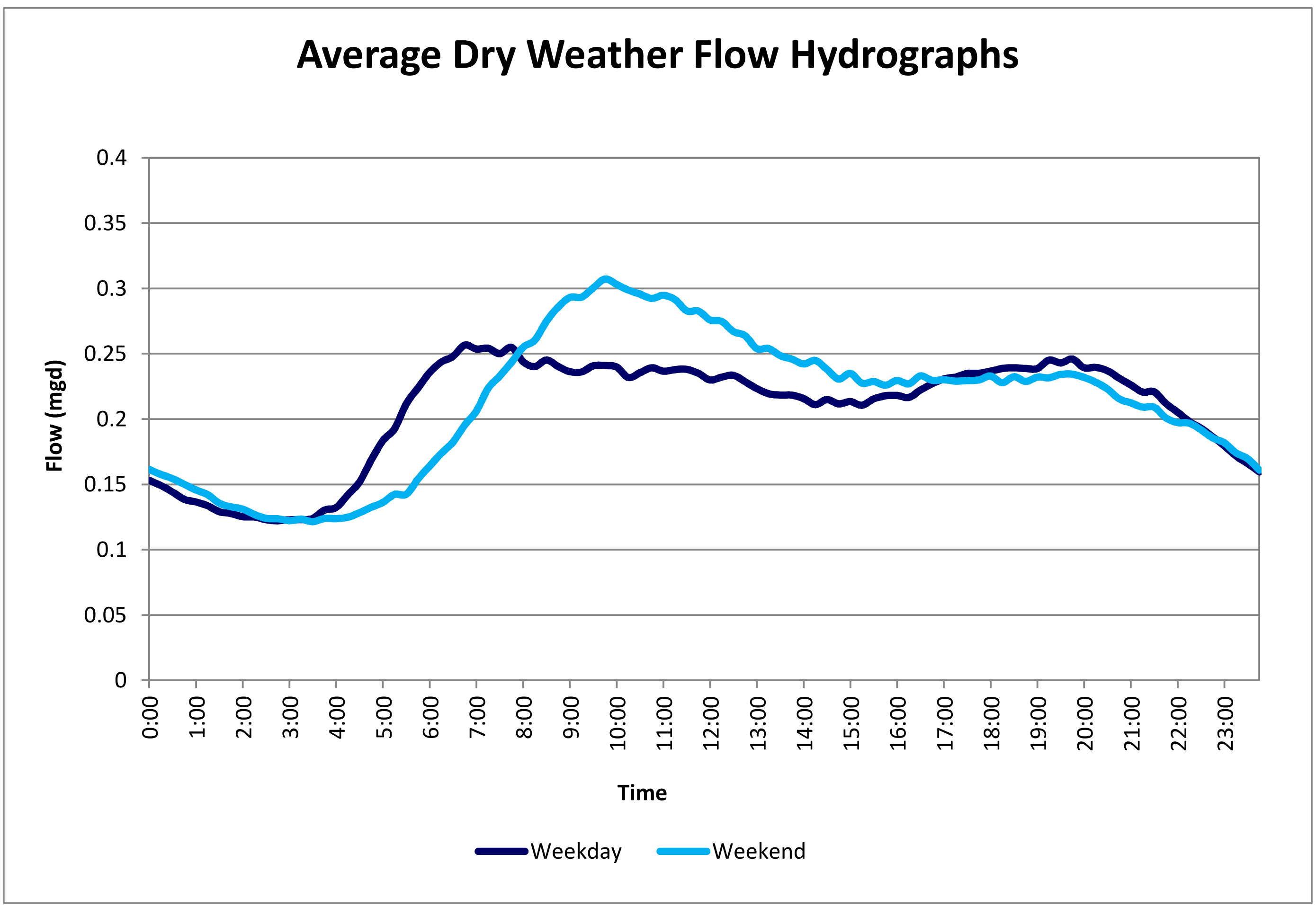
MBE_7

General Information

Site:	MBE_7
Description of Location:	Morrow Drive and Bellview Drive
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	204
Service Population:	2,110

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.207	98	0.257	122	0.122	58	0.59	127
Weekend	0.212	100	0.307	146	0.121	58	0.57	58
Total	**0.208**	**99**	**0.272**	**129**	**0.122**	**58**	**0.58**	**185**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_7

General Information

Site:	MBE_7
Description of Location:	Morrow Drive and Bellview Drive
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	204
Service Population:	2,110

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.18	0.18	1.12	134	0.62	1.08	133	5.19
6/10/2014	1.27	0.54	1.00	9.40	1.27	0.817	8.45	3.93
8/13/2013	2.27	0.76	0.987	27.8	1.54	0.837	23.9	4.02
2/5/2014	1.49	0.08	0.864	8.47	0.30	0.824	8.36	3.96
2/21/2014	0.19	0.09	0.712	7.58	0.19	0.625	7.48	3.00
Five-Storm Average	**2.08**	**0.33**	**0.94**	**37.5**	**0.78**	**0.837**	**36.2**	**4.02**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

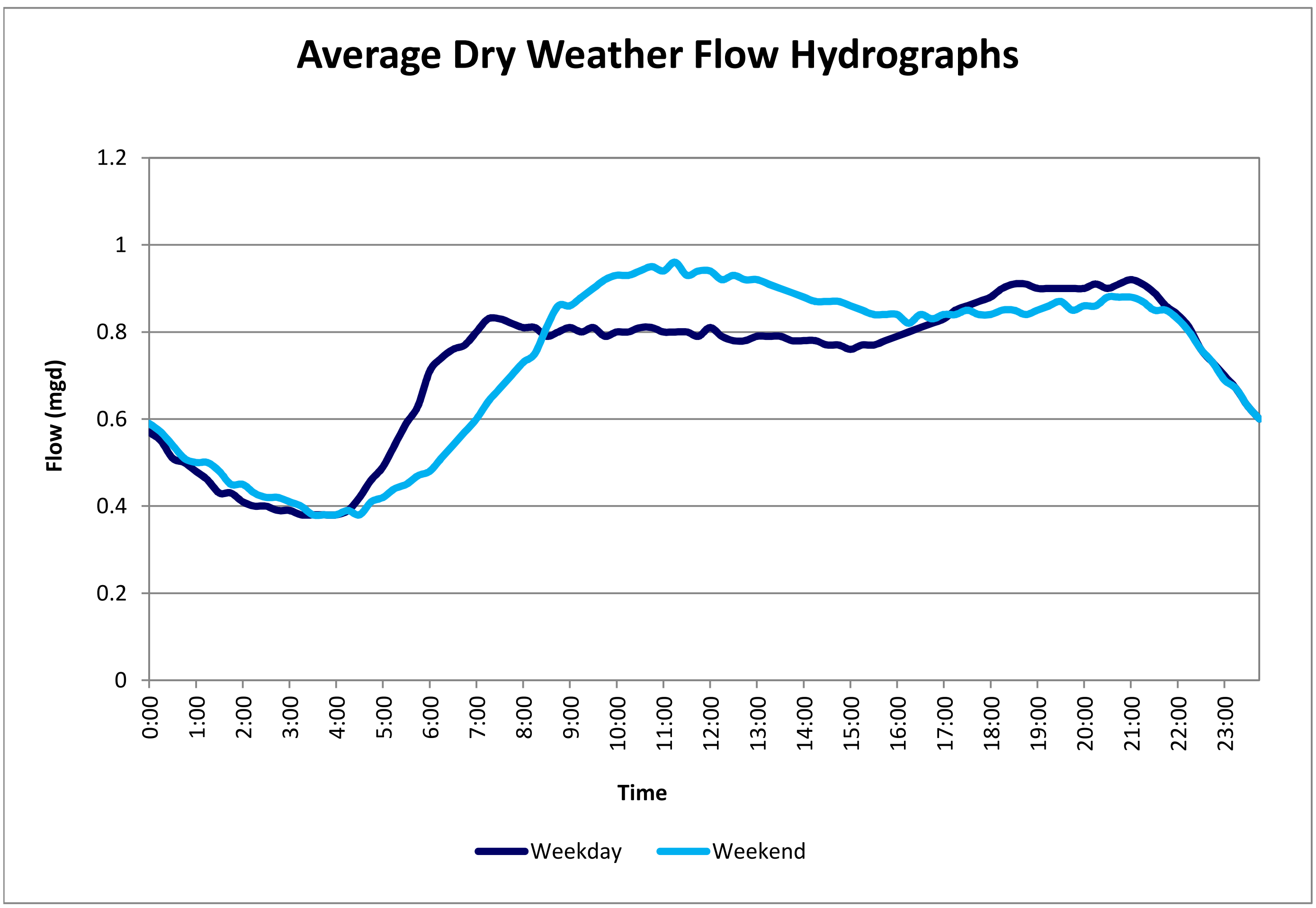
MBE_8

General Information

Site:	MBE_8
Description of Location:	Bensalem Country Club
Data Range:	1/1/2010 to 12/31/2010
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	230
Service Population:	1,318

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.722	548	0.920	698	0.380	288	0.53	148
Weekend	0.730	554	0.960	728	0.380	288	0.52	68
Total	**0.724**	**550**	**0.933**	**708**	**0.380**	**288**	**0.52**	**216**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

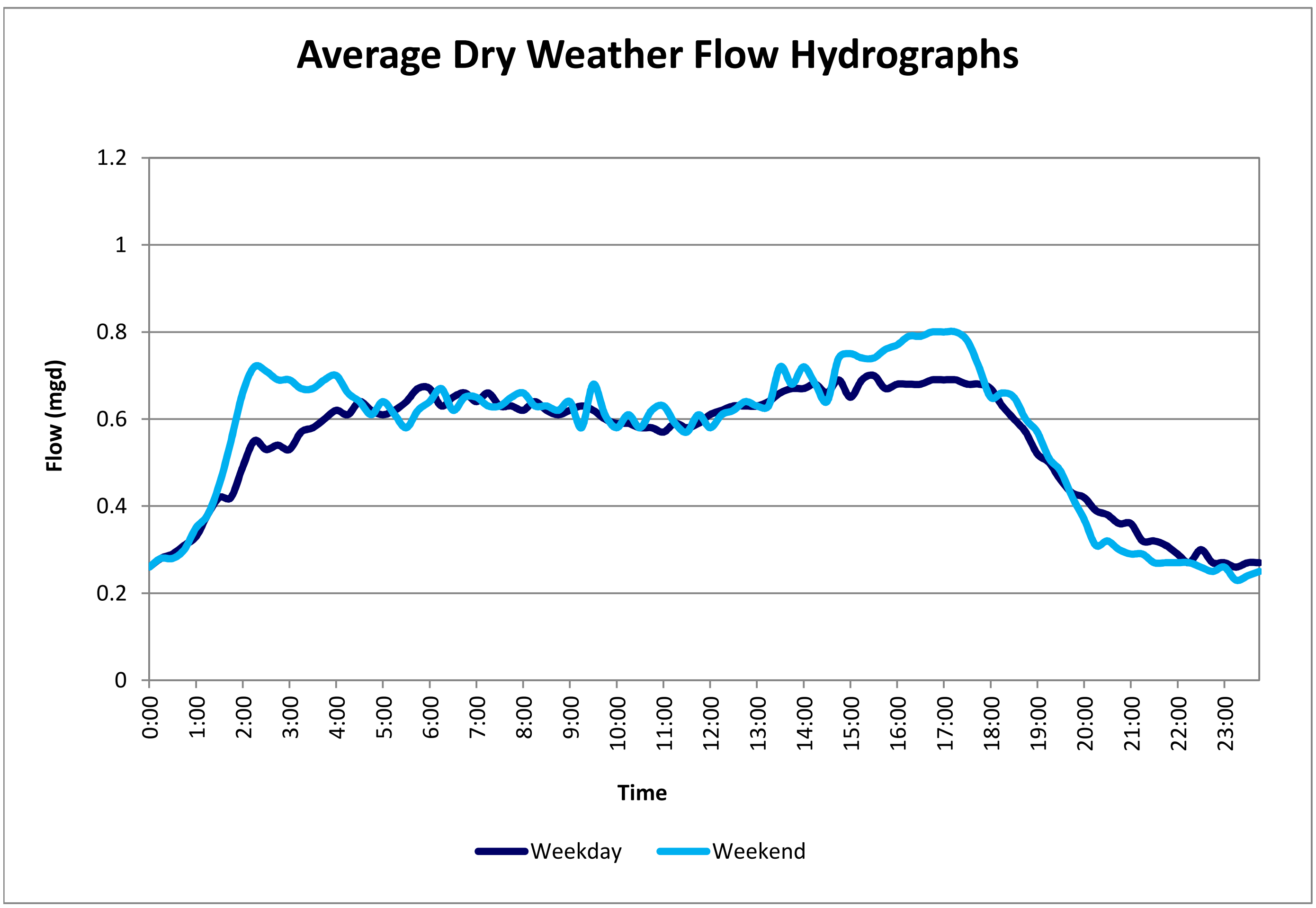
MBE_8

General Information

Site:	MBE_8
Description of Location:	Bensalem Country Club
Data Range:	4/26/2014 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	230
Service Population:	1,318

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.545	414	0.700	531	0.260	197	0.48	18
Weekend	0.568	431	0.800	607	0.230	175	0.41	6
Total	**0.551**	**418**	**0.725**	**550**	**0.253**	**192**	**0.46**	**24**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_8

General Information

Site:	MBE_8
Description of Location:	Bensalem Country Club
Data Range:	1/1/2010 to 12/31/2010
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	230
Service Population:	1,318

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
10/1/2010	3.53	0.60	2.28	80.7	1.33	2.06	78.1	2.85
1/25/2010	1.51	0.11	1.77	46.3	0.32	1.69	43.3	2.33
3/13/2010	2.97	0.16	1.76	87.5	0.59	1.64	87.1	2.27
7/13/2010	1.69	0.32	1.73	6.69	0.94	1.61	6.31	2.22
3/30/2010	1.73	0.07	1.64	81.3	0.28	1.57	80.4	2.17
Five-Storm Average	**2.29**	**0.25**	**1.84**	**60.5**	**0.69**	**1.71**	**59.0**	**2.37**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

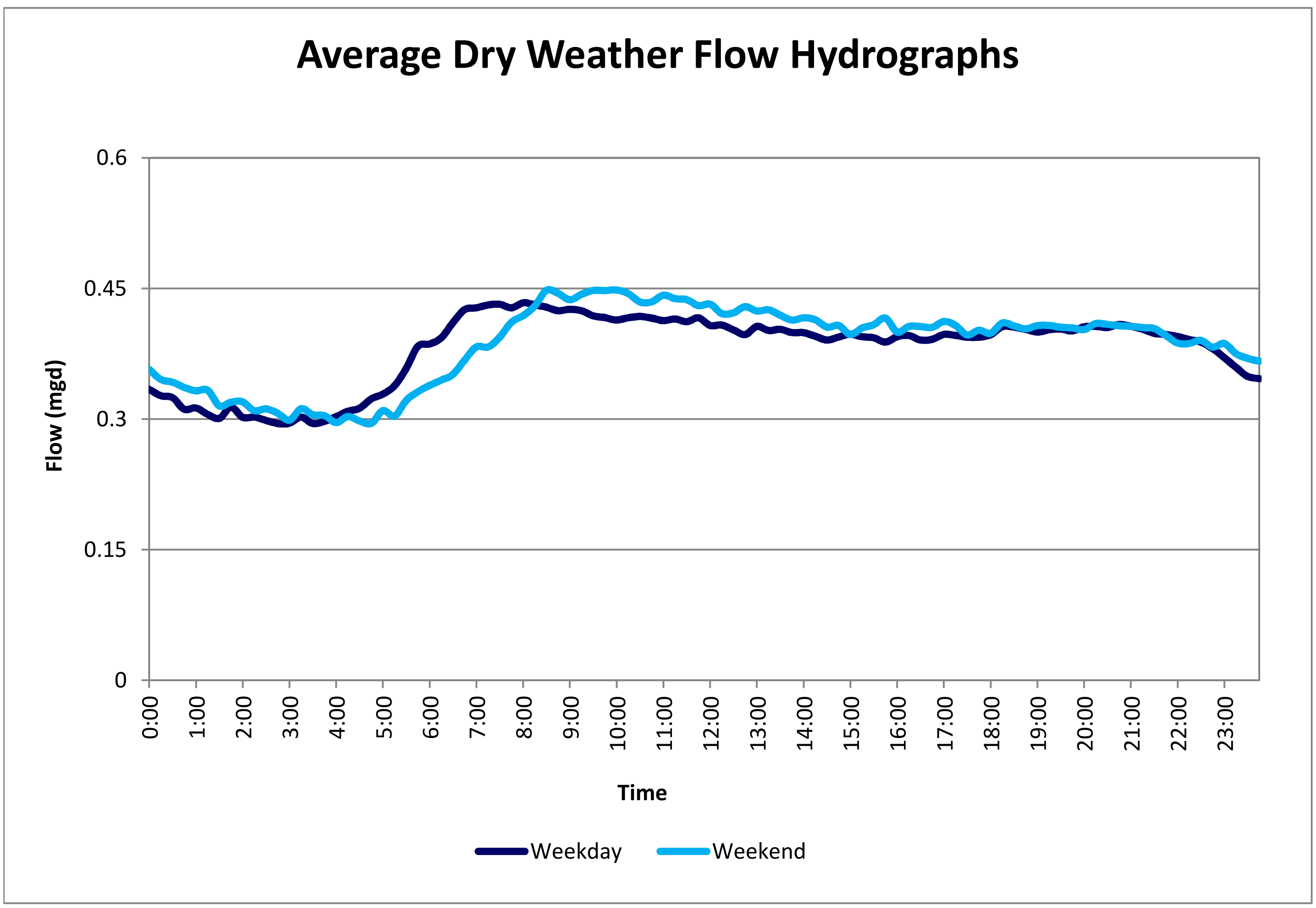
MBE_9

General Information

Site:	MBE_9
Description of Location:	Tillman Drive and Poquessing Creek
Data Range:	1/1/2010 to 12/31/10
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	290
Service Population:	2,023

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.381	188	0.433	214	0.295	146	0.77	99
Weekend	0.386	191	0.448	222	0.295	146	0.76	55
Total	**0.383**	**189**	**0.439**	**217**	**0.295**	**146**	**0.77**	**154**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

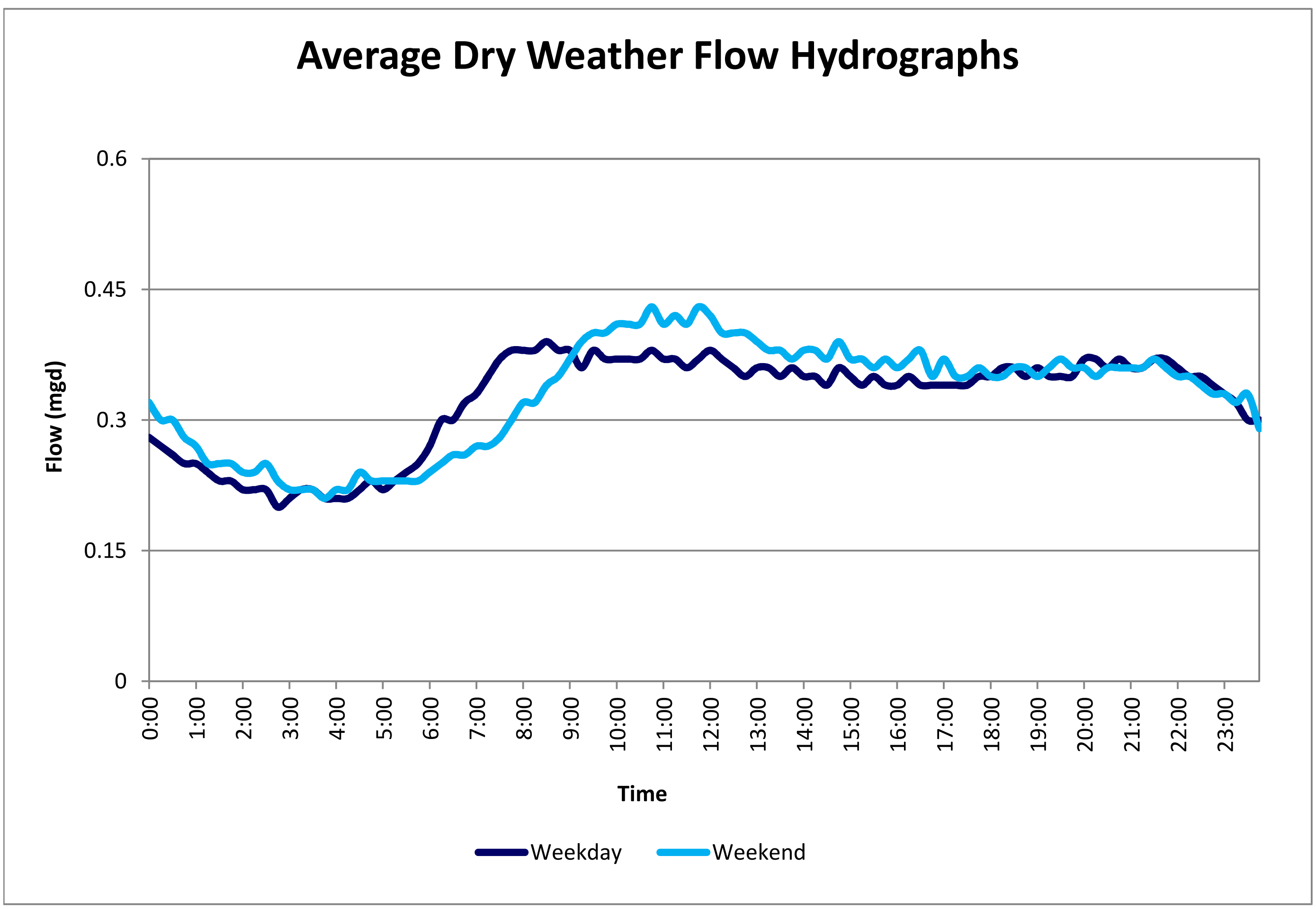
MBE_9

General Information

Site:	MBE_9
Description of Location:	Tillman Drive and Poquessing Creek
Data Range:	2/14/2013 to 5/17/2013
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	290
Service Population:	2,023

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.323	159	0.390	193	0.200	99	0.62	48
Weekend	0.329	163	0.430	213	0.210	104	0.64	21
Total	**0.325**	**160**	**0.402**	**199**	**0.203**	**100**	**0.63**	**69**



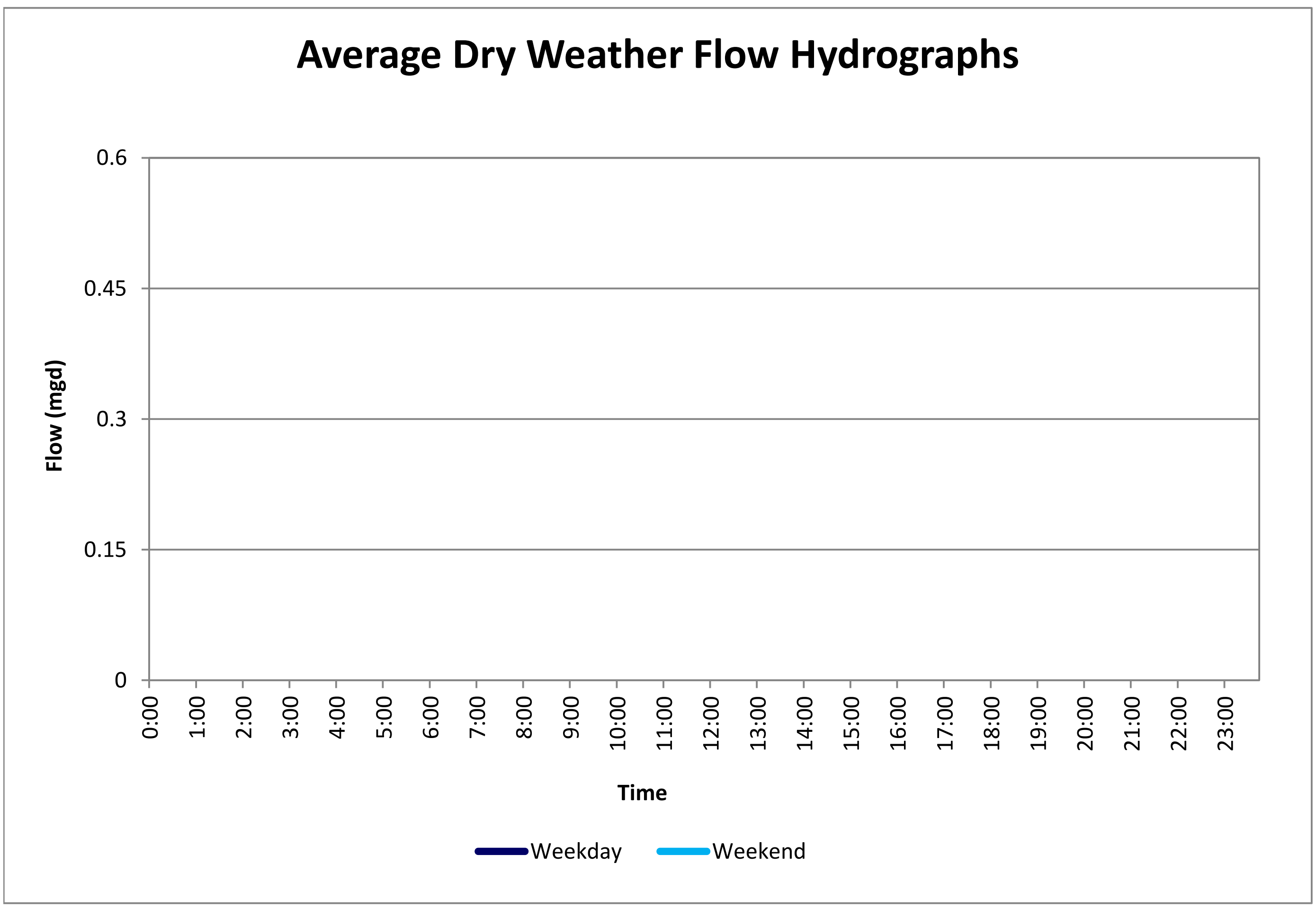
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_9

General Information

Site:	MBE_9
Description of Location:	Tillman Drive and Poquessing Creek
Data Range:	4/5/2014 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	290
Service Population:	2,023

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Analysis was not completed because the site was determined to have unreliable data for the entire deployment.								



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_9

General Information

Site:	MBE_9
Description of Location:	Tillman Drive and Poquessing Creek
Data Range:	1/1/2010 to 12/31/2010
	2/14/2013 to 5/17/2013
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	290
Service Population:	2,023

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/13/2010	2.98	0.17	1.34	141	0.57	1.30	140	3.39
10/1/2010	4.64	0.63	1.22	72.4	1.39	1.14	68.5	2.98
1/25/2010	1.62	0.12	1.07	58.8	0.36	1.00	54.6	2.61
3/29/2010	1.88	0.30	0.954	77.4	0.62	0.902	74.9	2.36
12/1/2010	1.13	0.12	0.752	6.99	0.32	0.665	6.63	1.74
Five-Storm Average	**2.45**	**0.27**	**1.07**	**71.3**	**0.65**	**1.00**	**68.9**	**2.61**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

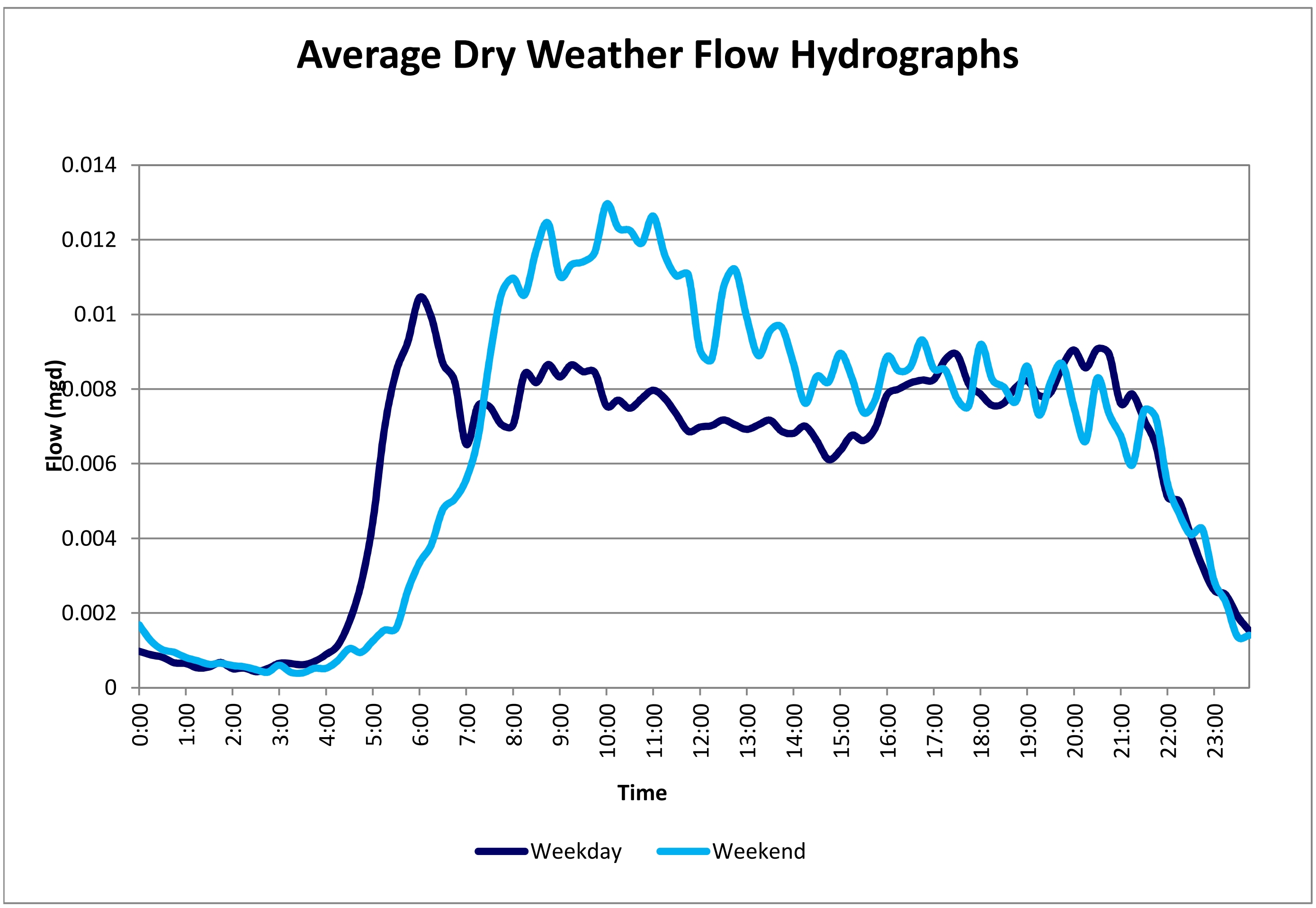
MBE_10

General Information

Site:	MBE_10
Description of Location:	Colonial Avenue at Poquessing Creek
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	37
Service Population:	272

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.0059	22	0.0105	38	0.0004	2	0.07	77
Weekend	0.0064	24	0.0130	48	0.0004	1	0.06	34
Total	**0.0061**	**22**	**0.0112**	**41**	**0.0004**	**2**	**0.07**	**111**



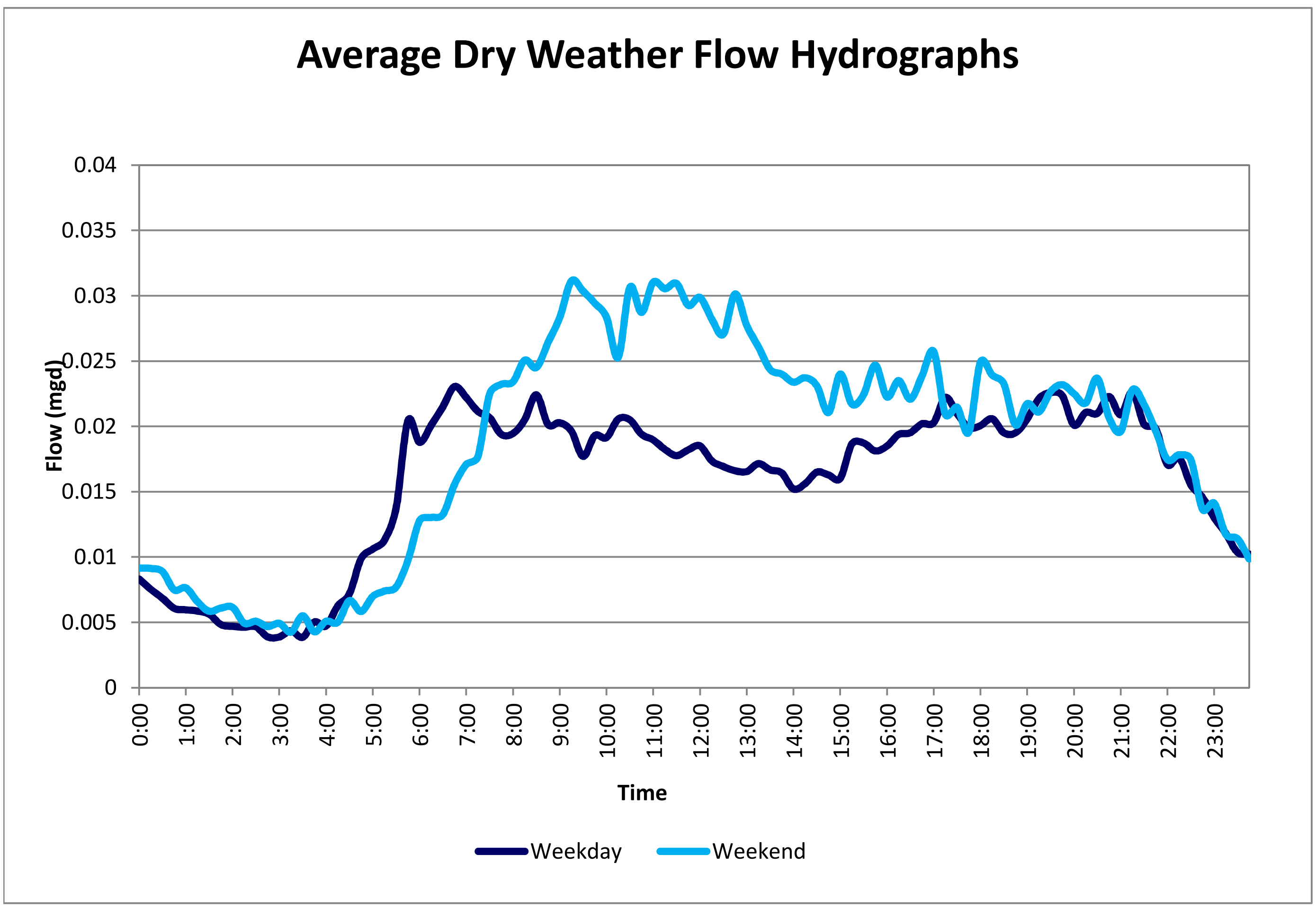
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_10

General Information

Site:	MBE_10
Description of Location:	Colonial Avenue at Poquessing Creek
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	37
Service Population:	272

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.016	58	0.023	85	0.004	14	0.24	72
Weekend	0.019	69	0.031	114	0.004	16	0.23	33
Total	**0.017**	**62**	**0.026**	**94**	**0.004**	**15**	**0.24**	**105**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_10

General Information

Site:	MBE_10
Description of Location:	Colonial Avenue at Poquessing Creek
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	37
Service Population:	272

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/10/2014	1.28	0.56	0.139	4.27	1.11	0.092	3.05	5.45
5/16/2012	1.31	0.22	0.090	8.91	0.56	0.066	7.17	10.8
9/4/2012	2.13	0.28	0.081	8.94	0.79	0.076	8.46	12.5
4/22/2012	2.13	0.12	0.080	8.85	0.41	0.065	7.36	10.7
5/28/2014	0.36	0.10	0.074	2.32	0.22	0.050	1.92	2.97
Five-Storm Average	**1.44**	**0.26**	**0.093**	**6.66**	**0.62**	**0.070**	**5.59**	**8.50**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

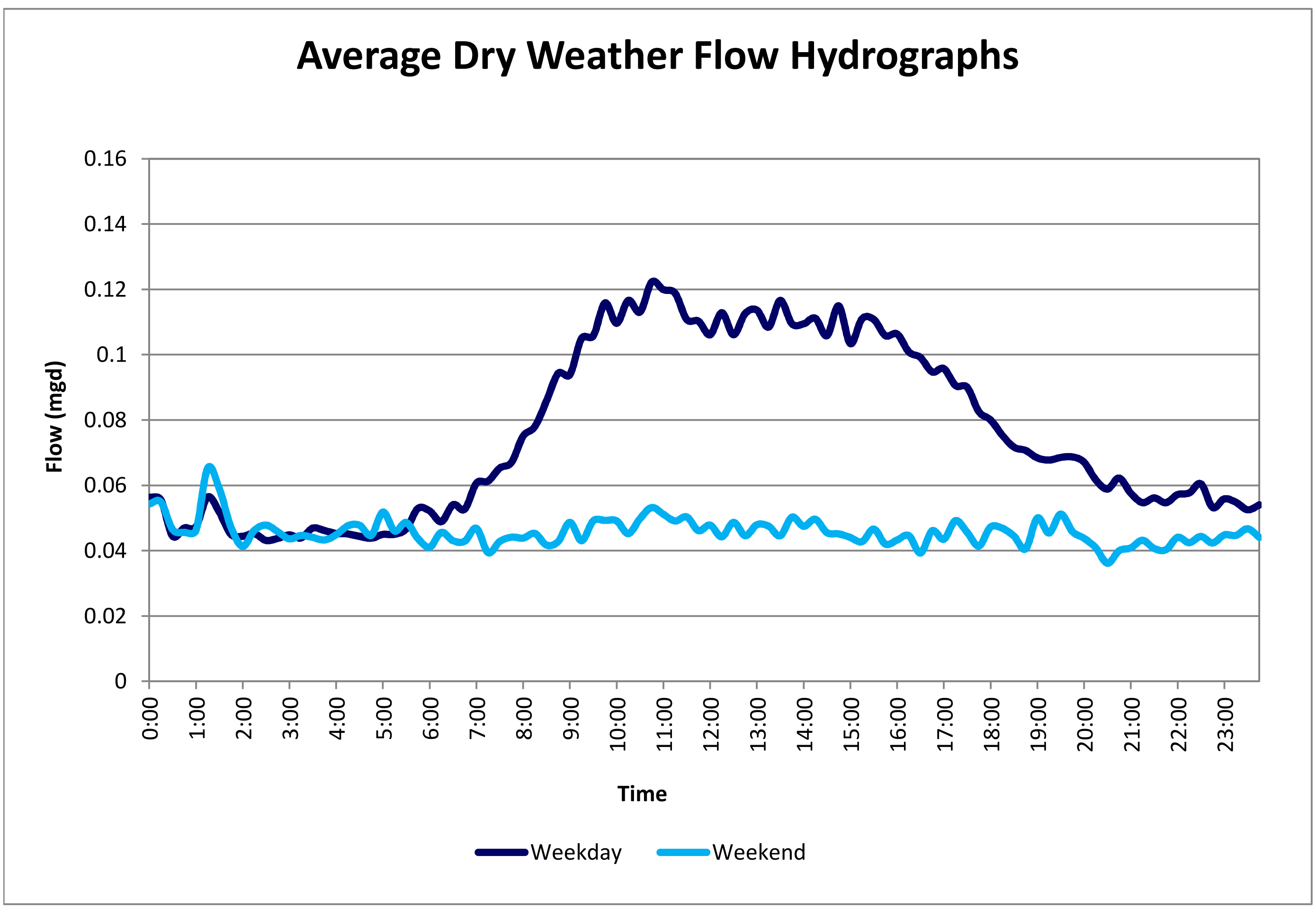
MBE_11

General Information

Site:	MBE_11
Description of Location:	GE Water parking lot - Somerton Road
Data Range:	1/1/2010 to 7/31/2010
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	71
Service Population:	0

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.076	NA	0.122	NA	0.043	NA	0.57	115
Weekend	0.046	NA	0.065	NA	0.036	NA	0.79	54
Total	**0.066**	**NA**	**0.104**	**NA**	**0.041**	**NA**	**0.64**	**169**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_11

General Information

Site:	MBE_11
Description of Location:	GE Water parking lot - Somerton Road
Data Range:	1/1/2010 to 7/31/2010
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	71
Service Population:	0

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
1/25/2010	1.52	0.12	0.560	3.54	0.33	0.514	3.43	7.76
2/16/2010	0.04	0.01	0.512	3.10	0.03	0.434	2.97	6.56
3/29/2010	3.41	0.33	0.482	3.16	0.53	0.396	2.96	5.98
2/23/2010	1.03	0.04	0.481	2.99	0.11	0.461	2.93	6.96
3/13/2010	2.96	0.16	0.439	2.86	0.60	0.418	2.76	6.31
Five-Storm Average	**1.79**	**0.13**	**0.495**	**3.13**	**0.32**	**0.445**	**3.01**	**6.72**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

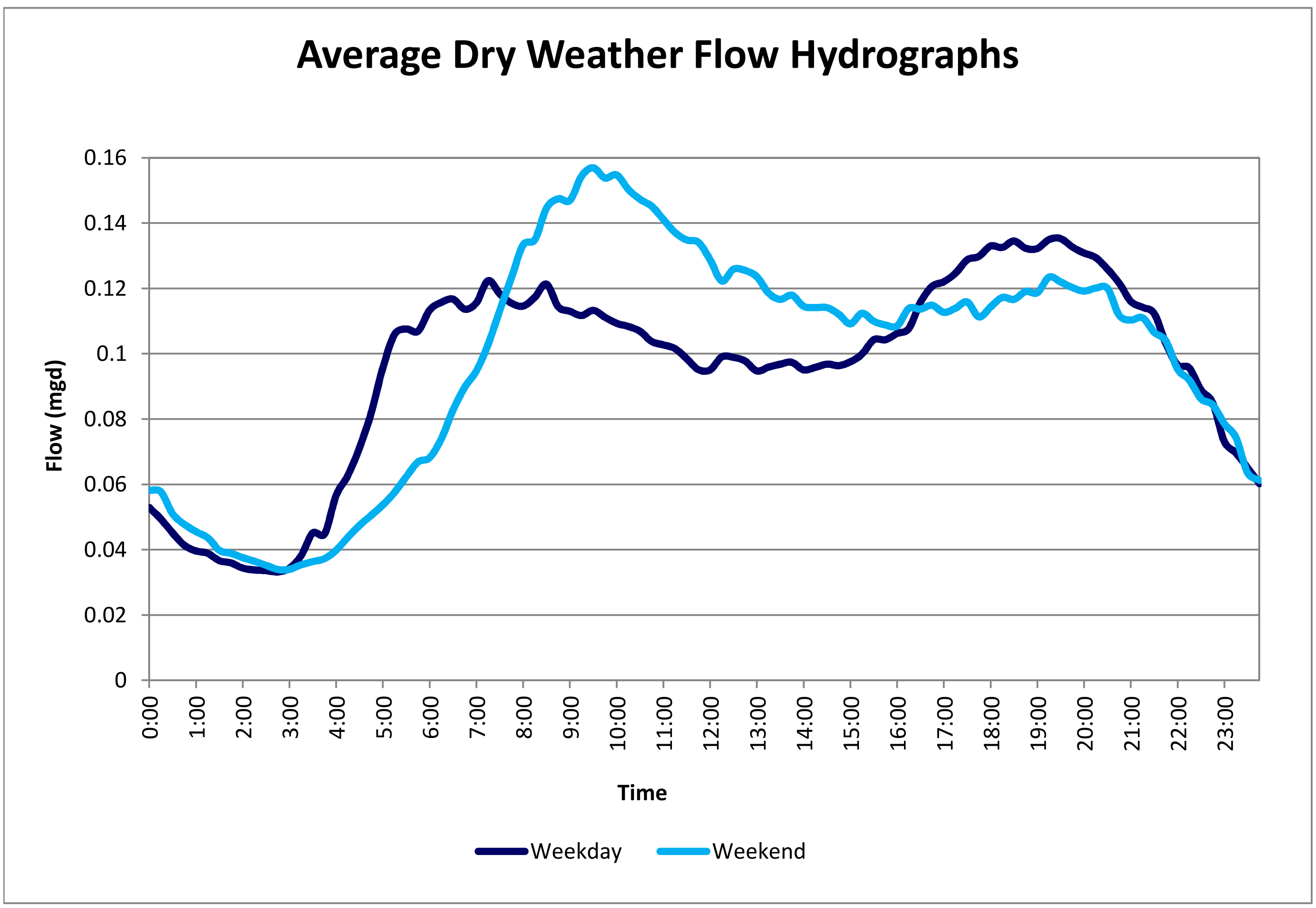
MBE_12

General Information

Site:	MBE_12
Description of Location:	Creekside Apartments North
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	36
Service Population:	1,288

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.096	74	0.135	105	0.033	26	0.35	162
Weekend	0.098	76	0.157	122	0.034	26	0.35	90
Total	**0.097**	**75**	**0.143**	**111**	**0.033**	**26**	**0.35**	**252**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

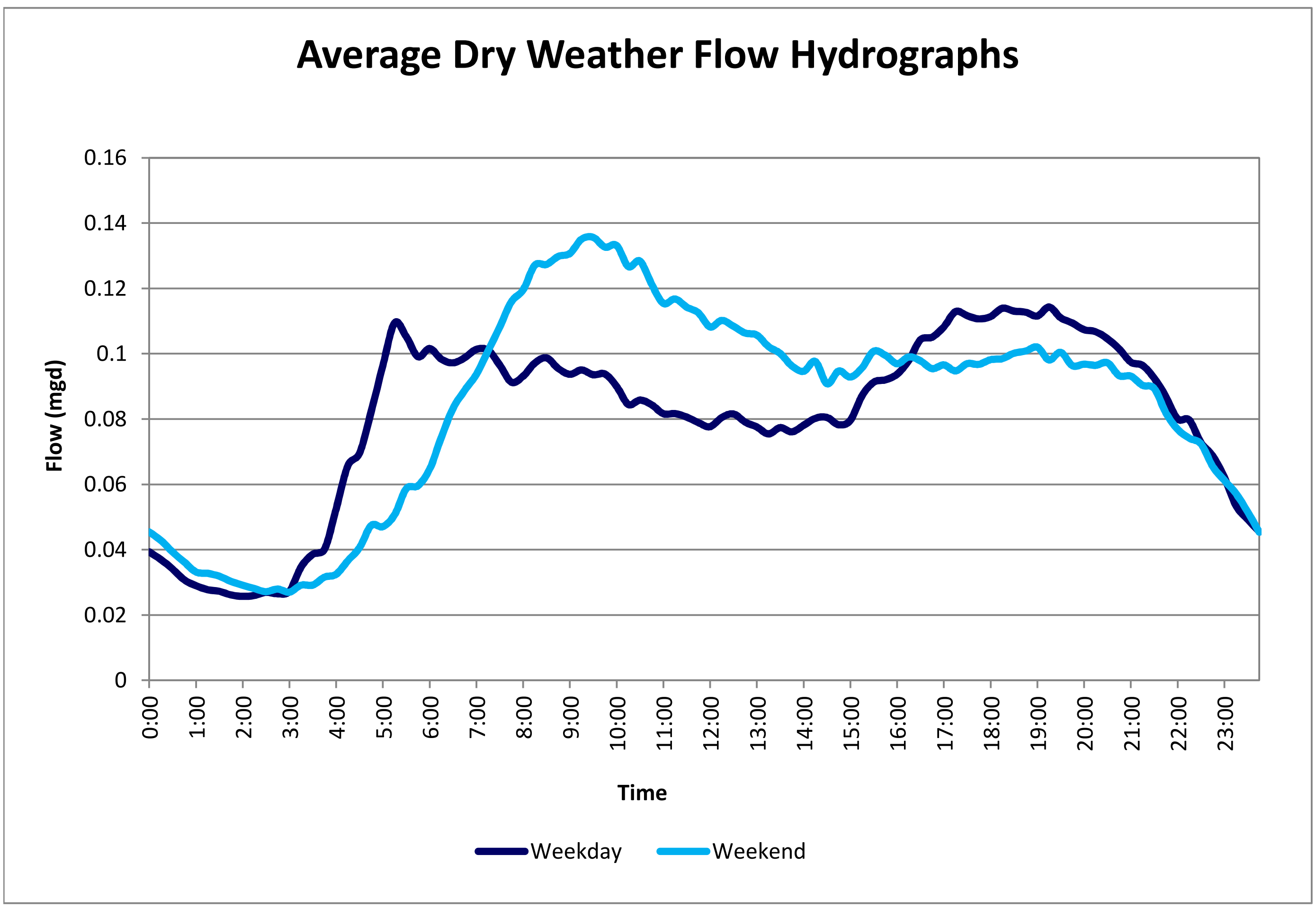
MBE_12

General Information

Site:	MBE_12
Description of Location:	Creekside Apartments North
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	36
Service Population:	1,288

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.081	63	0.114	89	0.026	20	0.32	165
Weekend	0.084	65	0.136	105	0.027	21	0.32	72
Total	**0.082**	**63**	**0.121**	**94**	**0.026**	**20**	**0.32**	**237**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_12

General Information

Site:	MBE_12
Description of Location:	Creekside Apartments North
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	36
Service Population:	1,288

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/10/2014	2.24	1.21	0.331	3.73	2.21	0.226	3.02	2.77
10/29/2012	2.17	0.11	0.281	3.49	0.32	0.243	3.35	2.52
8/13/2013	2.12	0.74	0.244	7.74	1.47	0.158	7.69	1.94
6/7/2013	3.58	0.31	0.231	8.28	0.80	0.213	8.22	2.61
9/3/2012	0.95	0.37	0.222	3.21	0.70	0.159	2.81	1.65
Five-Storm Average	**2.21**	**0.55**	**0.262**	**5.29**	**1.10**	**0.200**	**5.02**	**2.30**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

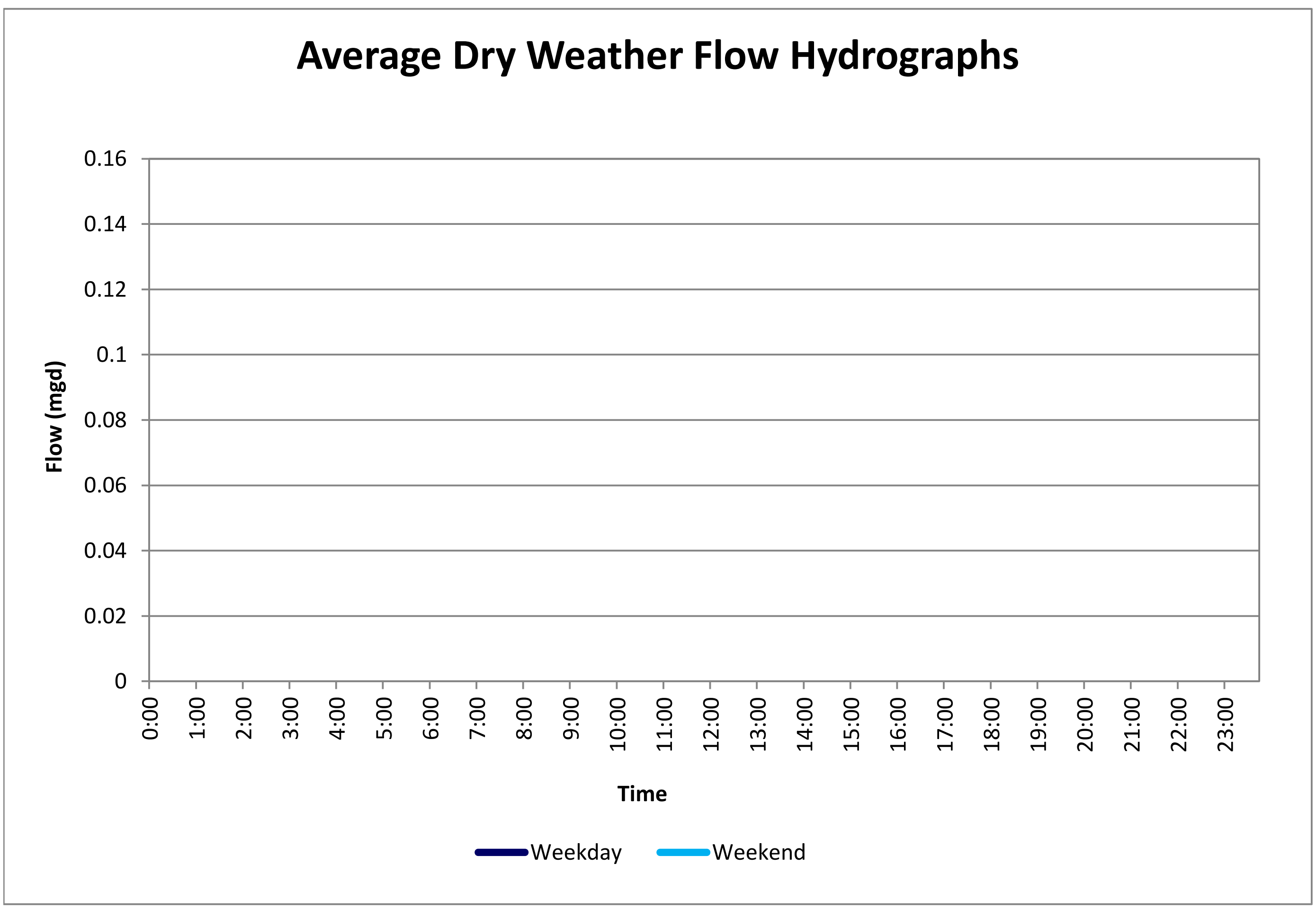
MBE_13

General Information

Site:	MBE_13
Description of Location:	Route 1 and Poquessing Creek
Data Range:	1/1/2012 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	17
Service Population:	12

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Analysis was not completed because the site was determined to have unreliable data for the entire monitoring period.								



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_13

General Information

Site:	MBE_13
Description of Location:	Route 1 and Poquessing Creek
Data Range:	1/1/2012 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Bensalem
Drainage Area (Acres):	17
Service Population:	12

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
Analysis was not completed because the site was determined to have unreliable data for the entire monitoring period.								

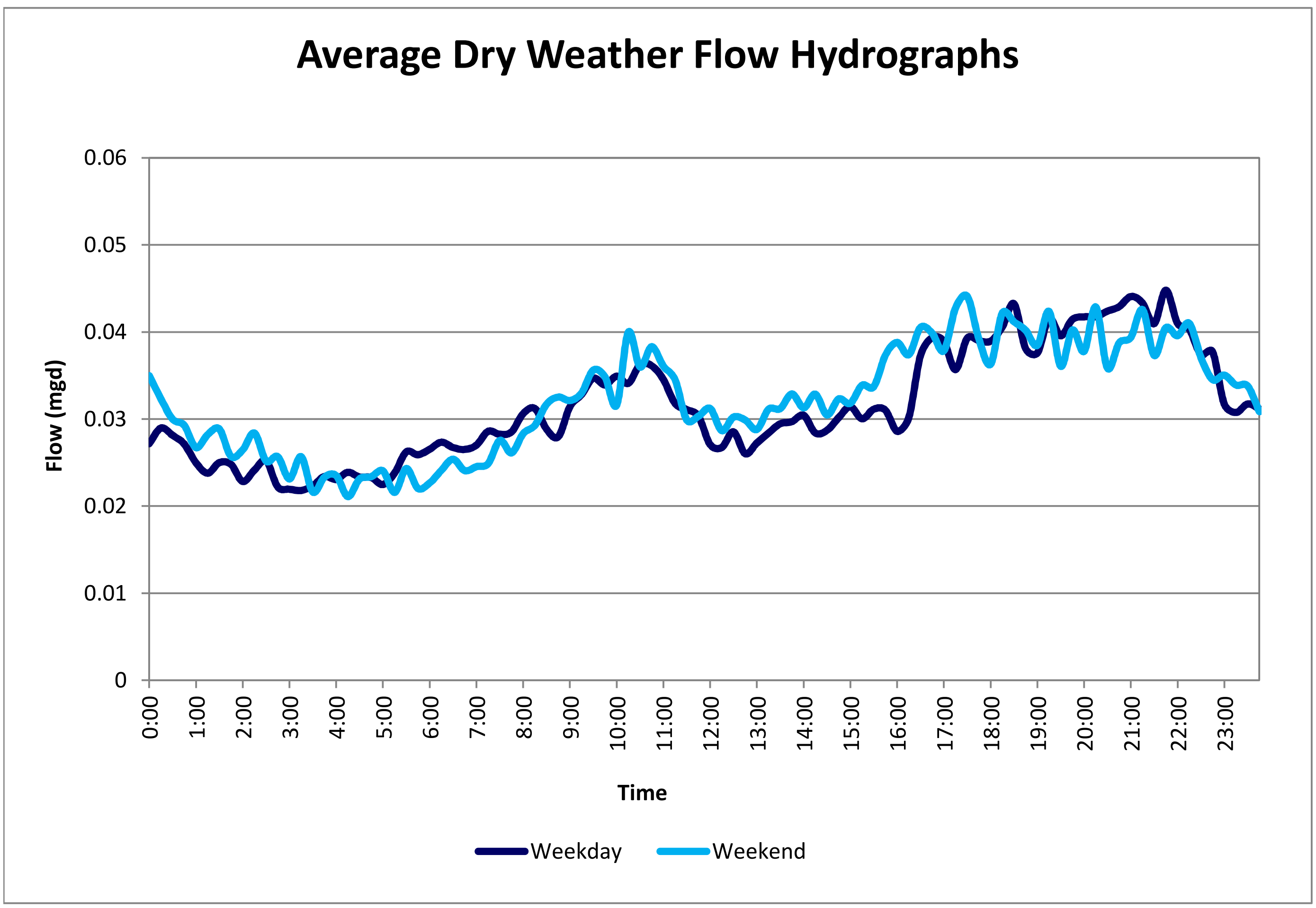
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_14

General Information

Site:	MBE_14
Description of Location:	Old Lincoln Highway and Old Trevose Road
Data Range:	7/1/2012 to 3/31/2013
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	15
Service Population:	30

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.031	1050	0.045	1493	0.022	727	0.69	78
Weekend	0.032	1076	0.044	1470	0.021	703	0.65	35
Total	**0.032**	**1058**	**0.045**	**1486**	**0.022**	**719**	**0.68**	**113**



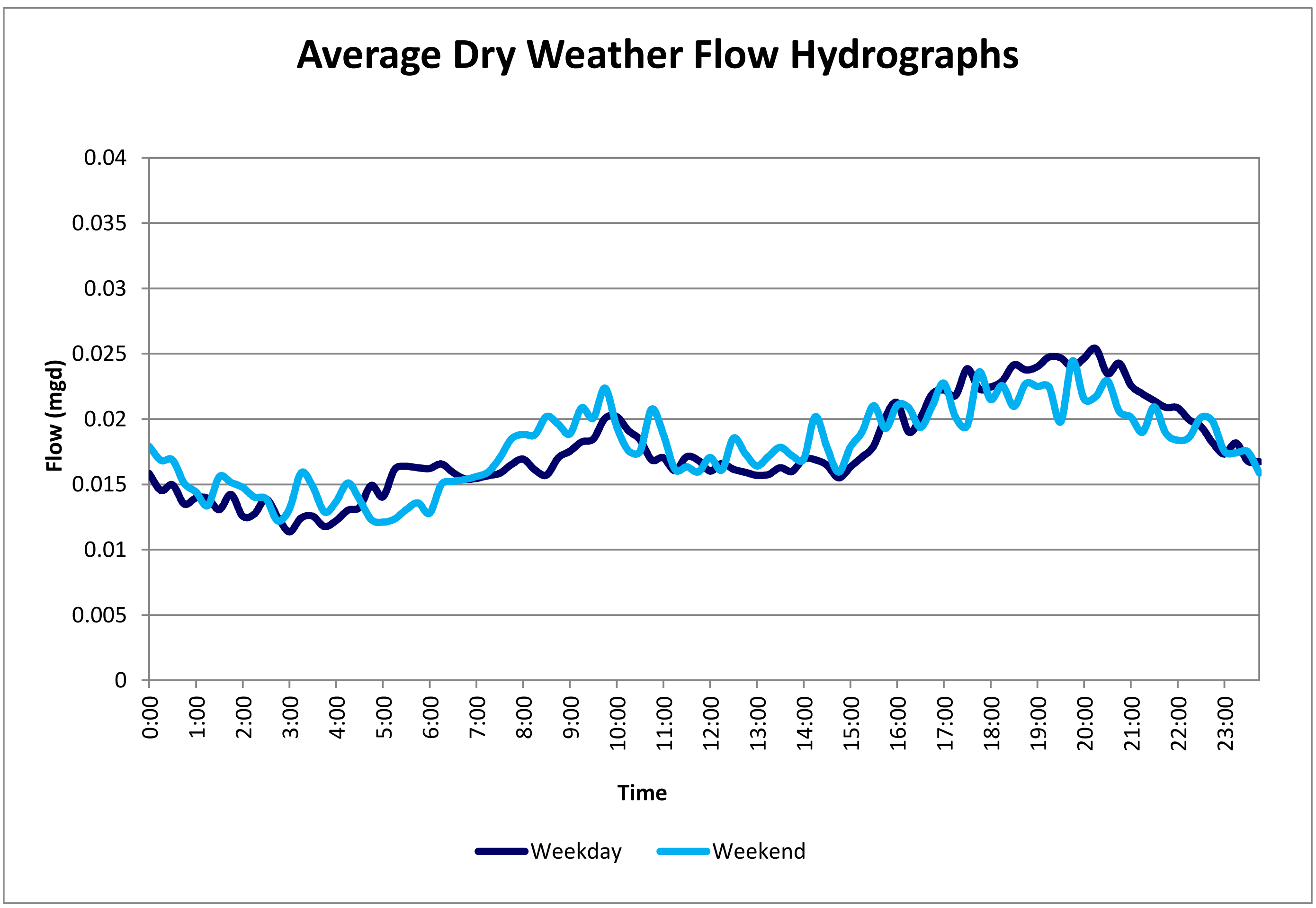
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_14

General Information

Site:	MBE_14
Description of Location:	Old Lincoln Highway and Old Trevose Road
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	15
Service Population:	30

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.018	590	0.025	846	0.011	379	0.64	142
Weekend	0.018	595	0.024	815	0.012	404	0.68	56
Total	**0.018**	**592**	**0.025**	**838**	**0.012**	**386**	**0.65**	**198**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_14

General Information

Site:	MBE_14
Description of Location:	Old Lincoln Highway and Old Trevose Road
Data Range:	7/1/2012 to 6/30/2014
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	15
Service Population:	30

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/7/2013	3.57	0.30	0.596	7.27	0.75	0.426	5.79	24.1
4/10/2013	0.52	0.15	0.412	5.52	0.24	0.266	4.08	15.0
4/29/2013	0.36	0.02	0.351	5.10	0.05	0.171	2.65	9.66
9/22/2013	1.24	0.28	0.284	6.35	0.50	0.183	6.33	10.3
4/8/2014	0.49	0.04	0.251	1.92	0.12	0.075	1.26	4.24
Five-Storm Average	**1.24**	**0.16**	**0.379**	**5.23**	**0.33**	**0.224**	**4.02**	**12.7**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

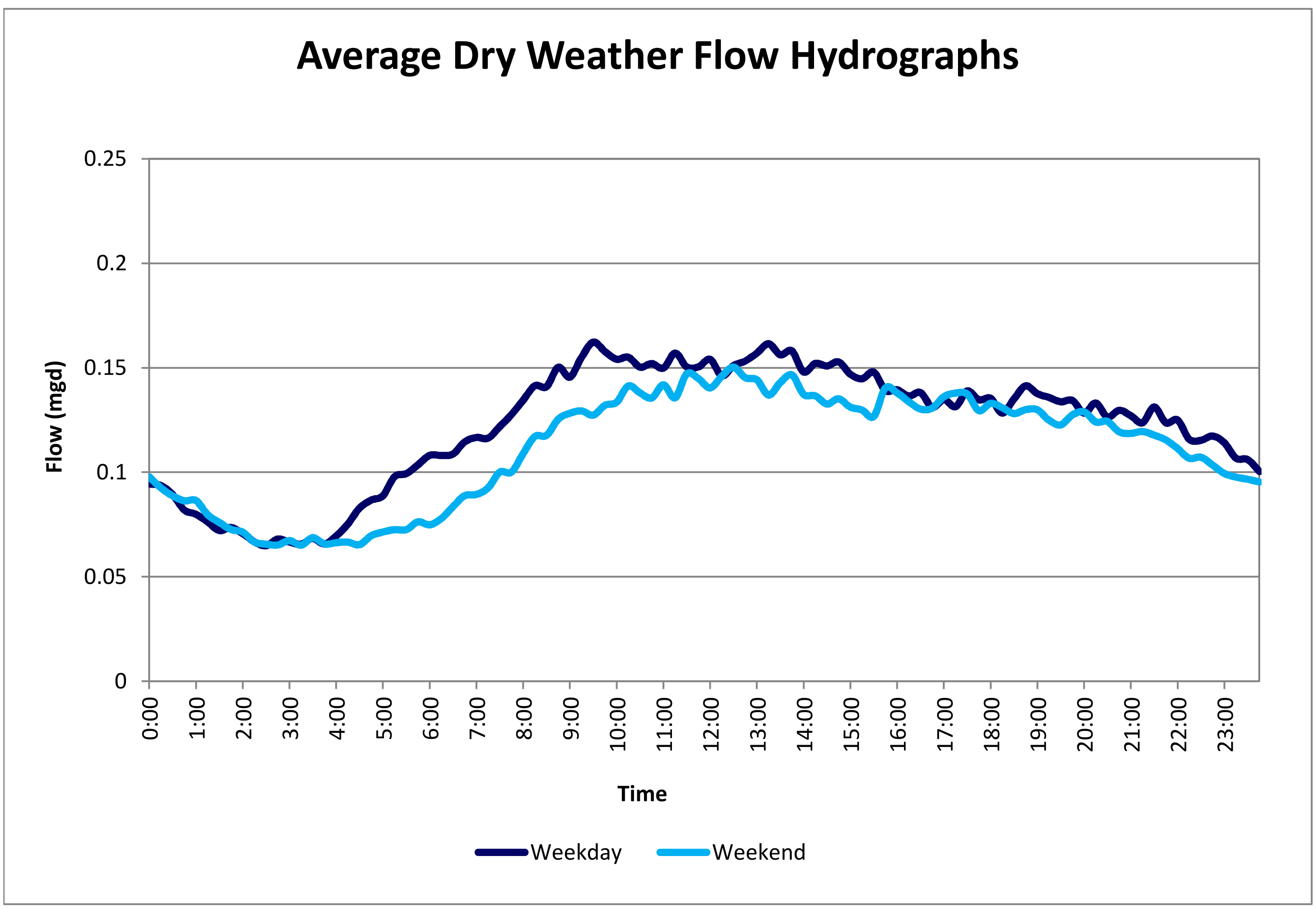
MBE_15

General Information

Site:	MBE_15
Description of Location:	Knights Road and Poquessing Creek
Data Range:	1/1/2010 to 12/31/2010
Pipe Diameter:	9.5"
Contract Community:	Bensalem
Drainage Area (Acres):	145
Service Population:	849

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.122	144	0.162	191	0.065	76	0.53	301
Weekend	0.111	131	0.150	177	0.065	77	0.58	80
Total	**0.120**	**141**	**0.160**	**188**	**0.065**	**76**	**0.54**	**381**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_15

General Information

Site:	MBE_15
Description of Location:	Knights Road and Poquessing Creek
Data Range:	1/1/2010 to 12/31/2010
Pipe Diameter:	9.5"
Contract Community:	Bensalem
Drainage Area (Acres):	145
Service Population:	849

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
10/1/2010	3.66	0.64	0.744	102	1.37	0.661	98.8	5.51
3/29/2010	1.86	0.33	0.690	59.8	0.58	0.532	57.4	4.43
3/30/2010	1.72	0.07	0.653	94.5	0.28	0.585	93.2	4.88
3/13/2010	2.97	0.16	0.640	95.4	0.59	0.604	95.0	5.03
3/14/2010	0.36	0.08	0.628	7.29	0.22	0.532	7.15	4.43
Five-Storm Average	**2.11**	**0.26**	**0.671**	**71.8**	**0.61**	**0.583**	**70.3**	**4.86**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

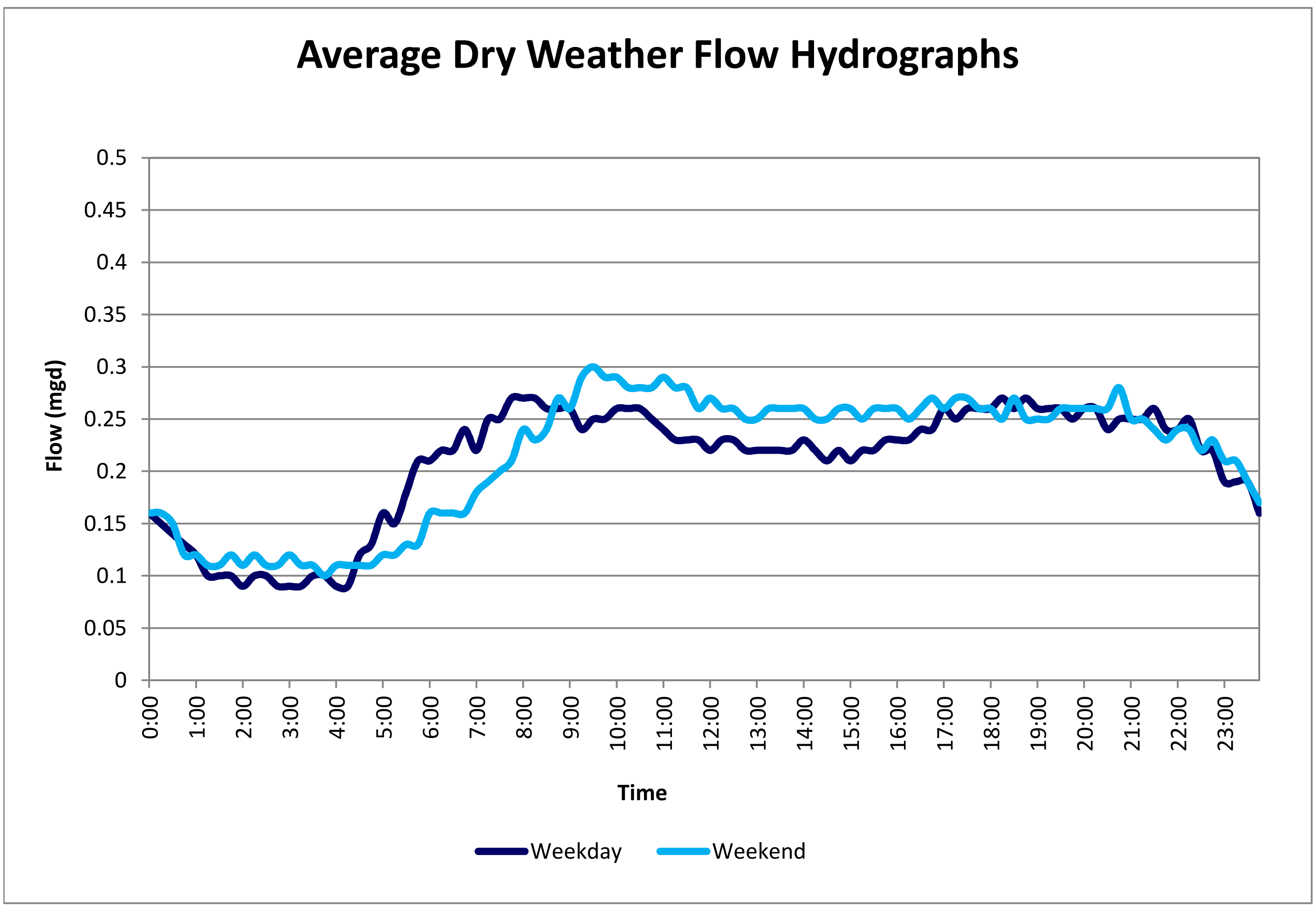
MBE_16

General Information

Site:	MBE_16
Description of Location:	Creekside Apartments South
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	25
Service Population:	904

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.209	231	0.270	299	0.090	100	0.43	29
Weekend	0.215	238	0.300	332	0.100	111	0.46	21
Total	**0.212**	**234**	**0.283**	**313**	**0.094**	**104**	**0.44**	**50**



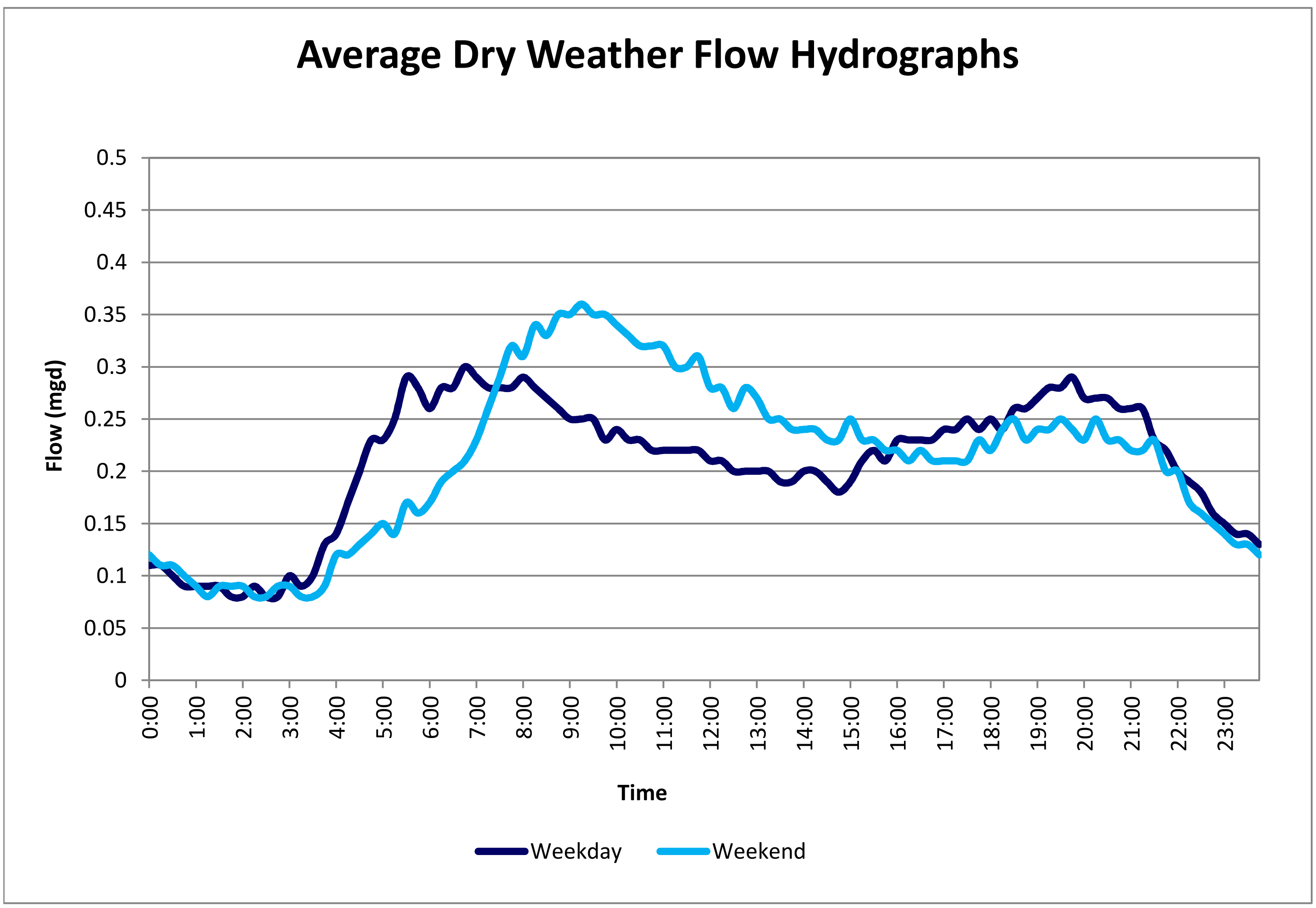
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MBE_16

General Information

Site:	MBE_16
Description of Location:	Creekside Apartments South
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	25
Service Population:	904

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.208	230	0.300	332	0.080	88	0.38	107
Weekend	0.212	235	0.360	398	0.080	88	0.38	44
Total	**0.209**	**232**	**0.317**	**351**	**0.080**	**88**	**0.38**	**151**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_16

General Information

Site:	MBE_16
Description of Location:	Creekside Apartments South
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Bensalem
Drainage Area (Acres):	25
Service Population:	904

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
2/5/2014	1.48	0.082	2.64	NA	0.29	1.28	NA	6.12
8/13/2013	2.12	0.74	1.04	88.3	1.47	0.611	84.9	2.92
6/10/2014	2.24	1.21	0.755	26.6	2.21	0.474	21.7	2.27
10/11/2013	0.86	0.26	0.695	4.48	0.49	0.428	3.93	2.05
3/29/2014	1.65	0.12	0.654	NA	0.37	0.421	NA	2.01
Five-Storm Average	**1.67**	**0.48**	**1.16**	**39.8**	**0.97**	**0.643**	**36.8**	**3.08**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

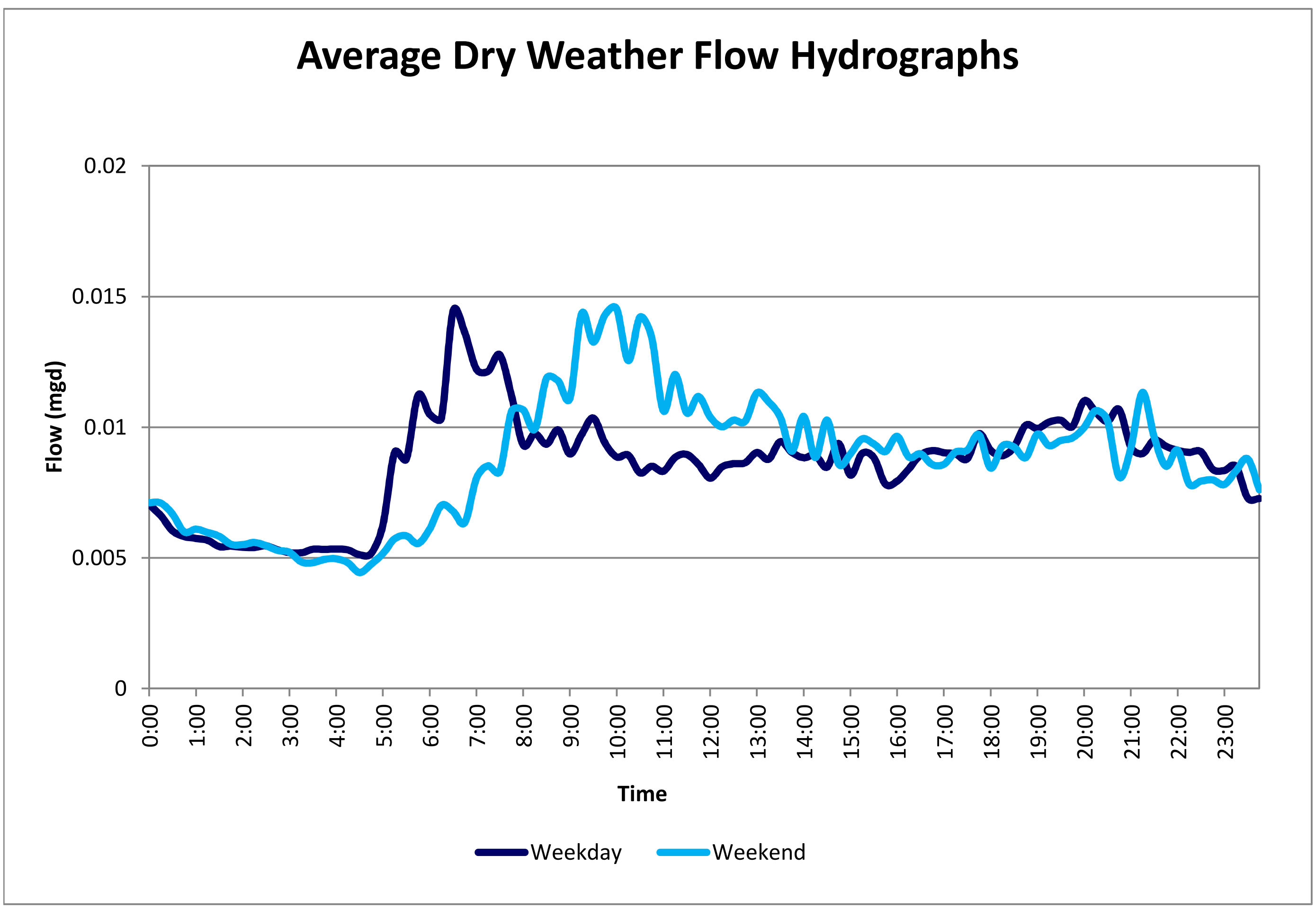
MBE_17

General Information

Site:	MBE_17
Description of Location:	Beechwood Development
Data Range:	2/11/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	27
Service Population:	3

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.009	2863	0.014	4812	0.005	1706	0.60	55
Weekend	0.009	2911	0.015	4843	0.004	1478	0.51	21
Total	**0.009**	**2876**	**0.014**	**4821**	**0.005**	**1643**	**0.57**	**76**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MBE_17

General Information

Site:	MBE_17
Description of Location:	Beechwood Development
Data Range:	2/11/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Bensalem
Drainage Area (Acres):	27
Service Population:	3

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.								

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

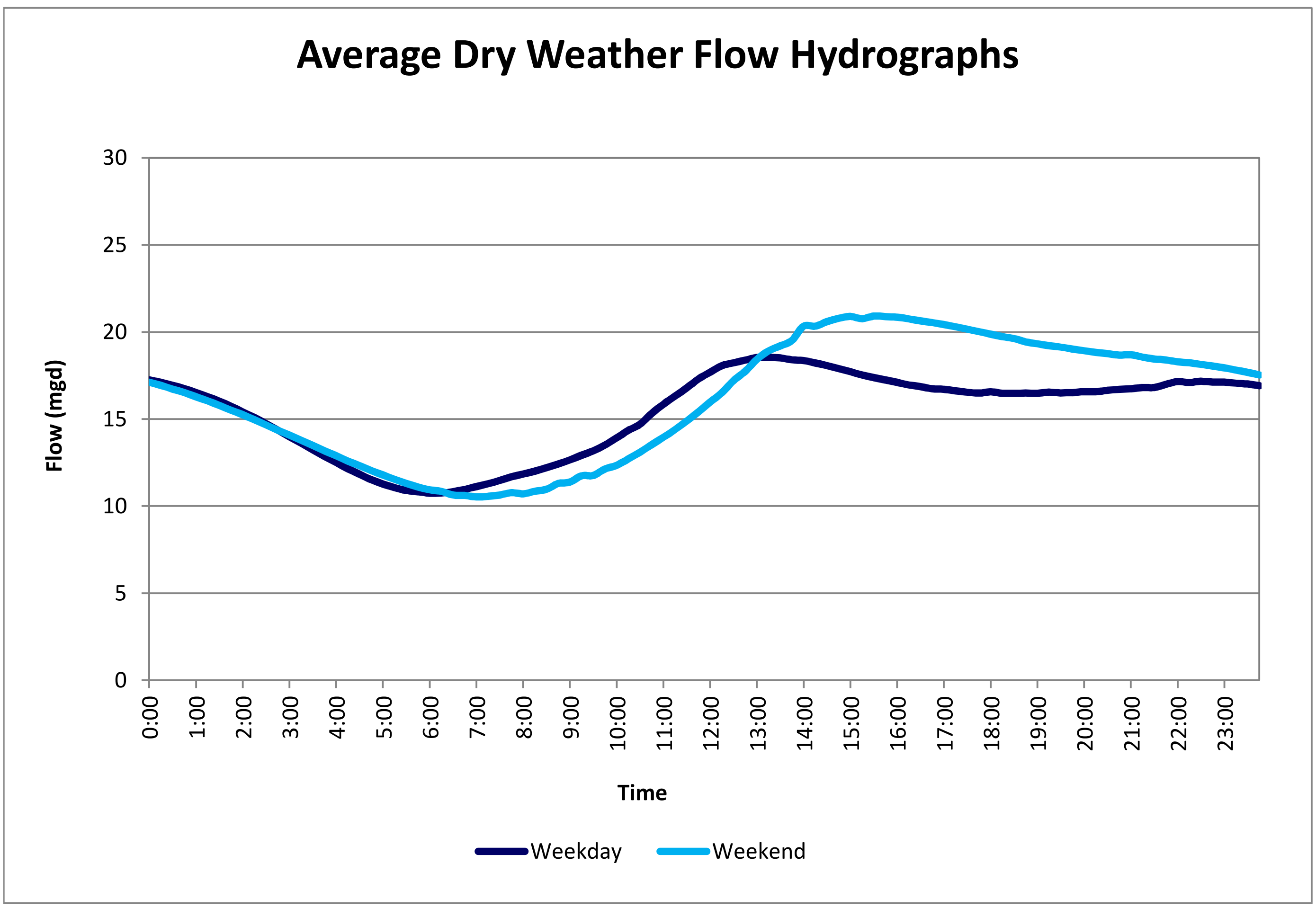
MB_1

General Information

Site:	MB_1
Description of Location:	Totem Road
Data Range:	1/1/2012 to 3/31/13
Pipe Diameter:	42"
Contract Community:	Bucks
Drainage Area (Acres):	24,992
Service Population:	96,028

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	15.4	160	18.6	193	10.7	112	0.70	167
Weekend	16.1	168	20.9	218	10.5	110	0.65	96
Total	**15.7**	**163**	**19.4**	**202**	**10.7**	**111**	**0.68**	**263**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

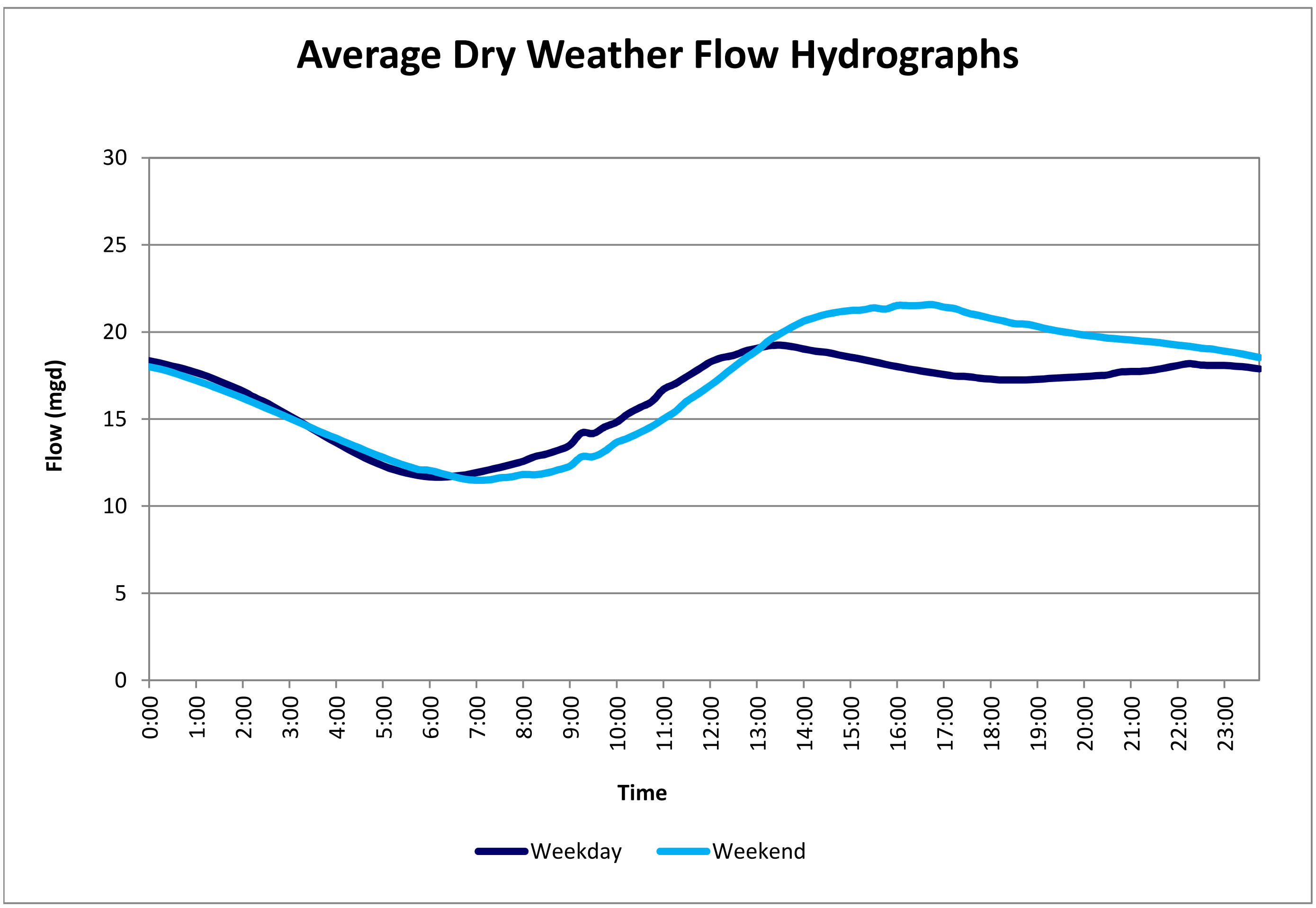
MB_1

General Information

Site:	MB_1
Description of Location:	Totem Road
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	42"
Contract Community:	Bucks
Drainage Area (Acres):	24,992
Service Population:	96,028

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	16.3	170	19.2	200	11.7	121	0.72	152
Weekend	17.0	177	21.6	225	11.5	120	0.67	63
Total	**16.5**	**172**	**19.9**	**207**	**11.6**	**121**	**0.70**	**215**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MB_1

General Information

Site:	MB_1
Description of Location:	Totem Road
Data Range:	1/1/2012 to 6/30/14
Pipe Diameter:	42"
Contract Community:	Bucks
Drainage Area (Acres):	24,992
Service Population:	96,028

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.08	0.18	61.6	NA*	0.63	56.8	NA*	3.44
5/10/2014	0.42	0.08	59.2	NA*	0.16	48.2	NA*	2.92
6/7/2013	3.68	0.26	55.8	NA*	0.63	55.1	NA*	3.34
5/22/2014	1.25	0.21	49.7	NA*	0.44	33.2	NA*	2.01
2/27/2013	0.65	0.06	49.4	NA*	0.18	32.0	NA*	2.04
Five-Storm Average	**2.21**	**0.16**	**55.1**	**NA***	**0.41**	**45.1**	**NA***	**2.75**

* Monitor is a magnectic meter and does not utilze depth sensing technologies.

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

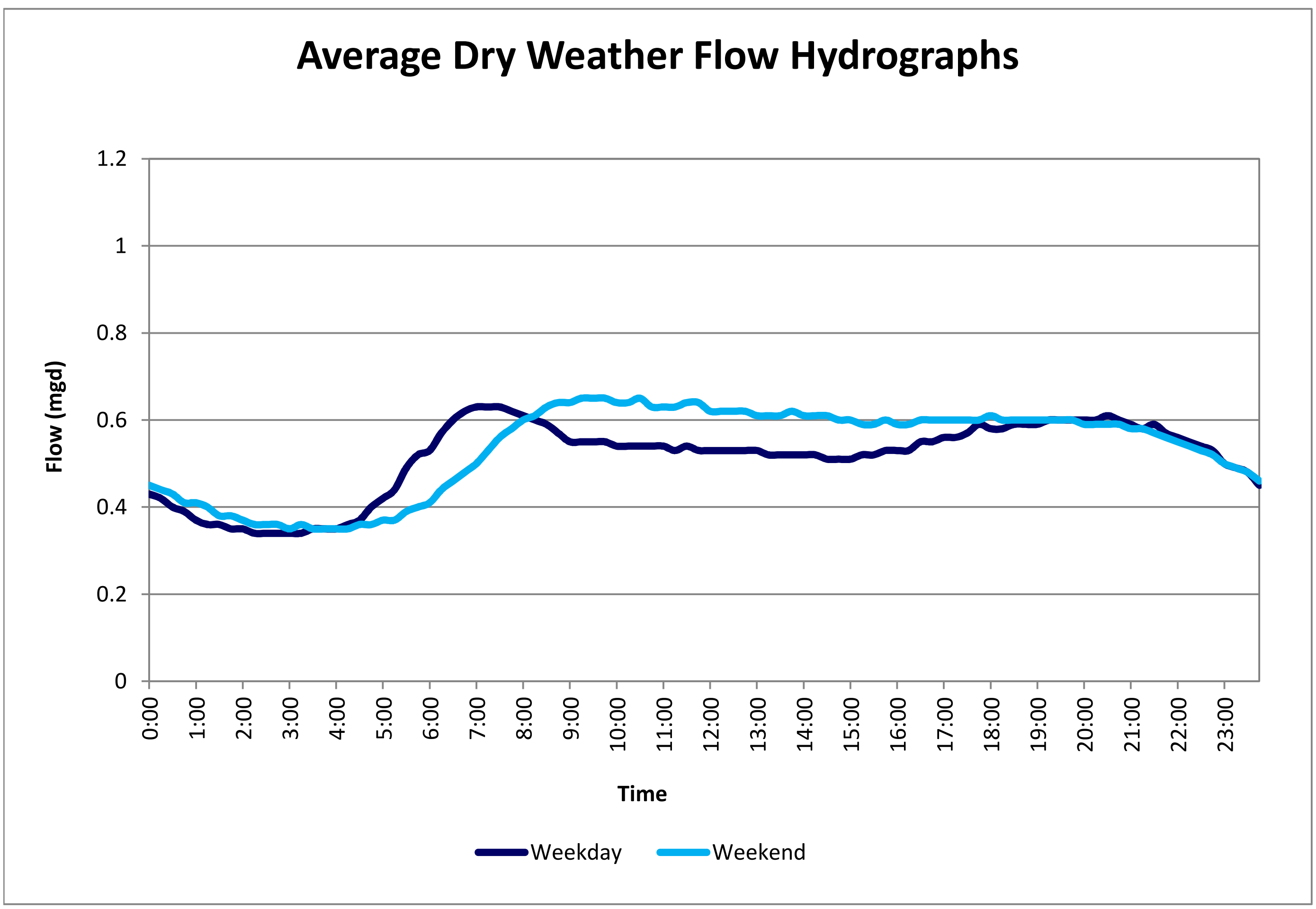
MC_1

General Information

Site:	MC_1
Description of Location:	Cheltenham Avenue
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	16"
Contract Community:	Cheltenham
Drainage Area (Acres):	203
Service Population:	3,533

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.513	145	0.630	178	0.340	96	0.66	125
Weekend	0.534	151	0.650	184	0.350	99	0.66	65
Total	**0.520**	**147**	**0.637**	**180**	**0.343**	**97**	**0.66**	**190**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

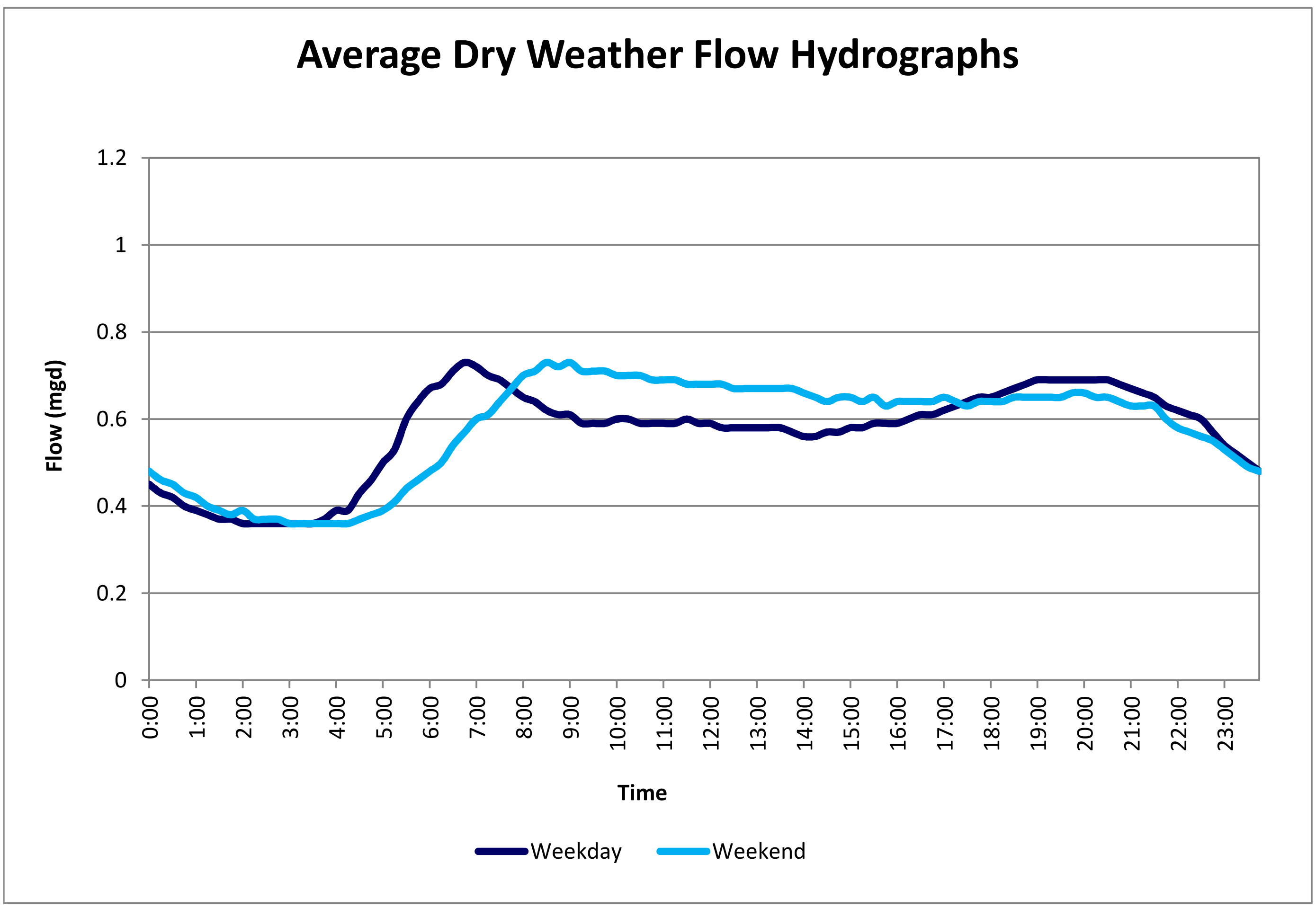
MC_1

General Information

Site:	MC_1
Description of Location:	Cheltenham Avenue
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	16"
Contract Community:	Cheltenham
Drainage Area (Acres):	203
Service Population:	3,533

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.569	161	0.730	207	0.360	102	0.63	123
Weekend	0.579	164	0.730	207	0.360	102	0.62	54
Total	**0.572**	**162**	**0.730**	**207**	**0.360**	**102**	**0.63**	**177**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MC_1

General Information

Site:	MC_1
Description of Location:	Cheltenham Avenue
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	16"
Contract Community:	Cheltenham
Drainage Area (Acres):	203
Service Population:	3,533

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/9/2014	1.80	0.54	2.61	30.1	1.41	2.00	19.2	3.50
5/1/2014	5.22	0.34	2.26	15.4	0.92	1.97	13.5	3.44
5/22/2014	0.21	0.16	2.06	14.2	0.21	1.70	9.24	2.97
4/15/2014	1.05	0.14	1.86	13.9	0.27	1.25	10.6	2.19
8/13/2013	2.39	0.67	1.51	11.1	1.55	1.32	10.3	2.31
Five-Storm Average	**2.13**	**0.37**	**2.06**	**16.9**	**0.87**	**1.65**	**12.6**	**2.88**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

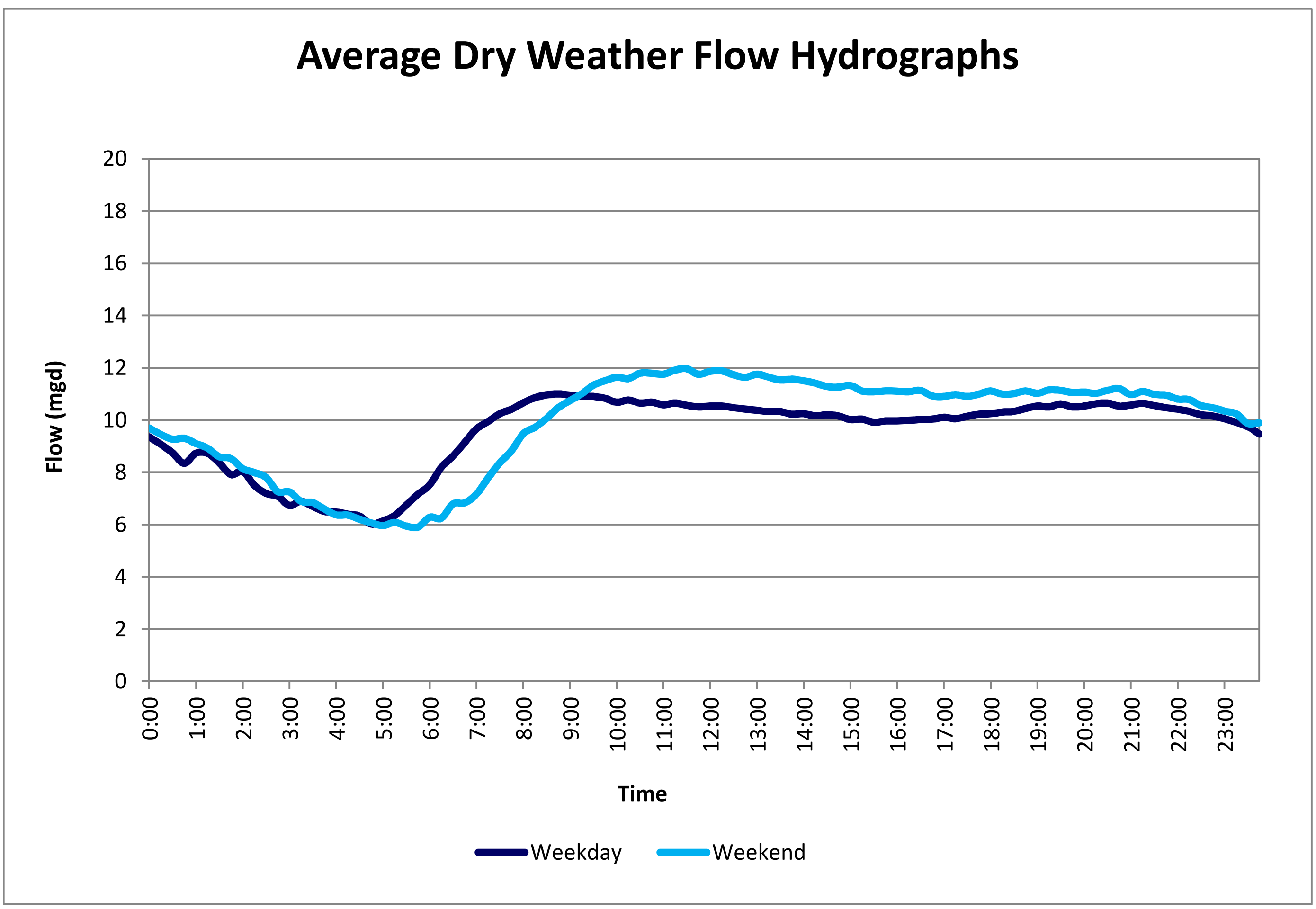
MC_2

General Information

Site:	MC_2
Description of Location:	Tookany Circle
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	36"
Contract Community:	Cheltenham
Drainage Area (Acres):	8,444
Service Population:	64,742

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	9.54	147	11.0	170	6.02	93	0.63	101
Weekend	9.88	153	12.0	185	5.90	91	0.60	53
Total	**9.66**	**149**	**11.3**	**175**	**5.98**	**92**	**0.62**	**154**



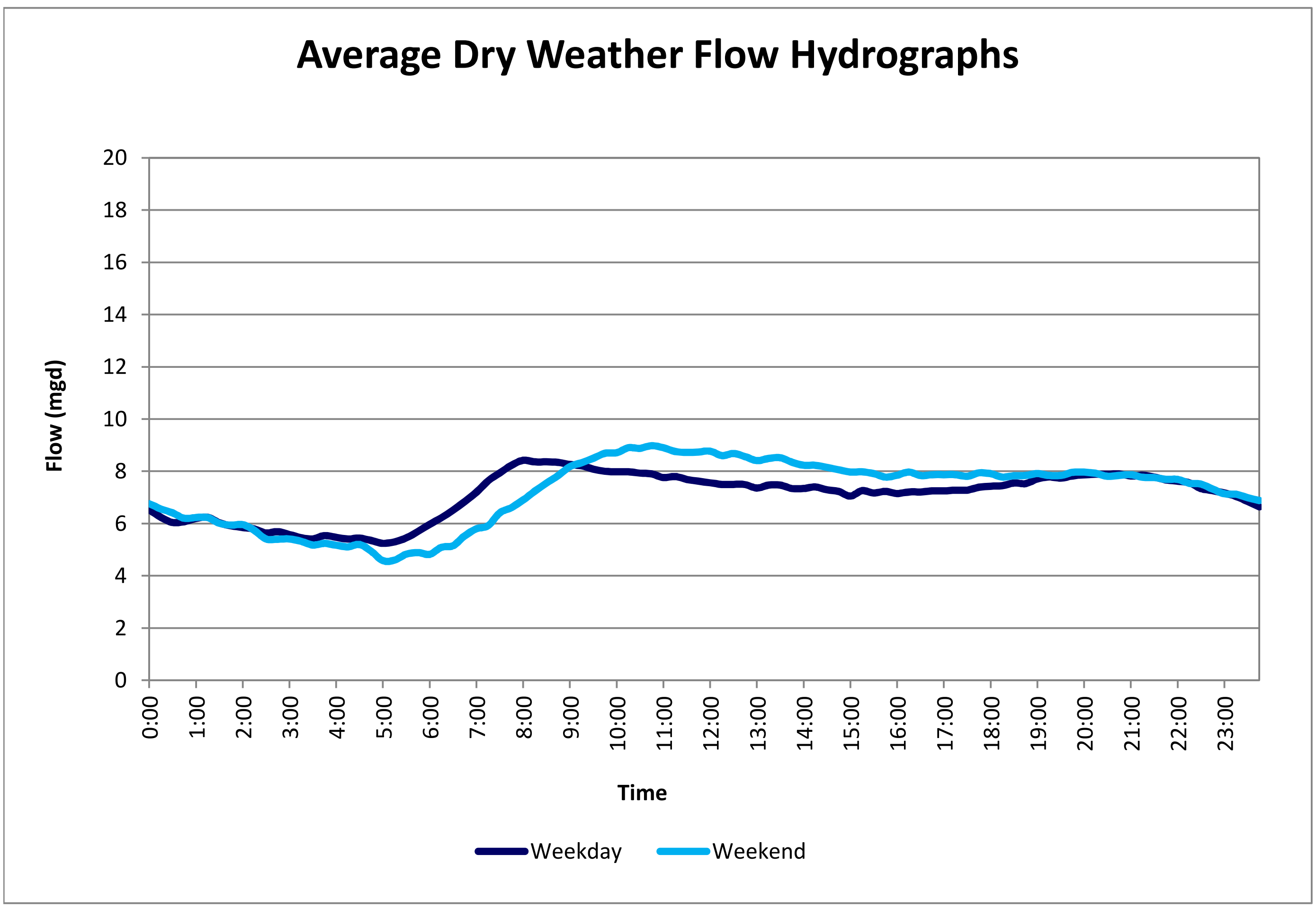
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MC_2

General Information

Site:	MC_2
Description of Location:	Tookany Circle
Data Range:	4/1/2013 to 11/25/2013
Pipe Diameter:	36"
Contract Community:	Cheltenham
Drainage Area (Acres):	8,444
Service Population:	64,742

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	7.08	109	8.42	130	5.24	81	0.74	152
Weekend	7.21	111	8.98	139	4.58	71	0.64	63
Total	**7.12**	**110**	**8.58**	**133**	**5.05**	**78**	**0.71**	**215**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MC_2

General Information

Site:	MC_2
Description of Location:	Tookany Circle
Data Range:	4/1/2012 to 11/25/2013
Pipe Diameter:	36"
Contract Community:	Cheltenham
Drainage Area (Acres):	8,444
Service Population:	64,742

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/22/2012	2.14	0.12	19.8	29.2	0.41	18.3	29.0	1.89
12/21/2012	2.06	0.20	19.3	35.8	0.41	18.1	34.8	1.87
6/7/2013	3.57	0.23	18.8	44.5	0.71	18.4	41.3	2.58
5/27/2012	0.98	0.28	18.8	28.7	0.77	17.5	28.0	1.81
6/10/2013	1.76	0.34	18.2	28.2	0.60	17.2	27.4	2.42
Five-Storm Average	**2.10**	**0.23**	**19.0**	**33.3**	**0.58**	**17.9**	**32.1**	**2.12**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

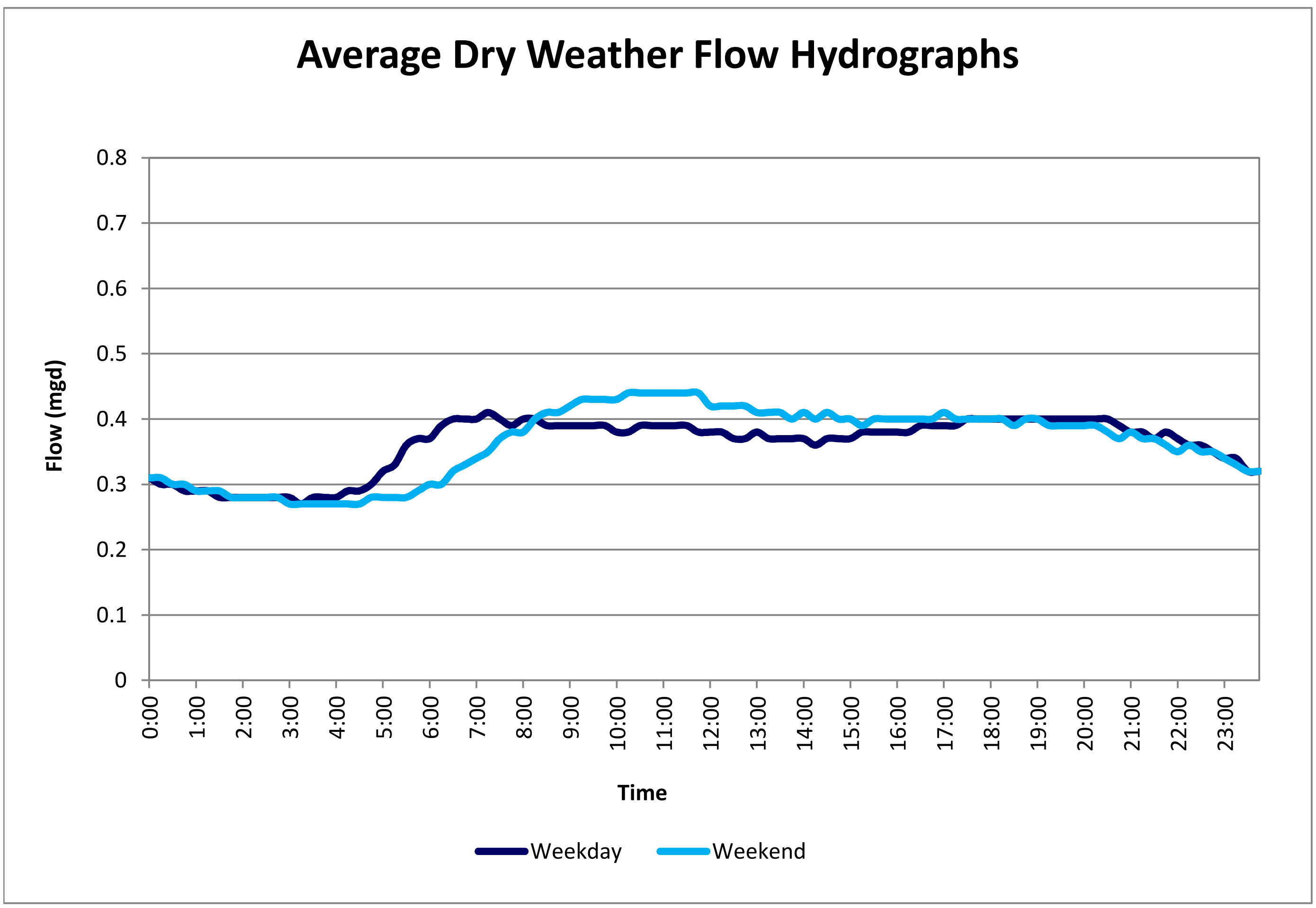
MC_3

General Information

Site:	MC_3
Description of Location:	Fillmore Street
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	10"
Contract Community:	Cheltenham
Drainage Area (Acres):	139
Service Population:	1,208

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.361	299	0.410	339	0.270	224	0.75	115
Weekend	0.364	301	0.440	364	0.270	224	0.74	54
Total	**0.362**	**300**	**0.420**	**347**	**0.270**	**224**	**0.75**	**169**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

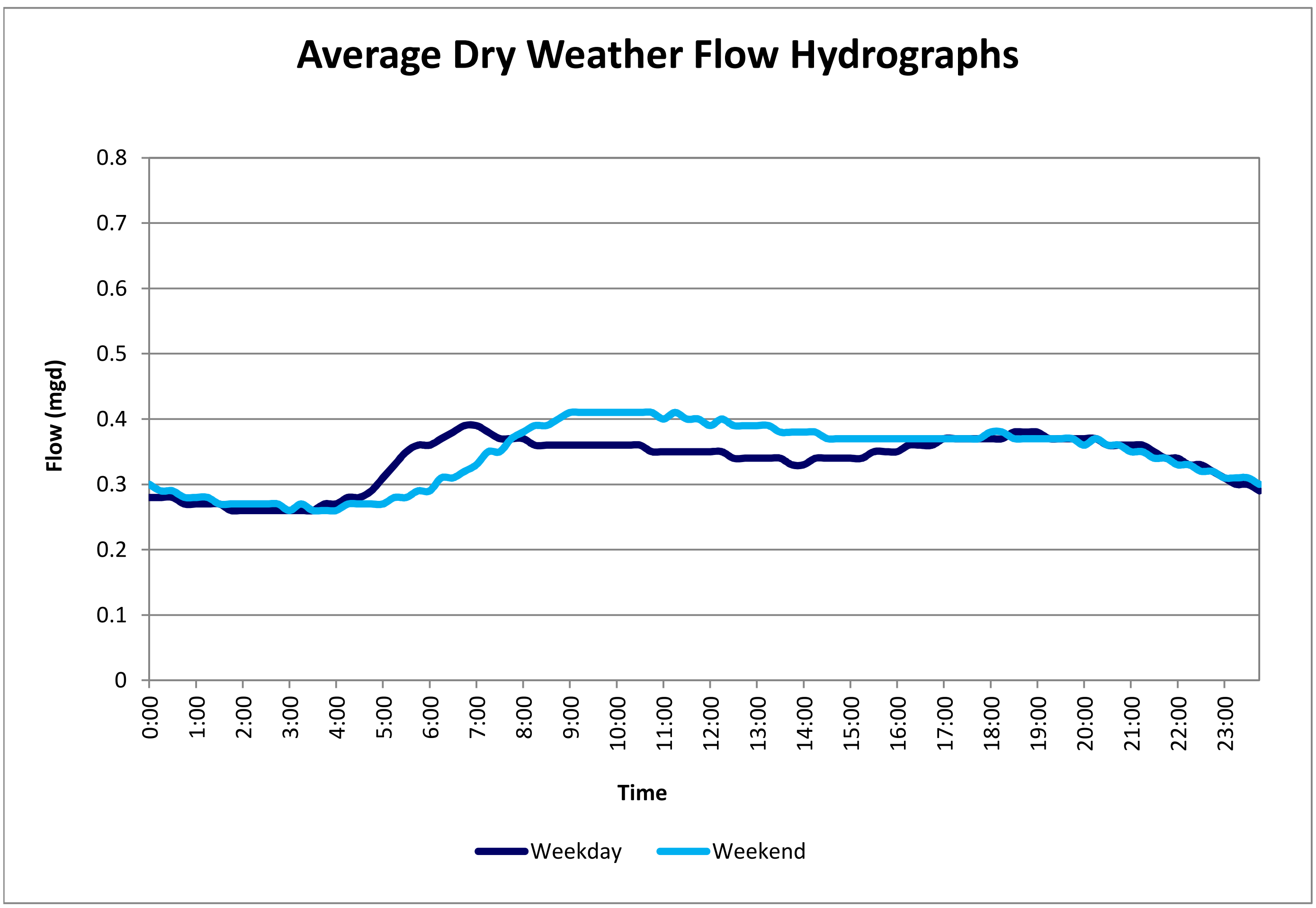
MC_3

General Information

Site:	MC_3
Description of Location:	Fillmore Street
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Cheltenham
Drainage Area (Acres):	139
Service Population:	1,208

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.336	278	0.390	323	0.260	215	0.77	171
Weekend	0.344	285	0.410	339	0.260	215	0.76	83
Total	**0.338**	**280**	**0.397**	**328**	**0.260**	**215**	**0.77**	**254**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MC_3

General Information

Site:	MC_3
Description of Location:	Fillmore Street
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Cheltenham
Drainage Area (Acres):	139
Service Population:	1,208

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2013	5.11	0.22	1.10	10.3	0.81	1.02	10.2	3.02
9/4/2012	3.16	0.73	1.04	9.38	1.47	0.875	8.99	2.42
6/9/2014	1.61	0.39	0.809	9.22	1.16	0.748	8.95	2.21
8/13/2013	2.07	0.73	0.784	15.8	1.40	0.725	10.6	2.14
7/20/2012	1.06	0.37	0.750	8.12	0.60	0.610	7.61	1.69
Five-Storm Average	**2.60**	**0.49**	**0.897**	**10.6**	**1.09**	**0.796**	**9.27**	**2.30**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

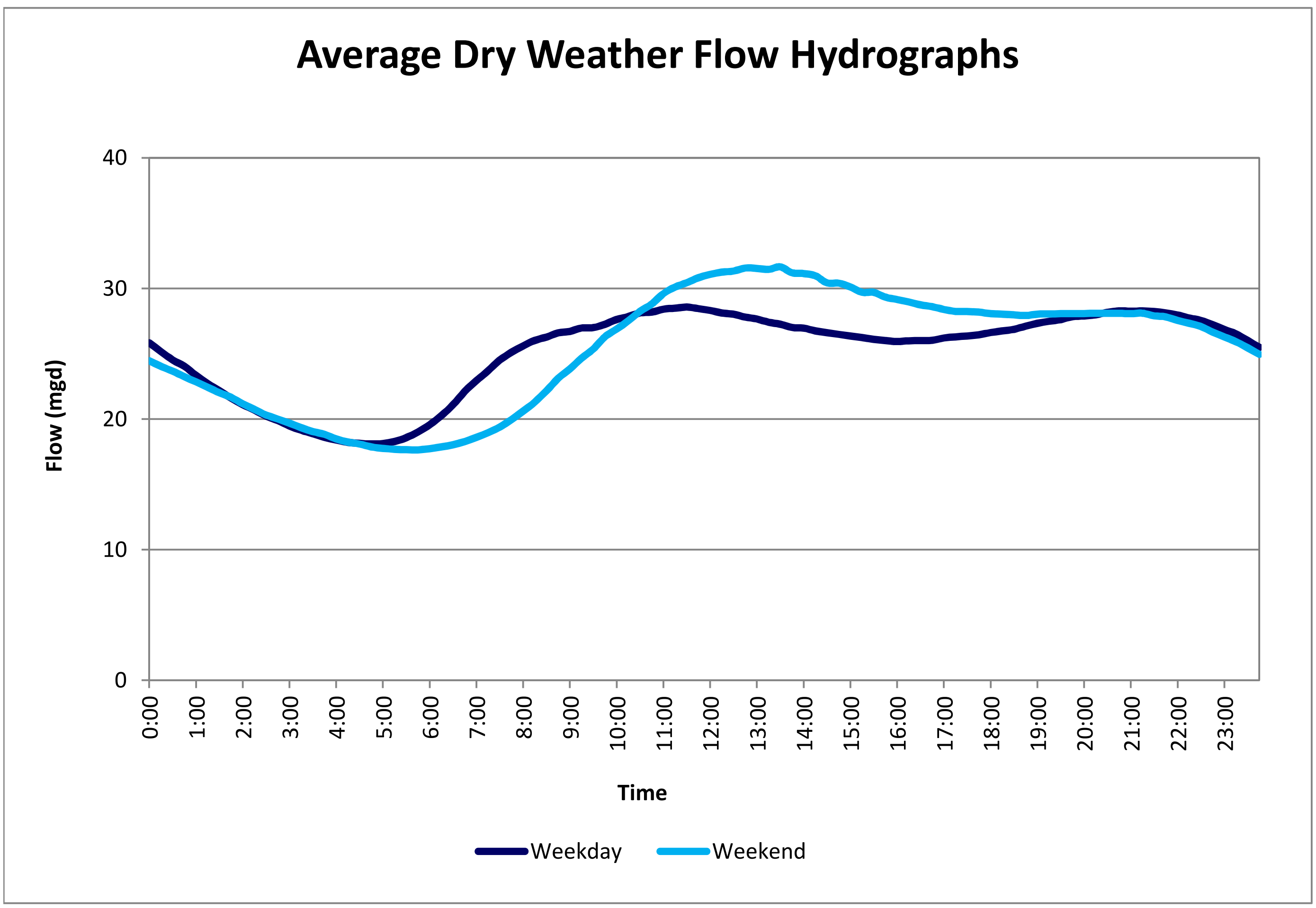
MD_1

General Information

Site:	MD_1
Description of Location:	Penrose Avenue
Data Range:	4/1/2011 to 3/31/2012
Pipe Diameter:	66"
Contract Community:	DELCORA
Drainage Area (Acres):	41,340
Service Population:	277,202

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	25.1	91	28.6	103	18.1	65	0.72	171
Weekend	25.4	92	31.7	114	17.6	64	0.70	54
Total	**25.2**	**91**	**29.3**	**106**	**18.0**	**65**	**0.71**	**225**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

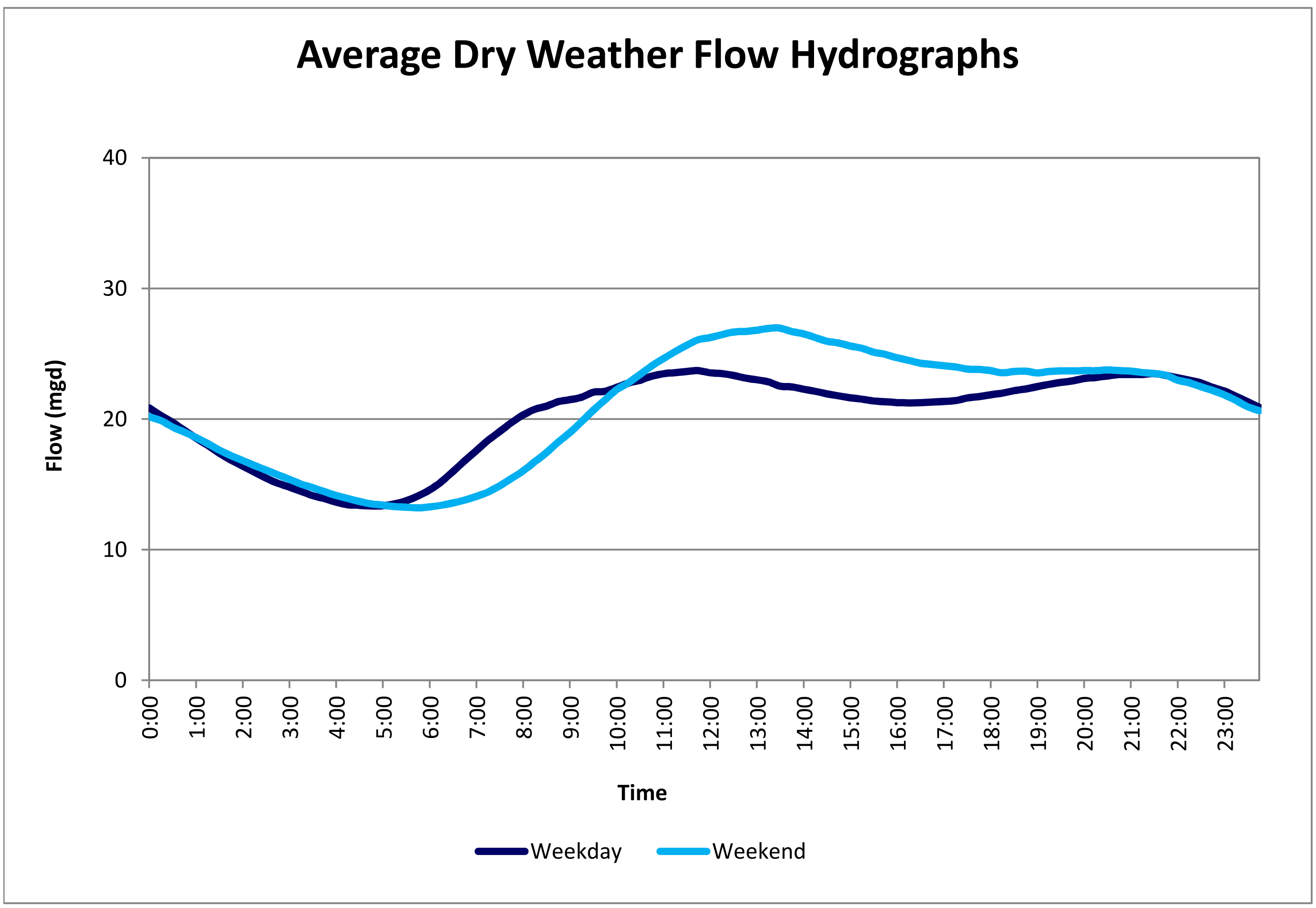
MD_1

General Information

Site:	MD_1
Description of Location:	Penrose Avenue
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	66"
Contract Community:	DELCORA
Drainage Area (Acres):	41,340
Service Population:	277,202

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	20.3	73	23.7	85	13.4	48	0.66	152
Weekend	20.9	75	27.0	97	13.2	48	0.63	63
Total	**20.5**	**74**	**24.7**	**89**	**13.3**	**48**	**0.65**	**215**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

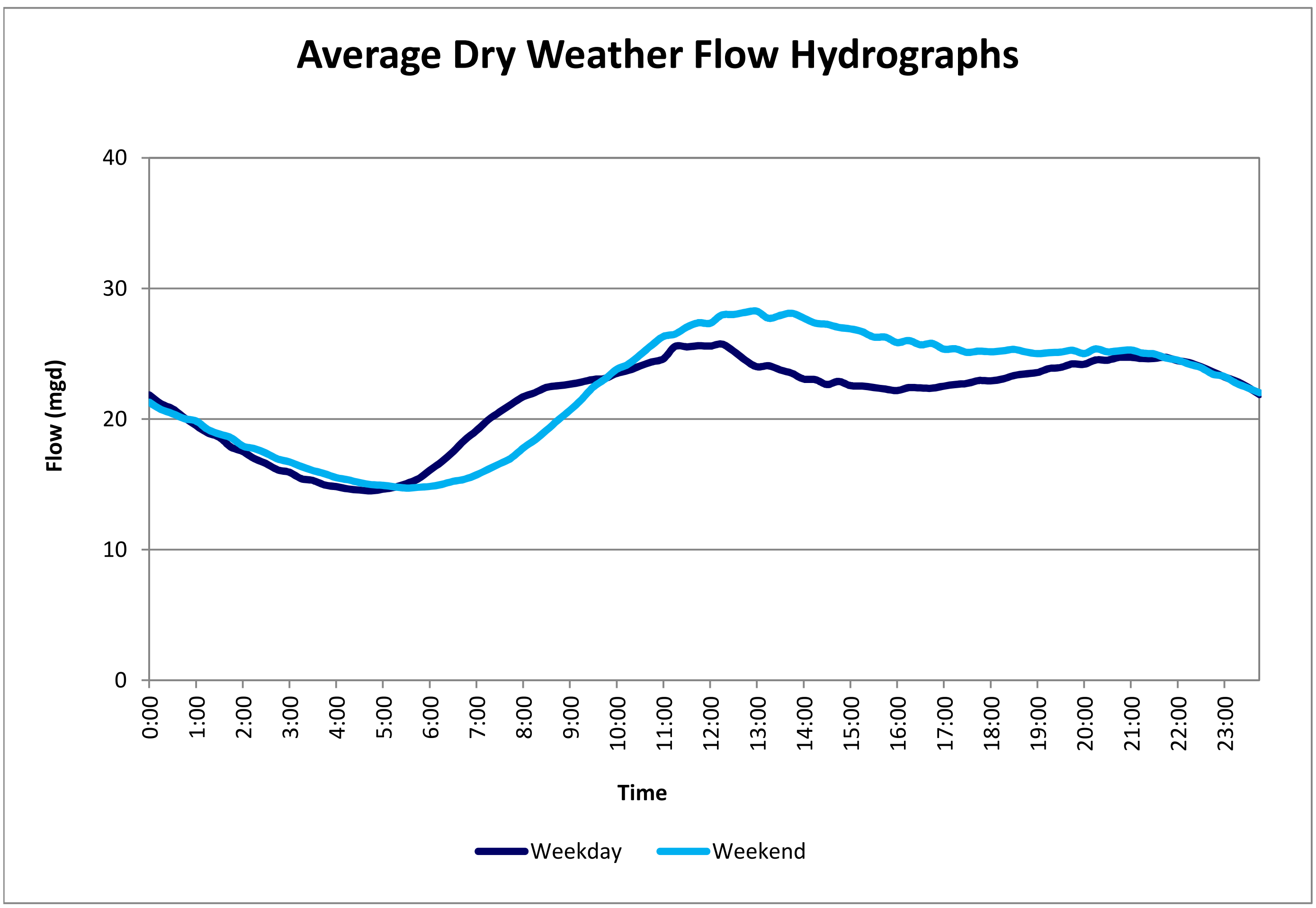
MD_1

General Information

Site:	MD_1
Description of Location:	Penrose Avenue
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	66"
Contract Community:	DELCORA
Drainage Area (Acres):	41,340
Service Population:	277,202

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	21.5	78	25.7	93	14.5	52	0.67	144
Weekend	22.3	80	28.3	102	14.7	53	0.66	70
Total	**21.8**	**78**	**26.6**	**96**	**14.6**	**53**	**0.67**	**214**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MD_1

General Information

Site:	MD_1
Description of Location:	Penrose Avenue
Data Range:	4/1/2011 to 6/30/2014
Pipe Diameter:	66"
Contract Community:	DELCORA
Drainage Area (Acres):	41,340
Service Population:	277,202

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
9/6/2011	3.85	0.20	106	NA*	0.51	100	NA*	3.97
6/7/2013	3.59	0.15	105	NA*	0.57	105	NA*	4.82
9/8/2011	1.80	0.25	105	NA*	0.58	99.5	NA*	3.95
4/30/2014	5.23	0.23	105	NA*	0.81	105	NA*	4.82
10/29/2012	4.14	0.12	104	NA*	0.42	104	NA*	5.07
Five-Storm Average	**3.72**	**0.19**	**105**	**NA***	**0.58**	**103**	**NA***	**4.52**

* Monitor is a magnectic meter and does not utilze depth sensing technologies.

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

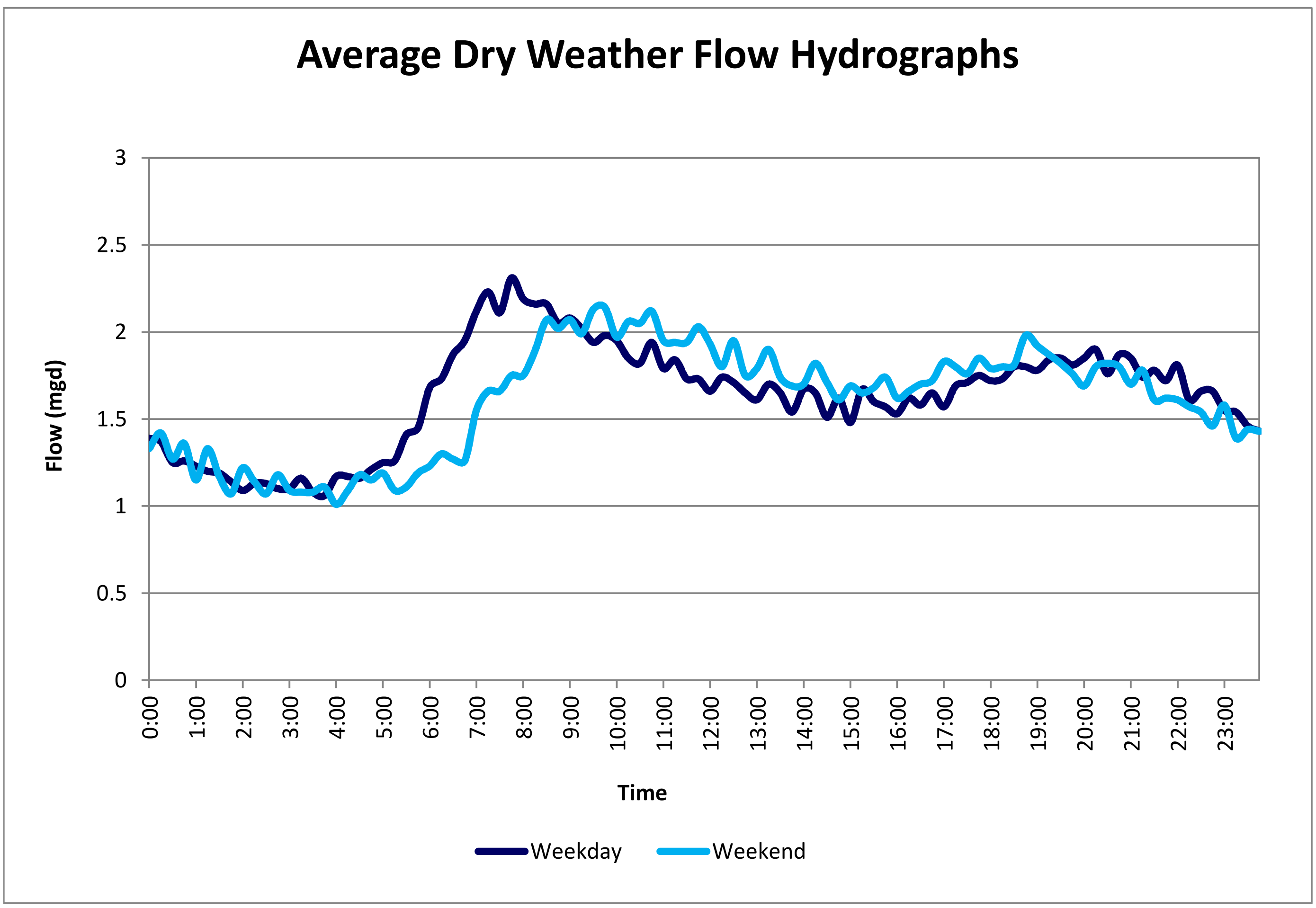
ML_1

General Information

Site:	ML_1
Description of Location:	51st Street
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	24"
Contract Community:	Lower Merion
Drainage Area (Acres):	2,671
Service Population:	15,278

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.63	107	2.31	151	1.06	69	0.65	229
Weekend	1.61	105	2.14	140	1.01	66	0.63	95
Total	**1.63**	**106**	**2.26**	**148**	**1.05**	**68**	**0.64**	**324**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

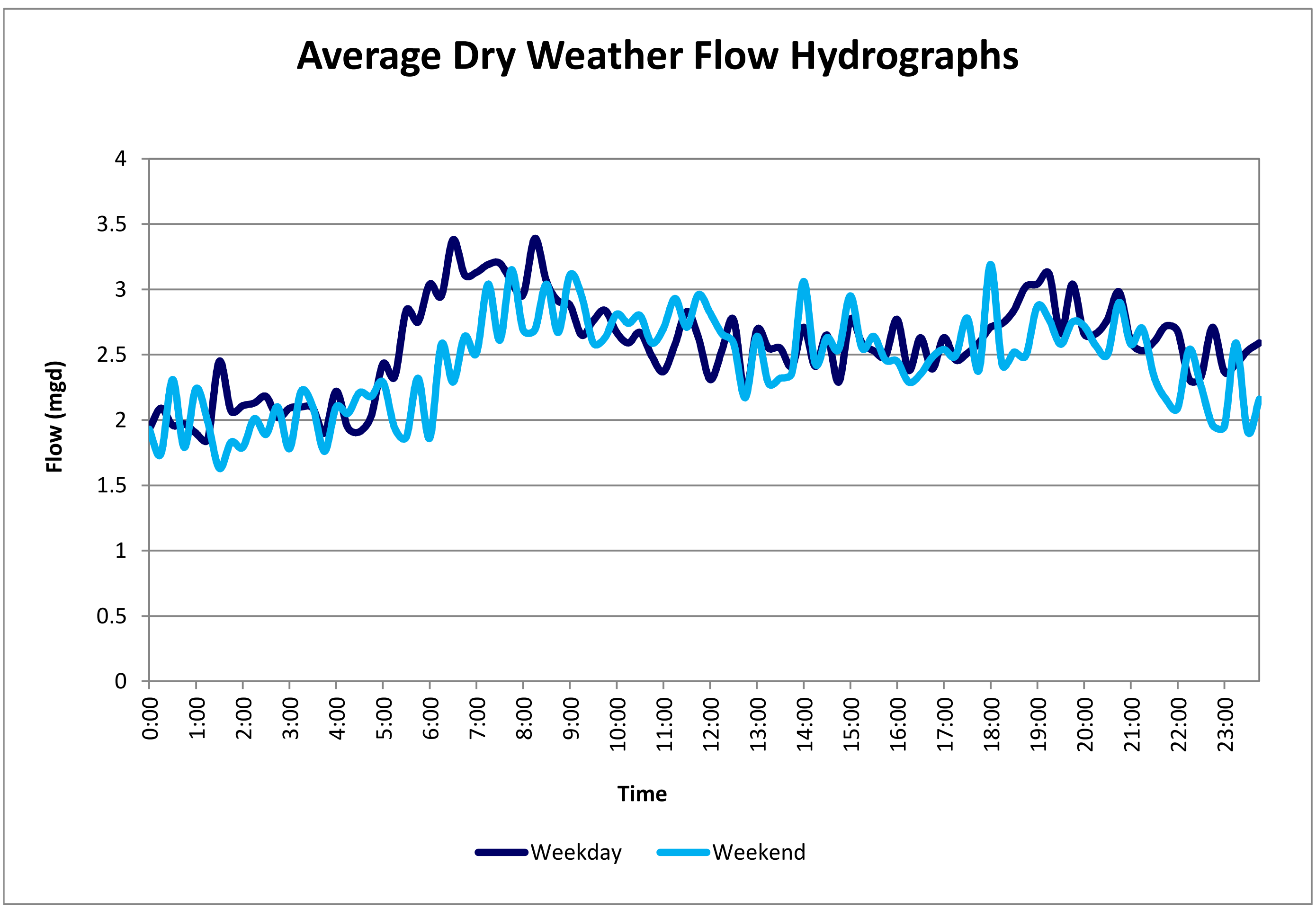
ML_1

General Information

Site:	ML_1
Description of Location:	51st Street
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Lower Merion
Drainage Area (Acres):	2,671
Service Population:	15,278

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	2.56	168	3.39	222	1.85	121	0.72	31
Weekend	2.43	159	3.19	209	1.63	107	0.67	17
Total	**2.52**	**165**	**3.32**	**217**	**1.77**	**116**	**0.70**	**48**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_1

General Information

Site:	ML_1
Description of Location:	51st Street
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Lower Merion
Drainage Area (Acres):	2,671
Service Population:	15,278

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.34	0.32	8.40	20.9	0.87	7.35	20.8	2.92
6/7/2013	3.89	0.26	7.63	18.5	0.80	6.46	17.8	2.56
5/17/2014	2.25	0.22	6.04	17.8	0.72	4.63	17.0	1.84
12/21/2012	2.26	0.18	5.95	18.5	0.44	4.62	17.4	2.83
9/2/2013	1.50	0.62	5.74	18.5	1.21	4.57	18.1	1.81
Five-Storm Average	**3.05**	**0.32**	**6.75**	**18.8**	**0.81**	**5.53**	**18.2**	**2.39**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

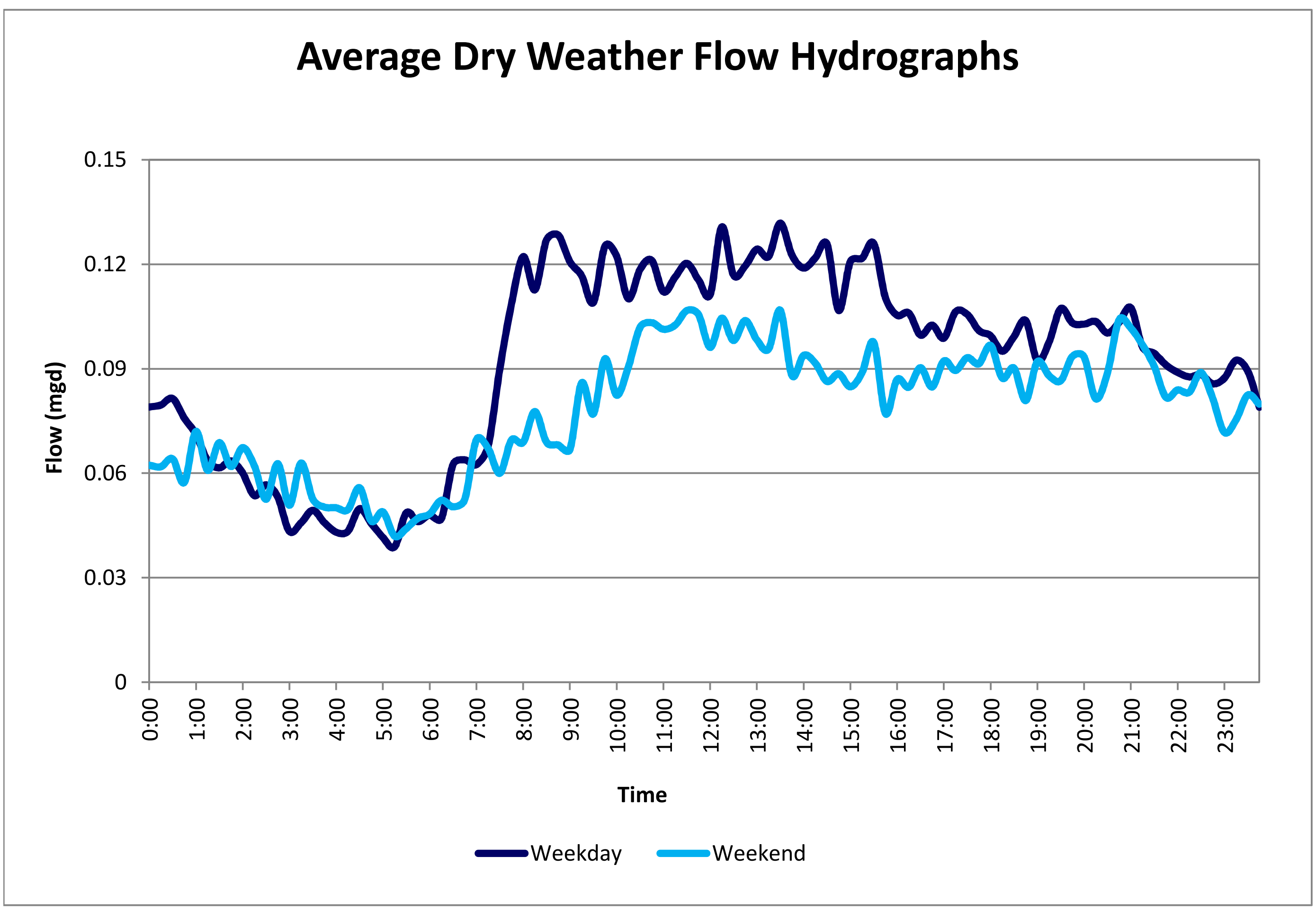
ML_2

General Information

Site:	ML_2
Description of Location:	59th Street
Data Range:	8/16/2007 to 11/16/2007
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	55
Service Population:	379

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.092	243	0.132	348	0.039	103	0.42	55
Weekend	0.079	207	0.107	282	0.042	111	0.53	21
Total	**0.088**	**233**	**0.125**	**329**	**0.040**	**105**	**0.45**	**76**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

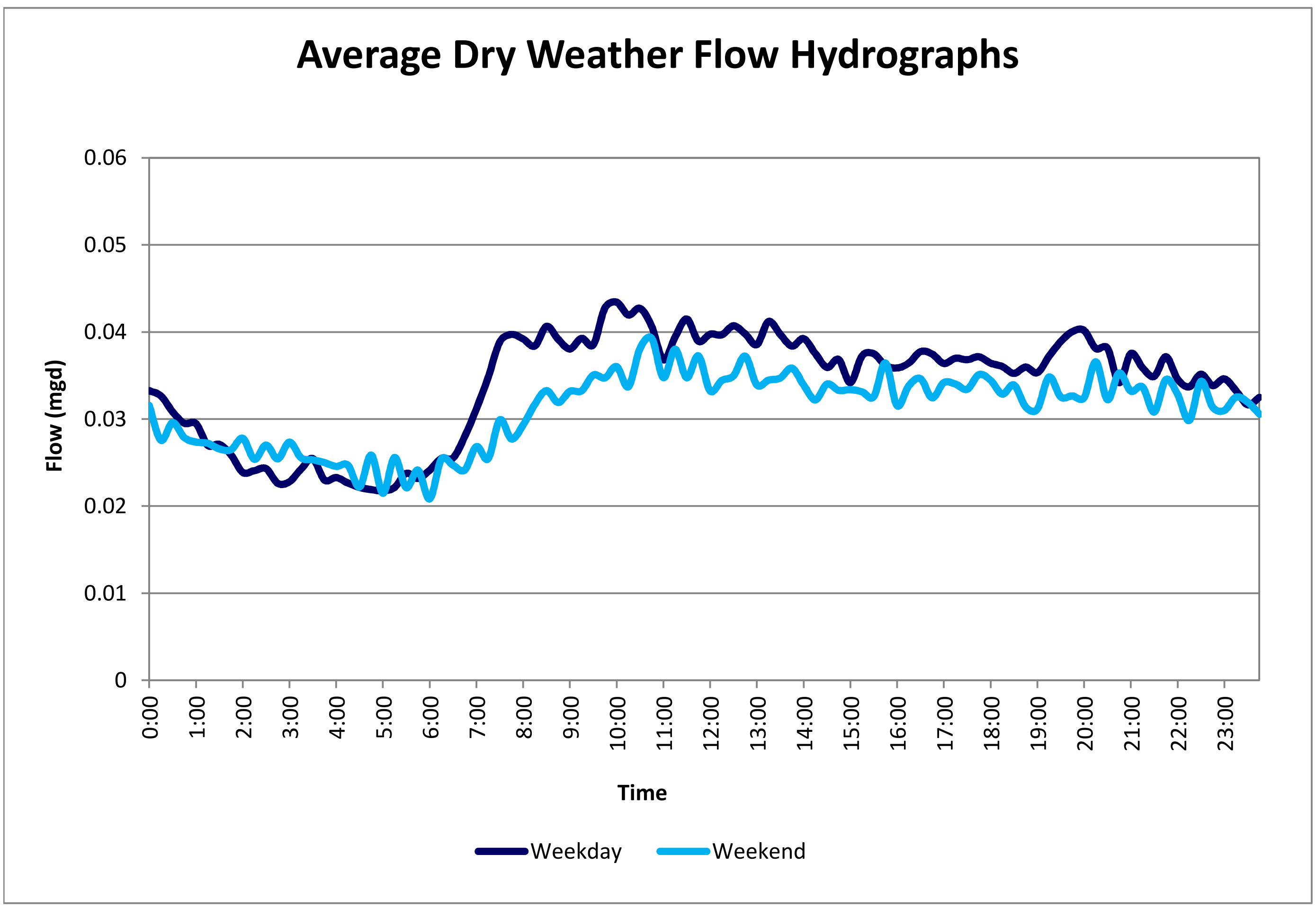
ML_2

General Information

Site:	ML_2
Description of Location:	59th Street
Data Range:	2/6/2010 to 5/31/2010
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	55
Service Population:	379

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.034	90	0.043	115	0.022	57	0.64	41
Weekend	0.031	82	0.039	104	0.021	55	0.67	20
Total	**0.033**	**87**	**0.042**	**111**	**0.021**	**57**	**0.65**	**61**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

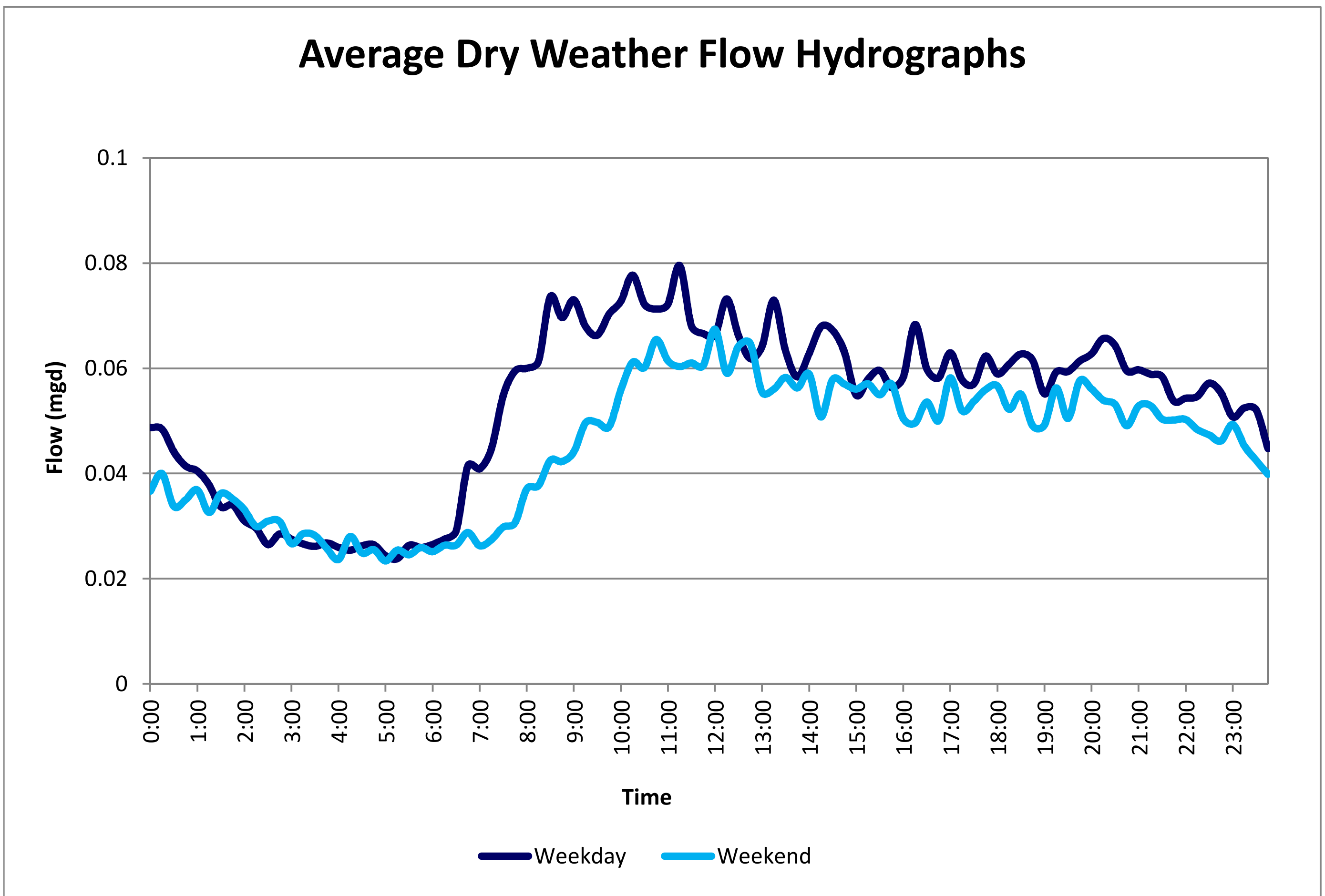
ML_2

General Information

Site:	ML_2
Description of Location:	59th Street
Data Range:	2/13/2013 to 5/17/2013
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	55
Service Population:	379

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.053	140	0.080	210	0.024	63	0.45	50
Weekend	0.045	120	0.067	178	0.023	62	0.52	21
Total	**0.051**	**134**	**0.076**	**200**	**0.024**	**62**	**0.47**	**71**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_2

General Information

Site:	ML_2
Description of Location:	59th Street
Data Range:	2/6/2010 to 5/31/2010
	2/13/2013 to 5/17/2013
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	55
Service Population:	379

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/12/2013	0.55	0.17	0.365	3.23	0.46	0.279	2.78	5.50
5/11/2013	1.03	0.16	0.273	3.13	0.40	0.233	3.03	4.60
5/8/2013	0.76	0.18	0.257	3.21	0.29	0.206	2.81	4.06
4/10/2013	0.60	0.25	0.249	3.02	0.34	0.187	2.77	3.69
2/26/2013	0.63	0.06	0.235	2.96	0.21	0.214	2.68	4.22
Five-Storm Average	**0.71**	**0.16**	**0.276**	**3.11**	**0.34**	**0.224**	**2.81**	**4.41**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

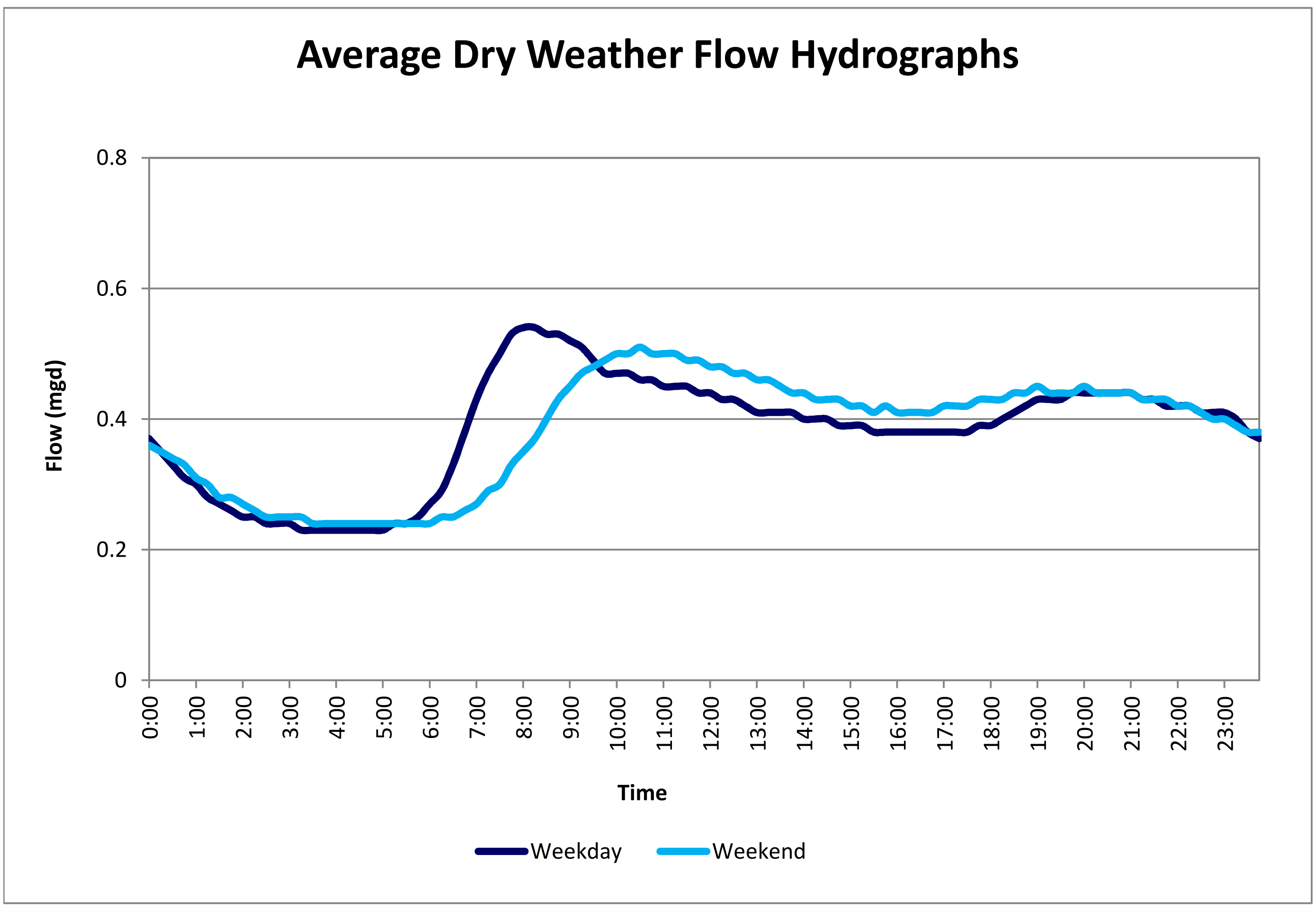
ML_3

General Information

Site:	ML_3
Description of Location:	63rd Street
Data Range:	4/1/2012 to 3/31/2013
Pipe Diameter:	14"
Contract Community:	Lower Merion
Drainage Area (Acres):	618
Service Population:	3,782

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.384	101	0.540	143	0.230	61	0.60	186
Weekend	0.383	101	0.510	135	0.240	63	0.63	91
Total	**0.383**	**101**	**0.530**	**140**	**0.233**	**62**	**0.61**	**277**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

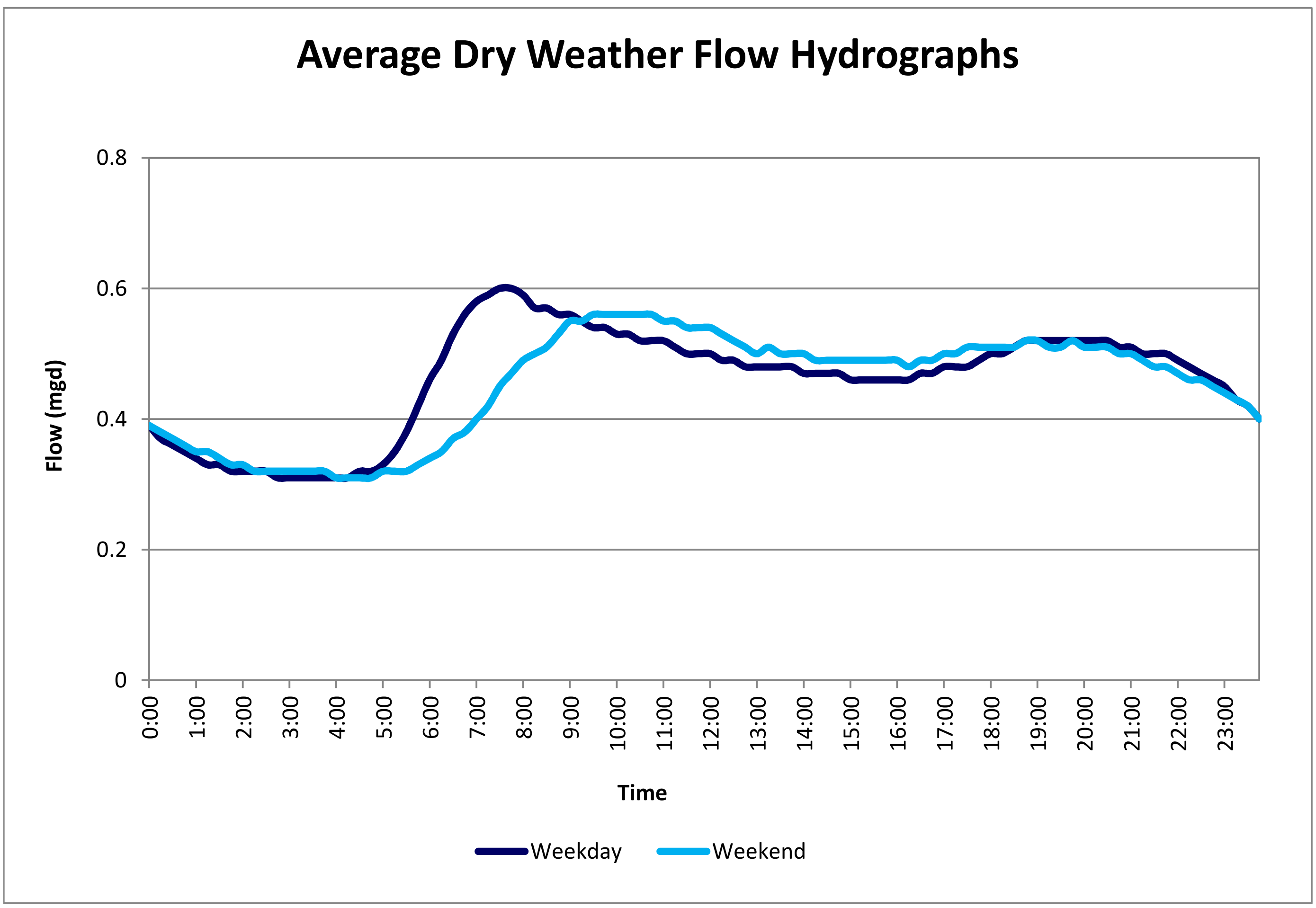
ML_3

General Information

Site:	ML_3
Description of Location:	63rd Street
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	14"
Contract Community:	Lower Merion
Drainage Area (Acres):	618
Service Population:	3,782

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.461	122	0.600	159	0.310	82	0.67	135
Weekend	0.453	120	0.560	148	0.310	82	0.68	62
Total	**0.458**	**121**	**0.587**	**155**	**0.310**	**82**	**0.68**	**197**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_3

General Information

Site:	ML_3
Description of Location:	63rd Street
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	14"
Contract Community:	Lower Merion
Drainage Area (Acres):	618
Service Population:	3,782

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.38	0.45	2.03	13.1	0.94	1.80	12.7	3.93
6/22/2012	1.61	0.39	1.75	11.6	1.21	1.50	11.1	3.92
9/2/2013	1.78	0.61	1.75	11.9	1.32	1.54	11.5	3.36
6/7/2013	3.93	0.28	1.62	11.7	0.85	1.49	11.4	3.25
3/30/2014	2.81	0.22	1.49	11.4	0.35	1.47	11.3	3.20
Five-Storm Average	**3.10**	**0.39**	**1.73**	**11.9**	**0.94**	**1.56**	**11.6**	**3.53**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

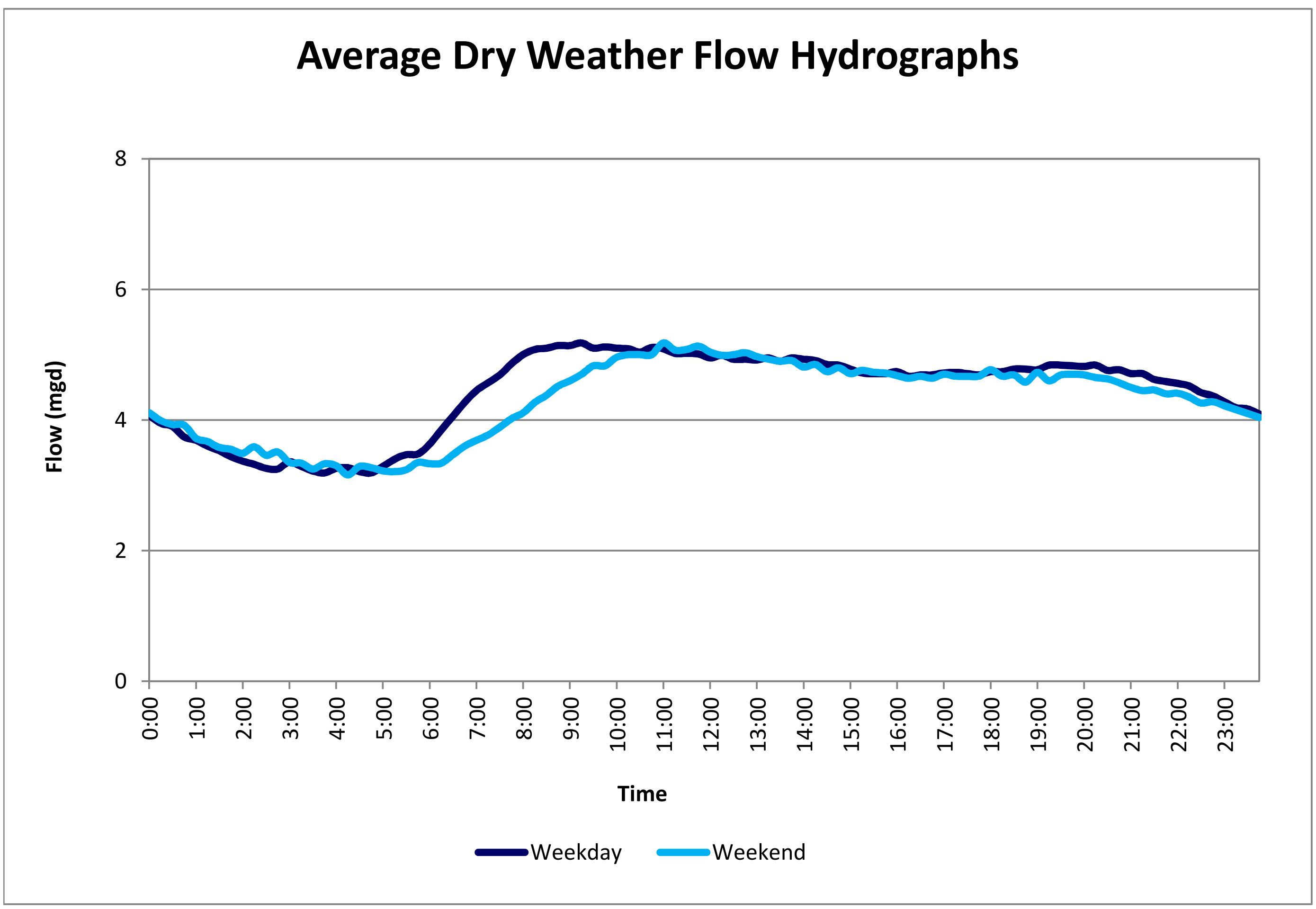
ML_4

General Information

Site:	ML_4
Description of Location:	66th Street
Data Range:	10/1/2010 to 9/30/2011
Pipe Diameter:	24"
Contract Community:	Lower Merion
Drainage Area (Acres):	7,486
Service Population:	26,716

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	4.43	166	5.18	194	3.19	119	0.72	186
Weekend	4.30	161	5.18	194	3.16	118	0.74	71
Total	**4.39**	**164**	**5.18**	**194**	**3.18**	**119**	**0.72**	**257**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_4

General Information

Site:	ML_4
Description of Location:	66th Street
Data Range:	10/1/2010 to 9/30/2011
Pipe Diameter:	24"
Contract Community:	Lower Merion
Drainage Area (Acres):	7,486
Service Population:	26,716

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
8/27/2011	6.48	0.40	9.87	NA*	1.30	9.11	NA*	2.08
9/8/2011	3.53	0.79	9.64	NA*	1.34	7.60	NA*	1.73
8/9/2011	1.60	0.49	9.44	NA*	1.19	9.15	NA*	2.08
3/6/2011	1.97	0.16	9.39	NA*	0.34	8.94	NA*	2.04
8/21/2011	2.32	0.37	9.04	NA*	1.11	8.70	NA*	1.98
Five-Storm Average	**3.18**	**0.44**	**9.48**	**NA***	**1.06**	**8.70**	**NA***	**1.98**

* Monitor is a magnectic meter and does not utilze depth sensing technologies.

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

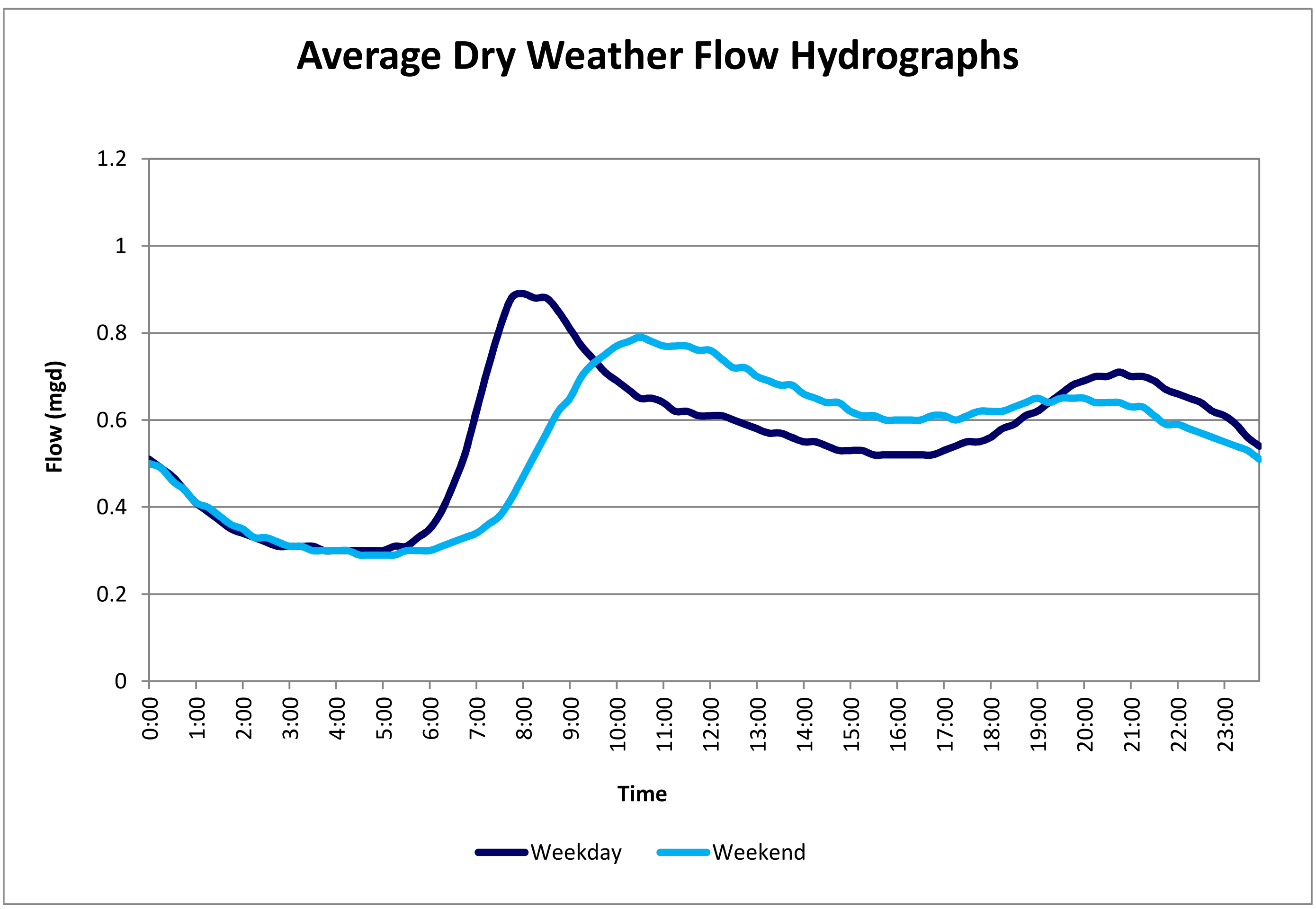
ML_5

General Information

Site:	ML_5
Description of Location:	73rd Street
Data Range:	1/1/2012 to 3/31/2013
Pipe Diameter:	16"
Contract Community:	Lower Merion
Drainage Area (Acres):	1,064
Service Population:	8,883

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.556	63	0.890	100	0.300	34	0.54	187
Weekend	0.546	61	0.790	89	0.290	33	0.53	76
Total	**0.553**	**62**	**0.861**	**97**	**0.297**	**33**	**0.54**	**263**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

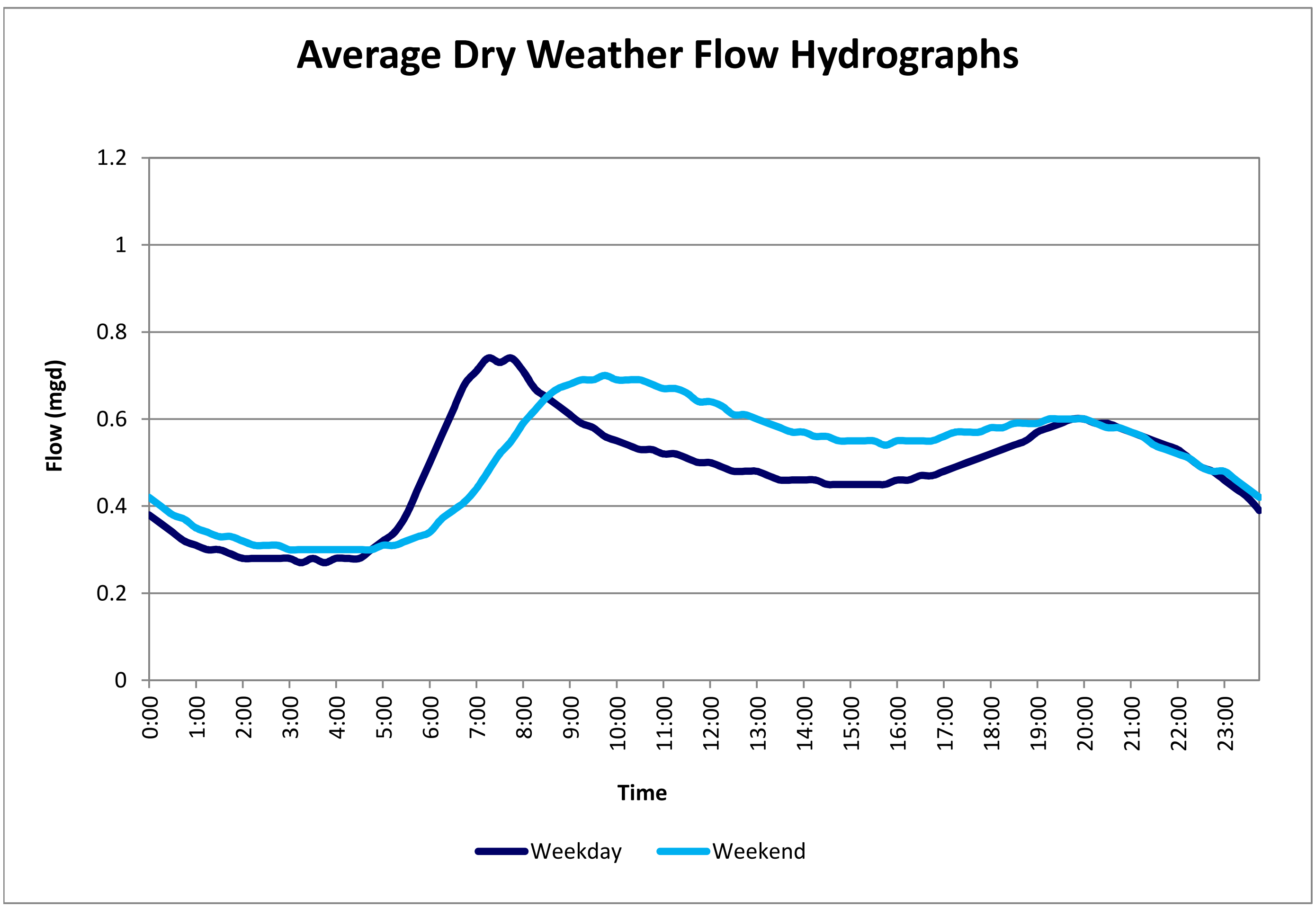
ML_5

General Information

Site:	ML_5
Description of Location:	73rd Street
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	16"
Contract Community:	Lower Merion
Drainage Area (Acres):	1,064
Service Population:	8,883

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.479	54	0.740	83	0.270	30	0.56	127
Weekend	0.509	57	0.700	79	0.300	34	0.59	63
Total	**0.489**	**55**	**0.727**	**82**	**0.280**	**32**	**0.57**	**190**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_5

General Information

Site:	ML_5
Description of Location:	73rd Street
Data Range:	1/1/2012 to 6/30/14
Pipe Diameter:	16"
Contract Community:	Lower Merion
Drainage Area (Acres):	1,064
Service Population:	8,883

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
6/22/2012	2.02	0.61	4.01	116	1.69	3.68	15.4	6.65
4/30/2014	5.27	0.33	3.98	15.8	0.82	3.89	15.6	7.96
9/1/2013	2.23	0.71	3.45	15.3	1.73	3.34	15.2	6.83
6/7/2013	3.63	0.17	2.81	14.0	0.63	2.73	14.0	5.58
8/13/2013	1.95	0.41	2.49	14.3	0.99	2.33	13.9	4.76
Five-Storm Average	**3.02**	**0.45**	**3.35**	**35.0**	**1.17**	**3.19**	**14.8**	**6.36**

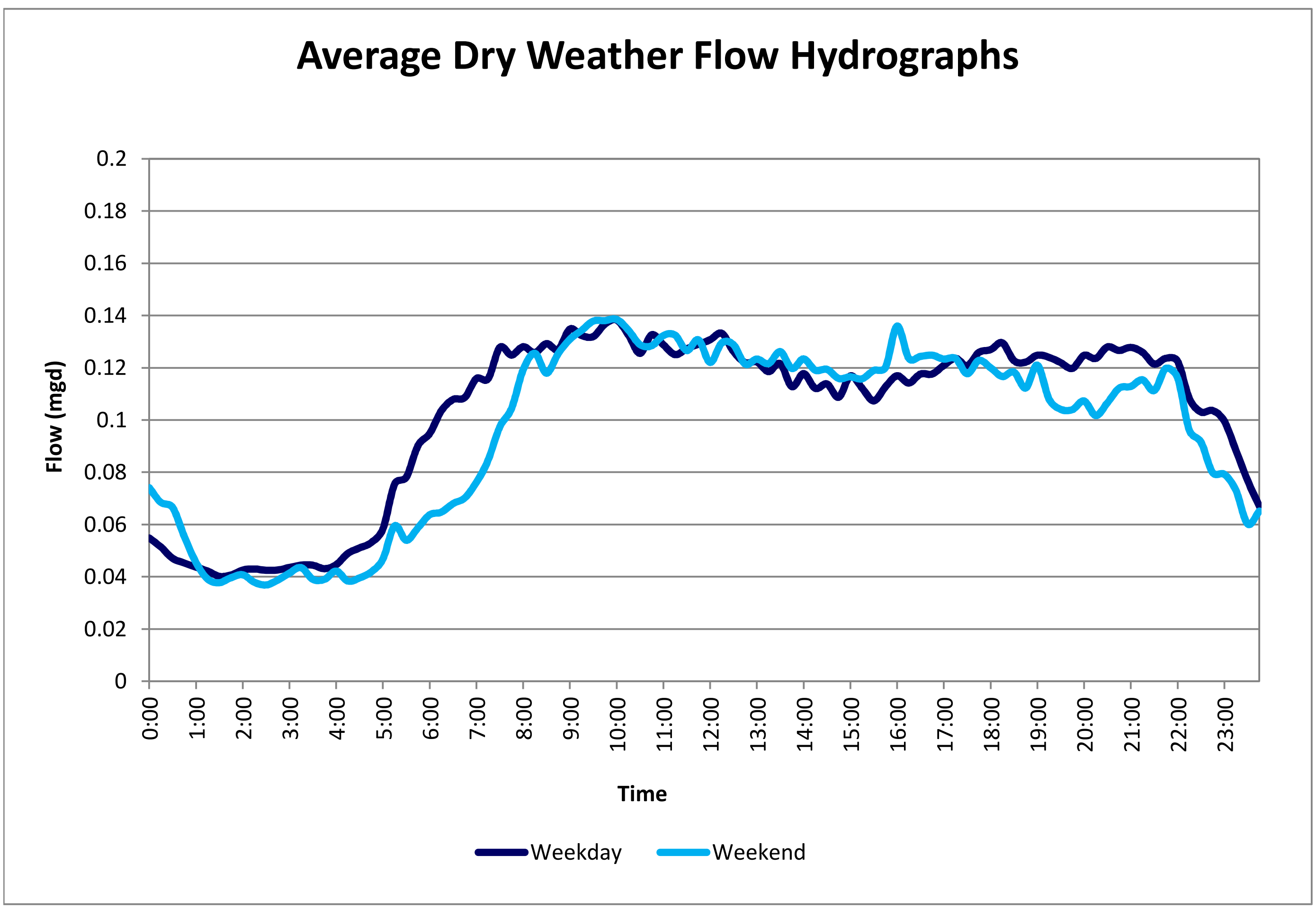
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
ML_6

General Information

Site:	ML_6
Description of Location:	Conshohocken Avenue
Data Range:	1/1/2012 to 12/31/2012
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	58
Service Population:	420

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.102	243	0.138	329	0.040	96	0.39	90
Weekend	0.096	229	0.139	330	0.037	88	0.38	30
Total	**0.101**	**240**	**0.138**	**329**	**0.039**	**94**	**0.39**	**120**



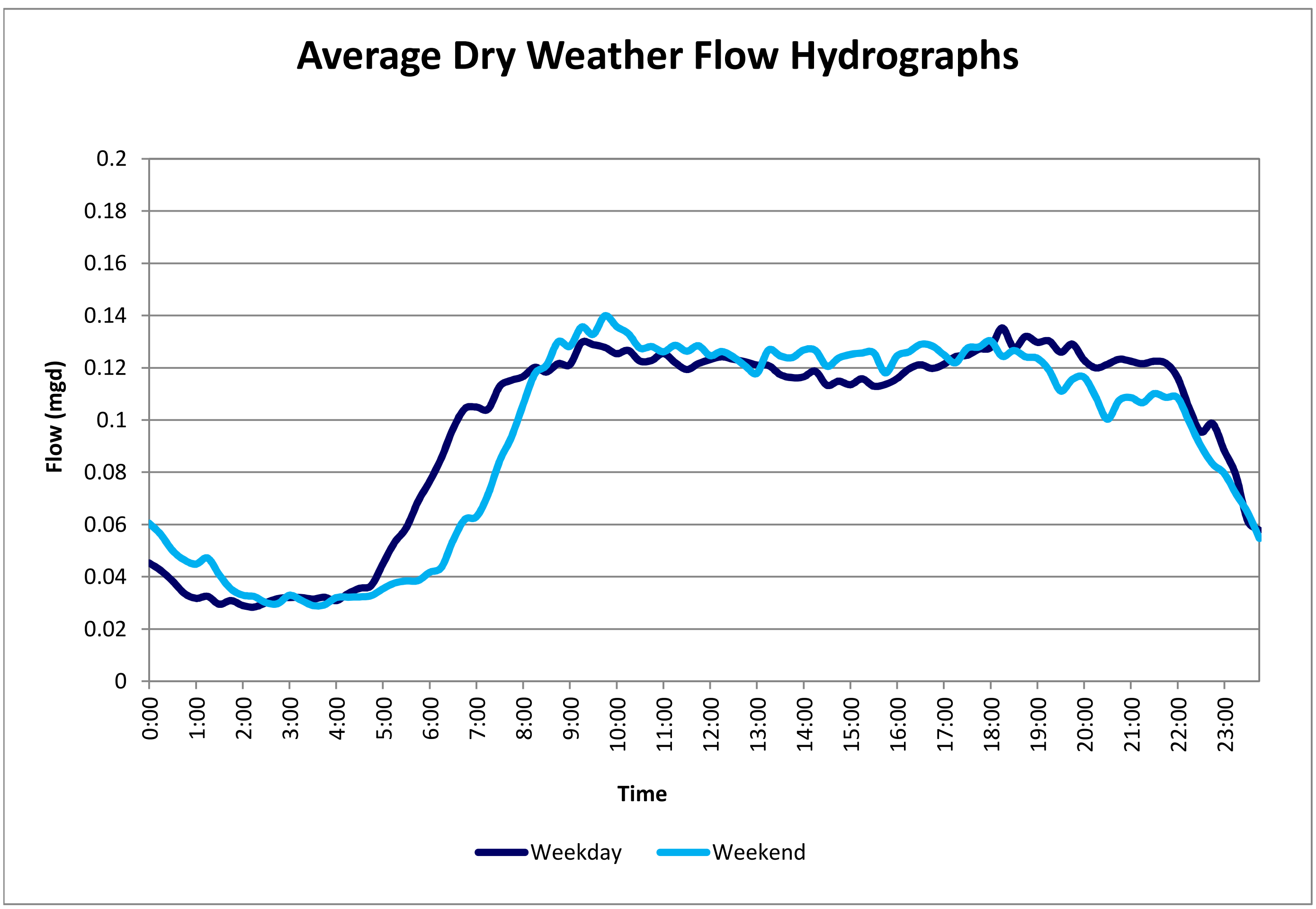
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
ML_6

General Information

Site:	ML_6
Description of Location:	Conshohocken Avenue
Data Range:	1/1/2013 to 6/30/2014
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	58
Service Population:	420

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.096	229	0.135	322	0.028	68	0.30	178
Weekend	0.093	222	0.140	333	0.029	69	0.31	77
Total	**0.095**	**227**	**0.137**	**325**	**0.029**	**68**	**0.30**	**255**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_6

General Information

Site:	ML_6
Description of Location:	Conshohocken Avenue
Data Range:	1/1/2012 to 6/30/2014
Pipe Diameter:	8"
Contract Community:	Lower Merion
Drainage Area (Acres):	58
Service Population:	420

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
1/10/2014	0.32	0.03	0.491	6.47	0.03	0.229	4.04	2.40
9/2/2013	1.03	0.35	0.438	5.08	0.66	0.283	4.38	2.97
8/28/2013	1.46	0.68	0.408	4.95	1.27	0.269	4.09	2.82
6/27/2013	0.59	0.36	0.366	4.49	0.48	0.178	3.31	1.87
4/30/2014	5.28	0.37	0.356	5.31	0.89	0.324	5.05	3.40
Five-Storm Average	**1.74**	**0.36**	**0.412**	**5.26**	**0.66**	**0.257**	**4.17**	**2.69**

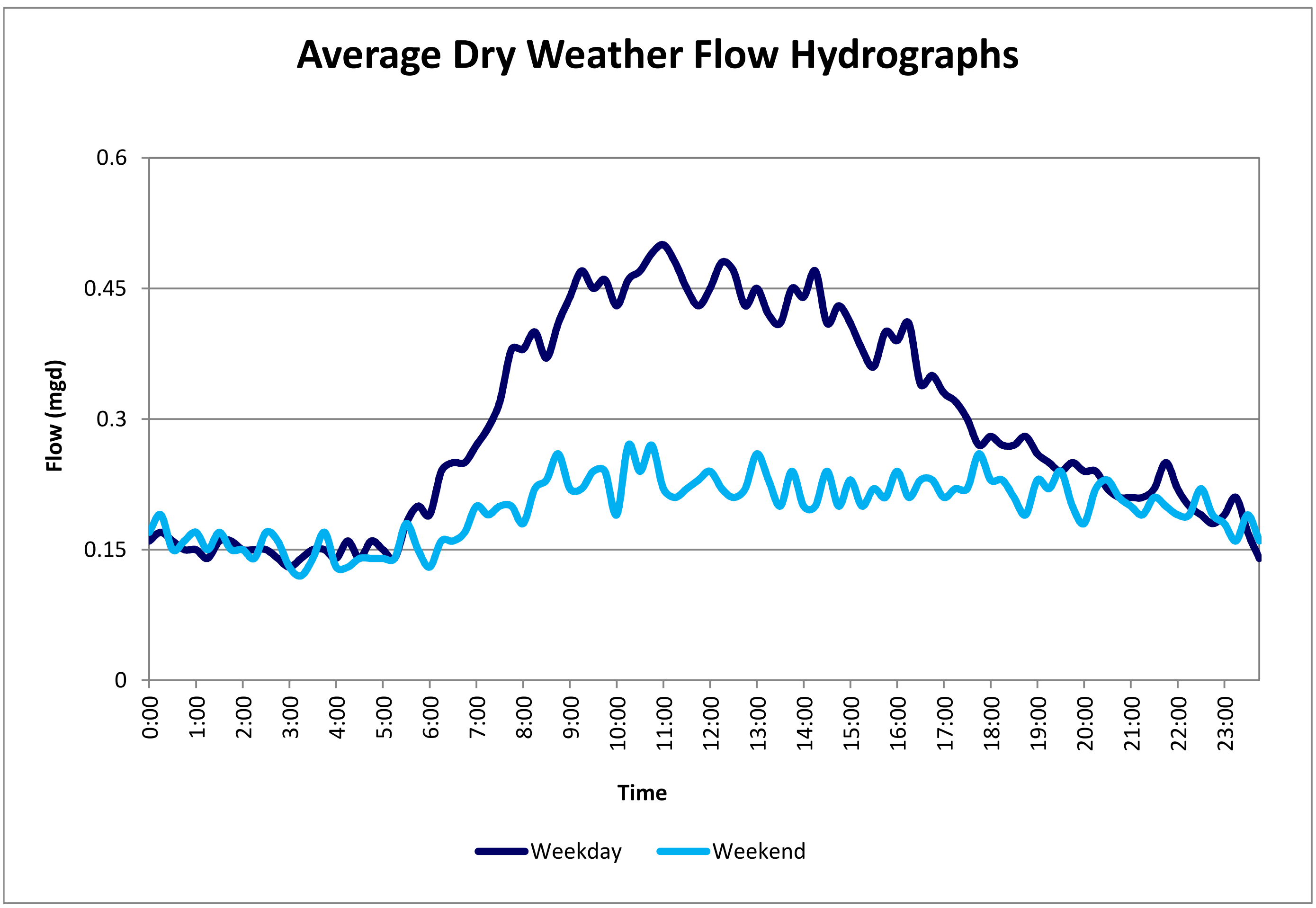
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
ML_7

General Information

Site:	ML_7
Description of Location:	City Avenue
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Lower Merion
Drainage Area (Acres):	205
Service Population:	373

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.291	780	0.500	1340	0.130	349	0.45	115
Weekend	0.197	528	0.270	724	0.120	322	0.61	54
Total	**0.261**	**700**	**0.427**	**1143**	**0.127**	**340**	**0.50**	**169**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

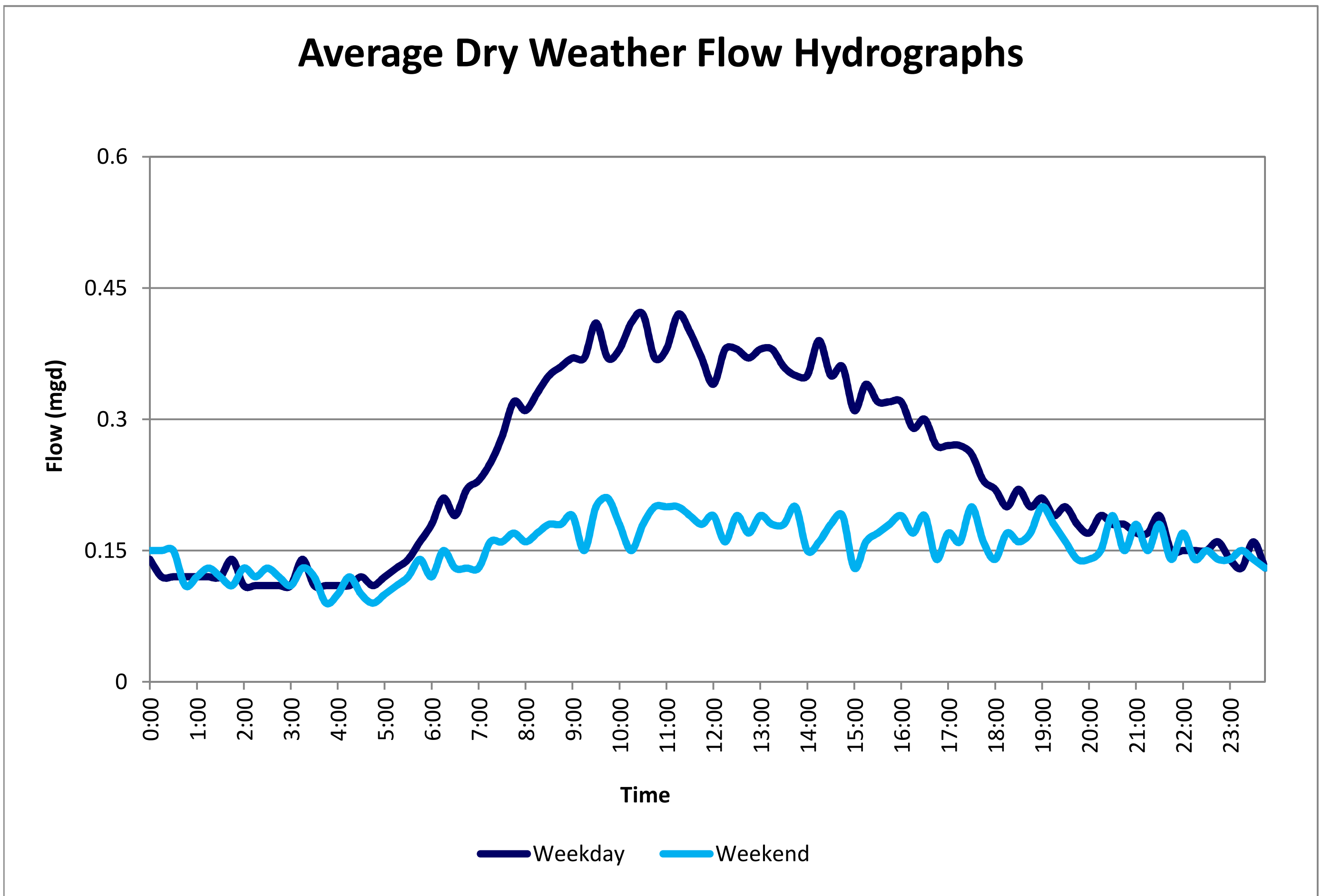
ML_7

General Information

Site:	ML_7
Description of Location:	City Avenue
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Lower Merion
Drainage Area (Acres):	205
Service Population:	373

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.238	639	0.420	1126	0.110	295	0.46	171
Weekend	0.155	415	0.210	563	0.090	241	0.58	85
Total	**0.211**	**565**	**0.350**	**939**	**0.103**	**277**	**0.50**	**256**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

ML_7

General Information

Site:	ML_7
Description of Location:	City Avenue
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Lower Merion
Drainage Area (Acres):	205
Service Population:	373

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	

Pump station discharges upstream of the monitor eclipse the peak wet weather flow rates making the data unsuitable for this analysis.

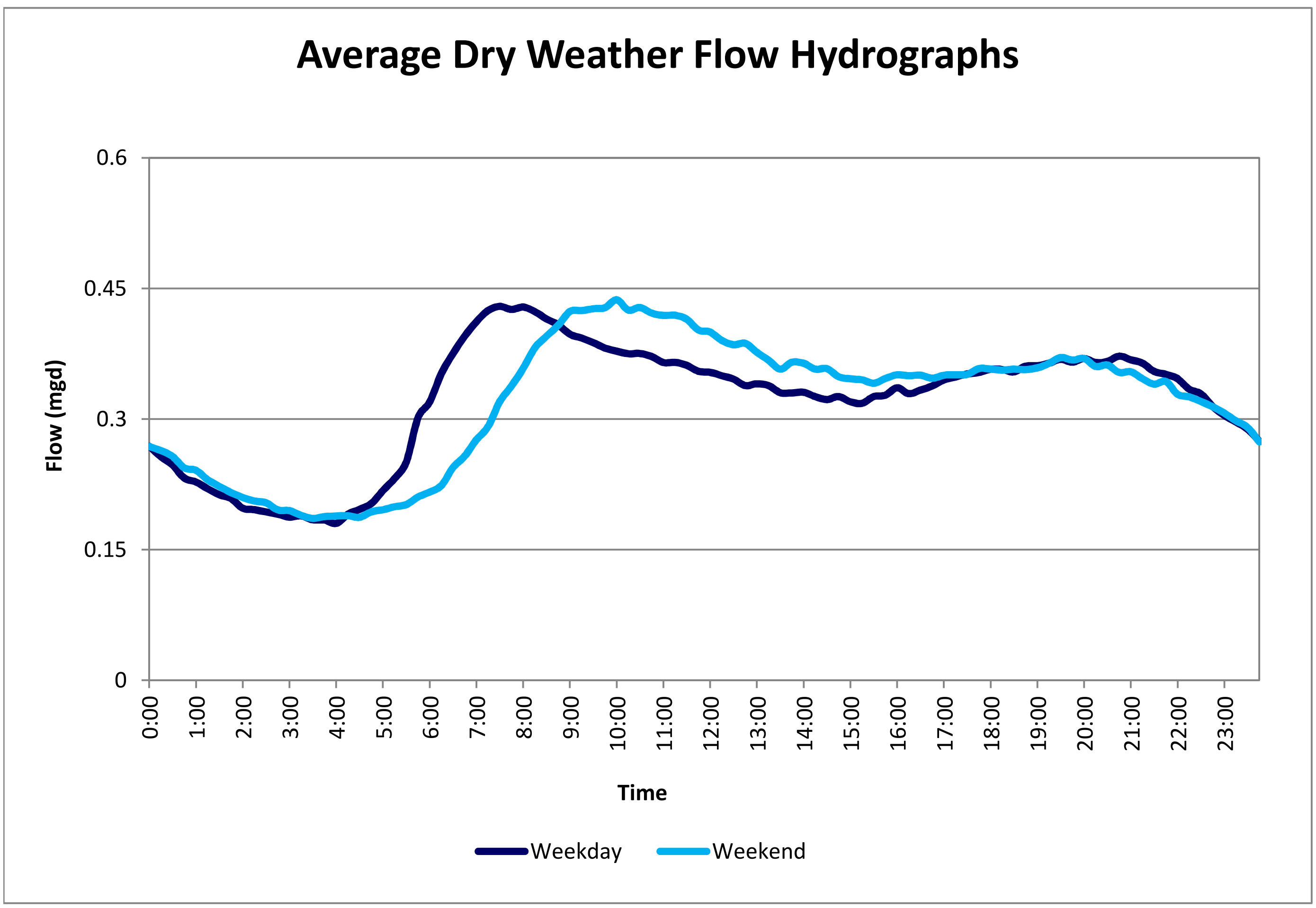
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_1

General Information

Site:	MLM_1
Description of Location:	Philmont Avenue and Byberry Road
Data Range:	1/1/2012 to 12/31/2012
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	448
Service Population:	1,748

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.321	184	0.429	246	0.180	103	0.56	144
Weekend	0.320	183	0.437	250	0.186	106	0.58	74
Total	**0.321**	**183**	**0.432**	**247**	**0.182**	**104**	**0.57**	**218**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

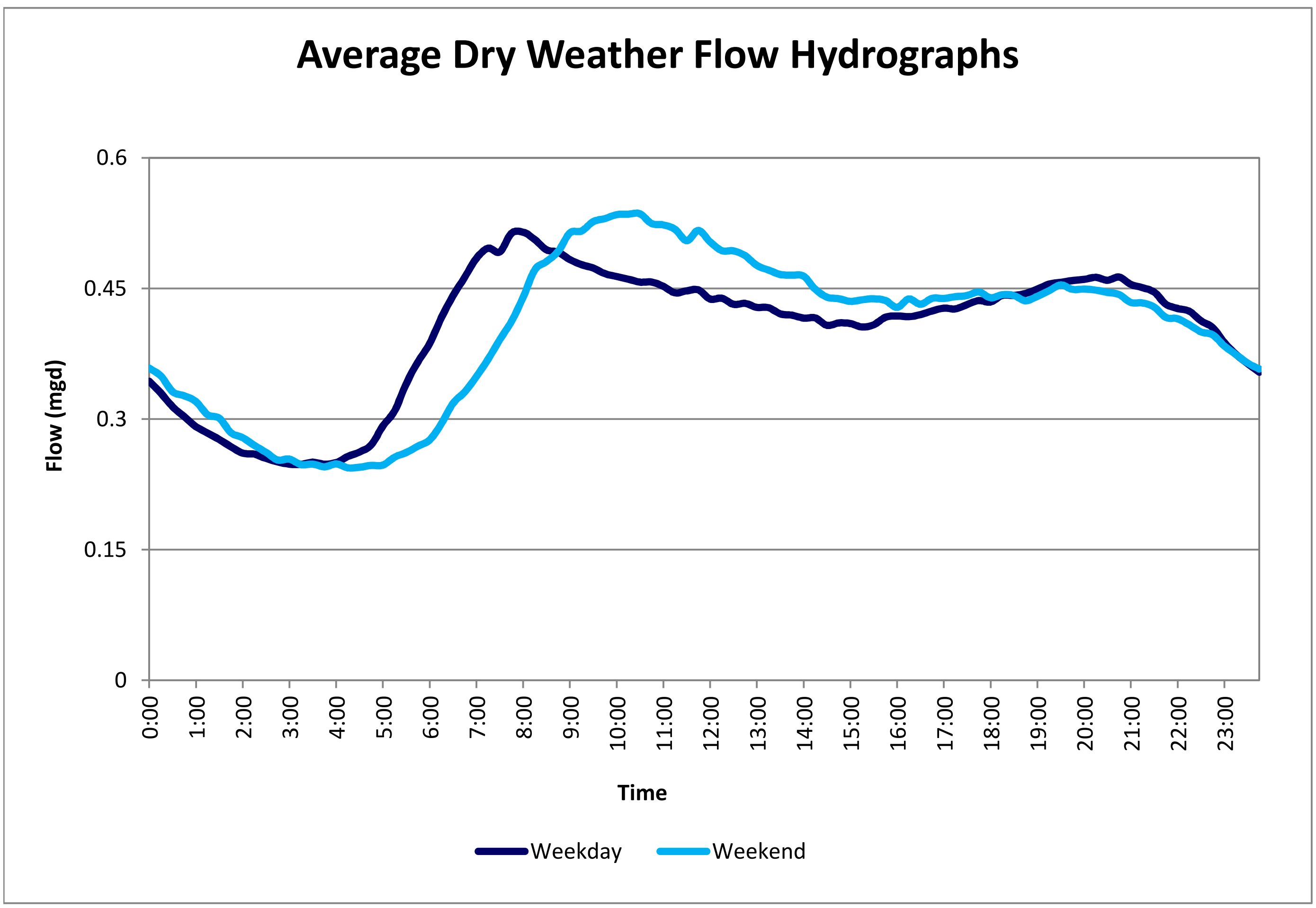
MLM_1

General Information

Site:	MLM_1
Description of Location:	Philmont Avenue and Byberry Road
Data Range:	1/1/2013 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	448
Service Population:	1,748

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.401	229	0.515	294	0.248	142	0.62	27
Weekend	0.402	230	0.536	306	0.244	140	0.61	10
Total	**0.401**	**230**	**0.520**	**298**	**0.247**	**141**	**0.62**	**37**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_1

General Information

Site:	MLM_1
Description of Location:	Philmont Avenue and Byberry Road
Data Range:	1/1/2012 to 6/30/2014
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	448
Service Population:	1,748

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
9/4/2012	2.08	0.43	1.49	11.1	0.94	1.23	7.54	3.83
6/6/2013	3.91	0.30	1.37	6.59	0.69	1.32	6.38	3.29
12/29/2013	1.24	0.11	1.34	6.97	0.36	1.30	6.84	3.24
11/26/2013	2.64	0.14	1.23	6.33	0.43	1.18	6.19	2.94
12/21/2012	1.97	0.18	1.17	6.00	0.45	1.09	5.96	3.40
Five-Storm Average	**2.37**	**0.23**	**1.32**	**7.40**	**0.58**	**1.22**	**6.58**	**3.34**

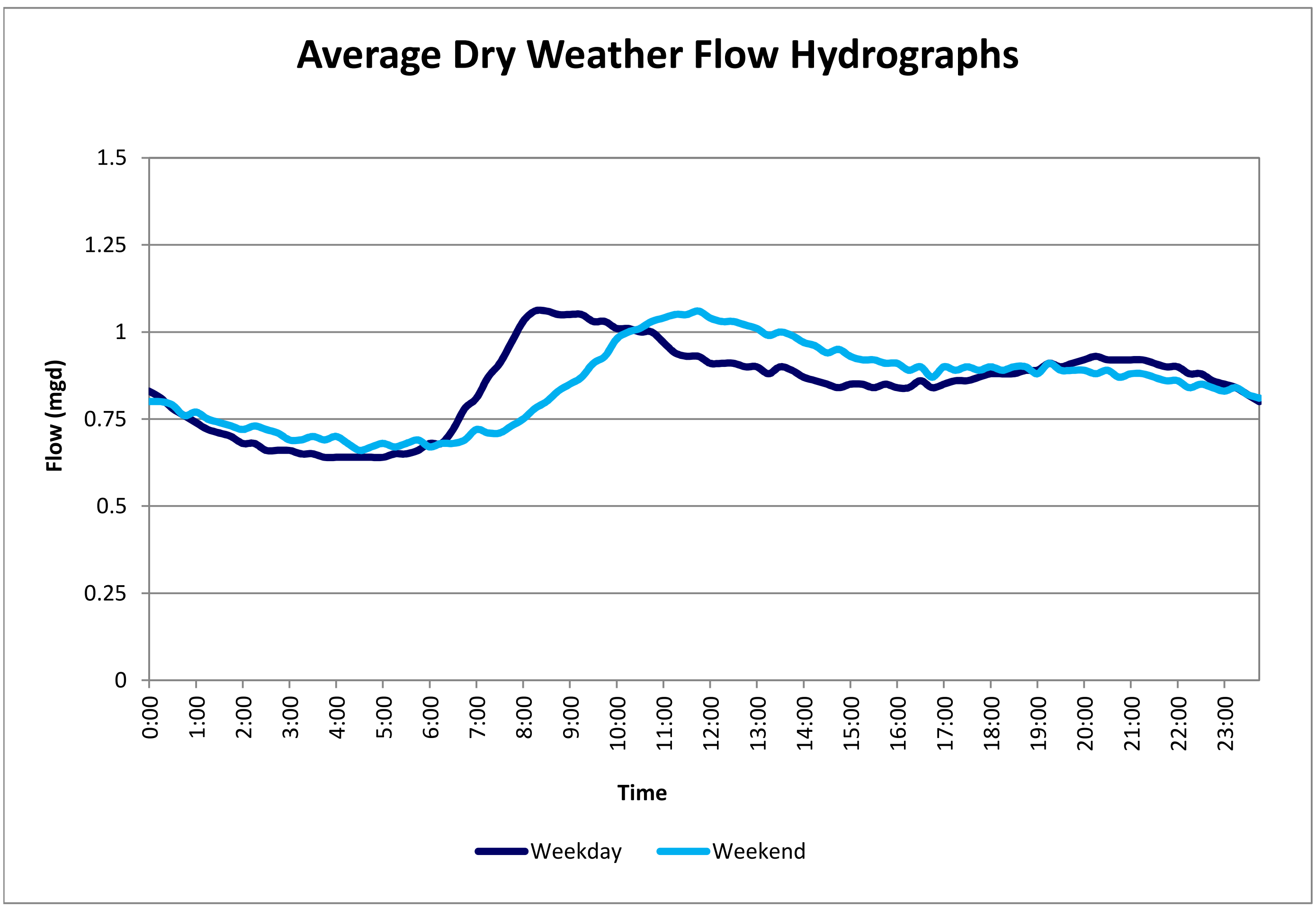
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_2

General Information

Site:	MLM_2
Description of Location:	Welsh Road and Huntington Pike
Data Range:	1/1/2012 to 12/31/2012
Pipe Diameter:	12"
Contract Community:	Lower Moreland
Drainage Area (Acres):	1,797
Service Population:	6,529

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.846	130	1.06	162	0.640	98	0.76	26
Weekend	0.848	130	1.06	162	0.660	101	0.78	15
Total	**0.847**	**130**	**1.06**	**162**	**0.647**	**99**	**0.76**	**41**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

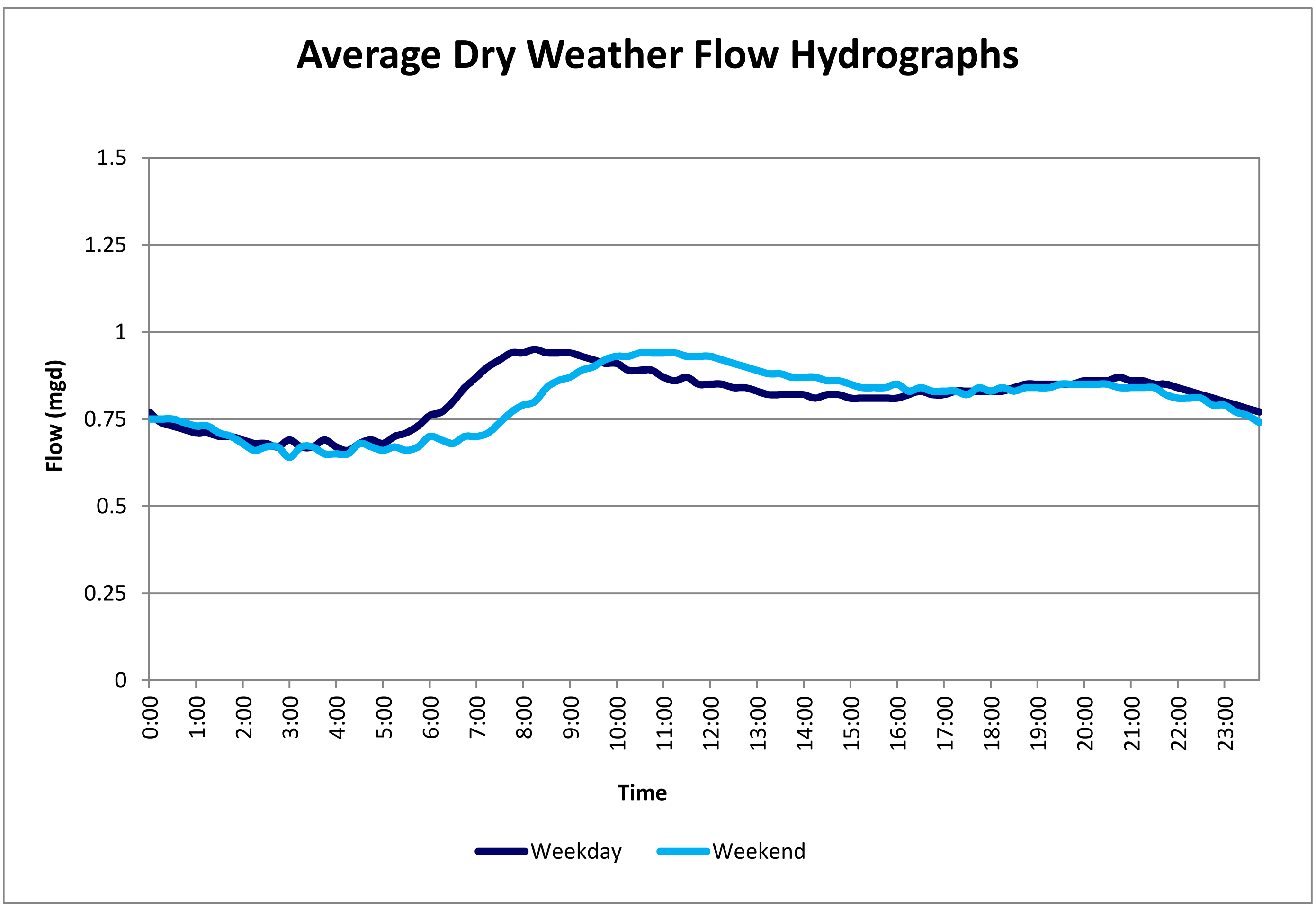
MLM_2

General Information

Site:	MLM_2
Description of Location:	Welsh Road and Huntington Pike
Data Range:	1/1/2013 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Lower Moreland
Drainage Area (Acres):	1,797
Service Population:	6,529

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.811	124	0.950	146	0.660	101	0.81	127
Weekend	0.801	123	0.940	144	0.640	98	0.80	64
Total	**0.808**	**124**	**0.947**	**145**	**0.653**	**100**	**0.81**	**191**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_2

General Information

Site:	MLM_2
Description of Location:	Welsh Road and Huntington Pike
Data Range:	1/1/2012 to 6/30/2014
Pipe Diameter:	12"
Contract Community:	Lower Moreland
Drainage Area (Acres):	1,797
Service Population:	6,529

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.17	0.31	3.29	NA*	0.92	3.28	NA*	4.06
8/13/2013	2.41	0.64	3.10	NA*	1.49	3.07	NA*	3.80
6/7/2013	3.89	0.29	3.04	NA*	0.69	2.94	NA*	3.64
3/30/2014	2.79	0.19	2.97	NA*	0.41	2.67	NA*	3.30
6/10/2013	1.90	0.38	2.77	NA*	0.60	2.68	NA*	3.32
Five-Storm Average	**3.23**	**0.36**	**3.03**	**NA***	**0.82**	**2.93**	**NA***	**3.62**

* Monitor is a magnectic meter and does not utilze depth sensing technologies.

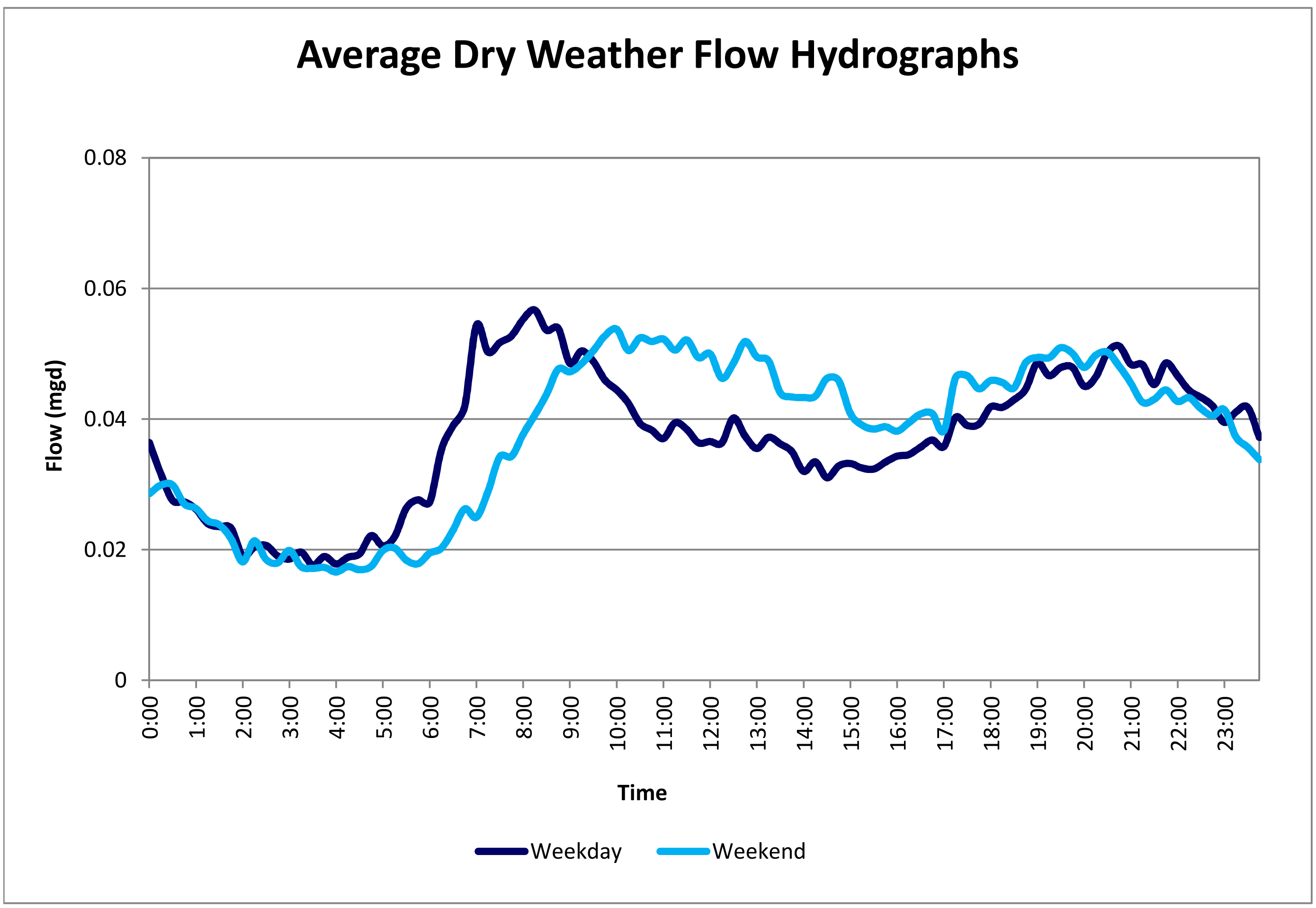
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_3

General Information

Site:	MLM_3
Description of Location:	Ramage Run and City Limit Boundary
Data Range:	8/17/2007 to 11/17/2007
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	96
Service Population:	344

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.037	108	0.057	165	0.018	51	0.47	46
Weekend	0.038	110	0.054	156	0.017	48	0.44	21
Total	**0.037**	**108**	**0.056**	**162**	**0.017**	**50**	**0.46**	**67**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

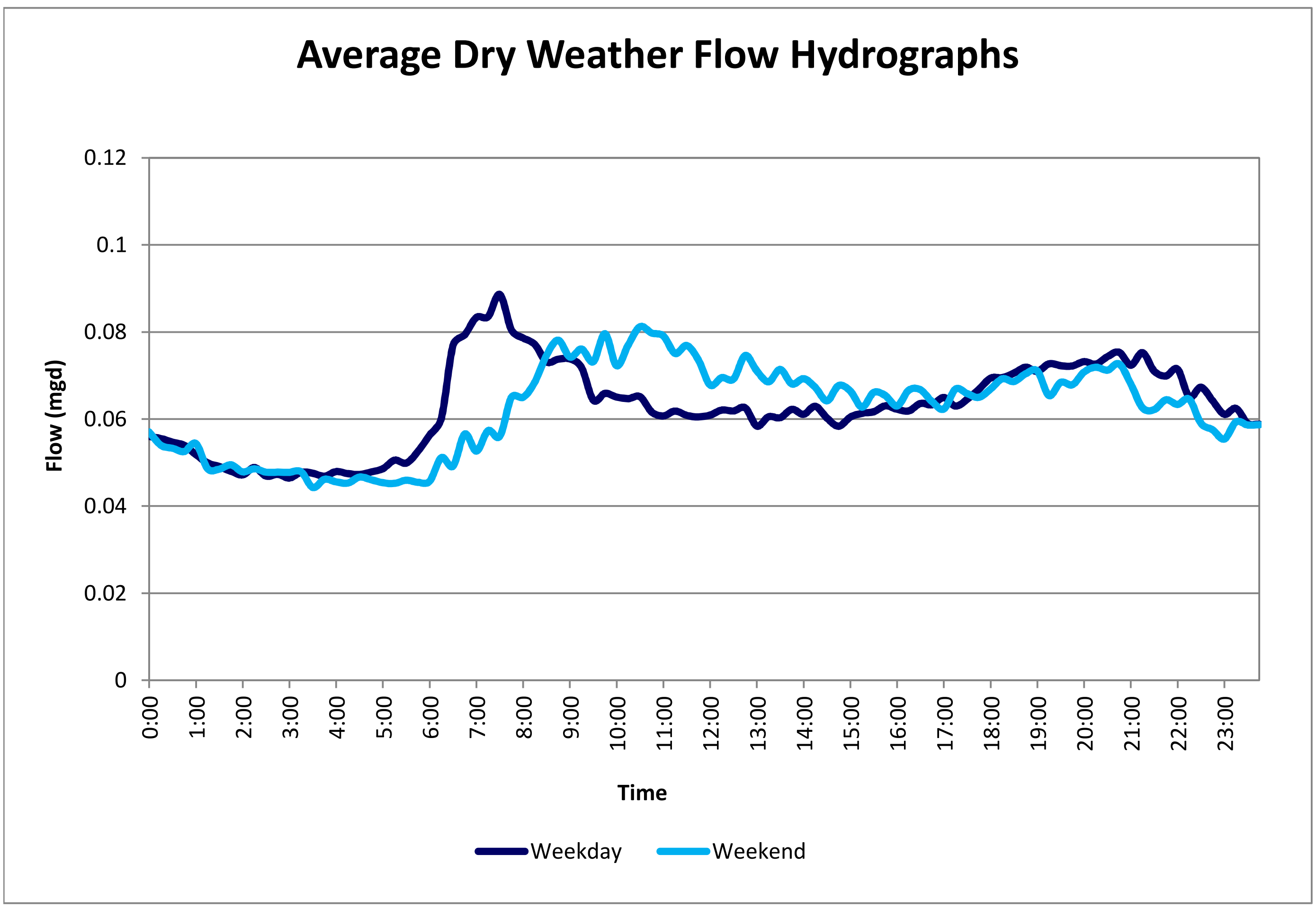
MLM_3

General Information

Site:	MLM_3
Description of Location:	Ramage Run and City Limit Boundary
Data Range:	2/6/2010 to 5/5/2010
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	96
Service Population:	344

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.063	183	0.089	258	0.046	135	0.74	54
Weekend	0.062	181	0.081	236	0.044	129	0.71	19
Total	**0.063**	**182**	**0.087**	**252**	**0.046**	**133**	**0.73**	**73**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_3

General Information

Site:	MLM_3
Description of Location:	Ramage Run and City Limit Boundary
Data Range:	8/17/2007 to 11/17/2007
	2/6/2010 to 5/5/2010
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	96
Service Population:	344

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/13/2010	2.99	0.16	0.212	2.76	0.55	0.196	2.66	3.13
3/30/2010	1.72	0.07	0.197	2.75	0.27	0.162	2.48	2.58
3/14/2010	0.35	0.08	0.160	2.50	0.24	0.117	2.43	1.87
4/26/2010	0.79	0.06	0.147	2.99	0.12	0.121	2.67	1.93
2/23/2010	1.16	0.05	0.139	2.38	0.17	0.124	2.26	1.98
Five-Storm Average	**1.40**	**0.09**	**0.171**	**2.68**	**0.27**	**0.144**	**2.50**	**2.30**

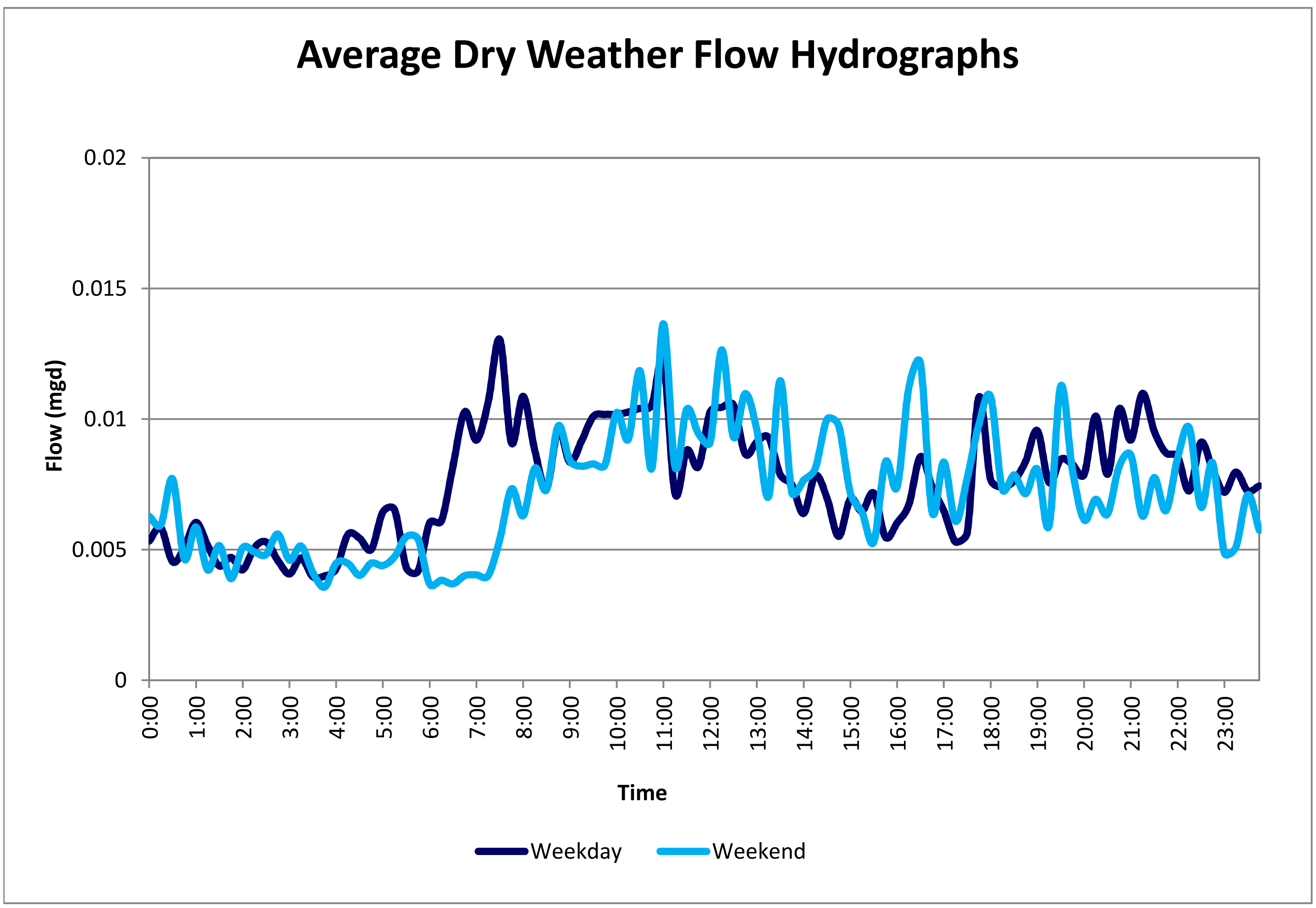
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_4

General Information

Site:	MLM_4
Description of Location:	Pine Road
Data Range:	8/28/2007 to 11/17/2007
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	22
Service Population:	80

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.008	95	0.013	163	0.004	50	0.52	48
Weekend	0.007	90	0.014	171	0.004	45	0.50	18
Total	**0.007**	**94**	**0.013**	**165**	**0.004**	**48**	**0.52**	**66**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

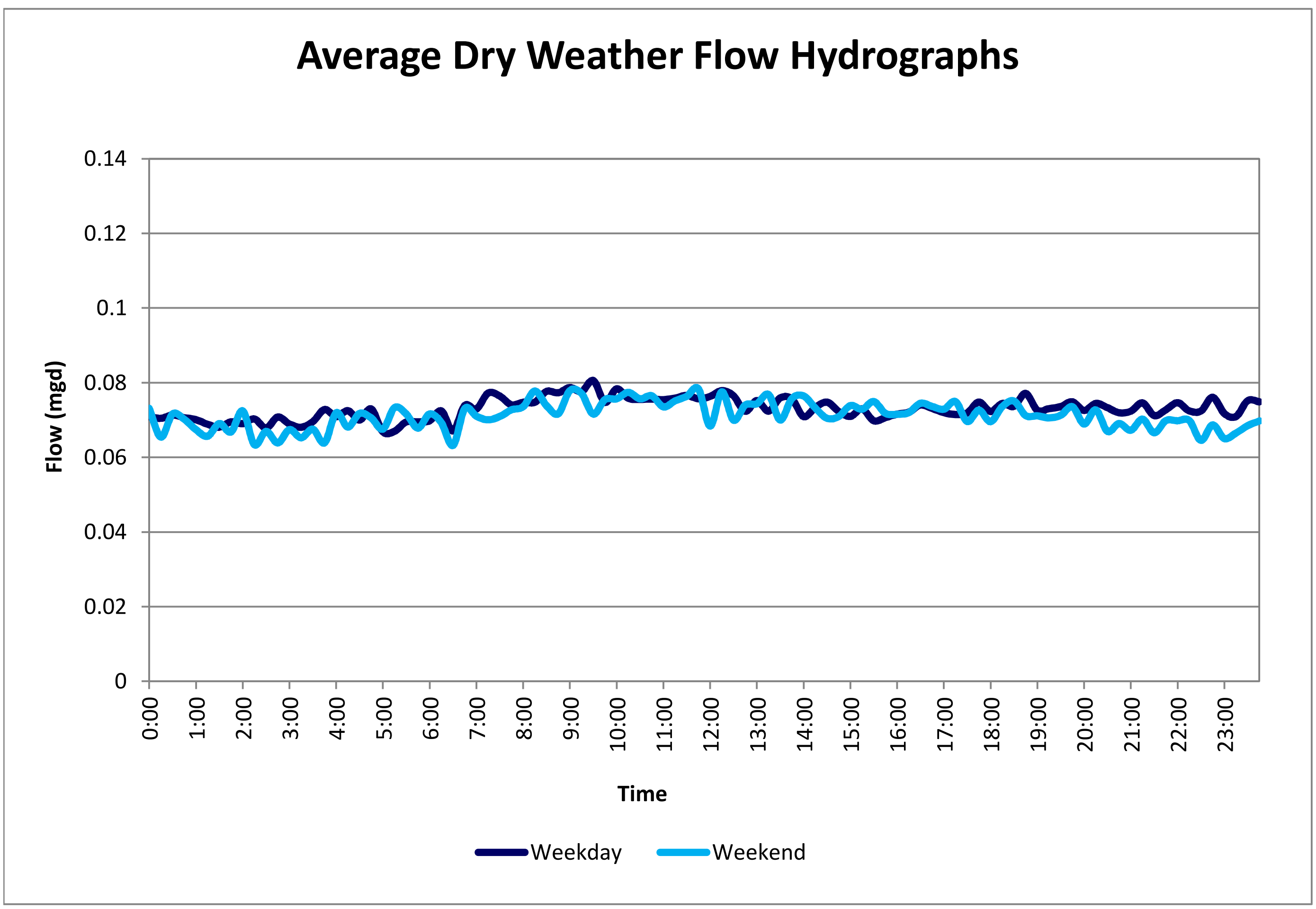
MLM_4

General Information

Site:	MLM_4
Description of Location:	Pine Road
Data Range:	2/6/2010 to 5/5/2010
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	22
Service Population:	80

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.073	912	0.081	1007	0.067	835	0.92	32
Weekend	0.071	890	0.078	979	0.063	790	0.89	13
Total	**0.072**	**906**	**0.080**	**999**	**0.066**	**822**	**0.91**	**45**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

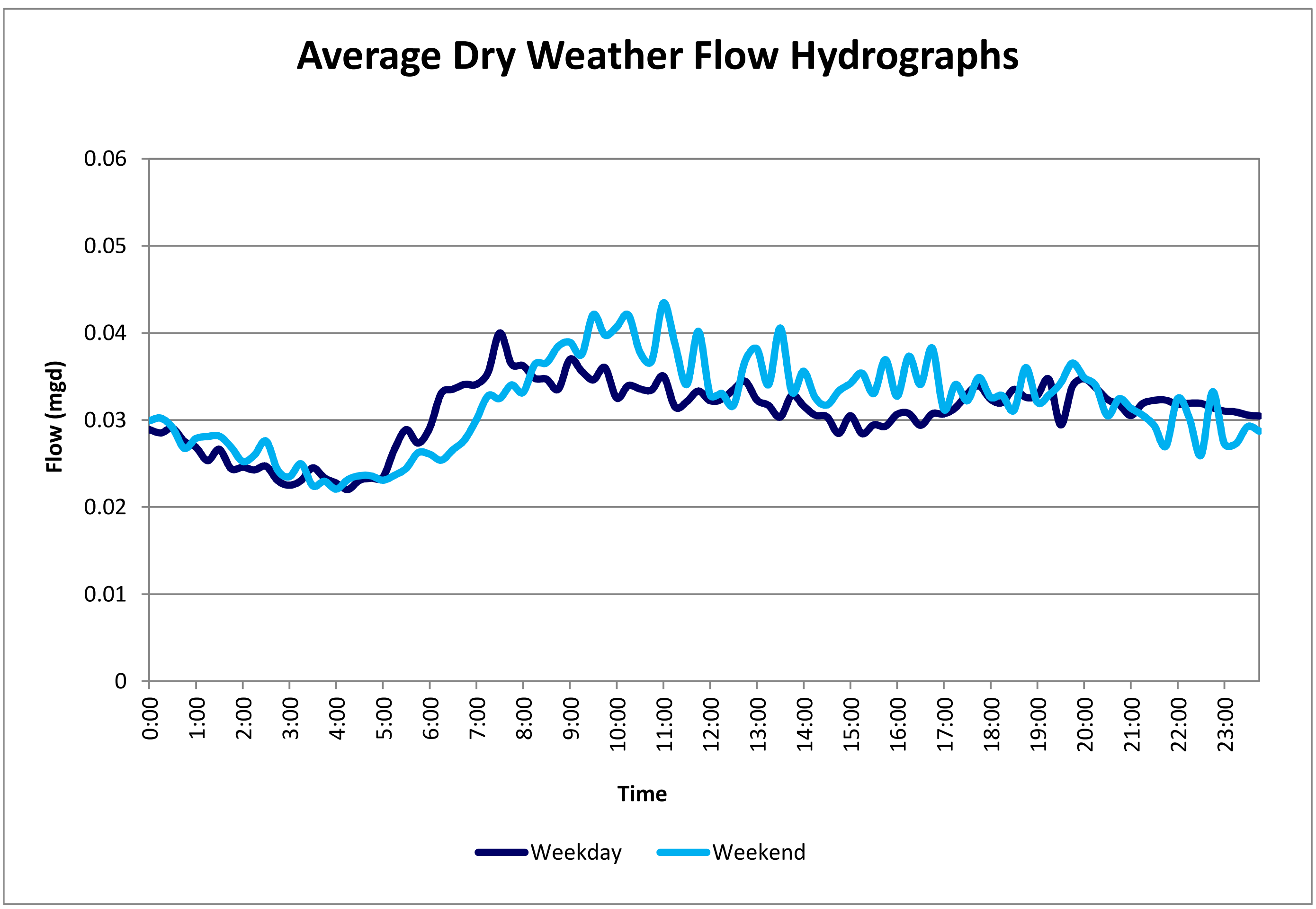
MLM_4

General Information

Site:	MLM_4
Description of Location:	Pine Road
Data Range:	2/13/2013 to 5/17/2013
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	22
Service Population:	80

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.031	384	0.040	500	0.022	275	0.72	57
Weekend	0.032	397	0.043	543	0.022	276	0.70	19
Total	**0.031**	**387**	**0.041**	**511**	**0.022**	**275**	**0.71**	**76**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_4

General Information

Site:	MLM_4
Description of Location:	Pine Road
Data Range:	8/28/2007 to 11/17/2007
	2/6/2010 to 5/5/2010
	2/13/2013 to 5/17/2013
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	22
Service Population:	80

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	

It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

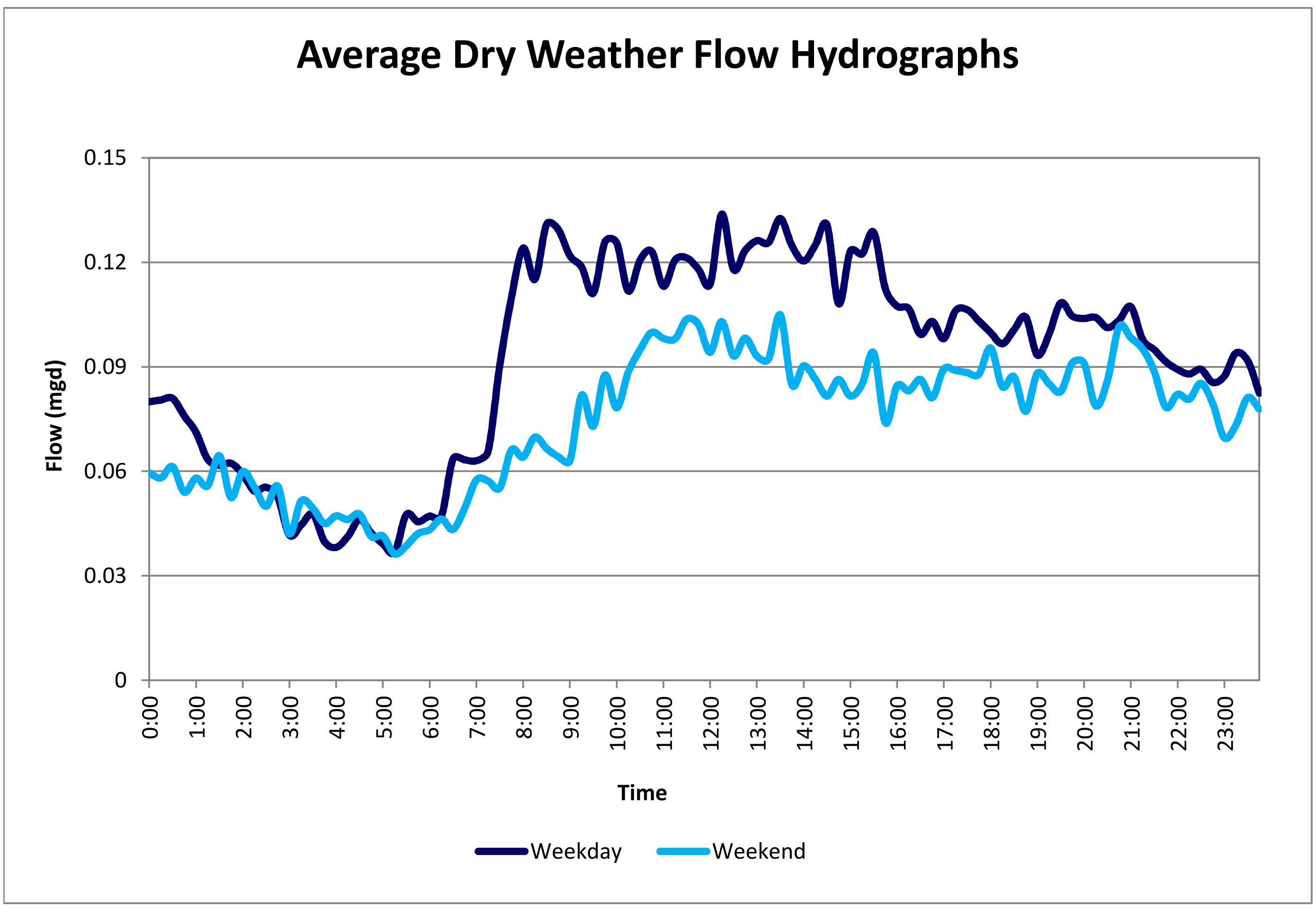
MLM_5

General Information

Site:	MLM_5
Description of Location:	Jonathan Place
Data Range:	9/8/2007 to 11/17/2007
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	13
Service Population:	54

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.093	1718	0.134	2478	0.037	680	0.40	58
Weekend	0.074	1377	0.105	1943	0.036	672	0.49	21
Total	**0.088**	**1627**	**0.126**	**2336**	**0.037**	**678**	**0.42**	**79**



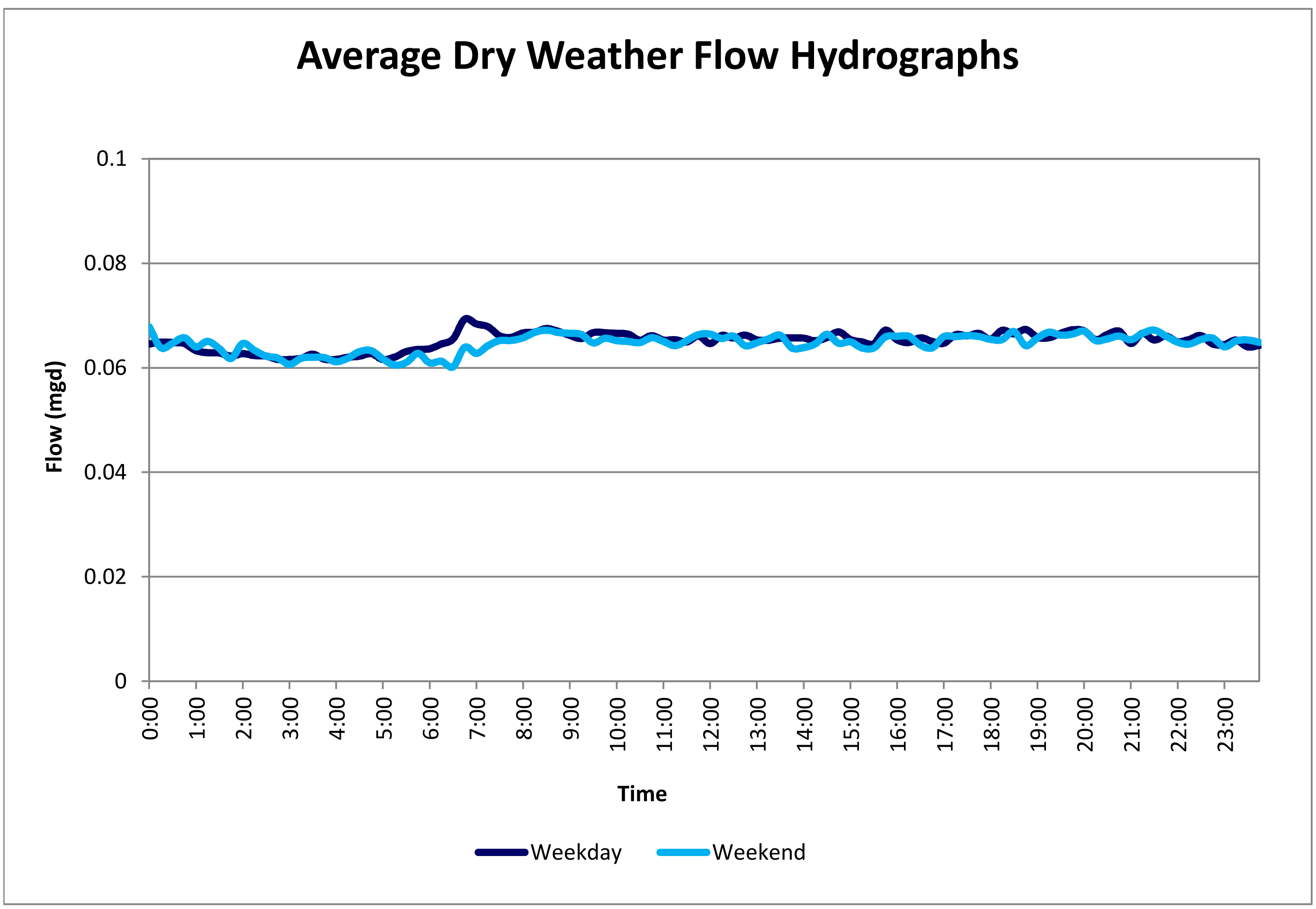
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_5

General Information

Site:	MLM_5
Description of Location:	Jonathan Place
Data Range:	2/6/2010 to 5/5/2010
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	13
Service Population:	54

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.065	1206	0.069	1283	0.062	1140	0.95	51
Weekend	0.065	1197	0.068	1256	0.060	1114	0.93	17
Total	**0.065**	**1204**	**0.069**	**1276**	**0.061**	**1134**	**0.94**	**68**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

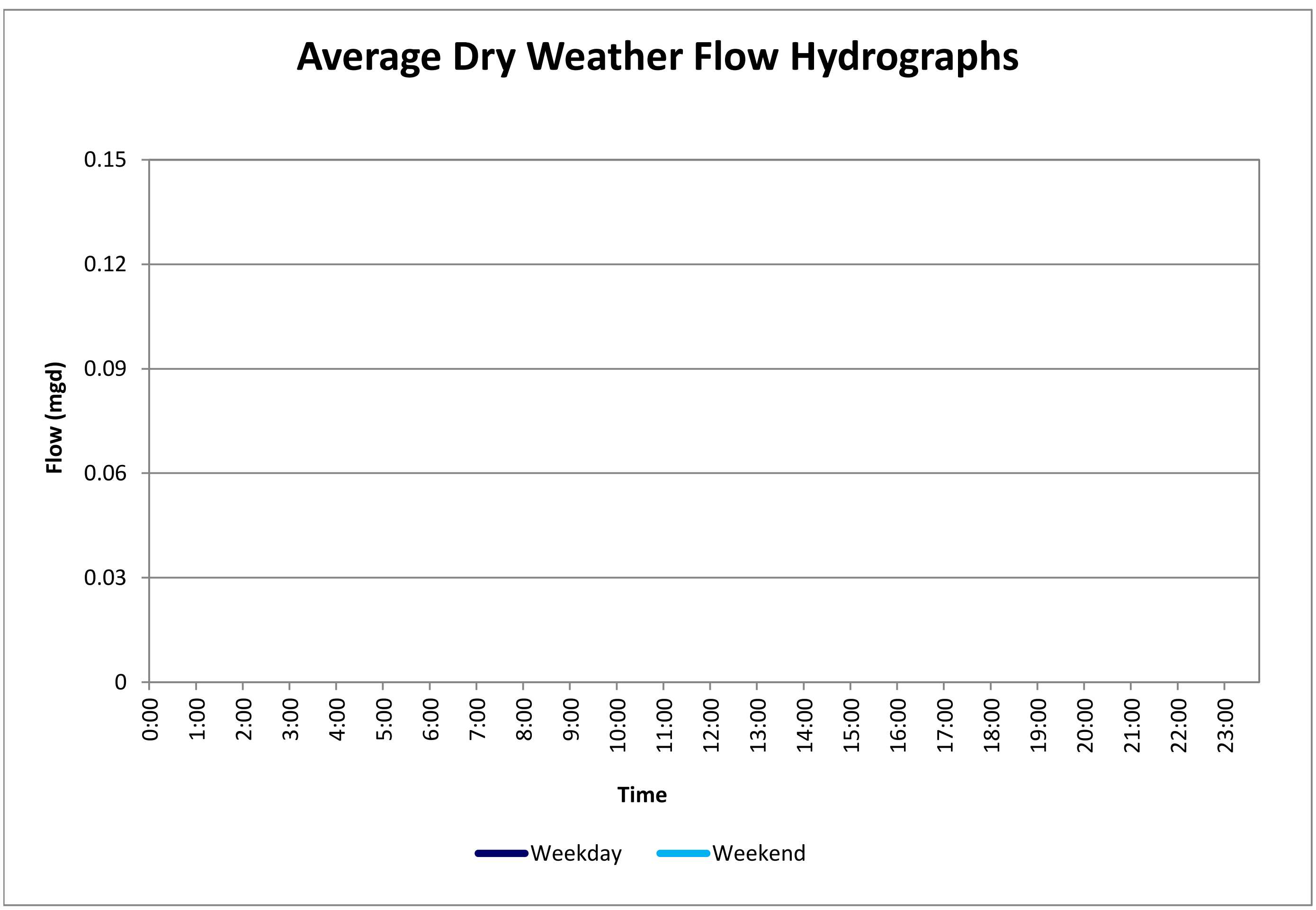
MLM_5

General Information

Site:	MLM_5
Description of Location:	Jonathan Place
Data Range:	2/13/2013 to 5/17/2013
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	13
Service Population:	54

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Analysis was not completed because the site was determined to have unreliable data for the entire deployment.								



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_5

General Information

Site:	MLM_5
Description of Location:	Jonathan Place
Data Range:	9/8/2007 to 11/17/2007
	2/6/2010 to 5/5/2010
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	13
Service Population:	54

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/15/2010	0.25	0.04	0.138	2.43	0.12	0.127	2.29	1.95
3/13/2010	3.08	0.16	0.131	2.39	0.56	0.110	2.19	1.69
3/29/2010	2.07	0.26	0.118	2.07	0.59	0.113	2.06	1.74
3/30/2010	1.66	0.06	0.116	2.08	0.24	0.113	2.06	1.74
3/22/2010	1.50	0.27	0.105	2.02	0.59	0.104	1.98	1.60
Five-Storm Average	**1.71**	**0.16**	**0.122**	**2.20**	**0.42**	**0.113**	**2.12**	**1.74**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

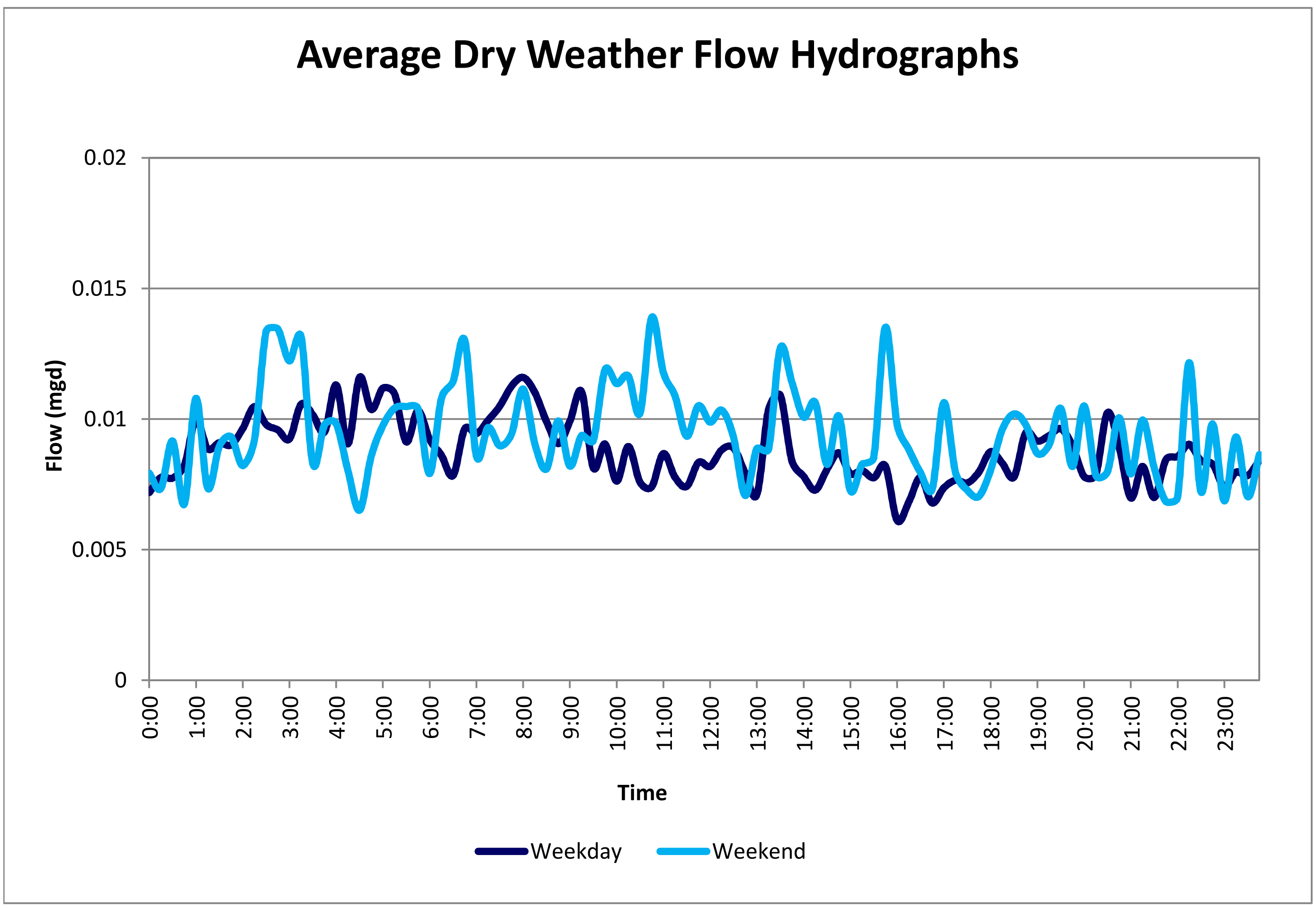
MLM_6

General Information

Site:	MLM_6
Description of Location:	Pine Road
Data Range:	8/28/2007 to 11/17/2007
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	17
Service Population:	79

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.009	112	0.012	147	0.006	77	0.69	46
Weekend	0.009	120	0.014	176	0.007	82	0.69	20
Total	**0.009**	**114**	**0.012**	**156**	**0.006**	**79**	**0.69**	**66**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

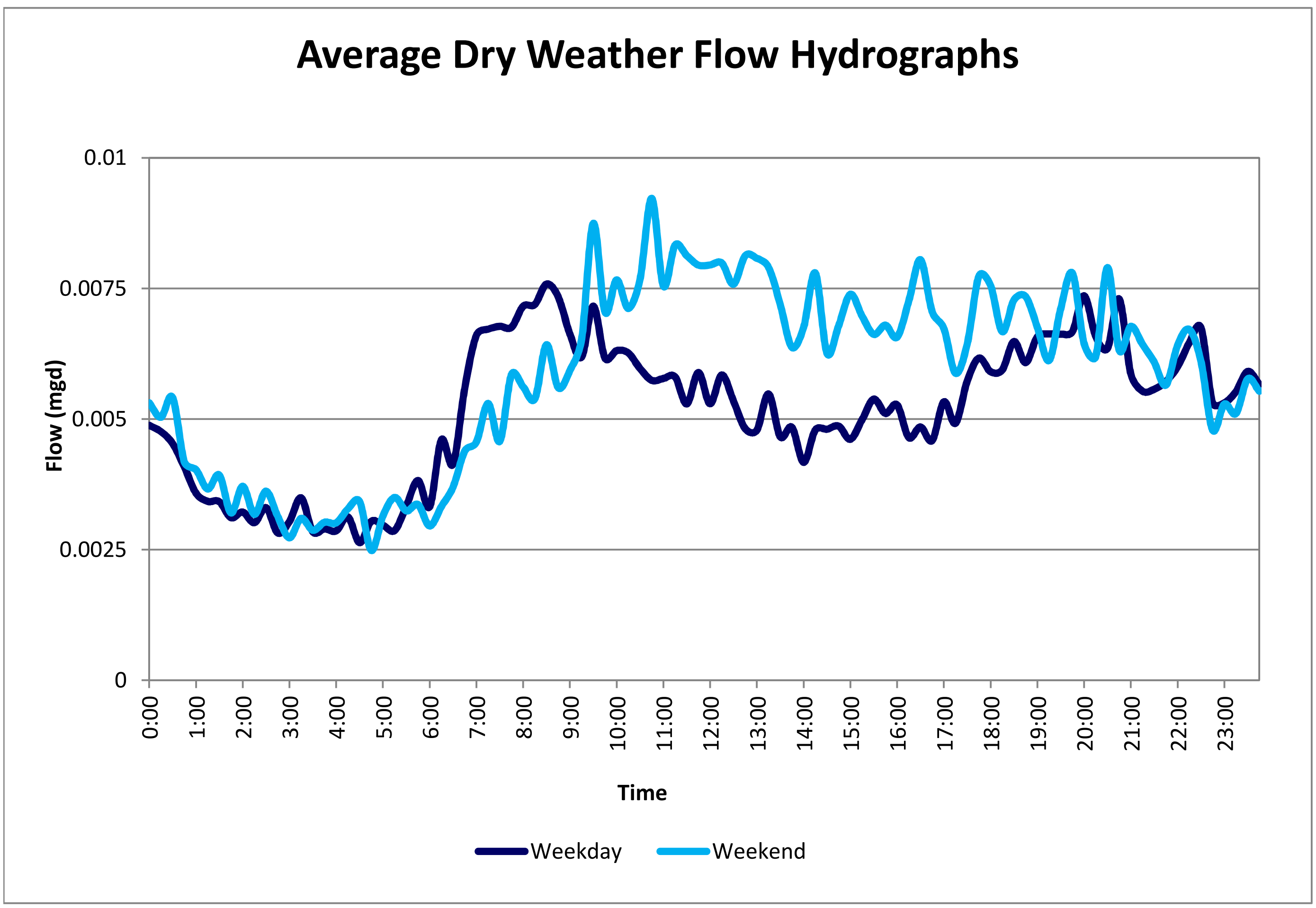
MLM_6

General Information

Site:	MLM_6
Description of Location:	Pine Road
Data Range:	2/6/2010 to 5/5/2010
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	17
Service Population:	79

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.00518	66	0.00758	96	0.00263	33	0.51	47
Weekend	0.00585	74	0.00922	117	0.00249	31	0.42	20
Total	**0.00538**	**68**	**0.00807**	**102**	**0.00259**	**33**	**0.48**	**67**



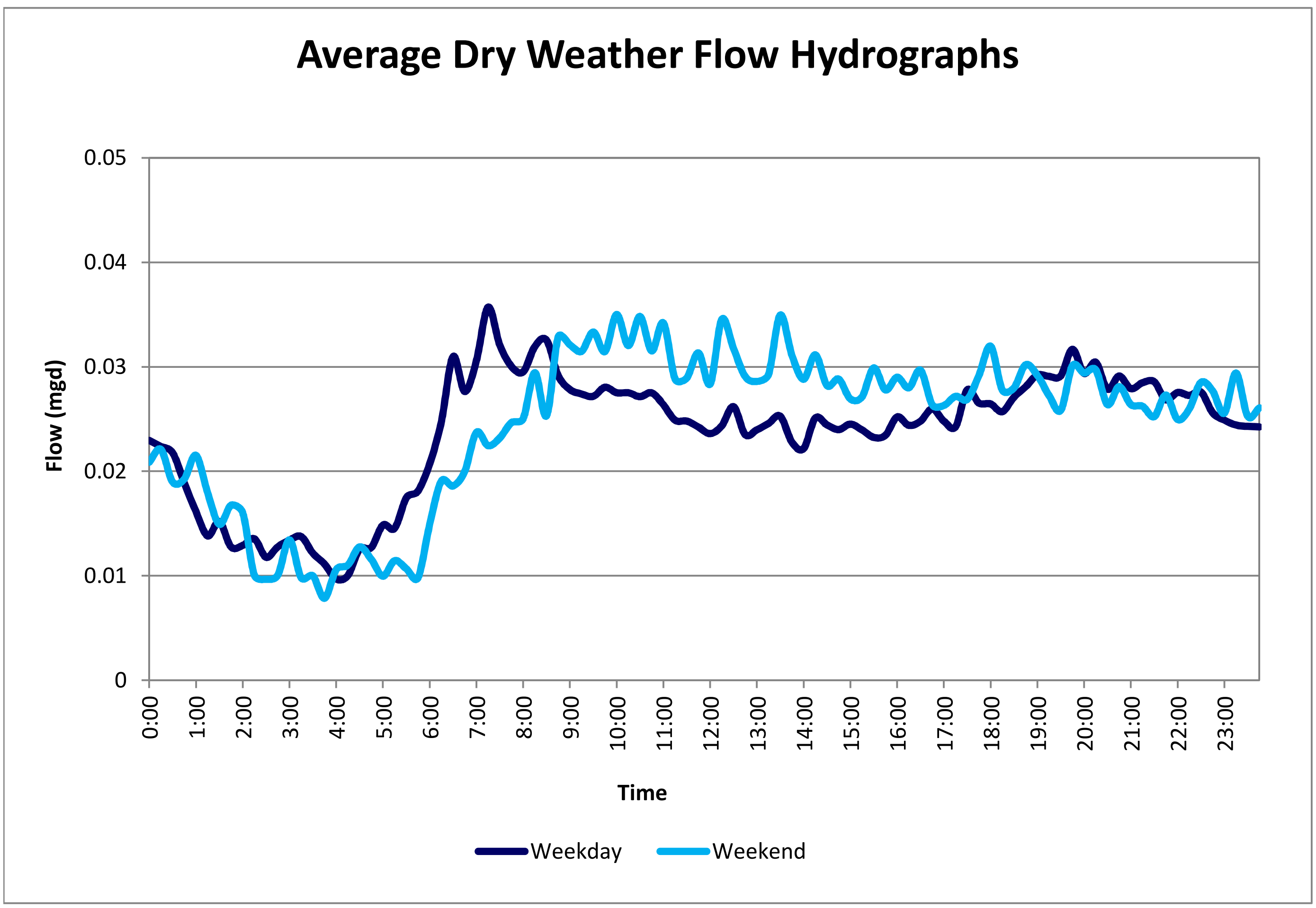
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_6

General Information

Site:	MLM_6
Description of Location:	Pine Road
Data Range:	2/11/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	17
Service Population:	79

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.024	301	0.036	452	0.010	123	0.41	63
Weekend	0.025	310	0.035	443	0.008	99	0.32	24
Total	**0.024**	**303**	**0.036**	**449**	**0.009**	**116**	**0.38**	**87**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_6

General Information

Site:	MLM_6
Description of Location:	Pine Road
Data Range:	8/28/2007 to 11/17/2007
	2/6/2010 to 5/5/2010
	2/11/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Lower Moreland
Drainage Area (Acres):	17
Service Population:	79

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
11/6/2007	0.26	0.03	0.153	3.32	0.07	0.062	3.16	6.89
11/13/2007	0.18	0.03	0.126	3.88	0.05	0.042	1.54	4.67
10/10/2007	1.07	0.27	0.114	3.82	0.62	0.063	2.86	7.00
10/11/2007	0.41	0.10	0.093	2.02	0.29	0.031	0.99	3.44
10/19/2007	0.51	0.18	0.091	3.85	0.48	0.027	1.59	3.00
Five-Storm Average	**0.49**	**0.12**	**0.115**	**3.38**	**0.30**	**0.045**	**2.03**	**5.00**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

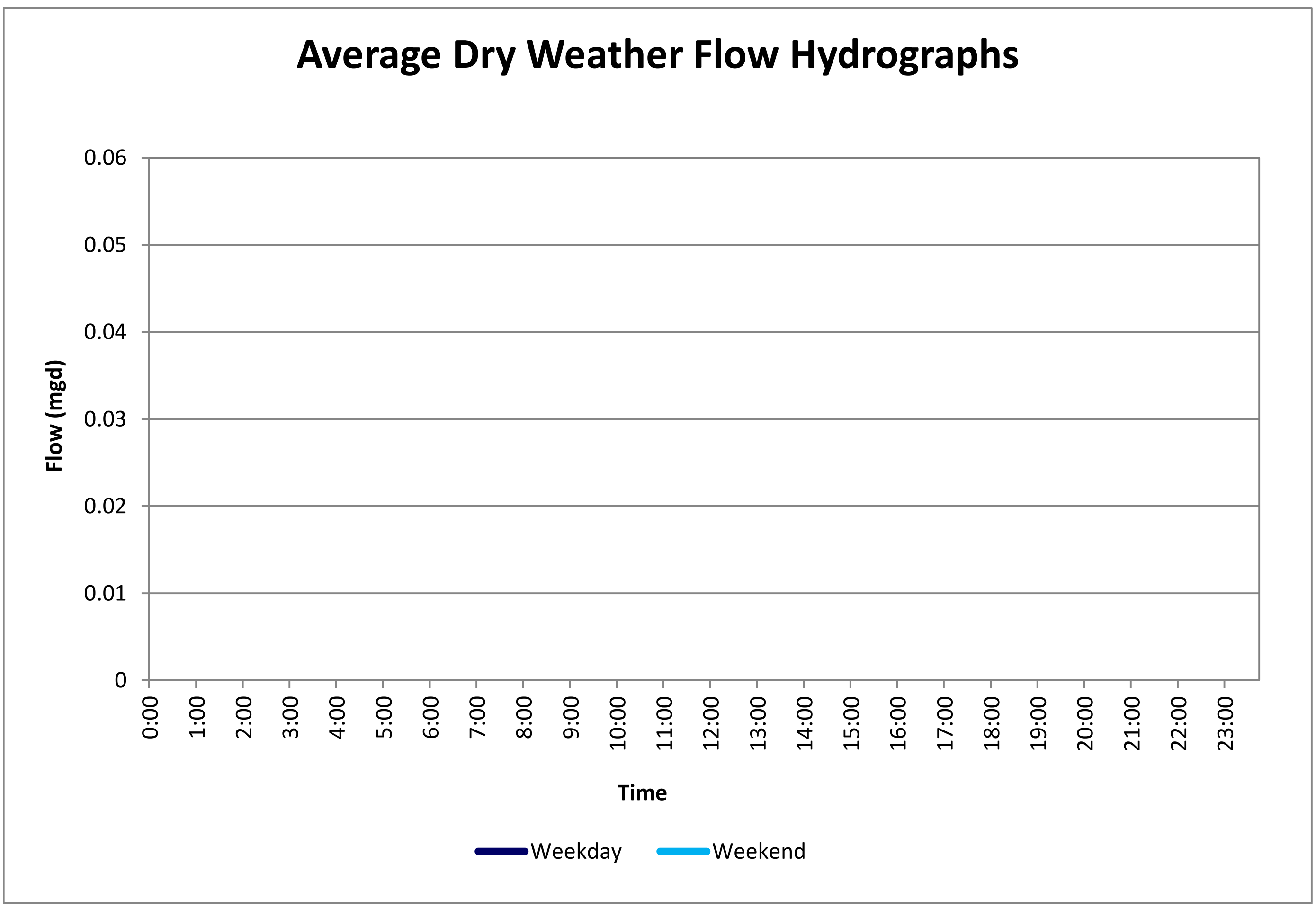
MLM_7

General Information

Site:	MLM_7
Description of Location:	Welsh Road
Data Range:	8/16/2007 to 11/17/2007
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	23
Service Population:	87

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Analysis was not completed because the site was determined to have unreliable data for the entire deployment.								



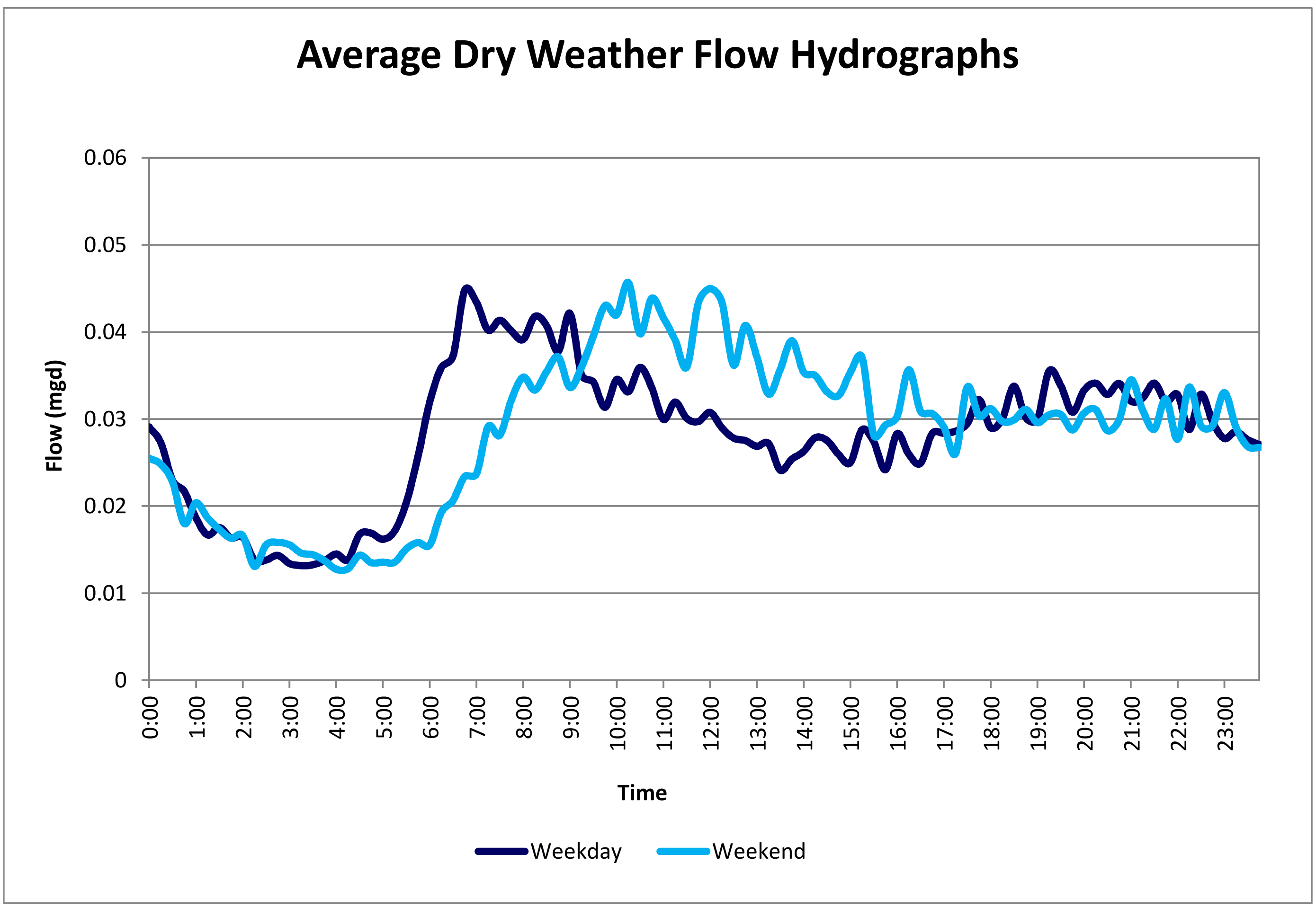
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MLM_7

General Information

Site:	MLM_7
Description of Location:	Welsh Road
Data Range:	2/6/2010 to 5/5/2010
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	23
Service Population:	87

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.028	325	0.045	515	0.013	151	0.47	57
Weekend	0.029	330	0.046	525	0.013	147	0.44	22
Total	**0.028**	**326**	**0.045**	**518**	**0.013**	**150**	**0.46**	**79**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

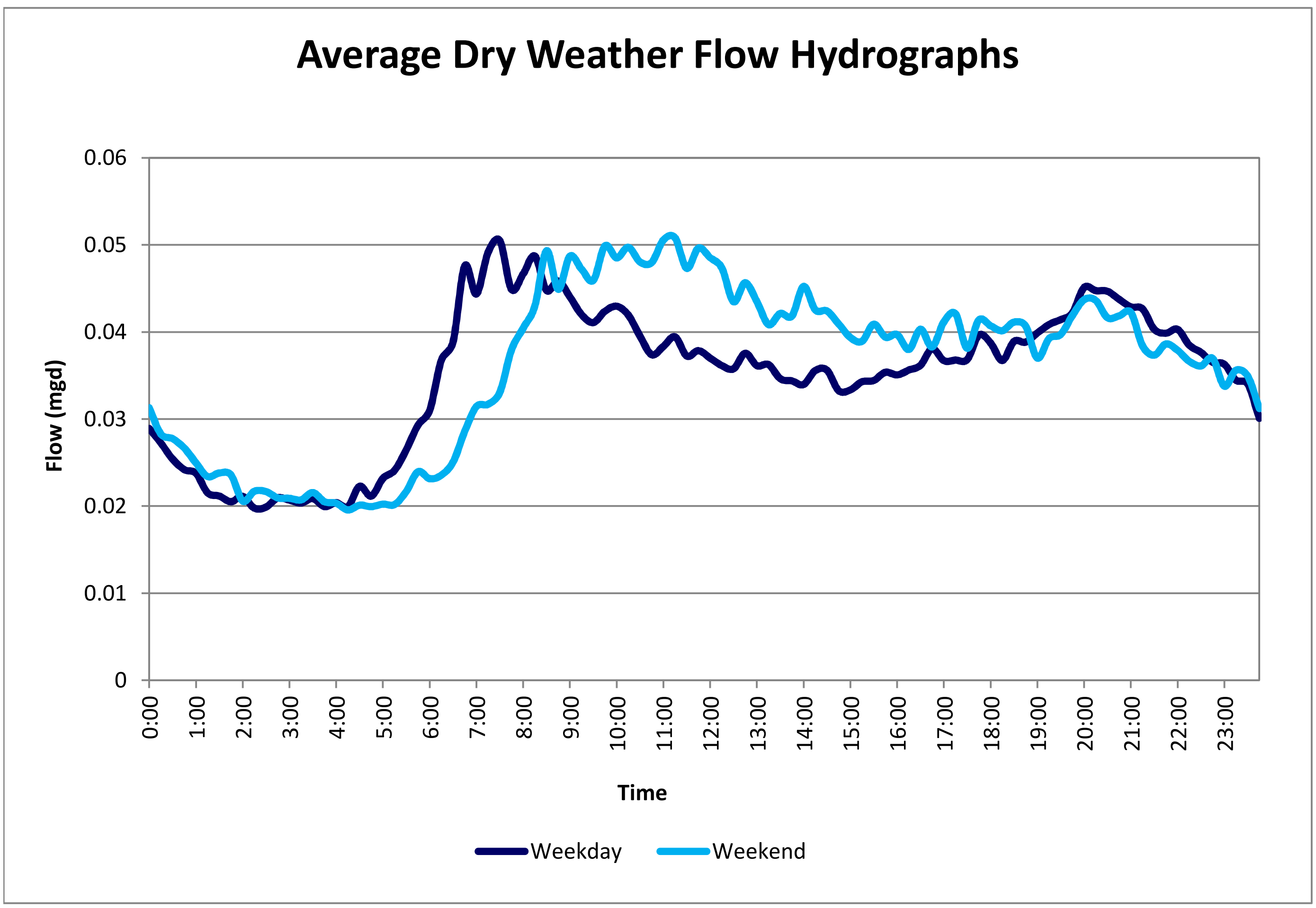
MLM_7

General Information

Site:	MLM_7
Description of Location:	Welsh Road
Data Range:	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	23
Service Population:	87

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.035	403	0.050	580	0.020	227	0.56	60
Weekend	0.036	416	0.051	584	0.020	225	0.54	25
Total	**0.035**	**407**	**0.051**	**581**	**0.020**	**226**	**0.56**	**85**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MLM_7

General Information

Site:	MLM_7
Description of Location:	Welsh Road
Data Range:	2/6/2010 to 5/5/2010
	2/13/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Lower Moreland
Drainage Area (Acres):	23
Service Population:	87

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/13/2010	3.08	0.16	0.115	2.22	0.56	0.073	2.12	2.58
3/14/2010	0.25	0.04	0.111	2.12	0.12	0.069	1.95	2.43
3/30/2010	1.66	0.06	0.098	2.05	0.24	0.074	2.00	2.61
3/22/2010	1.50	0.27	0.094	2.01	0.59	0.069	1.93	2.41
3/25/2010	0.12	0.01	0.091	2.03	0.04	0.057	1.92	1.99
Five-Storm Average	**1.32**	**0.11**	**0.102**	**2.09**	**0.31**	**0.068**	**1.98**	**2.40**

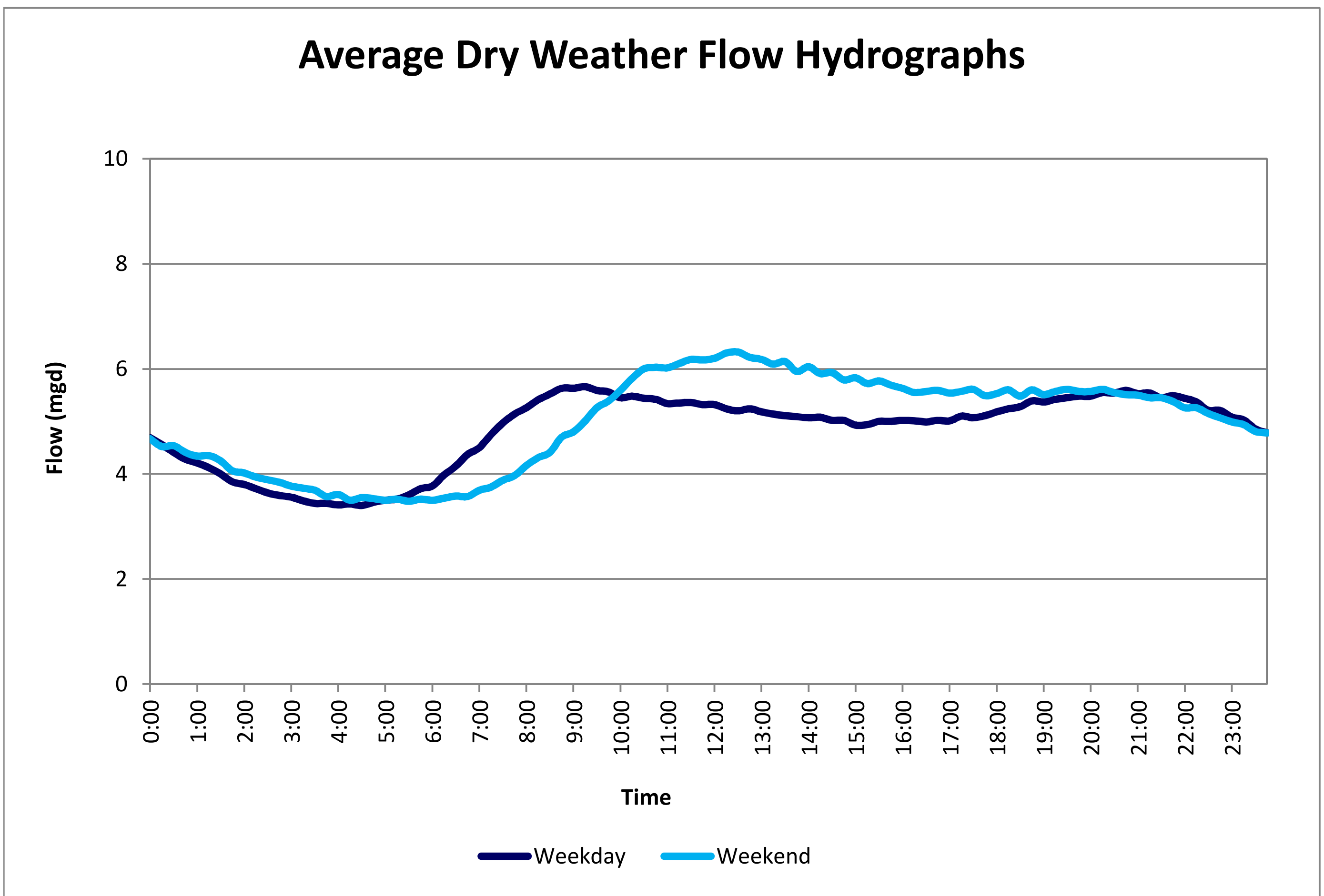
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MSH_1

General Information

Site:	MSH_1
Description of Location:	Trevose Road at Poquessing Creek
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	30"
Contract Community:	Lower Southhampton
Drainage Area (Acres):	5,132
Service Population:	21,642

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	4.83	223	5.66	262	3.40	157	0.70	74
Weekend	4.99	230	6.32	292	3.48	161	0.70	32
Total	**4.88**	**225**	**5.86**	**271**	**3.42**	**158**	**0.70**	**106**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

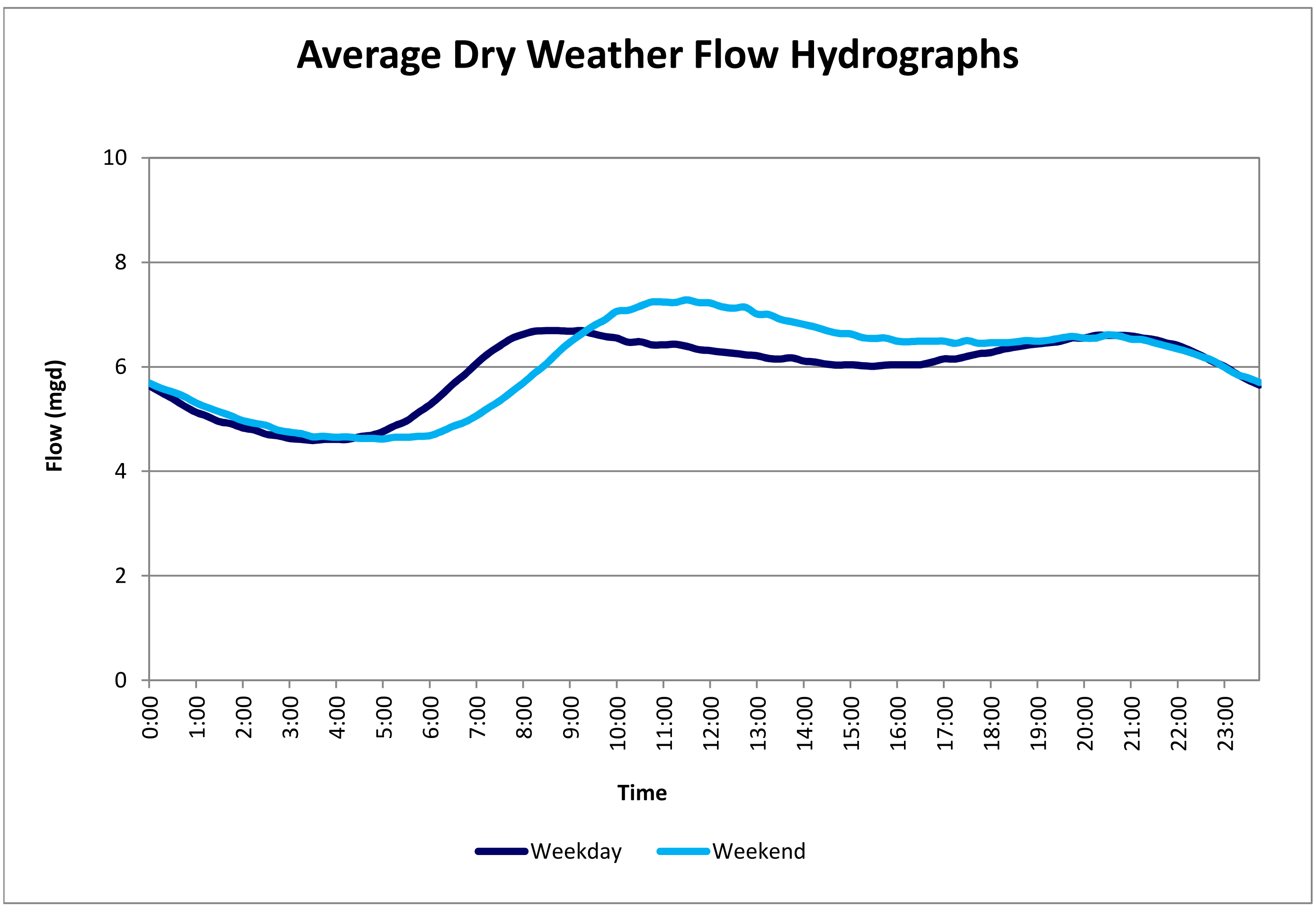
MSH_1

General Information

Site:	MSH_1
Description of Location:	Trevose Road at Poquessing Creek
Data Range:	4/1/2013 to 6/30/14
Pipe Diameter:	30"
Contract Community:	Lower Southhampton
Drainage Area (Acres):	5,132
Service Population:	21,642

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	5.93	274	6.69	309	4.59	212	0.77	190
Weekend	6.05	280	7.28	336	4.62	213	0.76	90
Total	**5.97**	**276**	**6.88**	**318**	**4.60**	**213**	**0.77**	**280**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MSH_1

General Information

Site:	MSH_1
Description of Location:	Trevose Road at Poquessing Creek
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	30"
Contract Community:	Lower Southhampton
Drainage Area (Acres):	5,132
Service Population:	21,642

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.10	0.31	16.8	77.0	0.88	16.3	76.7	2.74
3/30/2014	2.72	0.17	14.6	63.1	0.41	14.3	61.5	2.39
8/13/2013	2.41	0.72	14.5	89.7	1.44	14.3	85.3	2.39
6/10/2013	1.81	0.22	14.4	65.0	0.52	14.2	63.8	2.38
6/7/2013	3.67	0.23	13.9	70.5	0.61	13.6	66.8	2.28
Five-Storm Average	**3.14**	**0.33**	**14.8**	**73.1**	**0.77**	**14.5**	**70.8**	**2.44**

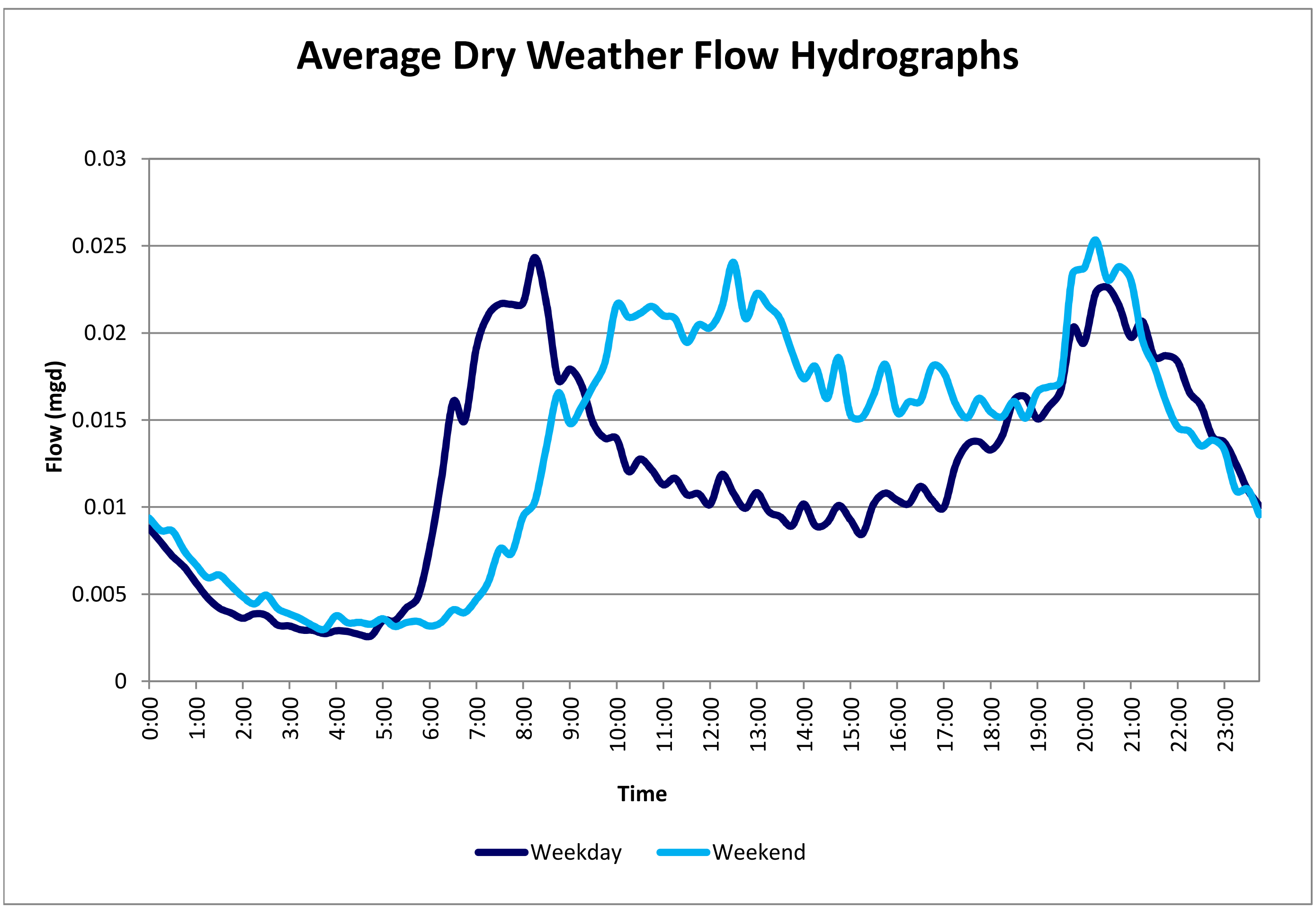
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MSH_2

General Information

Site:	MSH_2
Description of Location:	Lukens Street
Data Range:	9/1/2007 to 11/16/2007
Pipe Diameter:	8"
Contract Community:	Lower Southampton
Drainage Area (Acres):	60
Service Population:	282

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.012	42	0.024	86	0.003	9	0.22	23
Weekend	0.013	48	0.025	90	0.003	11	0.22	18
Total	**0.013**	**44**	**0.025**	**88**	**0.003**	**10**	**0.22**	**41**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

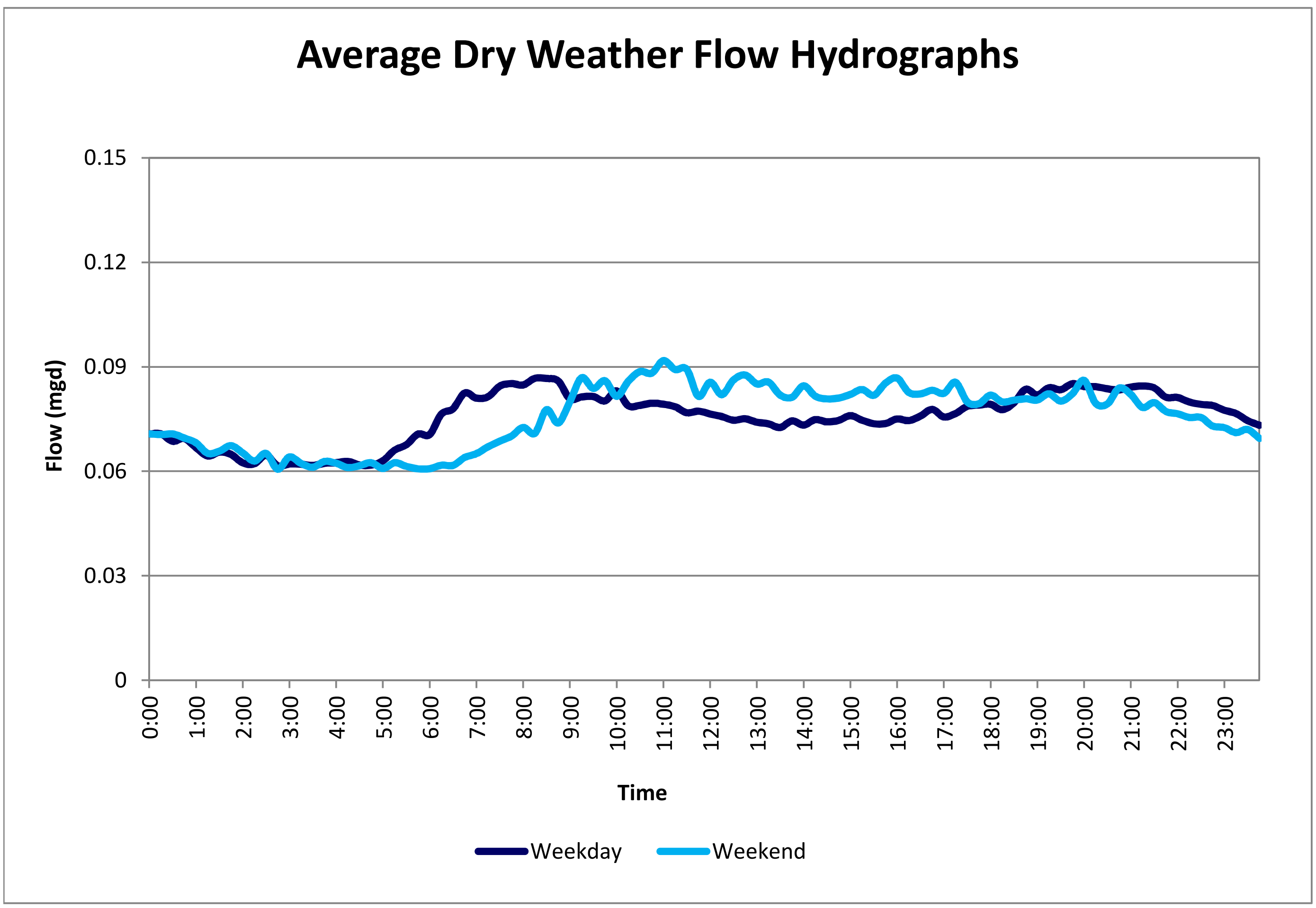
MSH_2

General Information

Site:	MSH_2
Description of Location:	Lukens Street
Data Range:	2/6/2010 to 5/4/2010
Pipe Diameter:	8"
Contract Community:	Lower Southampton
Drainage Area (Acres):	60
Service Population:	282

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.075	268	0.087	307	0.062	218	0.82	39
Weekend	0.076	269	0.092	325	0.061	215	0.80	16
Total	**0.076**	**268**	**0.088**	**313**	**0.061**	**217**	**0.81**	**55**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

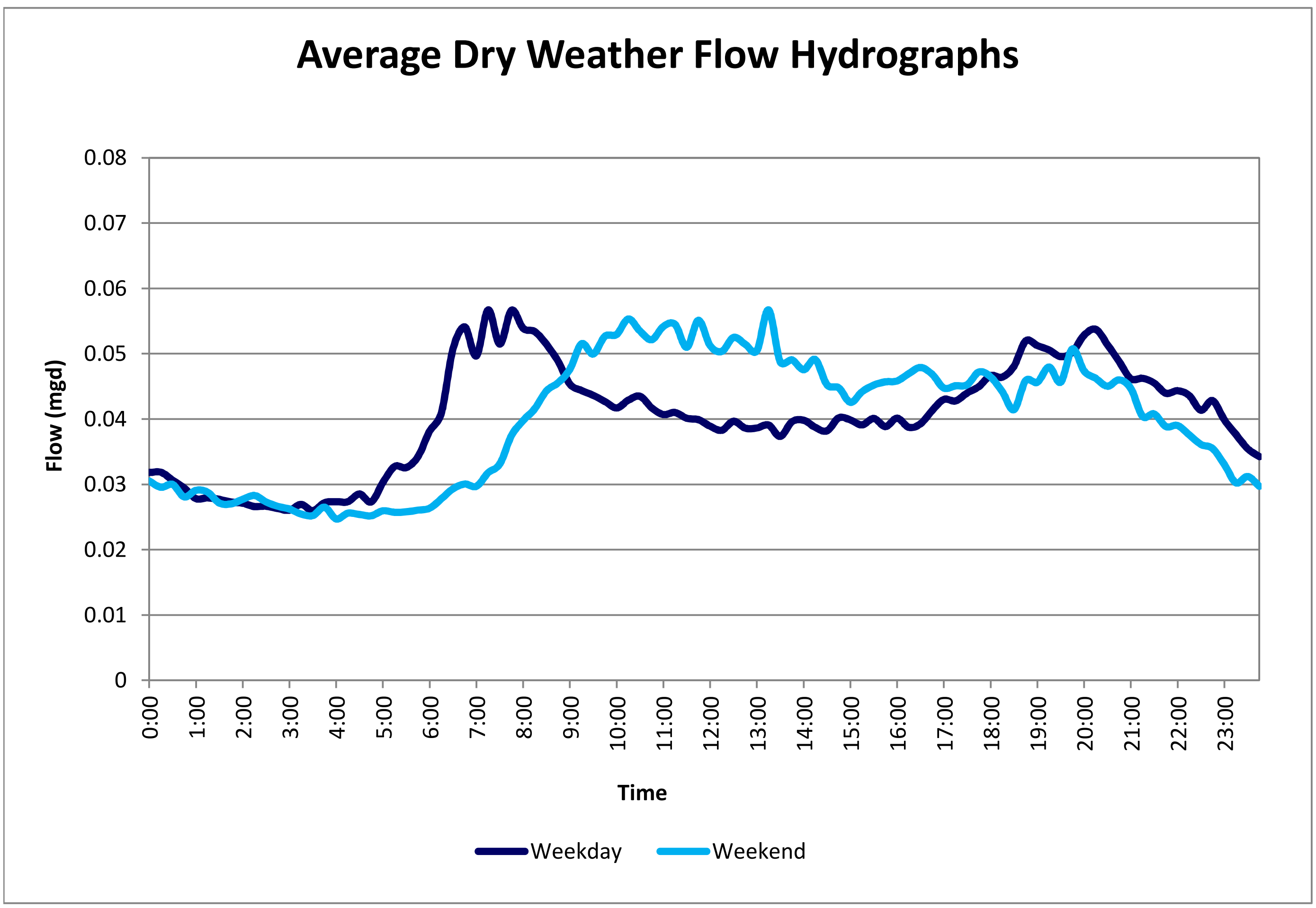
MSH_2

General Information

Site:	MSH_2
Description of Location:	Lukens Street
Data Range:	2/13/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Lower Southampton
Drainage Area (Acres):	60
Service Population:	282

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.040	143	0.057	201	0.026	92	0.65	45
Weekend	0.040	141	0.057	201	0.025	88	0.62	19
Total	**0.040**	**142**	**0.057**	**201**	**0.026**	**91**	**0.64**	**64**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MSH_2

General Information

Site:	MSH_2
Description of Location:	Lukens Street
Data Ranges:	9/1/2007 to 11/16/2007
	2/6/2010 to 5/4/2010
	2/13/2013 to 5/16/2013
Pipe Diameter:	8"
Contract Community:	Lower Southampton
Drainage Area (Acres):	60
Service Population:	282

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
5/10/2013	0.81	0.13	0.111	2.82	0.28	0.074	2.42	1.85
4/10/2013	0.53	0.14	0.071	2.79	0.25	0.060	2.76	1.50
10/27/2007	2.46	0.20	0.065	2.33	0.45	0.055	2.20	4.43
10/9/2007	1.00	0.21	0.022	1.41	0.53	0.018	1.33	1.42
9/11/2007	0.80	0.23	0.021	2.01	0.57	0.025	1.57	2.00
Five-Storm Average	**1.00**	**0.21**	**0.022**	**1.41**	**0.53**	**0.018**	**1.33**	**1.42**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

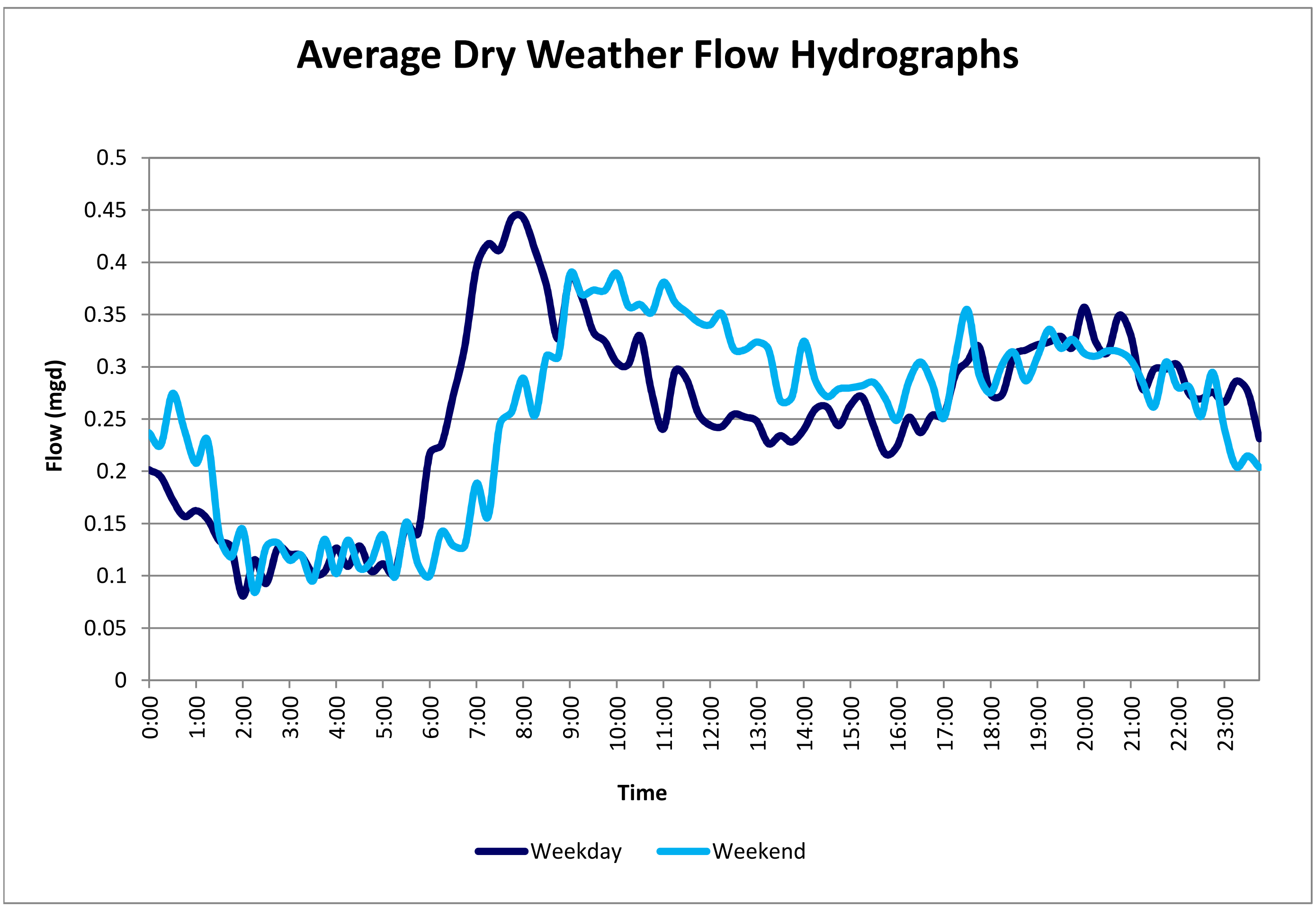
MS_1

General Information

Site:	MS_1
Description of Location:	Northwestern Avenue and Thomas Road
Data Range:	8/16/2007 to 11/17/2007
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	77
Service Population:	404

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.254	628	0.443	1096	0.081	200	0.32	61
Weekend	0.255	630	0.390	964	0.084	208	0.33	23
Total	**0.254**	**629**	**0.428**	**1060**	**0.082**	**202**	**0.32**	**84**



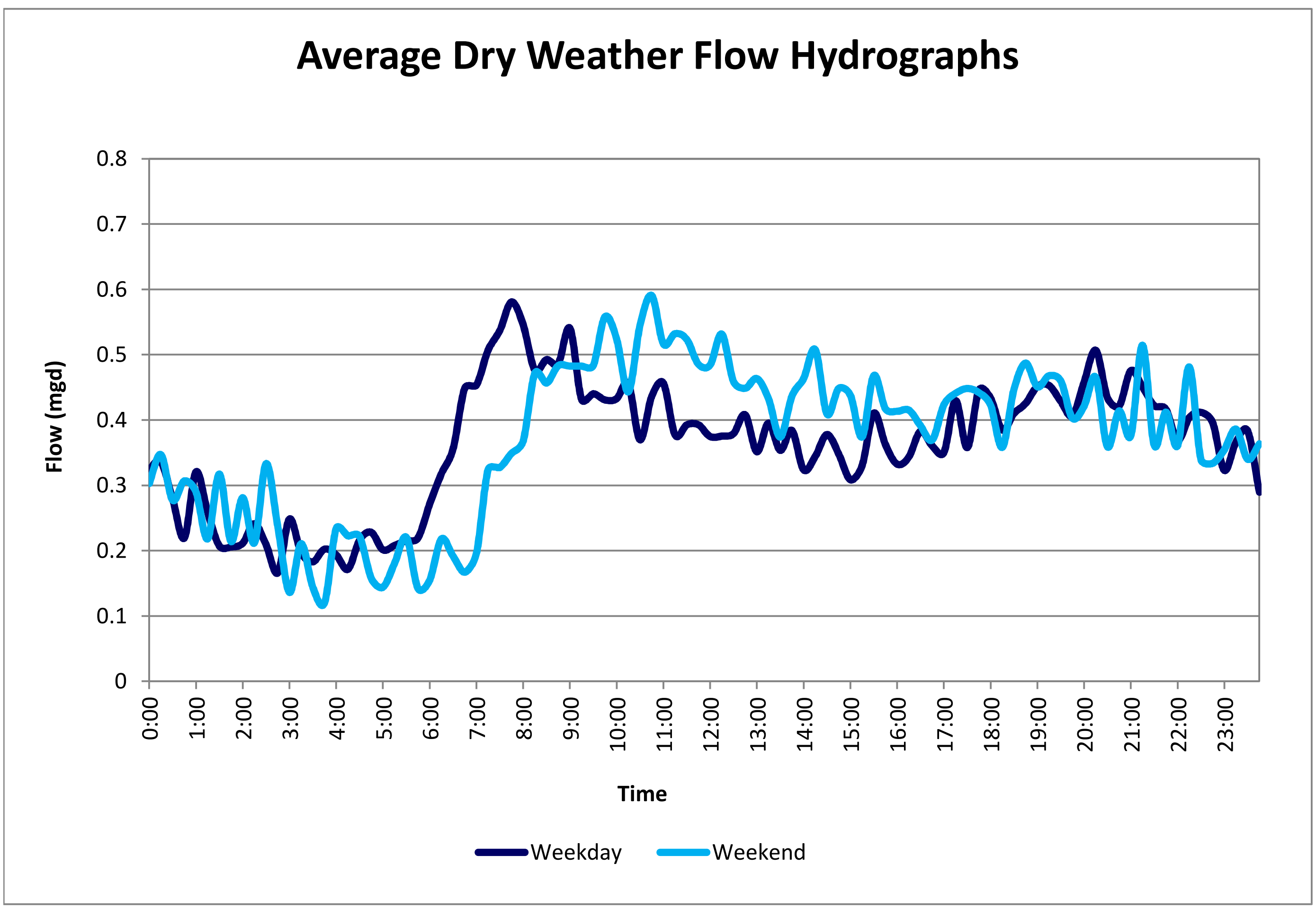
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_1

General Information

Site:	MS_1
Description of Location:	Northwestern Avenue and Thomas Road
Data Range:	2/6/2010 to 5/6/2010
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	77
Service Population:	404

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.363	898	0.581	1437	0.166	411	0.46	48
Weekend	0.371	918	0.591	1462	0.120	297	0.32	23
Total	**0.366**	**905**	**0.584**	**1445**	**0.151**	**374**	**0.41**	**71**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

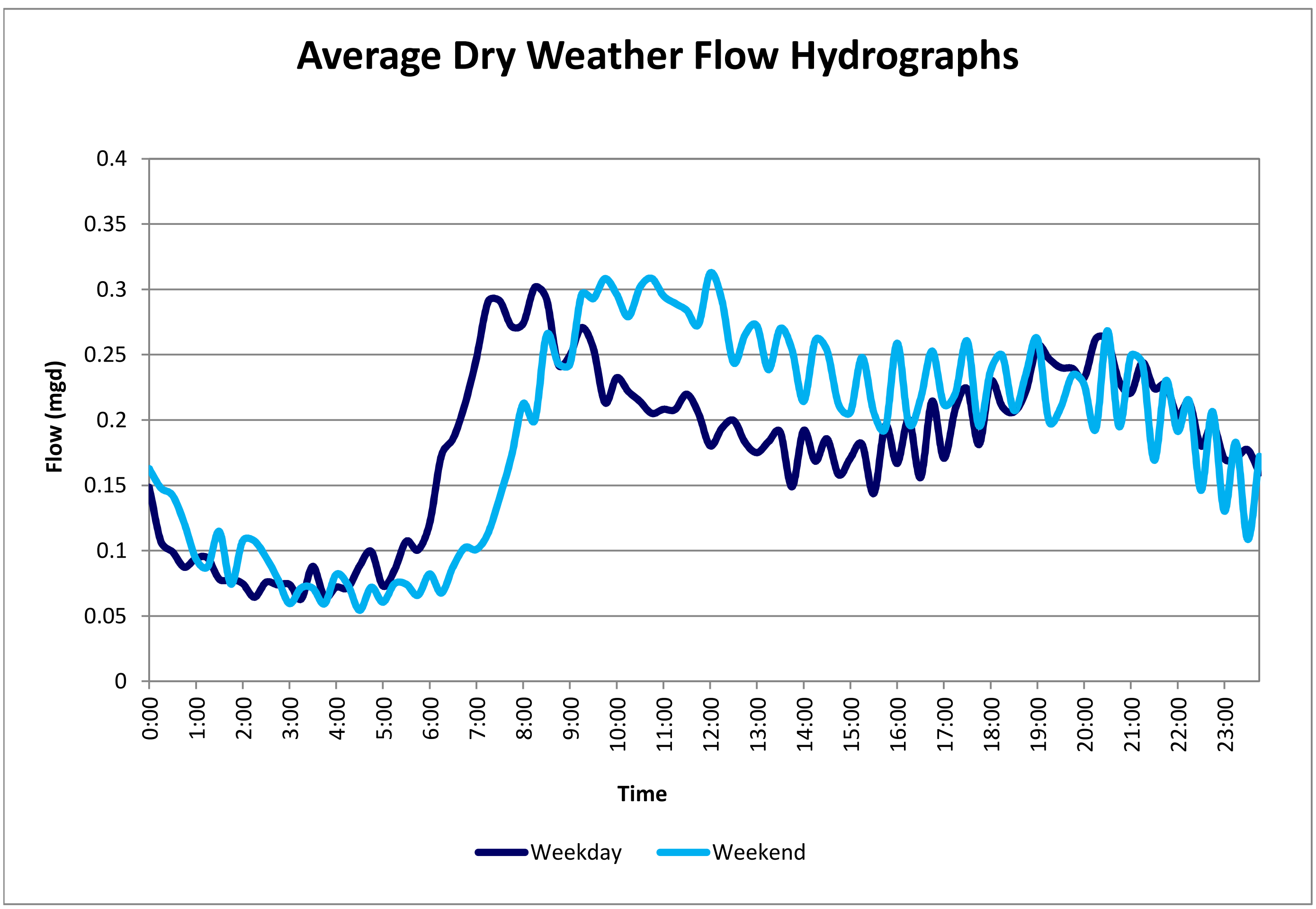
MS_1

General Information

Site:	MS_1
Description of Location:	Northwestern Avenue and Thomas Road
Data Range:	2/11/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	77
Service Population:	404

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.180	445	0.302	747	0.063	156	0.35	64
Weekend	0.189	467	0.312	773	0.054	134	0.29	23
Total	**0.182**	**451**	**0.305**	**754**	**0.061**	**150**	**0.33**	**87**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_1

General Information

Site:	MS_1
Description of Location:	Pine RoadNorthwestern Avenue and Thomas Road
Data Range:	8/31/2007 to 11/17/2007
	2/6/2010 to 5/7/2010
	2/11/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	77
Service Population:	404

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.								

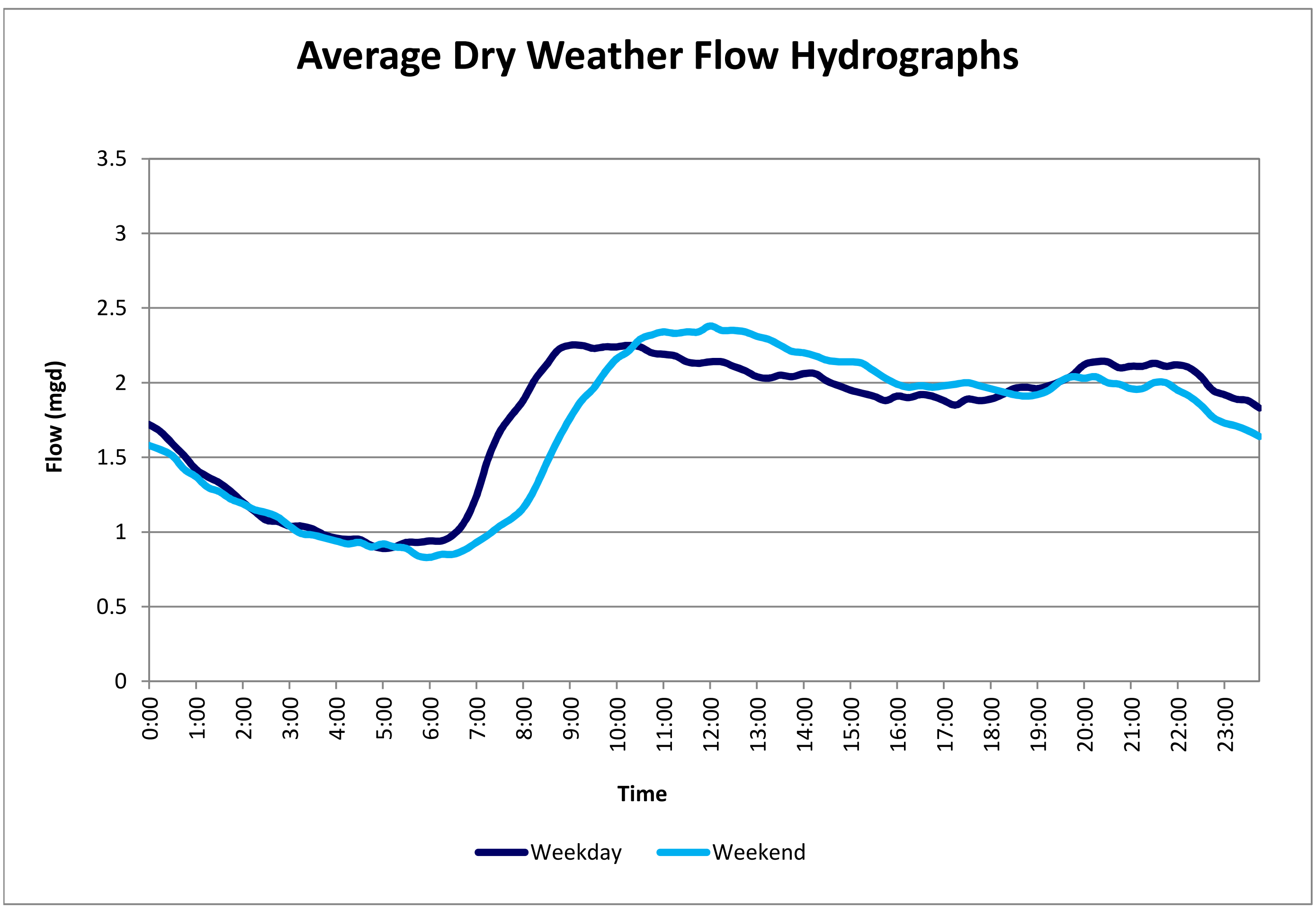
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_2

General Information

Site:	MS_2
Description of Location:	Northwestern Avenue and Wissahickon Creek
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	30"
Contract Community:	Springfield
Drainage Area (Acres):	2,648
Service Population:	12,155

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.76	145	2.25	185	0.890	73	0.51	28
Weekend	1.70	140	2.38	196	0.830	68	0.49	21
Total	**1.73**	**143**	**2.31**	**190**	**0.864**	**71**	**0.50**	**49**



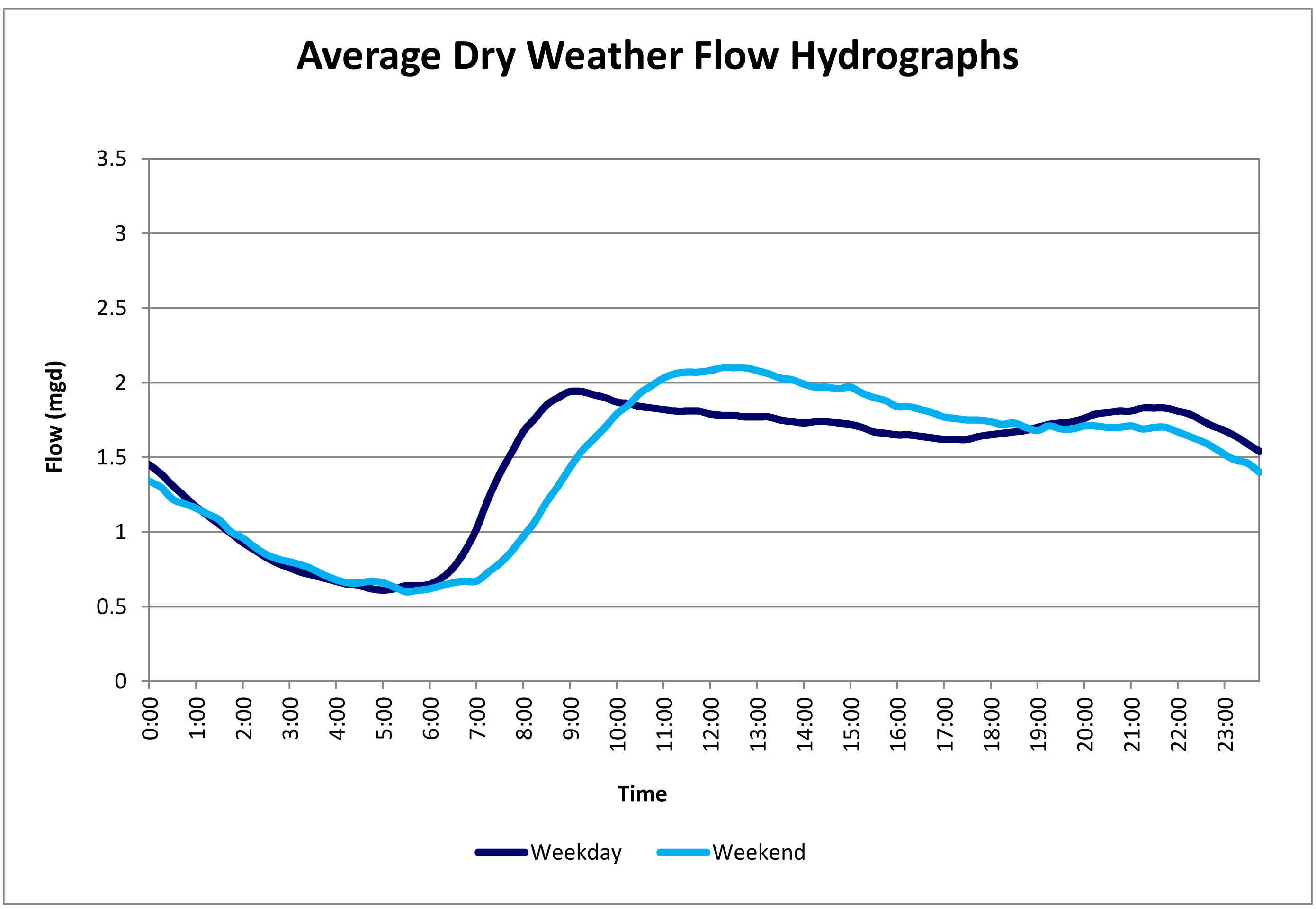
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_2

General Information

Site:	MS_2
Description of Location:	Northwestern Avenue and Wissahickon Creek
Data Range:	4/1/2013 to 6/30/14
Pipe Diameter:	30"
Contract Community:	Springfield
Drainage Area (Acres):	2,648
Service Population:	12,155

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.47	121	1.94	160	0.610	50	0.41	115
Weekend	1.45	120	2.10	173	0.600	49	0.41	54
Total	**1.47**	**121**	**1.99**	**164**	**0.607**	**50**	**0.41**	**169**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_2

General Information

Site:	MS_2
Description of Location:	Northwestern Avenue and Wissahickon Creek
Data Range:	4/1/2012 to 6/30/2014
Pipe Diameter:	30"
Contract Community:	Springfield
Drainage Area (Acres):	2,648
Service Population:	12,155

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
11/27/2013	2.96	0.12	7.25	77.2	0.42	6.95	76.9	4.02
6/7/2013	3.66	0.18	7.25	139	0.60	5.00	139	2.89
8/13/2013	3.62	0.59	7.23	142	1.94	6.42	141	3.71
12/21/2012	2.38	0.14	6.12	130	0.48	5.55	129	3.78
5/27/2012	1.30	0.50	5.72	36.8	1.13	5.61	36.7	3.82
Five-Storm Average	**2.78**	**0.31**	**6.71**	**105**	**0.91**	**5.91**	**105**	**3.64**

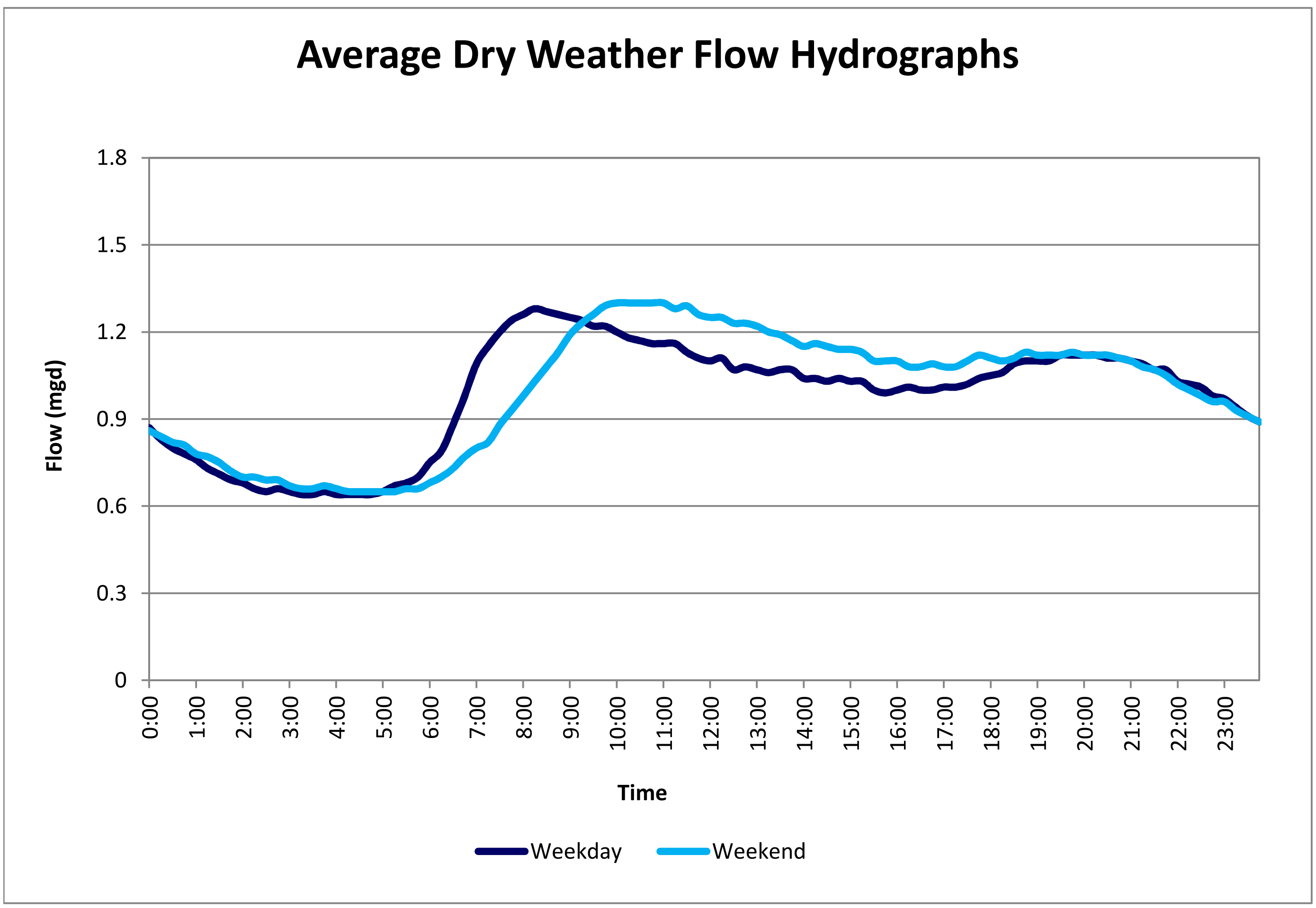
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_3

General Information

Site:	MS_3
Description of Location:	Erdenheim Avenue and Stenton Avenue
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	20"
Contract Community:	Springfield
Drainage Area (Acres):	1,429
Service Population:	6,941

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.981	141	1.28	184	0.640	92	0.65	181
Weekend	0.997	144	1.30	187	0.650	94	0.65	92
Total	**0.987**	**142**	**1.29**	**185**	**0.643**	**93**	**0.65**	**273**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

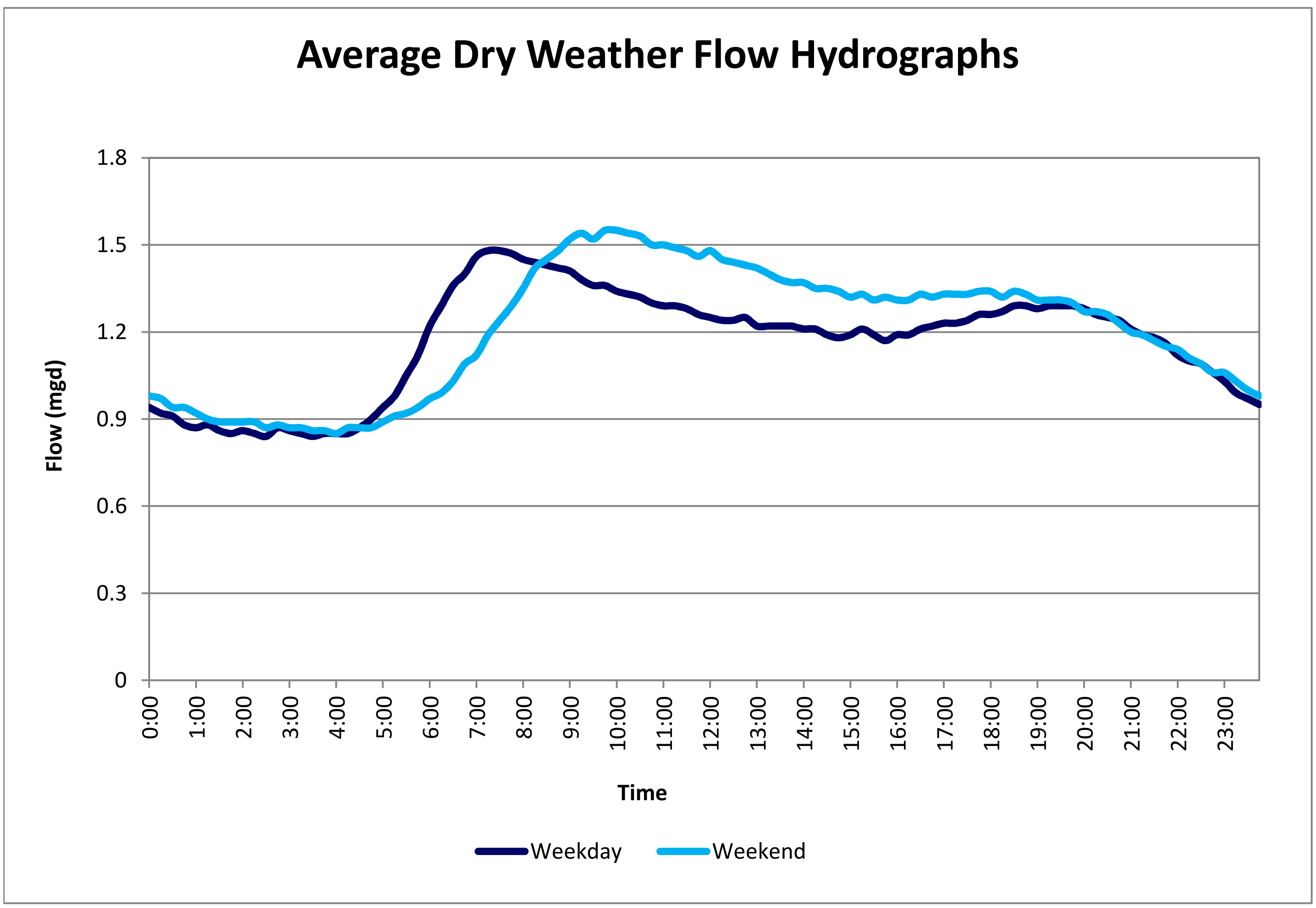
MS_3

General Information

Site:	MS_3
Description of Location:	Erdenheim Avenue and Stenton Avenue
Data Range:	4/1/2013 to 6/30/14
Pipe Diameter:	20"
Contract Community:	Springfield
Drainage Area (Acres):	1,429
Service Population:	6,941

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	1.16	168	1.48	213	0.840	121	0.72	152
Weekend	1.21	174	1.55	223	0.850	122	0.70	63
Total	**1.18**	**170**	**1.50**	**216**	**0.843**	**121**	**0.72**	**215**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_3

General Information

Site:	MS_3
Description of Location:	Erdenheim Avenue and Stenton Avenue
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	20"
Contract Community:	Springfield
Drainage Area (Acres):	1,429
Service Population:	6,941

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
7/20/2012	1.03	0.47	5.36	12.3	0.67	3.11	11.8	3.15
6/3/2013	0.92	0.20	5.33	46.6	0.43	5.17	46.3	4.38
12/21/2012	2.38	0.17	5.01	44.0	0.48	4.80	40.4	4.86
10/29/2012	3.12	0.17	4.72	13.8	0.49	3.35	13.6	3.39
6/9/2014	0.35	0.11	4.08	15.3	0.25	3.02	13.3	2.56
Five-Storm Average	**1.56**	**0.22**	**4.90**	**26.4**	**0.46**	**3.89**	**25.0**	**3.67**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

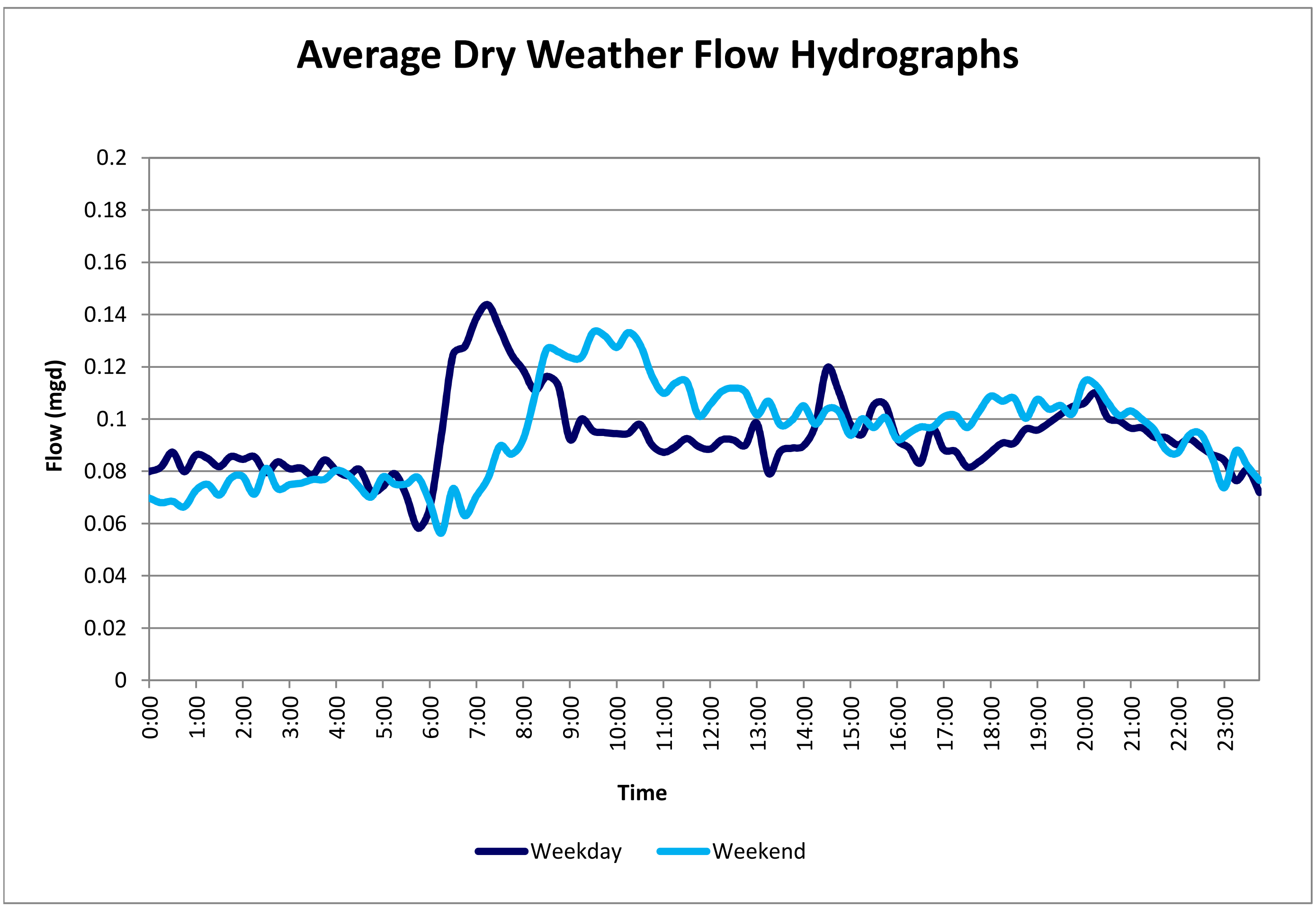
MS_4

General Information

Site:	MS_4
Description of Location:	Stenton Avenue
Data Range:	8/31/2007 to 11/17/2007
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	64
Service Population:	399

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.093	233	0.144	360	0.058	146	0.63	48
Weekend	0.094	236	0.133	334	0.056	141	0.60	20
Total	**0.093**	**234**	**0.141**	**353**	**0.058**	**145**	**0.62**	**68**



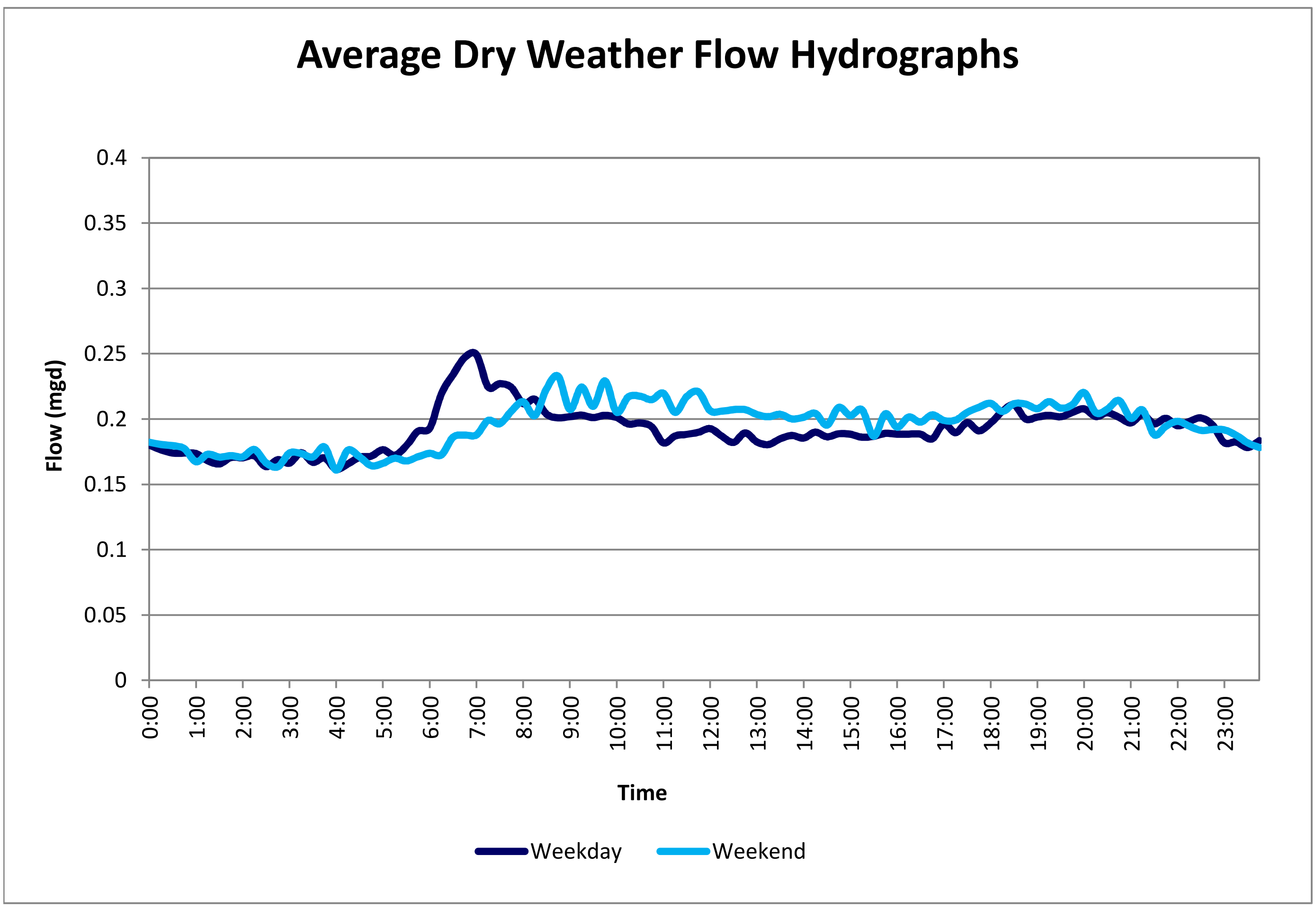
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_4

General Information

Site:	MS_4
Description of Location:	Stenton Avenue
Data Range:	2/6/2010 to 5/25/2010
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	64
Service Population:	399

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.191	480	0.249	625	0.162	405	0.84	60
Weekend	0.196	490	0.233	583	0.161	403	0.82	24
Total	**0.193**	**483**	**0.245**	**613**	**0.161**	**405**	**0.84**	**84**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

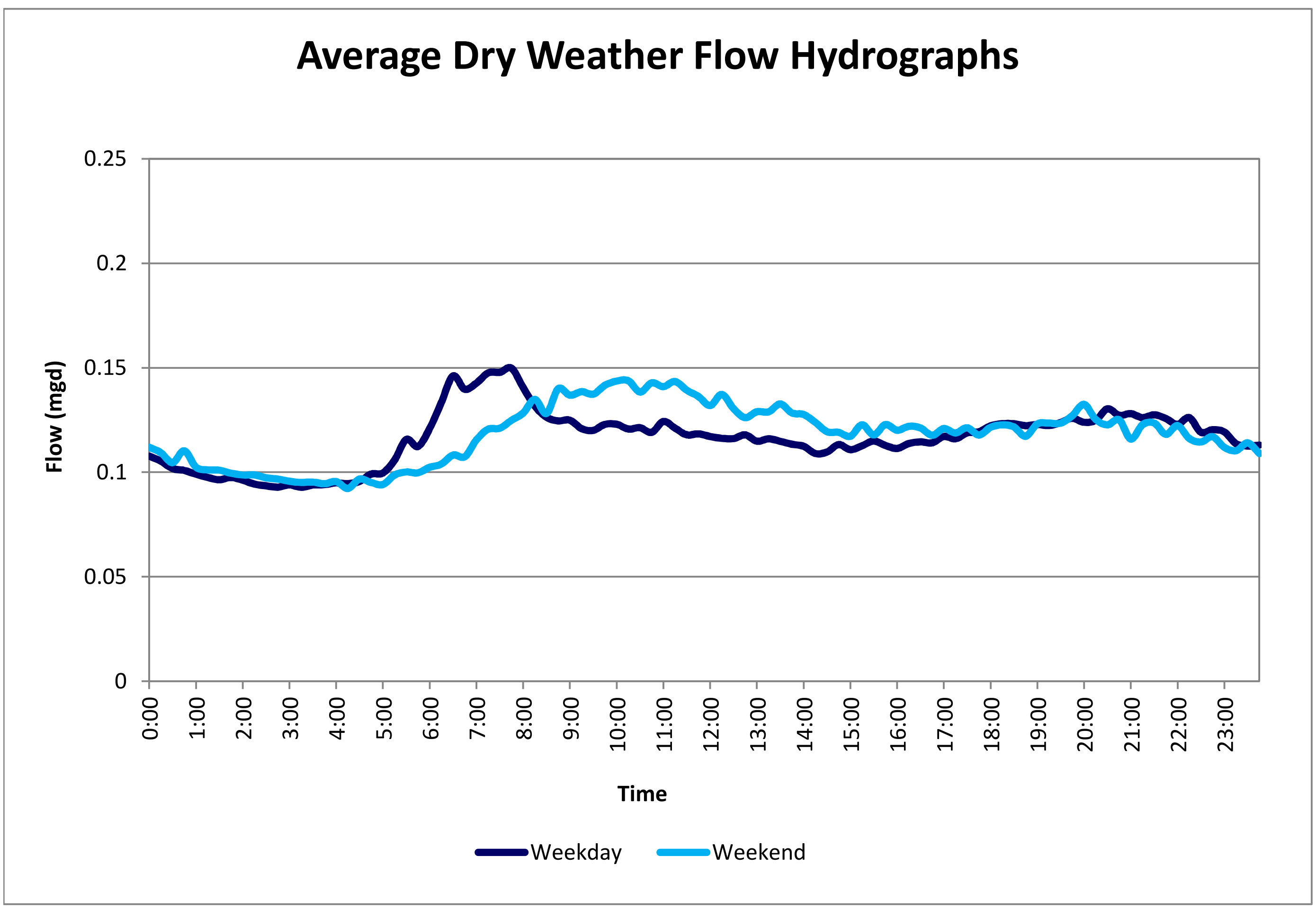
MS_4

General Information

Site:	MS_4
Description of Location:	Stenton Avenue
Data Range:	2/11/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	64
Service Population:	399

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.116	292	0.150	375	0.093	233	0.80	58
Weekend	0.118	297	0.144	360	0.092	231	0.78	22
Total	**0.117**	**293**	**0.148**	**371**	**0.093**	**232**	**0.79**	**80**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_4

General Information

Site:	MS_4
Description of Location:	Stenton Avenue
Data Range:	8/31/2007 to 11/17/2007
	2/6/2010 to 5/25/2010
	2/11/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	64
Service Population:	399

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.								

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

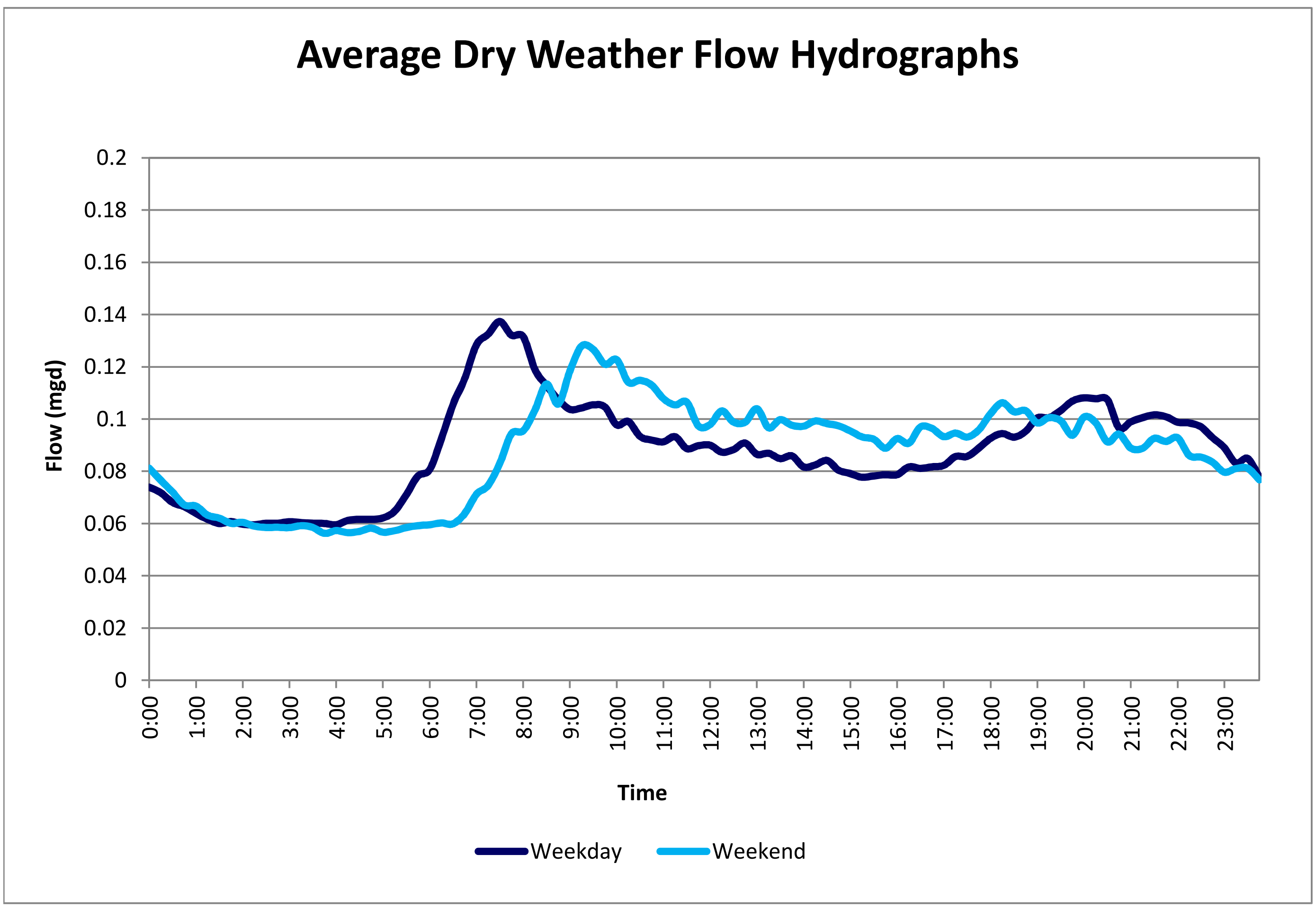
MS_5

General Information

Site:	MS_5
Description of Location:	Cresheim Valley Drive
Data Range:	8/17/2007 to 11/17/2007
Pipe Diameter:	8"
Contract Community:	Springfield
Drainage Area (Acres):	69
Service Population:	410

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.088	214	0.137	335	0.060	145	0.68	34
Weekend	0.087	213	0.128	312	0.056	137	0.65	12
Total	**0.088**	**214**	**0.135**	**329**	**0.059**	**143**	**0.67**	**46**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

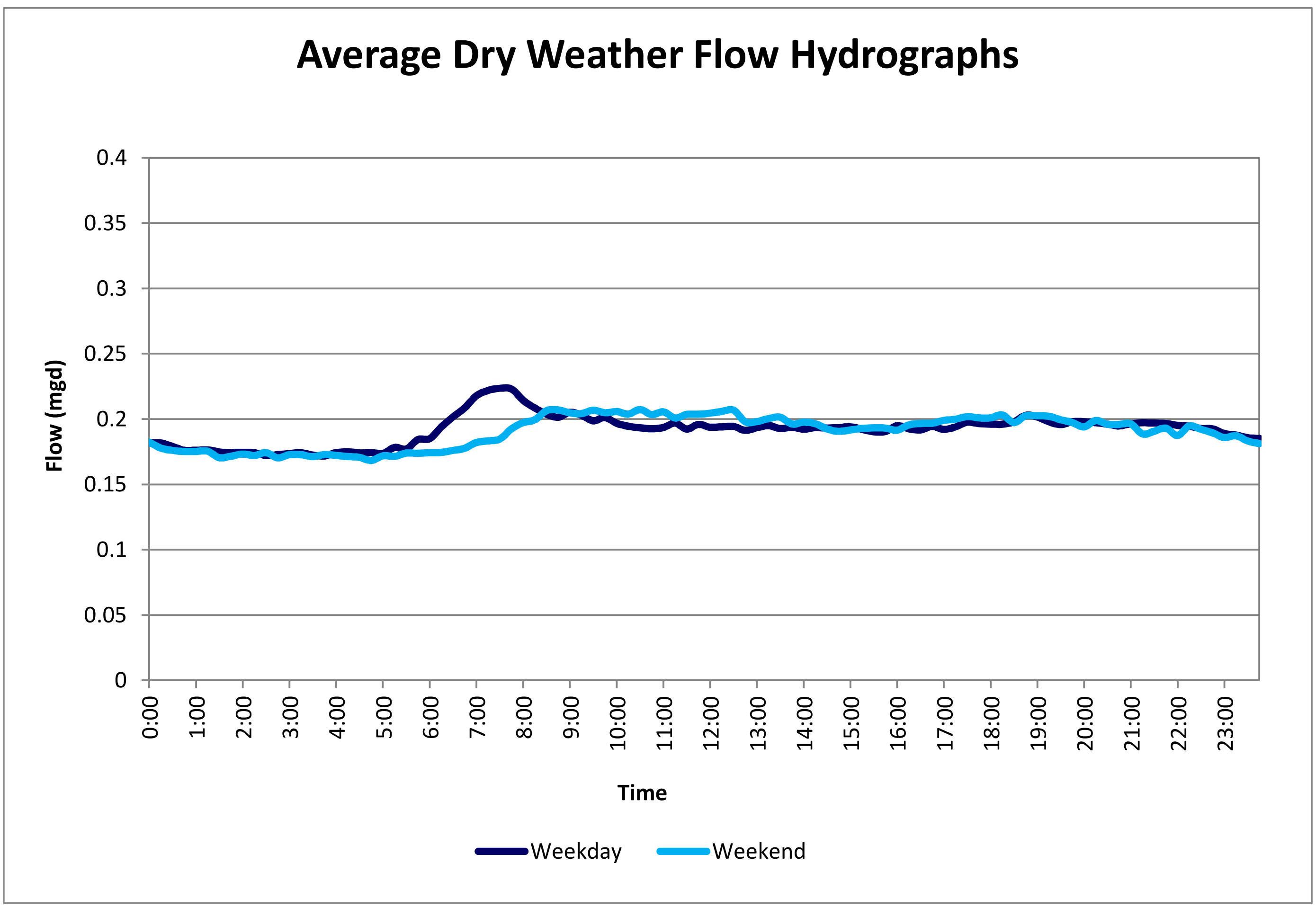
MS_5

General Information

Site:	MS_5
Description of Location:	Cresheim Valley Drive
Data Range:	2/6/2010 to 5/6/2010
Pipe Diameter:	8"
Contract Community:	Springfield
Drainage Area (Acres):	69
Service Population:	410

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.192	468	0.224	545	0.172	419	0.90	39
Weekend	0.190	464	0.207	506	0.168	410	0.88	17
Total	**0.191**	**467**	**0.219**	**533**	**0.171**	**416**	**0.89**	**56**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

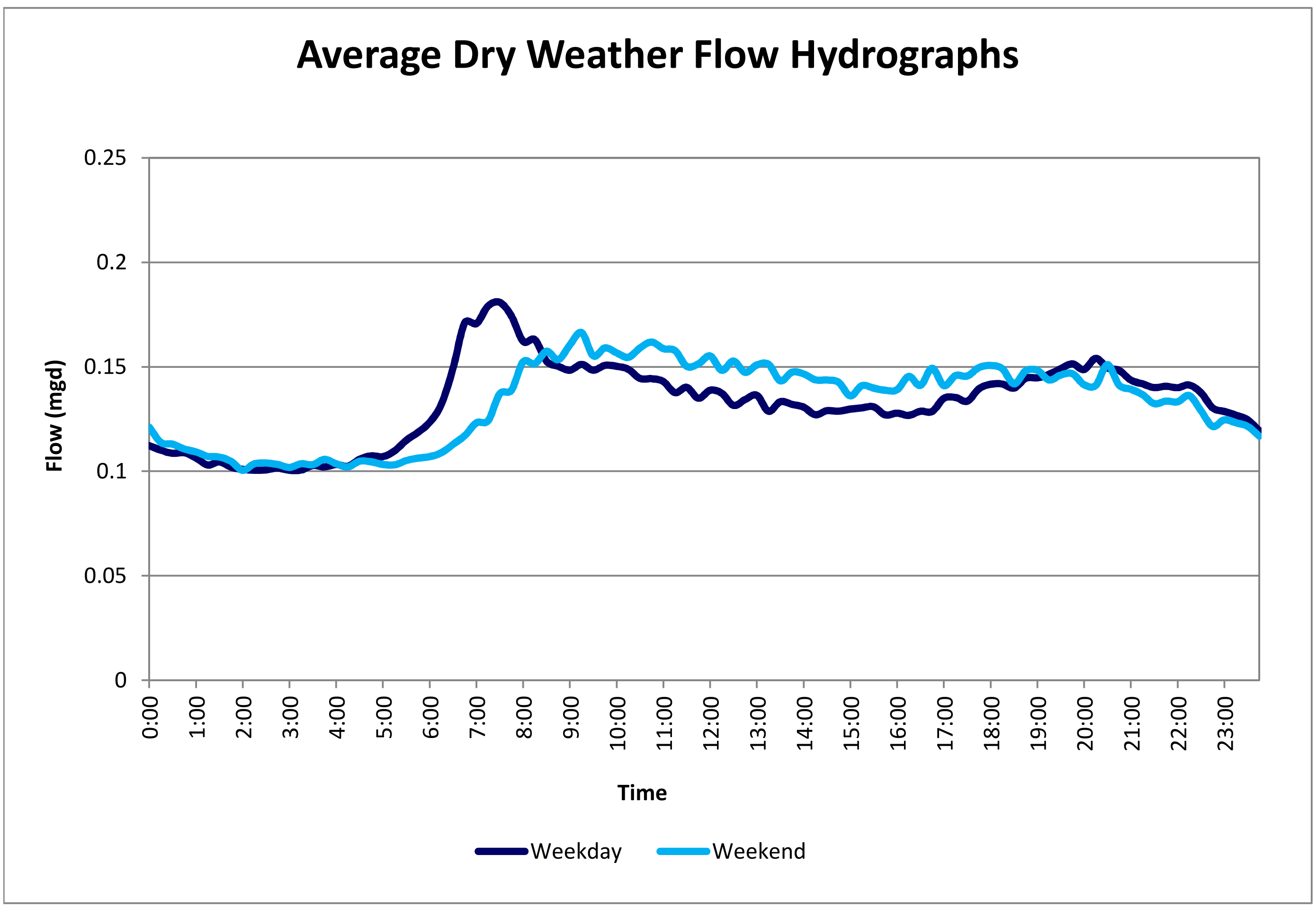
MS_5

General Information

Site:	MS_5
Description of Location:	Cresheim Valley Drive
Data Range:	2/15/2013 to 5/15/2013
Pipe Diameter:	8"
Contract Community:	Springfield
Drainage Area (Acres):	69
Service Population:	410

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.133	323	0.181	441	0.100	245	0.76	52
Weekend	0.133	325	0.166	406	0.100	245	0.75	23
Total	**0.133**	**324**	**0.176**	**430**	**0.100**	**245**	**0.76**	**75**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_5

General Information

Site:	MS_5
Description of Location:	Cresheim Valley Drive
Data Range:	8/17/2007 to 11/17/2007
	2/6/2010 to 5/6/2010
	2/15/2013 to 5/15/2013
Pipe Diameter:	8"
Contract Community:	Springfield
Drainage Area (Acres):	69
Service Population:	410

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
3/13/2010	3.56	0.17	0.891	6.09	0.58	0.792	6.00	4.15
3/29/2010	1.76	0.13	0.569	5.99	0.43	0.521	5.83	2.73
3/30/2010	1.57	0.07	0.451	5.62	0.24	0.433	5.53	2.27
2/23/2010	1.32	0.05	0.401	5.49	0.18	0.388	5.40	2.03
3/14/2010	0.39	0.08	0.344	5.07	0.18	0.345	4.99	1.81
Five-Storm Average	**1.72**	**0.10**	**0.531**	**5.65**	**0.32**	**0.496**	**5.55**	**2.60**

Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

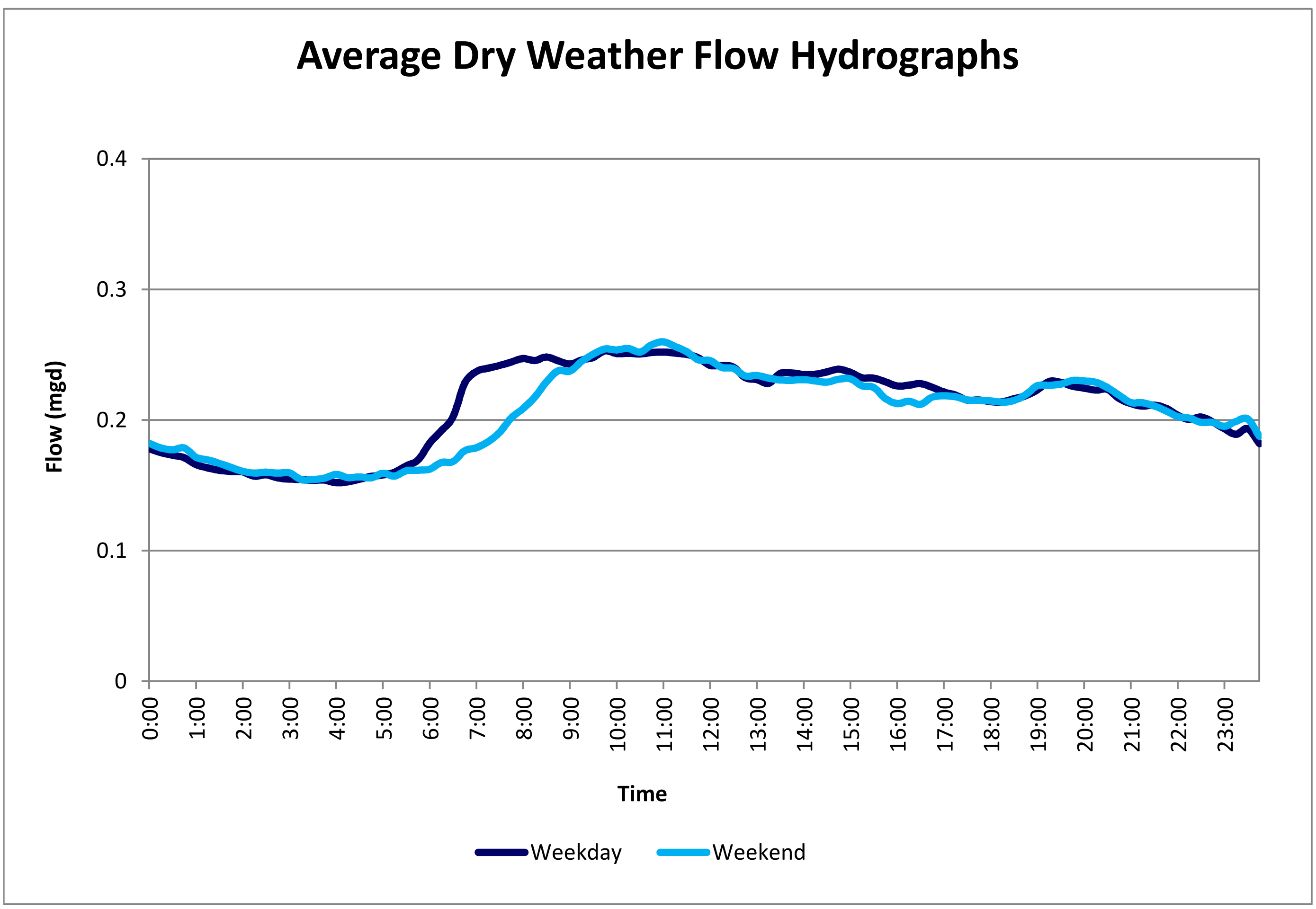
MS_6

General Information

Site:	MS_6
Description of Location:	Woodbrook Avenue and Stenton Avenue
Data Range:	4/1/2012 to 3/31/13
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	189
Service Population:	1,169

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.211	180	0.253	216	0.152	130	0.72	193
Weekend	0.206	176	0.260	222	0.154	132	0.75	97
Total	**0.209**	**179**	**0.255**	**218**	**0.153**	**131**	**0.73**	**290**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

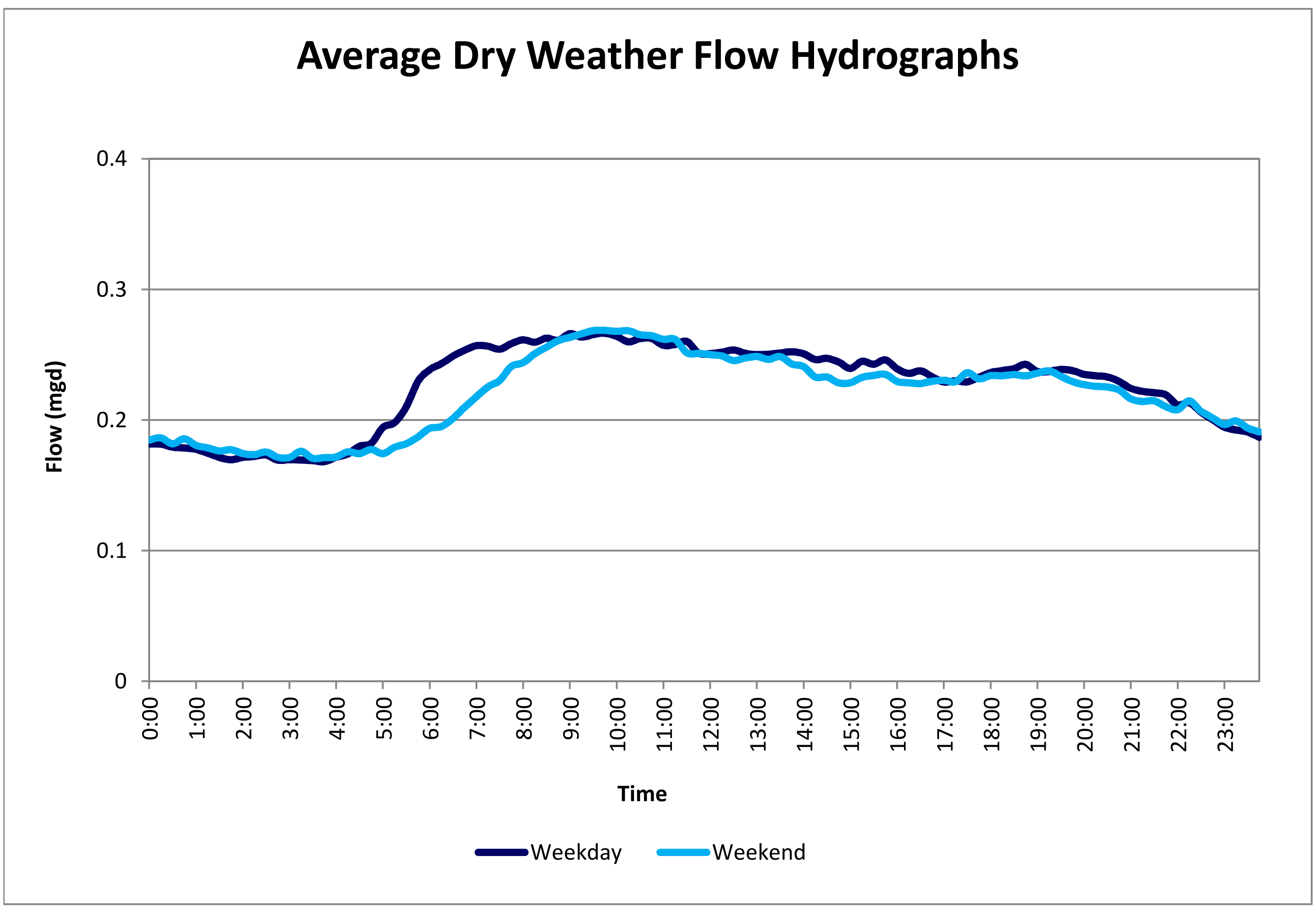
MS_6

General Information

Site:	MS_6
Description of Location:	Woodbrook Avenue and Stenton Avenue
Data Range:	4/1/2013 to 6/30/14
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	189
Service Population:	1,169

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.226	193	0.266	228	0.168	144	0.74	165
Weekend	0.219	188	0.269	230	0.171	146	0.78	83
Total	**0.224**	**191**	**0.267**	**229**	**0.169**	**145**	**0.76**	**248**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_6

General Information

Site:	MS_6
Description of Location:	Woodbrook Avenue and Stenton Avenue
Data Range:	4/1/2012 to 6/30/14
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	189
Service Population:	1,169

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
4/30/2014	5.03	0.22	2.48	10.9	0.73	2.30	10.6	10.3
5/22/2014	0.60	0.35	1.82	10.3	0.49	0.928	8.86	4.14
8/13/2013	2.52	0.43	1.59	11.2	1.14	1.44	10.7	6.43
6/7/2013	3.54	0.22	1.42	11.0	0.73	1.30	10.5	5.80
8/28/2013	1.49	0.57	1.40	10.3	1.07	0.858	9.23	3.83
Five-Storm Average	**2.64**	**0.36**	**1.74**	**10.7**	**0.83**	**1.37**	**10.0**	**6.09**

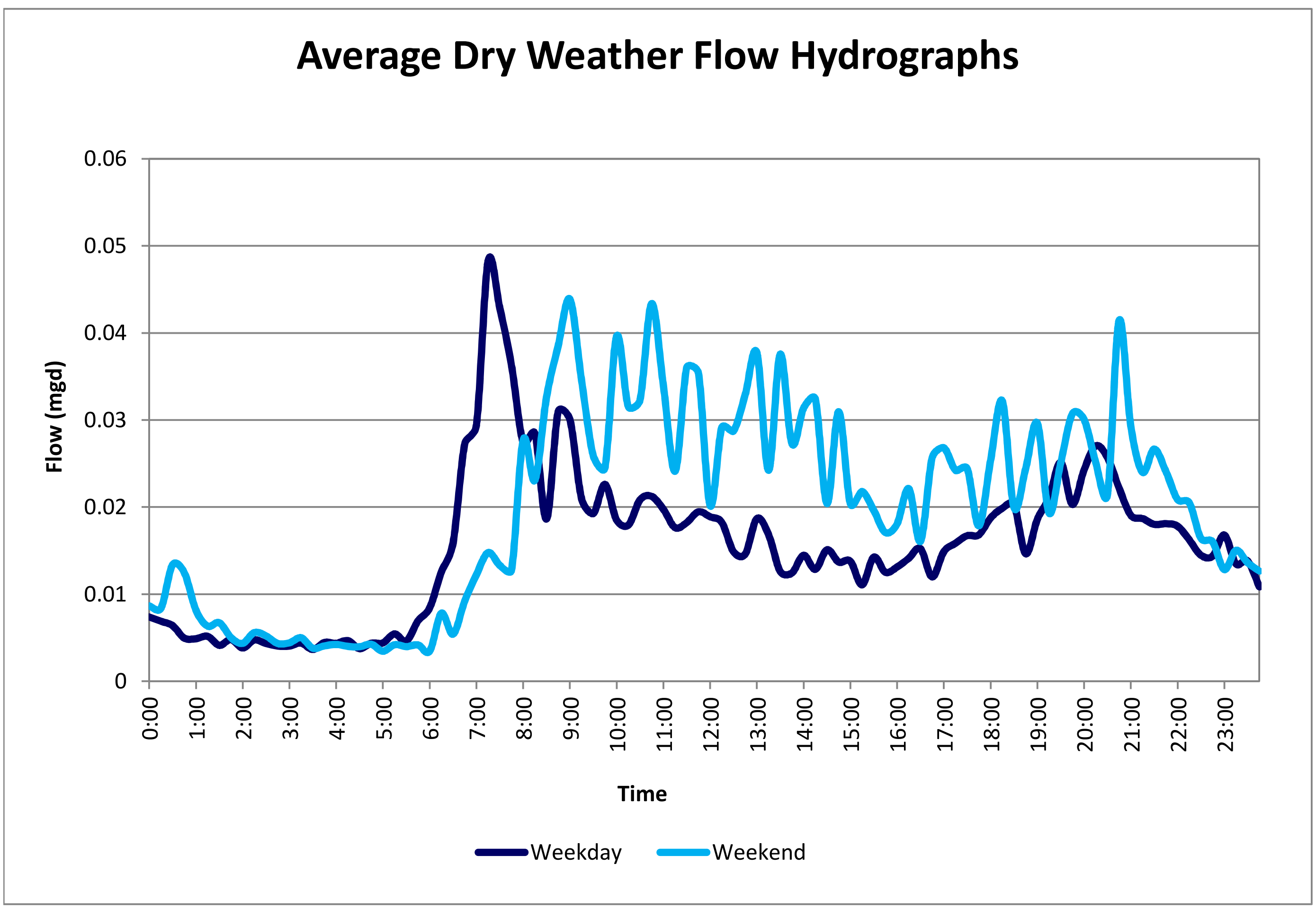
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_7

General Information

Site:	MS_7
Description of Location:	Stenton Avenue
Data Range:	8/29/2007 to 11/17/2007
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	13
Service Population:	110

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.016	141	0.048	438	0.004	33	0.23	35
Weekend	0.020	181	0.044	399	0.003	31	0.17	14
Total	**0.017**	**153**	**0.047**	**427**	**0.004**	**33**	**0.22**	**49**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

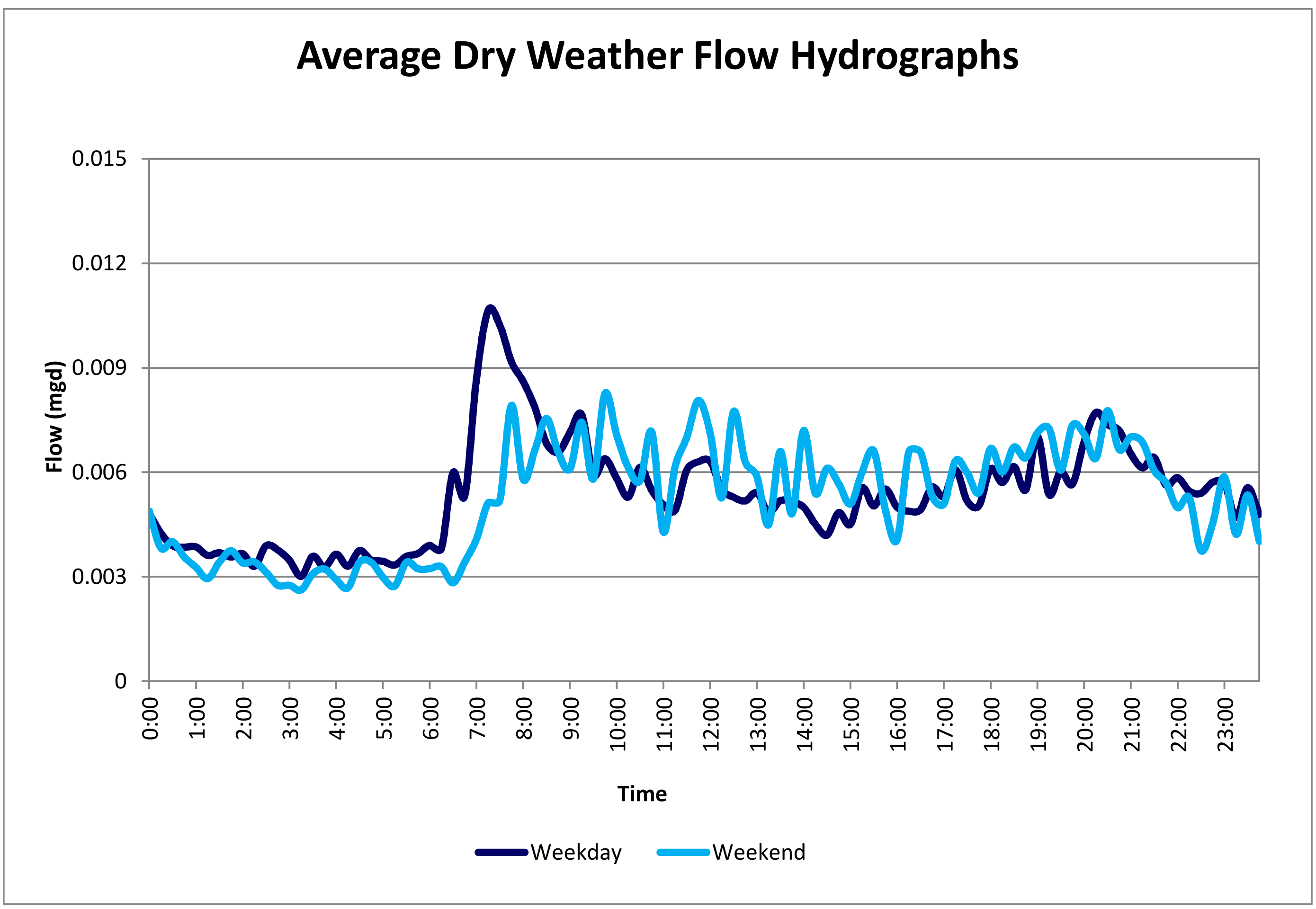
MS_7

General Information

Site:	MS_7
Description of Location:	Stenton Avenue
Data Range:	2/6/2010 to 5/7/2010
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	13
Service Population:	110

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.005	49	0.011	97	0.003	27	0.56	28
Weekend	0.005	48	0.008	75	0.003	24	0.50	17
Total	**0.005**	**48**	**0.010**	**89**	**0.003**	**26**	**0.54**	**45**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

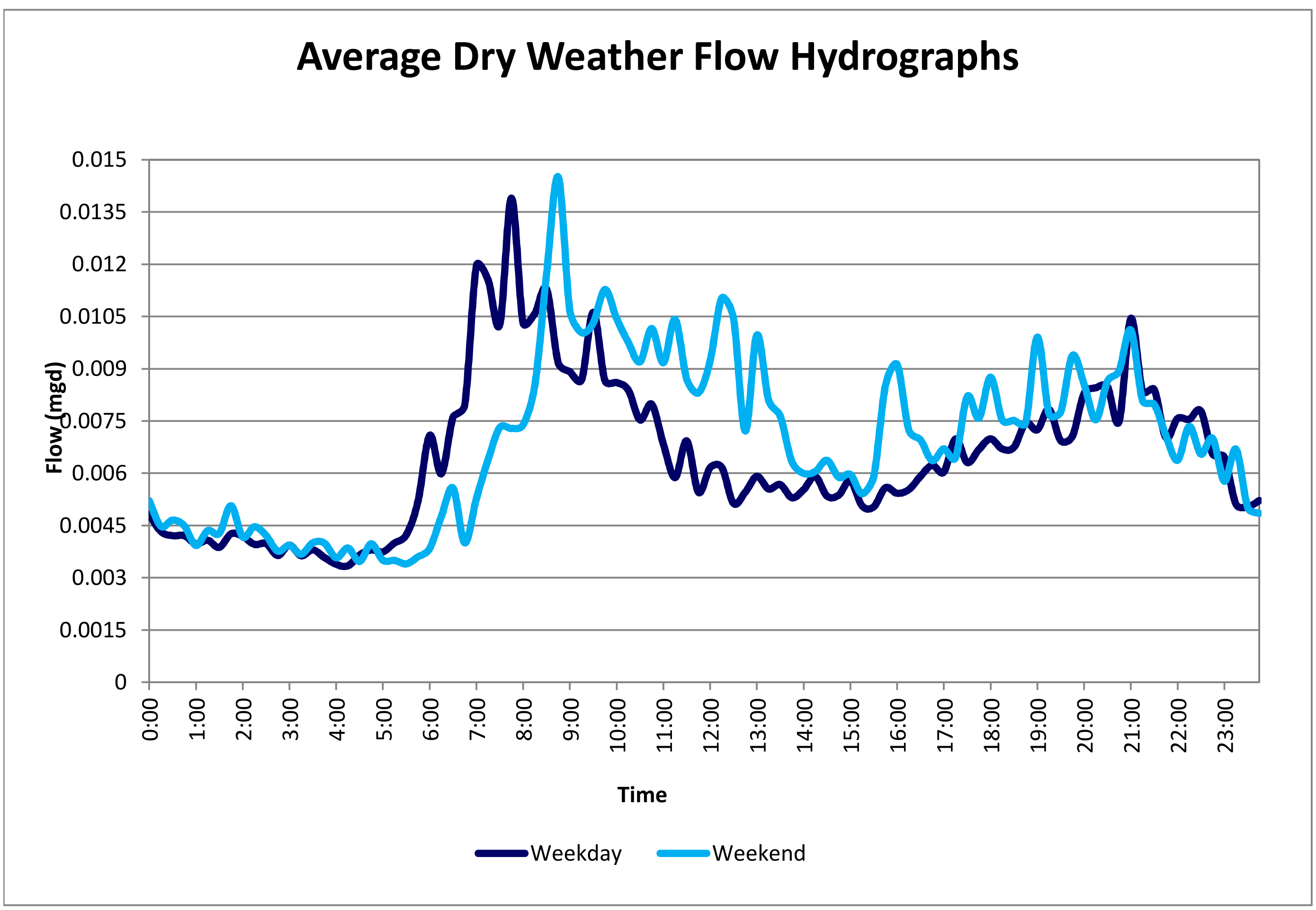
MS_7

General Information

Site:	MS_7
Description of Location:	Stenton Avenue
Data Range:	2/16/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	13
Service Population:	110

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.006	59	0.014	126	0.003	30	0.52	57
Weekend	0.007	63	0.015	132	0.003	31	0.49	22
Total	**0.007**	**60**	**0.014**	**128**	**0.003**	**31**	**0.51**	**79**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_7

General Information

Site:	MS_7
Description of Location:	Stenton Avenue
Data Range:	8/29/2007 to 11/17/2007
	2/6/2010 to 5/7/2010
	2/16/2013 to 5/16/2013
Pipe Diameter:	12"
Contract Community:	Springfield
Drainage Area (Acres):	13
Service Population:	110

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.								

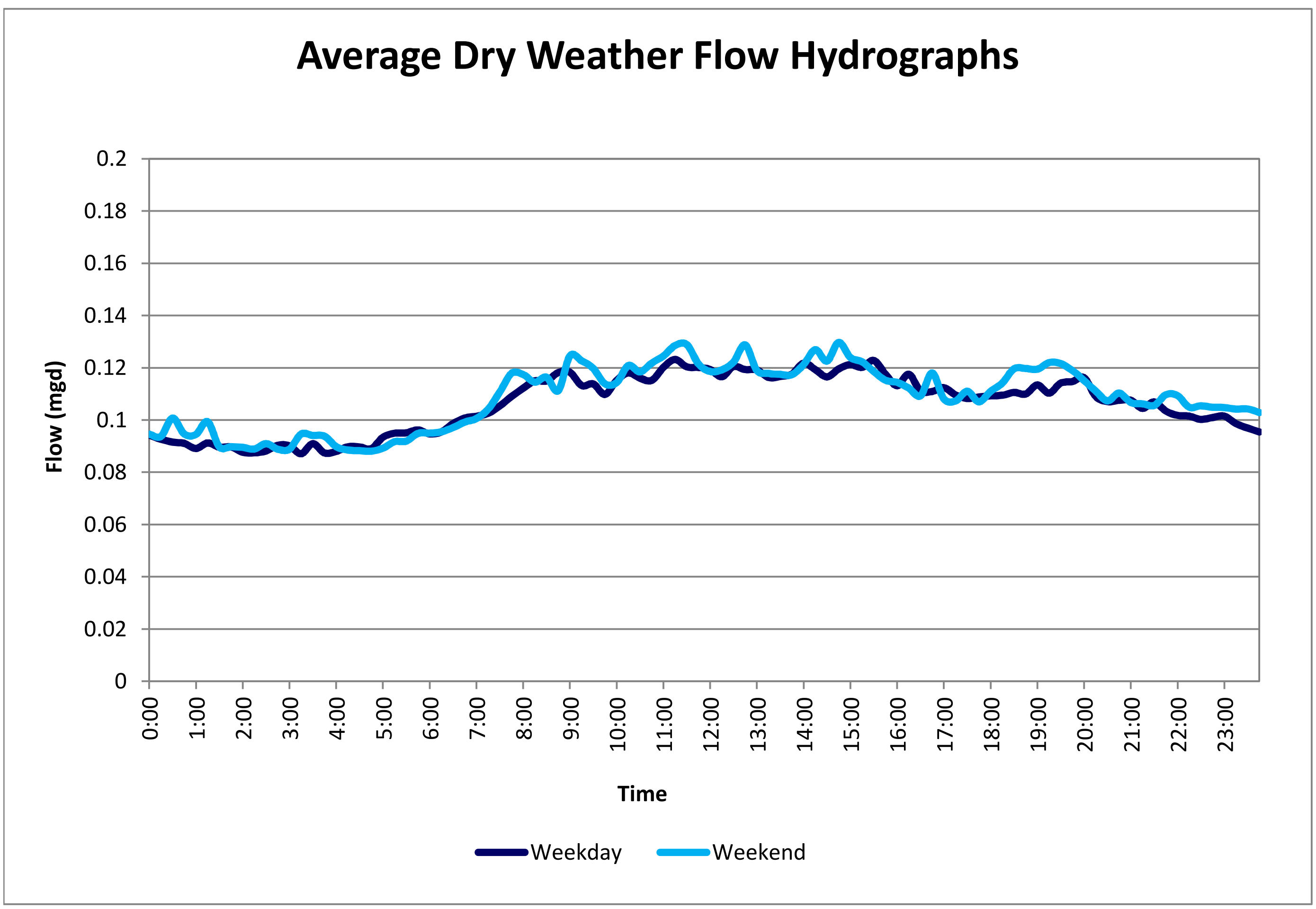
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_8

General Information

Site:	MS_8
Description of Location:	Ridge Avenue
Data Range:	10/27/2007 to 11/16/2007
Pipe Diameter:	10"
Contract Community:	Springfield
Drainage Area (Acres):	5
Service Population:	11

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.106	9652	0.123	11198	0.087	7916	0.82	14
Weekend	0.109	9881	0.130	11792	0.088	8007	0.81	5
Total	**0.107**	**9712**	**0.125**	**11354**	**0.087**	**7940**	**0.82**	**19**



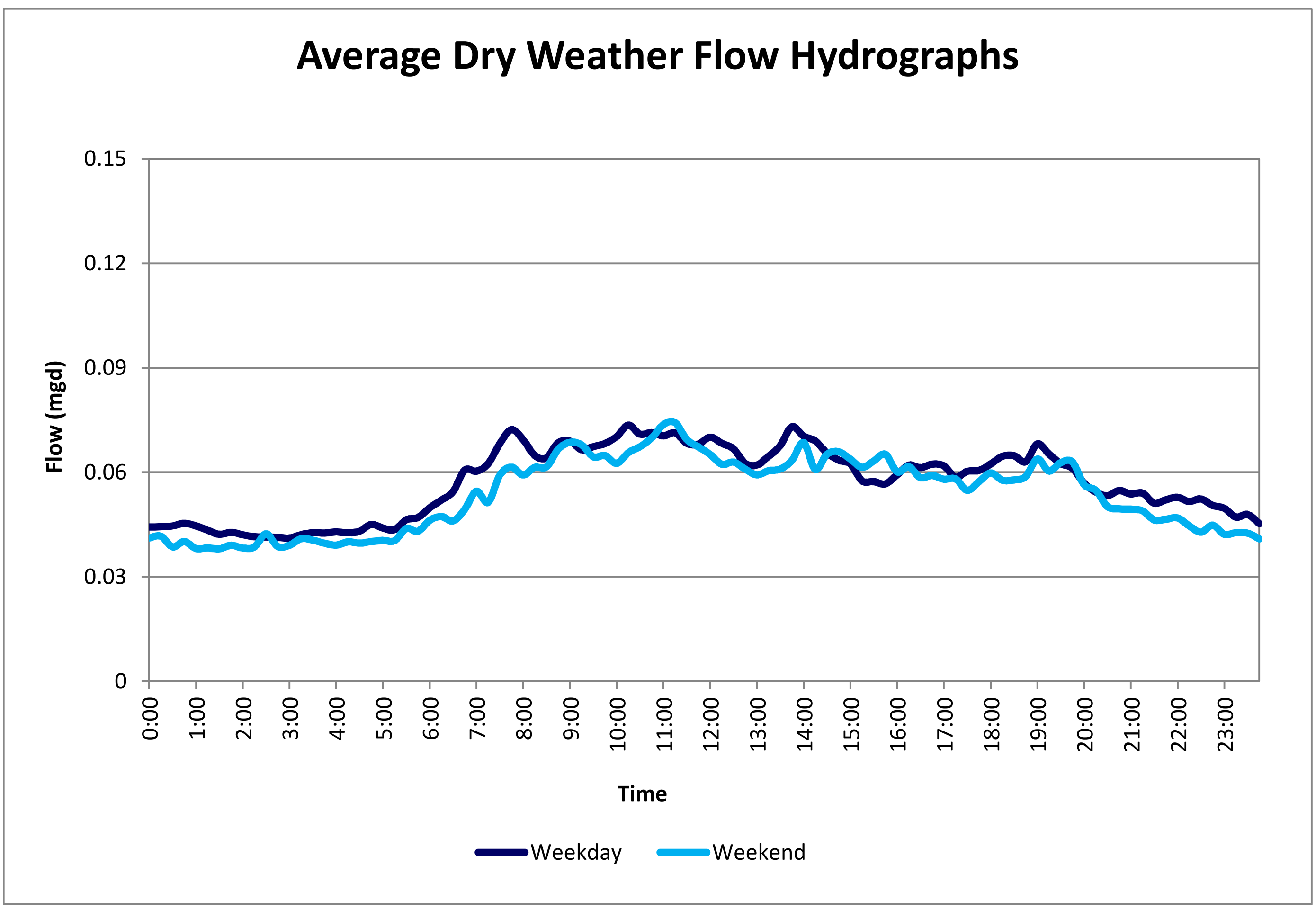
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MS_8

General Information

Site:	MS_8
Description of Location:	Ridge Avenue
Data Range:	2/6/2010 to 5/7/2010
Pipe Diameter:	10"
Contract Community:	Springfield
Drainage Area (Acres):	5
Service Population:	11

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.057	5195	0.074	6685	0.041	3740	0.72	34
Weekend	0.054	4876	0.074	6750	0.038	3456	0.71	15
Total	**0.056**	**5097**	**0.074**	**6705**	**0.040**	**3653**	**0.72**	**49**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Dry Weather Flow Analysis Results

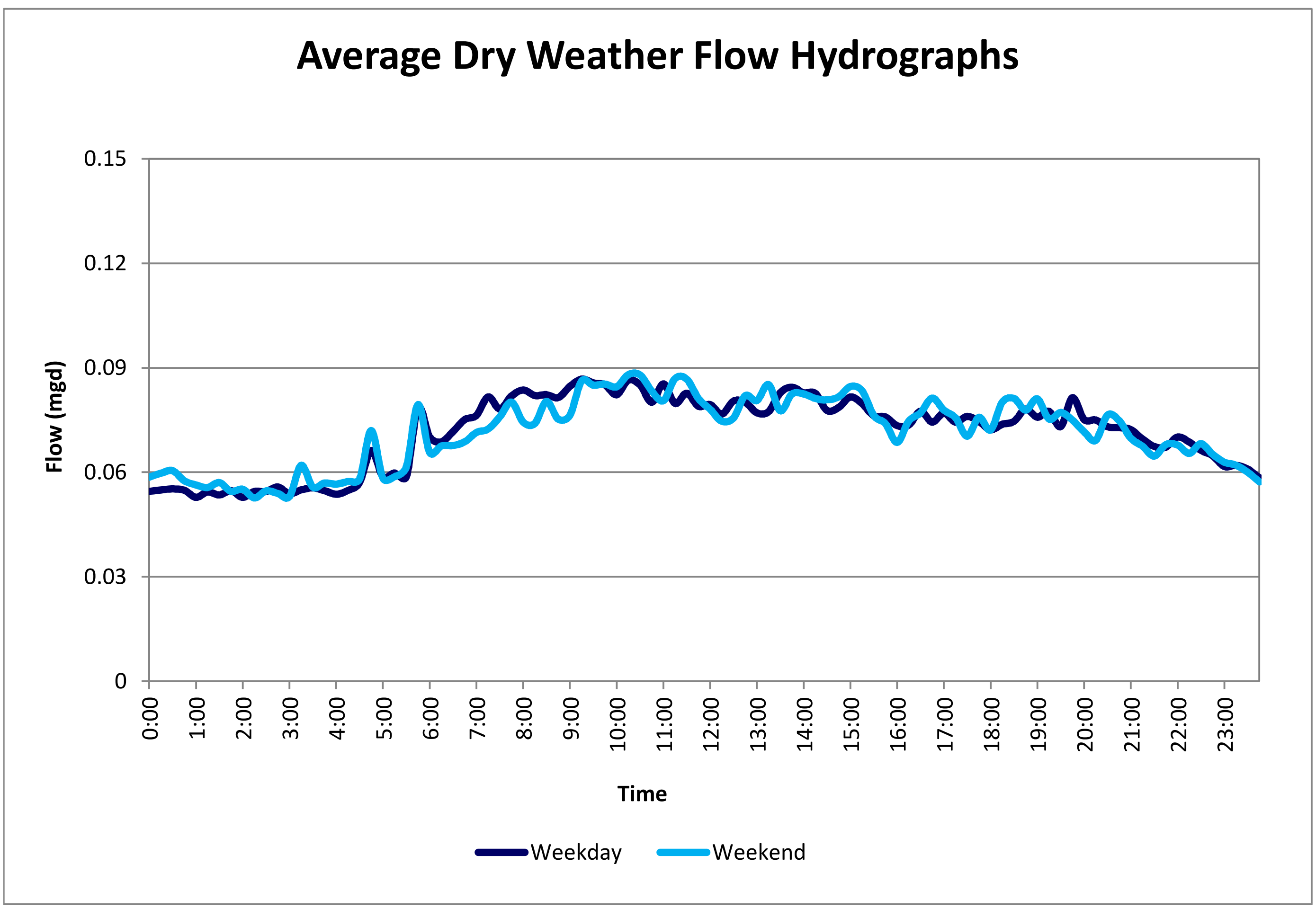
MS_8

General Information

Site:	MS_8
Description of Location:	Ridge Avenue
Data Range:	2/14/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Springfield
Drainage Area (Acres):	5
Service Population:	11

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	0.071	6497	0.087	7885	0.053	4800	0.74	43
Weekend	0.071	6499	0.088	8000	0.053	4785	0.74	18
Total	**0.071**	**6498**	**0.087**	**7919**	**0.053**	**4796**	**0.74**	**61**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MS_8

General Information

Site:	MS_8
Description of Location:	Ridge Avenue
Data Range:	10/27/2007 to 11/16/2007
	2/6/2010 to 5/7/2010
	2/14/2013 to 5/16/2013
Pipe Diameter:	10"
Contract Community:	Springfield
Drainage Area (Acres):	5
Service Population:	11

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
It was determined the data was unsuitable for this analysis due to intermittent temporary sensor failures eclipsing the wet weather peaks.								

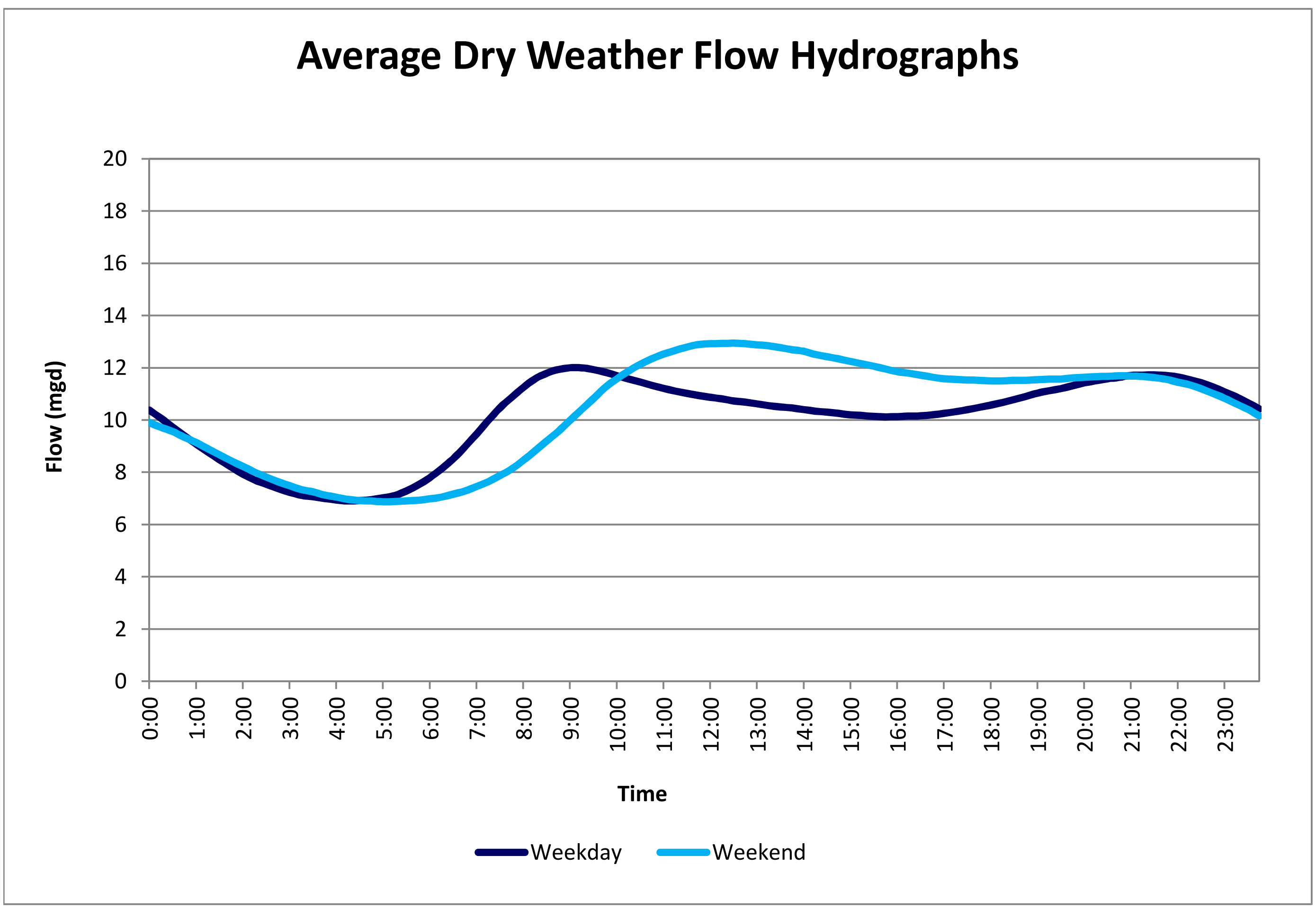
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MUD_1

General Information

Site:	MUD_1
Description of Location:	South 60th Street and Cobbs Creek Parkway
Data Range:	1/1/2011 to 12/31/2011
Pipe Diameter:	24"
Contract Community:	Upper Darby
Drainage Area (Acres):	7,668
Service Population:	100,393

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	10.1	100	12.0	120	6.90	69	0.68	123
Weekend	10.4	103	12.9	129	6.87	68	0.66	54
Total	**10.2**	**101**	**12.3**	**122**	**6.89**	**69**	**0.68**	**177**



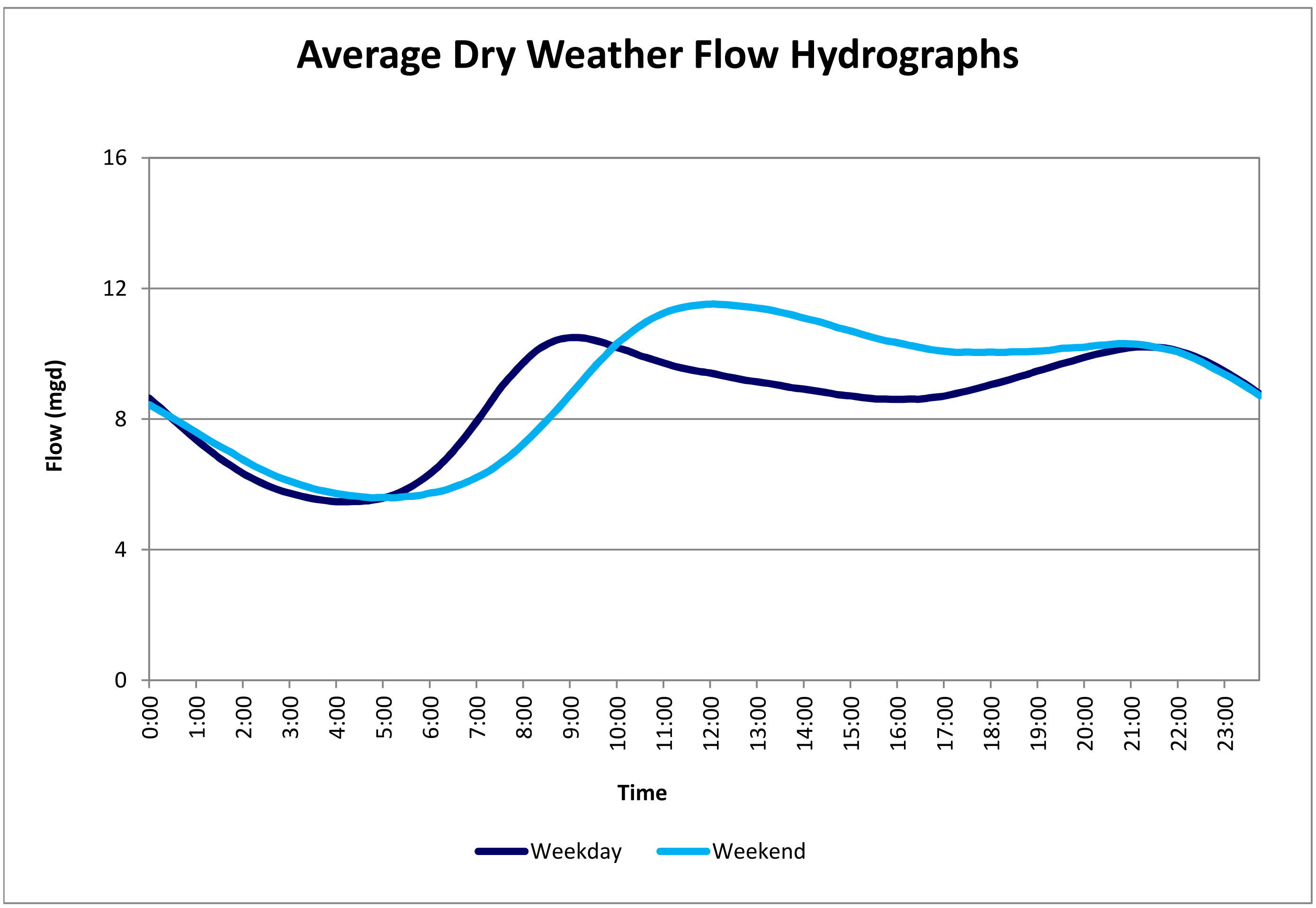
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MUD_1

General Information

Site:	MUD_1
Description of Location:	South 60th Street and Cobbs Creek Parkway
Data Range:	1/1/2012 to 3/31/2013
Pipe Diameter:	24"
Contract Community:	Upper Darby
Drainage Area (Acres):	7,668
Service Population:	100,393

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	8.54	85	10.5	104	5.47	54	0.64	198
Weekend	8.95	89	11.5	115	5.59	56	0.62	90
Total	**8.67**	**86**	**10.8**	**108**	**5.51**	**55**	**0.64**	**288**



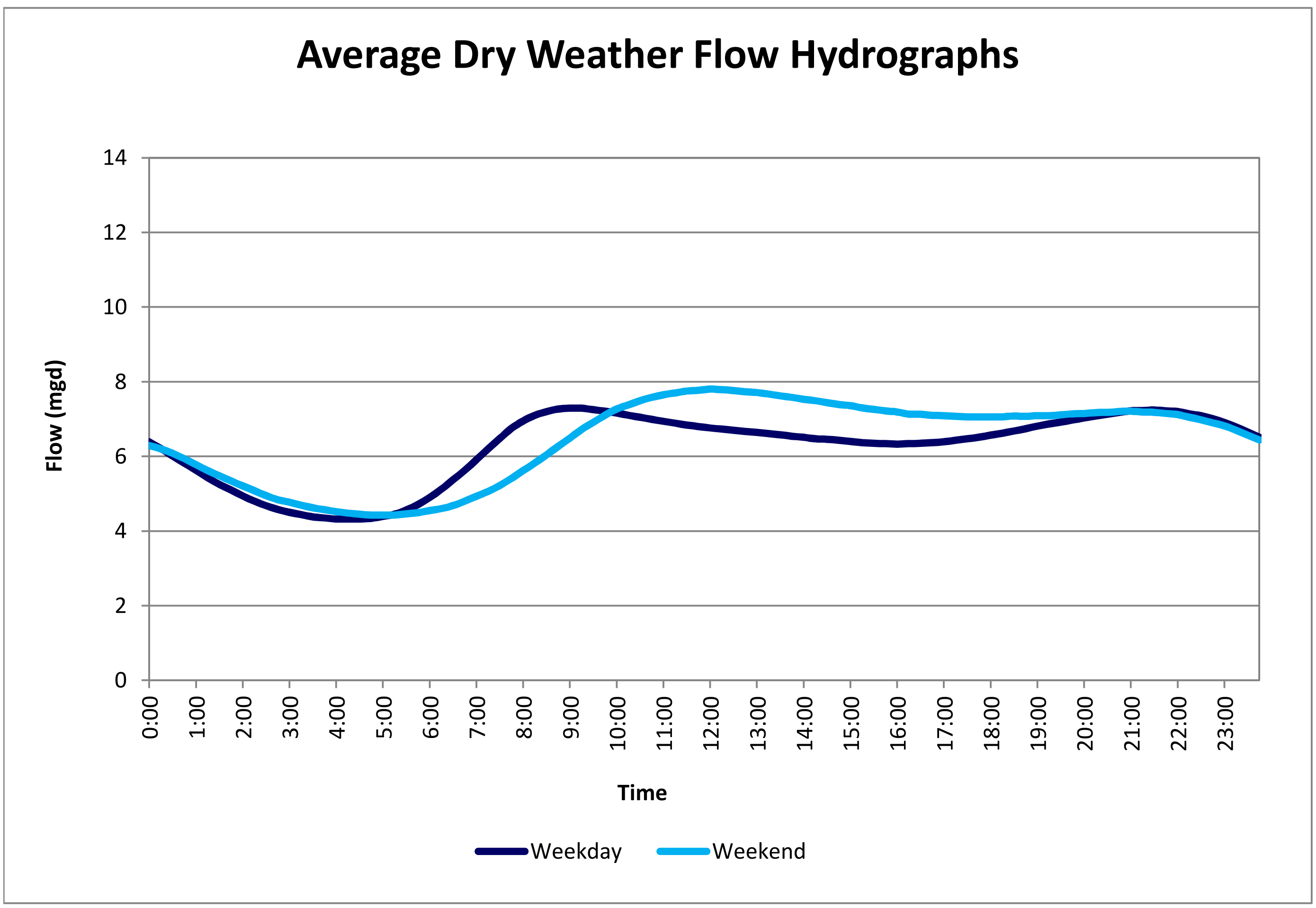
Philadelphia Water Department - Sanitary Sewer Evaluation Program
Dry Weather Flow Analysis Results
MUD_1

General Information

Site:	MUD_1
Description of Location:	South 60th Street and Cobbs Creek Parkway
Data Range:	4/1/2013 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Upper Darby
Drainage Area (Acres):	7,668
Service Population:	100,393

Dry Weather Flow Summary

	Average Daily Flow		Average Daily Maximum Flow		Average Daily Minimum Flow		GWI Ratio	Days Analyzed
	(mgd)	(gpcd)	(mgd)	(gpcd)	(mgd)	(gpcd)	(min/avg)	
Weekday	6.25	62	7.29	73	4.32	43	0.69	169
Weekend	6.44	64	7.80	78	4.43	44	0.69	87
Total	**6.32**	**63**	**7.46**	**74**	**4.36**	**43**	**0.69**	**256**



Philadelphia Water Department - Sanitary Sewer Evaluation Program

Wet Weather Flow Analysis Results

MUD_1

General Information

Site:	MUD_1
Description of Location:	South 60th Street and Cobbs Creek Parkway
Data Range:	1/1/2011 to 6/30/2014
Pipe Diameter:	24"
Contract Community:	Upper Darby
Drainage Area (Acres):	7,668
Service Population:	100,393

Wet Weather Flow Summary

Storm Date	Total Event Rainfall	Monitored Peak 15 Minute Rainfall	Monitored Peak 15 Minute Flow	Monitored Peak 15 Minute Level	Peak Hourly Rainfall	Monitored Peak Hourly Flow	Monitored Peak Hourly Level	Peaking Factor (PHF/ ADDWF)
	(inches)	(inches/ 15 min)	(mgd)	(inches)	(inches/ hour)	(mgd)	(inches)	
9/8/2011	3.09	0.55	38.2	NA*	1.39	37.7	NA*	3.70
8/27/2011	6.01	0.35	36.0	NA*	1.06	35.8	NA*	3.51
9/6/2011	3.57	0.23	34.3	NA*	0.53	33.6	NA*	3.30
6/22/2012	1.84	0.65	33.7	NA*	1.47	30.8	NA*	3.55
9/2/2013	2.27	0.52	33.4	NA*	1.76	31.6	NA*	5.01
Five-Storm Average	**3.35**	**0.46**	**35.1**	**NA***	**1.24**	**33.9**	**NA***	**3.81**

* Monitor is a magnectic meter and does not utilze depth sensing technologies.

Appendix C

Event Summary Tables

Appendix C
RDII Event Summary Tables

This appendix provides a series of tables that summarize the results of the wet weather flow analyses that were conducted on the monitored precipitation and wastewater flow data collected at each monitoring site. The analyses were conducted using the Environmental Protection Agency (US EPA) Sanitary Sewer Overflow Analysis Program (SSOAP).

In short, the program was used to analyze the precipitation and flow monitoring data collected to develop an understanding of the system rainfall dependent infiltration and inflow (RDII) characteristics. More specifically, the total monitored flows were segregated into their characteristic flow components of base wastewater flow (BWWF), groundwater infiltration (GWI), and RDII. The BWWF and GWI flows represent the dry weather flow component of the total monitored flow. This deconstruction of the total monitored flows was accomplished by adjusting the GWI flows to derive the RDII flows (difference between the observed flows and the total dry weather flow) that are approximately equal to zero during dry periods not directly affected by RDII events. After the GWI adjustments were made, the analyst identified the start and end times of the individual RDII events during the period of record. After adjustments for GWI variations were made and individual events were defined, summaries were produced of RDII volume, rainfall volumes, and total-R values. These summaries allow for an understanding of the sources of flow in the system, the relative quantities of RDII into the system, and whether RDII is excessive.

An individual spreadsheet of results was prepared for each flow monitoring site that was analyzed. The tables contain the following information.

- Column 1: Indicates an event number assigned in chronological order for each analyzed storm.
- Columns 2 through 4: Shows the start and ending dates and times for each storm, along with the associated duration in hours.
- Column 5: Total I/I volume during the event.
- Column 6: Total precipitation volume during the event.
- Column 7: Total-R value, which represent the fraction of the precipitation that was observed in the sanitary sewer system during an event. These values were calculated by dividing the total event I/I volume by the total event precipitation volume.
- Column 8: Peak I/I flow observed during the event.
- Column 9: Peak total flow during the event.
- Column 10: The peak 15 minute rainfall observed during the event.

- Columns 11 - 13: Average observed flow rate, average GWI flow rate, and average base wastewater flow rate over the duration of the event.
- Columns 14 – 16: Shows the start and ending dates and times for each period of precipitation within the defined event, along with the associated duration in hours.

The individual site summary tables are organized and grouped by the interceptor sewer into which the monitored sewershed conveys flow. A listing of the analyzed sewershed monitoring sites for each interceptor sewer is provided.

Appendix C
List of RDII Event Summary Tables

Abington Township

- MA-1 (Q3-2007 thru Q4-2007)
- MA-1 (Q1-2010 thru Q2-2010)
- MA-1 (Q1-2013 thru Q2-2013)
- MA-2 (Q2-2012 thru Q1-2013)
- MA-2 (Q2-2013 thru Q2-2014)
- MA-3 (Q1-2013 thru Q1-2014)

Bensalem Township

- MBE-1 (Q2-2012 thru Q1-2013)
- MBE-1 (Q2-2013 thru Q2-2014)
- MBE-2 (Q2-2012 thru Q1-2013)
- MBE-2 (Q2-2013 thru Q2-2014)
- MBE-3 (Q1-2010 thru Q4-2010)
- MBE-3 (Q1-2012 thru Q2-2012)
- MBE-3 (Q1-2014 thru Q2-2014)
- MBE-4 (Q2-2012 thru Q1-2013)
- MBE-4 (Q2-2013 thru Q2-2014)
- MBE-5 (Q2-2012 thru Q1-2013)
- MBE-5 (Q2-2013 thru Q2-2014)
- MBE-6 (Q2-2012 thru Q1-2013)
- MBE-6 (Q2-2013 thru Q2-2014)
- MBE-7 (Q2-2012 thru Q1-2013)
- MBE-7 (Q2-2013 thru Q2-2014)
- MBE-8 (Q1-2010 thru Q4-2010)
- MBE-9 (Q1-2010 thru Q4-2010)
- MBE-9 (Q1-2013 thru Q2-2013)
- MBE-10 (Q2-2012 thru Q1-2013)
- MBE-10 (Q2-2013 thru Q2-2014)
- MBE-11 (Q1-2010 thru Q3-2010)
- MBE-12 (Q2-2012 thru Q1-2013)
- MBE-12 (Q2-2013 thru Q2-2014)
- MBE-15 (Q1-2010 thru Q4-2010)

Bucks County Water and Sewer Authority

- MB-1 (Q1-2012 thru Q1-2013)
- MB-1 (Q2-2013 thru Q2-2014)

Cheltenham Township

- MC-1 (Q2-2012 thru Q1-2013)
- MC-1 (Q2-2013 thru Q2-2014)
- MC-2 (Q2-2012 thru Q1-2013)
- MC-2 (Q2-2013 thru Q2-2014)
- MC-3 (Q2-2012 thru Q1-2013)
- MC-3 (Q2-2013 thru Q2-2014)

Delaware County Regional Water Quality Control Authority (DELCORA)

- MD-1 (Q2-2011 thru Q1-2012
- MD-1 (Q2-2012 thru Q1-2013)
- MD-1 (Q2-2013 thru Q2-2014)

Lower Merion Township

- ML-1 (Q2-2012 thru Q1-2013)
- ML-1 (Q2-2013 thru Q2-2014)
- ML-2 (Q3-2007 thru Q4-2007)
- ML-2 (Q1-2010 thru Q2-2010)
- ML-2 (Q1-2013 thru Q2-2013)
- ML-3 (Q2-2012 thru Q1-2013)
- ML-3 (Q2-2013 thru Q2-2014)
- ML-4 (Q4-2010 thru Q3-2011)
- ML-5 (Q1-2012 thru Q1-2013)
- ML-5 (Q2-2013 thru Q2-2014)
- ML-6 (Q1-2012 thru Q4-2012)
- ML-6 (Q1-2013 thru Q2-2014)
- ML-7 (Q2-2012 thru Q1-2013)
- ML-7 (Q2-2013 thru Q2-2014)

Lower Moreland Township

- MLM-1 (Q1-2012 thru Q4-2012)
- MLM-1 (Q1-2013 thru Q2-2014)
- MLM-2 (Q1-2012 thru Q4-2012)

- MLM-2 (Q1-2013 thru Q2-2014)
- MLM-3 (Q3-2007 thru Q4-2007)
- MLM-3 (Q1-2010 thru Q2-2010)
- MLM-6 (Q3-2007 thru Q4-2007)
- MLM-6 (Q1-2010 thru Q2-2010)
- MLM-6 (Q1-2013 thru Q2-2013)
- MLM-7 (Q1-2010 thru Q2-2010)
- MLM-7 (Q1-2013 thru Q2-2013)

Lower Southampton Township

- MSH-1 (Q1-2012 thru Q1-2013)
- MSH-1 (Q2-2013 thru Q2-2014)
- MSH-2 (Q1-2010 thru Q2-2010)
- MSH-2 (Q1-2013 thru Q2-2013)

Springfield Township

- MS-1 (Q3-2007 thru Q4-2007)
- MS-1 (Q1-2013 thru Q2-2013)
- MS-2 (Q2-2012 thru Q1-2013)
- MS-2 (Q2-2013 thru Q2-2014)
- MS-3 (Q2-2012 thru Q1-2013)
- MS-3 (Q2-2013 thru Q2-2014)
- MS-5 (Q3-2007 thru Q4-2007)
- MS-5 (Q1-2010 thru Q2-2010)
- MS-5 (Q1-2013 thru Q2-2013)
- MS-6 (Q2-2012 thru Q1-2013)
- MS-6 (Q2-2013 thru Q2-2014)
- MS-7 (Q3-2007 thru Q4-2007)
- MS-7 (Q1-2010 thru Q2-2010)
- MS-7 (Q1-2013 thru Q2-2013)
- MS-8 (Q1-2010 thru Q2-2010)
- MS-8 (Q1-2013 thru Q2-2013)

Upper Darby Township

- MUD-1 (Q1-2011 thru Q4-2011)
- MUD-1 (Q1-2012 thru Q1-2013)
- MUD-1 (Q2-2013 thru Q2-2014)

MA_1 Abington Township

Pine Road

Pipe Size: 10" dia. Tributary Drainage Area: 32 acres Tributary Service Population: 169

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd) <--------EVENT AVERAGE-------->	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	9/11/2007 4:30	9/12/2007 3:00	22.5	0.007	0.92	0.007	0.034	0.034	0.37	0.009	-0.002	0.004	9/11/2007 4:30	9/11/2007 16:15	11.75
2	10/19/2007 22:45	10/20/2007 9:15	10.5	0.001	0.42	0.003	0.013	0.019	0.20	0.008	0.000	0.005	10/19/2007 23:00	10/20/2007 0:00	1
3	10/24/2007 17:45	10/25/2007 14:15	20.5	0.002	0.57	0.003	0.009	0.016	0.05	0.006	0.000	0.005	10/24/2007 17:45	10/25/2007 8:00	14.25
4	10/26/2007 14:00	10/30/2007 12:45	94.75	0.010	2.72	0.004	0.016	0.022	0.20	0.007	0.001	0.004	10/26/2007 14:00	10/27/2007 13:15	23.25
5	11/5/2007 22:45	11/6/2007 14:00	15.25	0.001	0.26	0.004	0.007	0.014	0.03	0.006	0.000	0.004	11/5/2007 23:00	11/6/2007 9:15	10.25
		Average:	32.7	0.004	0.98	0.004	0.016	0.021	0.17	0.007	0.000	0.004			12.1
		Maximum Value:	94.8	0.010	2.72	0.007	0.034	0.034	0.37	0.009	0.001	0.005			23
		Minimum Value:	10.5	0.001	0.26	0.003	0.0070	0.014	0.03	0.006	-0.002	0.004			1.00
		Standard Deviation:	35.0	0.004	1.01	0.002	0.0108	0.008	0.14	0.001	0.001	0.001			8.0
		Weighted Mean R-Value*:				0.004									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MA_1 Abington Township

Pine Road

Pipe Size: 10" dia. Tributary Drainage Area: 32 acres Tributary Service Population: 169

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/22/2010 20:15	2/26/2010 6:15	82	0.012	1.60	0.007	0.025	0.041	0.05	0.010	0.002	0.005	2/22/2010 20:30	2/26/2010 4:30	80
2	3/12/2010 9:45	3/20/2010 6:15	188.5	0.108	3.74	0.029	0.036	0.053	0.16	0.026	0.009	0.005	3/12/2010 9:45	3/15/2010 20:45	83
3	3/22/2010 8:00	3/24/2010 12:30	52.5	0.005	1.42	0.004	0.015	0.031	0.24	0.016	0.009	0.005	3/22/2010 8:00	3/23/2010 0:00	16
4	3/28/2010 21:00	4/7/2010 7:15	226.25	0.086	3.72	0.023	0.029	0.044	0.25	0.020	0.007	0.005	3/28/2010 21:15	4/6/2010 7:15	202
5	4/8/2010 23:30	4/10/2010 10:45	35.25	0.002	0.51	0.005	0.011	0.023	0.08	0.012	0.006	0.005	4/8/2010 23:45	4/9/2010 6:15	6.5
6	4/24/2010 23:30	4/28/2010 7:45	80.25	0.008	1.51	0.006	0.013	0.022	0.07	0.007	0.000	0.005	4/24/2010 23:45	4/26/2010 20:45	45
7	5/3/2010 5:45	5/3/2010 23:00	17.25	0.002	0.71	0.003	0.010	0.023	0.11	0.009	0.000	0.007	5/3/2010 5:45	5/3/2010 10:15	4.5
		Average:	97.4	0.032	1.89	0.011	0.020	0.034	0.14	0.014	0.005	0.005			62.4
		Maximum Value:	226.3	0.108	3.74	0.029	0.036	0.053	0.25	0.026	0.009	0.007			202
		Minimum Value:	17.3	0.002	0.51	0.003	0.010	0.022	0.05	0.007	0.000	0.005			4.50
		Standard Deviation:	79.3	0.045	1.32	0.011	0.010	0.012	0.08	0.007	0.004	0.001			69.7
		Weighted Mean R-Value*:				0.017									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MA_1 Abington Township

Pine Road

Pipe Size: 10" dia. Tributary Drainage Area: 32 acres Tributary Service Population: 169

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2/26/2013 19:15	2/27/2013 13:30	18.25	0.002	0.69	0.004	0.011	0.035	0.078	0.014	0.004	0.007	2/26/2013 19:15	2/27/2013 11:45	16.5
2	3/12/2013 3:15	3/13/2013 10:00	30.75	0.004	1.06	0.004	0.014	0.032	0.092	0.016	0.006	0.008	3/12/2013 3:30	3/12/2013 14:30	11
3	3/18/2013 18:00	3/20/2013 4:45	34.75	0.003	0.90	0.003	0.016	0.033	0.067	0.014	0.006	0.007	3/18/2013 18:00	3/19/2013 18:45	24.75
4	3/25/2013 6:30	3/26/2013 5:45	23.25	0.002	0.57	0.003	0.011	0.028	0.039	0.015	0.006	0.008	3/25/2013 6:30	3/25/2013 16:15	9.75
5	4/10/2013 19:45	4/12/2013 0:00	28.25	0.002	0.68	0.002	0.013	0.033	0.235	0.016	0.006	0.008	4/10/2013 20:15	4/11/2013 0:00	3.75
6	4/12/2013 21:45	4/13/2013 5:00	7.25	0.001	0.29	0.003	0.007	0.024	0.091	0.012	0.007	0.003	4/12/2013 21:45	4/12/2013 23:30	1.75
7	4/19/2013 21:45	4/20/2013 21:15	23.5	0.003	0.48	0.006	0.017	0.037	0.057	0.013	0.003	0.008	4/19/2013 21:45	4/20/2013 3:00	5.25
8	4/29/2013 1:45	4/30/2013 4:30	26.75	0.003	0.43	0.006	0.019	0.035	0.023	0.014	0.005	0.007	4/29/2013 2:00	4/30/2013 1:45	23.75
9	5/7/2013 22:15	5/8/2013 18:15	20	0.002	0.30	0.007	0.013	0.033	0.063	0.013	0.005	0.007	5/7/2013 22:15	5/8/2013 18:15	20
10	5/9/2013 3:45	5/10/2013 4:45	25	0.002	0.56	0.003	0.018	0.040	0.092	0.013	0.004	0.007	5/9/2013 3:45	5/9/2013 6:45	3
11	5/10/2013 22:30	5/12/2013 5:00	30.5	0.006	0.96	0.006	0.018	0.037	0.104	0.015	0.005	0.007	5/10/2013 22:45	5/12/2013 3:15	28.5
		Average:	24.4	0.003	0.63	0.004	0.014	0.033	0.086	0.014	0.005	0.007			13.5
		Maximum Value:	34.8	0.006	1.06	0.007	0.019	0.040	0.235	0.016	0.007	0.008			29
		Minimum Value:	7.3	0.001	0.29	0.002	0.007	0.024	0.023	0.012	0.003	0.003			1.75
		Standard Deviation:	7.5	0.001	0.26	0.002	0.004	0.004	0.055	0.001	0.001	0.001			9.7
		Weighted Mean R-Value*:				0.004									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MA_2 Abington Township
8700 Pine Road & Pennypack Creek
Pipe Size: 20" dia. Tributary Drainage Area: 3,161 acres Tributary Service Population: 10,222

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 7:15	13	0.000	0.16	0.002	0.545	2.35	0.03	1.73	1.24	0.428	4/1/2012 18:30	4/2/2012 2:30	8
2	5/3/2012 1:45	5/3/2012 9:45	8	0.001	0.17	0.004	0.643	2.28	0.05	1.57	0.934	0.451	5/3/2012 2:15	5/3/2012 4:45	2.5
3	5/9/2012 21:30	5/10/2012 5:15	7.75	0.001	0.17	0.003	0.370	1.91	0.02	1.37	0.943	0.290	5/9/2012 22:15	5/10/2012 4:00	5.75
4	5/22/2012 1:15	5/22/2012 9:00	7.75	0.000	0.19	0.003	0.495	2.37	0.02	1.58	1.08	0.368	5/22/2012 2:00	5/22/2012 7:00	5
5	7/5/2012 0:15	7/5/2012 6:45	6.5	0.000	0.15	0.002	0.323	1.68	0.10	1.08	0.839	0.144	7/5/2012 0:30	7/5/2012 3:30	3
6	9/4/2012 13:15	9/5/2012 5:00	15.75	0.002	0.88	0.002	0.739	2.66	0.39	1.92	1.10	0.569	9/4/2012 13:30	9/5/2012 0:30	11
7	9/18/2012 1:45	9/18/2012 9:45	8	0.001	0.26	0.002	0.439	2.55	0.10	1.69	1.08	0.451	9/18/2012 2:30	9/18/2012 5:45	3.25
8	9/26/2012 16:45	9/27/2012 9:15	16.5	0.001	0.16	0.003	0.540	2.51	0.04	1.79	1.17	0.553	9/26/2012 17:15	9/27/2012 8:45	15.5
9	10/15/2012 12:45	10/16/2012 0:45	12	0.001	0.36	0.002	0.345	2.20	0.10	1.91	1.01	0.759	10/15/2012 12:45	10/15/2012 20:45	8
10	10/28/2012 13:15	10/28/2012 21:30	8.25	0.001	0.14	0.007	0.463	2.46	0.03	2.19	1.10	0.843	10/28/2012 16:00	10/28/2012 20:15	4.25
11	11/13/2012 7:30	11/13/2012 16:00	8.5	0.000	0.16	0.003	0.289	2.25	0.03	2.06	0.991	0.956	11/13/2012 7:30	11/13/2012 12:00	4.5
12	12/20/2012 21:00	12/22/2012 5:30	32.5	0.005	2.08	0.003	1.09	3.13	0.19	1.92	1.00	0.580	12/20/2012 21:00	12/21/2012 7:30	10.5
13	12/26/2012 13:15	12/27/2012 18:45	29.5	0.005	1.16	0.004	0.897	2.77	0.10	2.08	1.07	0.685	12/26/2012 13:30	12/27/2012 9:15	19.75
14	12/29/2012 10:45	12/29/2012 20:15	9.5	0.001	0.24	0.004	0.355	2.62	0.02	2.26	1.14	0.927	12/29/2012 11:00	12/29/2012 16:00	5
15	2/8/2013 8:00	2/8/2013 17:45	9.75	0.001	0.23	0.003	0.354	2.48	0.02	2.21	1.15	0.915	2/8/2013 8:00	2/8/2013 13:45	5.75
16	2/26/2013 19:15	2/27/2013 17:00	21.75	0.002	0.70	0.003	0.558	2.59	0.08	2.02	1.17	0.648	2/26/2013 19:15	2/27/2013 11:45	16.5
17	3/12/2013 3:00	3/13/2013 9:15	30.25	0.004	1.07	0.003	0.815	3.08	0.08	2.25	1.38	0.625	3/12/2013 3:00	3/12/2013 14:45	11.75
18	3/16/2013 9:30	3/16/2013 19:45	10.25	0.001	0.18	0.004	0.305	2.60	0.02	2.34	1.26	0.950	3/16/2013 9:30	3/16/2013 18:00	8.5
19	3/18/2013 17:30	3/19/2013 20:30	27	0.003	0.91	0.003	0.563	2.57	0.06	2.12	1.23	0.684	3/18/2013 17:45	3/19/2013 18:45	25
20	3/25/2013 5:30	3/26/2013 0:30	19	0.001	0.55	0.002	0.443	2.66	0.04	2.22	1.27	0.817	3/25/2013 5:45	3/25/2013 16:15	10.5
21	3/31/2013 15:15	3/31/2013 23:30	8.25	0.001	0.16	0.004	0.340	2.32	0.03	2.09	1.17	0.789	3/31/2013 15:30	3/31/2013 22:45	7.25
		Average:	13.4	0.001	0.45	0.003	0.528	2.43	0.08	1.84	1.06	0.598			8.0
		Maximum Value:	32.5	0.005	2.08	0.007	1.09	3.13	0.39	2.26	1.24	0.96			19.8
		Minimum Value:	6.5	0.000	0.14	0.002	0.289	1.68	0.02	1.08	0.839	0.144			2.50
		Standard Deviation:	8.0	0.002	0.53	0.001	0.223	0.336	0.09	0.323	0.105	0.240			5.3
		Weighted Mean R-Value*:				0.003									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MA_2 Abington Township

Pine Road and Pennypack Creek

Pipe Size: 20" dia. Tributary Drainage Area: 3,161 acres Tributary Service Population: 10,222

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 21:00	24.75	0.002	0.72	0.002	0.470	2.50	0.21	1.95	1.08	0.732	4/10/2013 20:15	4/11/2013 0:00	3.75
2	4/12/2013 7:30	4/13/2013 19:00	35.5	0.003	0.95	0.004	0.521	2.72	0.11	2.08	1.11	0.783	4/12/2013 7:30	4/12/2013 23:30	16
3	4/19/2013 21:30	4/20/2013 17:30	20	0.001	0.52	0.003	0.467	2.54	0.05	1.91	1.13	0.637	4/19/2013 21:30	4/20/2013 3:00	5.5
4	4/29/2013 1:30	4/30/2013 1:45	24.25	0.002	0.47	0.004	0.512	2.35	0.03	1.72	0.852	0.719	4/29/2013 1:45	4/30/2013 1:45	24
5	5/7/2013 22:15	5/10/2013 4:45	54.5	0.003	1.23	0.003	0.449	2.39	0.10	1.58	0.786	0.671	5/7/2013 22:15	5/9/2013 6:45	32.5
6	5/10/2013 22:30	5/12/2013 7:45	33.25	0.004	1.10	0.004	0.819	2.47	0.12	1.64	0.822	0.544	5/10/2013 22:30	5/12/2013 6:15	31.75
7	5/18/2013 17:00	5/19/2013 11:30	18.5	0.001	0.34	0.003	0.445	2.15	0.06	1.45	0.781	0.569	5/18/2013 17:00	5/19/2013 11:30	18.5
8	6/3/2013 0:30	6/4/2013 6:00	29.5	0.004	1.07	0.003	0.663	2.93	0.27	1.91	1.04	0.608	6/3/2013 0:30	6/3/2013 17:15	16.75
9	6/6/2013 19:30	6/9/2013 18:30	71	0.018	3.64	0.005	2.08	3.79	0.19	2.15	0.936	0.690	6/6/2013 19:30	6/8/2013 2:00	30.5
10	6/10/2013 7:00	6/15/2013 20:00	133	0.022	2.47	0.009	1.56	3.57	0.25	2.30	1.21	0.743	6/10/2013 7:15	6/14/2013 19:15	108
11	6/18/2013 12:00	6/19/2013 4:00	16	0.001	0.28	0.004	0.427	2.66	0.04	2.16	1.34	0.686	6/18/2013 12:00	6/18/2013 20:30	8.5
12	6/27/2013 18:15	6/28/2013 22:00	27.75	0.004	1.43	0.003	1.567	3.78	0.34	2.27	1.25	0.748	6/27/2013 18:30	6/28/2013 19:45	25.25
13	10/7/2013 12:45	10/7/2013 23:30	10.75	0.001	0.59	0.002	0.530	2.11	0.10	1.76	0.653	0.869	10/7/2013 12:45	10/7/2013 17:15	4.5
14	10/10/2013 3:45	10/10/2013 22:30	18.75	0.001	0.27	0.005	0.604	2.21	0.03	1.66	0.672	0.845	10/10/2013 3:45	10/10/2013 14:45	11
15	10/11/2013 3:00	10/12/2013 14:00	35	0.004	1.18	0.003	1.07	2.68	0.19	1.58	0.672	0.699	10/11/2013 3:15	10/11/2013 18:30	15.25
16	11/26/2013 14:00	11/28/2013 17:30	51.5	0.011	2.81	0.004	1.60	2.92	0.17	1.88	0.721	0.732	11/26/2013 14:00	11/27/2013 17:45	27.75
17	12/8/2013 11:45	12/10/2013 5:45	42	0.004	1.04	0.004	0.786	2.64	0.06	1.60	0.700	0.689	12/8/2013 11:45	12/9/2013 10:00	22.25
18	12/10/2013 7:30	12/11/2013 5:00	21.5	0.001	0.35	0.004	0.532	2.25	0.04	1.62	0.736	0.756	12/10/2013 7:30	12/10/2013 18:00	10.5
19	12/14/2013 15:45	12/16/2013 5:00	37.25	0.003	0.85	0.004	0.565	2.52	0.09	1.58	0.759	0.627	12/14/2013 16:00	12/15/2013 1:00	9
20	12/23/2013 9:30	12/24/2013 5:30	20	0.003	0.35	0.009	0.956	2.73	0.06	1.85	0.845	0.692	12/23/2013 9:45	12/23/2013 19:45	10
21	12/29/2013 8:15	12/30/2013 5:45	21.5	0.003	1.19	0.002	0.705	2.53	0.09	1.83	0.833	0.722	12/29/2013 8:15	12/29/2013 16:15	8
22	1/5/2014 5:45	1/7/2014 5:45	48	0.008	0.93	0.008	1.19	3.28	0.11	1.89	0.862	0.700	1/5/2014 5:45	1/6/2014 20:30	38.75
23	1/10/2014 7:30	1/13/2014 1:15	65.75	0.007	1.00	0.007	0.963	2.86	0.07	1.98	1.02	0.732	1/10/2014 7:30	1/12/2014 0:15	40.75
24	2/19/2014 9:30	2/20/2014 5:00	19.5	0.001	0.36	0.003	0.421	2.62	0.12	2.03	1.22	0.708	2/19/2014 9:30	2/19/2014 12:00	2.5
25	3/12/2014 15:30	3/13/2014 11:15	19.75	0.001	0.35	0.004	0.593	2.90	0.13	2.26	1.42	0.677	3/12/2014 15:30	3/12/2014 21:45	6.25
26	3/19/2014 15:15	3/20/2014 10:45	19.5	0.002	0.85	0.003	0.852	3.08	0.13	2.26	1.36	0.668	3/19/2014 15:30	3/19/2014 22:00	6.5
27	3/29/2014 9:30	4/6/2014 0:15	182.75	0.043	3.15	0.014	1.52	3.71	0.19	2.66	1.45	0.726	3/29/2014 9:30	4/4/2014 23:30	158
28	4/7/2014 11:45	4/8/2014 16:30	28.75	0.002	0.50	0.005	0.491	3.21	0.05	2.53	1.61	0.753	4/7/2014 11:45	4/8/2014 6:30	18.75
29	4/15/2014 9:45	4/16/2014 11:30	25.75	0.003	1.03	0.003	0.598	3.08	0.15	2.48	1.53	0.752	4/15/2014 9:45	4/15/2014 23:30	13.75
30	4/29/2014 12:30	5/8/2014 19:15	222.75	0.092	5.23	0.018	4.03	6.25	0.34	3.17	1.60	0.718	4/29/2014 12:30	5/8/2014 8:15	211.75
31	5/10/2014 13:30	5/11/2014 15:15	25.75	0.002	0.91	0.003	1.10	3.77	0.22	2.70	1.82	0.692	5/10/2014 13:30	5/11/2014 0:00	10.5
32	5/16/2014 8:15	5/19/2014 13:30	77.25	0.011	1.46	0.008	1.27	3.74	0.16	2.69	1.68	0.716	5/16/2014 8:15	5/18/2014 15:00	54.75
33	5/27/2014 17:30	5/30/2014 18:30	73	0.009	1.10	0.008	1.07	3.38	0.14	2.37	1.40	0.725	5/27/2014 18:00	5/28/2014 14:45	20.75
34	6/9/2014 2:15	6/11/2014 6:15	52	0.008	1.55	0.005	3.02	5.33	0.31	2.34	1.37	0.676	6/9/2014 2:30	6/10/2014 21:00	42.5
35	6/12/2014 13:15	6/14/2014 17:30	52.25	0.004	0.80	0.005	0.680	3.17	0.10	2.35	1.47	0.715	6/12/2014 13:15	6/13/2014 17:45	28.5
		Average:	36.6	0.008	1.20	0.005	1.003	3.05	0.14	2.06	1.11	0.706			31.2

MA_2 Abington Township
Pine Road and Pennypack Creek
Pipe Size: 20" dia. Tributary Drainage Area: 3,161 acres Tributary Service Population: 10,222

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Maximum Value:	133.0	0.092	5.23	0.018	4.03	6.25	0.34	3.17	1.82	0.869			212
		Minimum Value:	10.8	0.001	0.27	0.002	0.421	2.11	0.03	1.45	0.653	0.544			2.50
		Standard Deviation:	26.0	0.017	1.07	0.003	0.765	0.854	0.09	0.402	0.340	0.063			43.5
		Weighted Mean R-Value*:				0.007									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MA_3 Abington Township

Shady Lane

Pipe Size: 12" dia. Tributary Drainage Area: 353 acres Tributary Service Population: 3,456

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2/26/2013 19:15	3/1/2013 20:00	72.75	0.012	0.69	0.017	0.242	0.615	0.08	0.364	0.232	0.095	2/26/2013 19:15	2/28/2013 8:00	36.75
2	3/8/2013 7:45	3/8/2013 20:15	12.5	0.002	0.20	0.008	0.112	0.482	0.03	0.389	0.239	0.121	3/8/2013 8:00	3/8/2013 13:30	5.5
3	3/12/2013 2:45	3/13/2013 21:15	42.5	0.007	1.07	0.007	0.232	0.598	0.09	0.384	0.246	0.098	3/12/2013 3:00	3/13/2013 17:15	38.25
4	3/18/2013 18:00	3/20/2013 14:30	44.5	0.010	0.89	0.011	0.240	0.526	0.06	0.397	0.251	0.094	3/18/2013 18:00	3/19/2013 18:45	24.75
5	3/25/2013 5:15	3/26/2013 14:00	32.75	0.007	0.58	0.012	0.205	0.559	0.04	0.394	0.245	0.100	3/25/2013 5:15	3/25/2013 16:15	11
6	4/10/2013 20:15	4/11/2013 18:15	22	0.004	0.58	0.006	0.136	0.485	0.20	0.375	0.246	0.092	4/10/2013 20:15	4/11/2013 0:00	3.75
7	4/12/2013 7:15	4/13/2013 14:30	31.25	0.009	0.98	0.010	0.273	0.599	0.09	0.412	0.241	0.102	4/12/2013 7:15	4/12/2013 23:30	16.25
8	4/19/2013 21:30	4/20/2013 10:00	12.5	0.004	0.52	0.007	0.184	0.486	0.05	0.394	0.265	0.062	4/19/2013 21:30	4/20/2013 3:00	5.5
9	4/29/2013 1:45	4/30/2013 6:45	29	0.004	0.46	0.008	0.135	0.522	0.02	0.384	0.271	0.082	4/29/2013 2:00	4/30/2013 3:45	25.75
10	5/7/2013 22:00	5/9/2013 21:00	47	0.007	1.20	0.006	0.156	0.506	0.09	0.377	0.247	0.094	5/7/2013 22:15	5/9/2013 6:45	32.5
11	5/10/2013 22:30	5/13/2013 7:45	57.25	0.012	0.93	0.013	0.202	0.494	0.12	0.389	0.253	0.086	5/10/2013 22:30	5/12/2013 6:15	31.75
12	5/18/2013 16:00	5/20/2013 3:00	35	0.004	0.37	0.010	0.116	0.474	0.05	0.371	0.256	0.092	5/18/2013 16:15	5/19/2013 18:15	26
13	5/23/2013 16:00	5/25/2013 5:45	37.75	0.004	0.85	0.005	0.130	0.517	0.39	0.379	0.262	0.090	5/23/2013 16:15	5/25/2013 2:30	34.25
14	5/28/2013 9:30	5/29/2013 1:00	15.5	0.001	0.28	0.004	0.109	0.506	0.03	0.403	0.274	0.113	5/28/2013 9:30	5/28/2013 21:45	12.25
15	6/3/2013 0:15	6/6/2013 10:45	82.5	0.012	1.73	0.007	0.309	0.713	0.49	0.380	0.256	0.092	6/3/2013 0:30	6/3/2013 17:15	16.75
16	6/6/2013 19:30	6/22/2013 0:00	364.5	0.144	6.76	0.021	0.471	0.873	0.29	0.475	0.289	0.095	6/6/2013 19:30	6/18/2013 20:45	289.25
17	6/27/2013 18:00	6/29/2013 1:30	31.5	0.008	1.07	0.007	0.355	0.805	0.29	0.468	0.314	0.099	6/27/2013 18:15	6/28/2013 20:00	25.75
18	7/1/2013 6:45	7/3/2013 4:45	46	0.011	0.56	0.020	0.186	0.618	0.30	0.439	0.287	0.097	7/1/2013 6:45	7/2/2013 20:30	37.75
19	7/10/2013 12:15	7/10/2013 16:45	4.5	0.001	0.27	0.004	0.136	0.510	0.26	0.418	0.261	0.106	7/10/2013 12:30	7/10/2013 13:30	1
20	7/12/2013 15:30	7/14/2013 9:00	41.5	0.004	1.30	0.003	0.159	0.537	0.28	0.369	0.257	0.087	7/12/2013 15:30	7/13/2013 20:00	28.5
21	7/22/2013 18:45	7/24/2013 20:45	50	0.005	1.09	0.005	0.222	0.530	0.28	0.331	0.210	0.096	7/22/2013 19:00	7/23/2013 18:00	23
22	7/28/2013 13:30	7/29/2013 5:30	16	0.003	0.33	0.008	0.141	0.477	0.09	0.331	0.211	0.082	7/28/2013 15:15	7/29/2013 2:30	11.25
23	8/1/2013 6:30	8/4/2013 4:15	69.75	0.011	0.91	0.012	0.237	0.553	0.12	0.340	0.206	0.097	8/1/2013 6:30	8/3/2013 13:45	55.25
24	8/8/2013 0:30	8/9/2013 5:15	28.75	0.002	0.72	0.003	0.189	0.407	0.23	0.290	0.190	0.082	8/8/2013 0:30	8/8/2013 16:45	16.25
25	8/13/2013 5:00	8/17/2013 3:00	94	0.024	2.26	0.011	0.469	0.807	0.76	0.341	0.186	0.097	8/13/2013 5:00	8/13/2013 9:45	4.75
26	8/22/2013 6:15	8/23/2013 0:45	18.5	0.001	0.47	0.003	0.183	0.461	0.24	0.307	0.171	0.118	8/22/2013 6:30	8/22/2013 17:15	10.75
27	8/28/2013 11:30	8/29/2013 1:00	13.5	0.003	0.57	0.005	0.180	0.459	0.14	0.324	0.166	0.111	8/28/2013 11:45	8/28/2013 19:15	7.5
28	9/2/2013 9:45	9/4/2013 0:00	38.25	0.008	1.26	0.006	0.471	0.796	0.77	0.334	0.180	0.106	9/2/2013 10:30	9/2/2013 13:15	2.75
29	9/12/2013 11:15	9/13/2013 20:45	33.5	0.004	0.48	0.009	0.170	0.499	0.12	0.310	0.179	0.101	9/12/2013 11:15	9/13/2013 3:15	16
30	9/21/2013 20:00	9/22/2013 22:45	26.75	0.007	1.25	0.006	0.273	0.536	0.34	0.311	0.157	0.095	9/21/2013 20:00	9/22/2013 4:00	8
31	10/7/2013 8:15	10/8/2013 1:45	17.5	0.004	0.56	0.008	0.122	0.407	0.10	0.331	0.162	0.112	10/7/2013 8:30	10/7/2013 17:15	8.75
32	10/10/2013 3:45	10/15/2013 2:15	118.5	0.021	1.70	0.013	0.199	0.472	0.24	0.292	0.155	0.095	10/10/2013 3:45	10/11/2013 18:30	38.75
33	11/26/2013 14:00	12/2/2013 0:00	130	0.029	2.68	0.011	0.321	0.465	0.15	0.285	0.138	0.095	11/26/2013 14:00	11/27/2013 17:45	27.75
34	12/6/2013 5:00	12/8/2013 6:45	49.75	0.009	1.00	0.009	0.139	0.407	0.06	0.267	0.132	0.092	12/6/2013 5:00	12/7/2013 2:30	21.5
35	12/8/2013 11:30	12/14/2013 3:30	136	0.017	1.50	0.012	0.154	0.432	0.05	0.275	0.150	0.096	12/8/2013 11:45	12/11/2013 6:45	67

MA_3 Abington Township

Shady Lane

Pipe Size: 12" dia. Tributary Drainage Area: 353 acres Tributary Service Population: 3,456

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	12/14/2013 16:00	12/17/2013 22:15	78.25	0.010	0.90	0.011	0.175	0.472	0.09	0.284	0.159	0.096	12/14/2013 16:15	12/17/2013 15:45	71.5
37	12/23/2013 3:30	12/25/2013 8:45	53.25	0.008	0.55	0.015	0.163	0.451	0.10	0.299	0.174	0.090	12/23/2013 4:00	12/24/2013 17:45	37.75
38	12/29/2013 8:15	1/4/2014 21:00	156.75	0.034	1.58	0.021	0.230	0.515	0.10	0.313	0.166	0.097	12/29/2013 8:15	1/3/2014 4:30	116.25
39	1/5/2014 5:45	1/9/2014 6:00	96.25	0.018	0.91	0.020	0.207	0.546	0.14	0.342	0.204	0.094	1/5/2014 5:45	1/6/2014 20:30	38.75
40	1/10/2014 7:30	1/14/2014 7:15	95.75	0.013	1.03	0.013	0.207	0.547	0.09	0.345	0.219	0.094	1/10/2014 7:30	1/14/2014 7:00	95.5
41	1/21/2014 10:15	1/25/2014 8:30	94.25	0.014	0.67	0.021	0.133	0.459	0.03	0.335	0.209	0.093	1/21/2014 10:15	1/21/2014 21:15	11
42	2/3/2014 1:45	2/10/2014 22:15	188.5	0.045	2.84	0.016	0.281	0.602	0.09	0.349	0.199	0.095	2/3/2014 2:00	2/9/2014 21:00	163
43	2/13/2014 0:15	2/18/2014 19:45	139.5	0.045	2.03	0.022	0.243	0.556	0.09	0.340	0.173	0.093	2/13/2014 0:30	2/18/2014 6:00	125.5
		Average:	65.3	0.014	1.13	0.010	0.214	0.541	0.18	0.354	0.216	0.096			39.1
		Maximum Value:	364.5	0.144	6.76	0.022	0.471	0.873	0.77	0.475	0.314	0.121			289
		Minimum Value:	4.5	0.001	0.20	0.003	0.109	0.407	0.02	0.267	0.132	0.062			1.00
		Standard Deviation:	63.9	0.023	1.07	0.006	0.092	0.110	0.17	0.050	0.047	0.010			52.2
		Weighted Mean R-Value*:				0.012									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_1 Bensalem Township

End of Interplex Drive, Kay and Poquessing Creek

Pipe Size: 12" dia.   Tributary Drainage Area: 241 acres   Tributary Service Population: 879

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/22/2012 10:00	4/23/2012 17:30	31.5	0.011	2.15	0.005	0.202	0.389	0.11	0.244	0.082	0.109	4/22/2012 10:15	4/23/2012 6:00	19.75
2	5/1/2012 4:15	5/1/2012 22:30	18.25	0.004	0.40	0.010	0.157	0.425	0.16	0.244	0.080	0.129	5/1/2012 4:15	5/1/2012 10:15	6
3	5/9/2012 3:15	5/9/2012 14:45	11.5	0.002	0.28	0.007	0.121	0.315	0.07	0.225	0.068	0.129	5/9/2012 3:30	5/9/2012 7:15	3.75
4	5/14/2012 20:30	5/15/2012 23:00	26.5	0.005	0.86	0.006	0.142	0.381	0.10	0.206	0.071	0.103	5/14/2012 20:45	5/15/2012 12:45	16
5	5/16/2012 1:00	5/17/2012 2:45	25.75	0.017	1.33	0.013	0.766	0.856	0.27	0.277	0.077	0.098	5/16/2012 1:15	5/16/2012 5:00	3.75
6	5/27/2012 4:00	5/27/2012 12:15	8.25	0.004	0.44	0.009	0.321	0.574	0.13	0.279	0.087	0.119	5/27/2012 4:15	5/27/2012 6:45	2.5
7	6/1/2012 19:45	6/2/2012 17:30	21.75	0.004	0.54	0.008	0.184	0.425	0.32	0.215	0.092	0.094	6/1/2012 20:00	6/2/2012 2:15	6.25
8	6/12/2012 9:45	6/13/2012 3:45	18	0.002	0.64	0.003	0.152	0.343	0.07	0.191	0.075	0.100	6/12/2012 9:45	6/12/2012 23:45	14
9	7/15/2012 20:45	7/16/2012 15:30	18.75	0.006	1.16	0.005	0.651	0.861	0.50	0.250	0.097	0.102	7/15/2012 21:30	7/16/2012 14:45	17.25
10	7/20/2012 0:15	7/20/2012 21:45	21.5	0.007	0.98	0.007	0.293	0.521	0.26	0.243	0.084	0.109	7/20/2012 0:30	7/20/2012 11:00	10.5
11	7/26/2012 19:45	7/27/2012 5:00	9.25	0.001	0.37	0.003	0.172	0.371	0.18	0.151	0.087	0.047	7/26/2012 20:00	7/27/2012 0:30	4.5
12	7/28/2012 12:45	7/29/2012 4:00	15.25	0.007	0.77	0.009	0.291	0.476	0.18	0.226	0.073	0.080	7/28/2012 12:45	7/28/2012 22:45	10
13	8/3/2012 18:15	8/4/2012 0:30	6.25	0.001	0.21	0.004	0.095	0.273	0.19	0.170	0.062	0.089	8/3/2012 18:30	8/3/2012 18:45	0.25
14	8/5/2012 18:30	8/6/2012 12:45	18.25	0.003	0.70	0.005	0.160	0.406	0.17	0.202	0.077	0.096	8/5/2012 18:45	8/6/2012 3:15	8.5
15	8/14/2012 10:00	8/14/2012 18:45	8.75	0.004	0.41	0.011	0.197	0.453	0.10	0.309	0.091	0.139	8/14/2012 10:15	8/14/2012 17:30	7.25
16	8/17/2012 22:15	8/18/2012 12:45	14.5	0.004	0.75	0.006	0.170	0.450	0.14	0.226	0.095	0.084	8/17/2012 22:15	8/18/2012 7:30	9.25
17	8/27/2012 9:15	8/28/2012 18:15	33	0.008	1.26	0.007	0.211	0.438	0.29	0.215	0.062	0.115	8/27/2012 9:30	8/28/2012 7:30	22
18	9/3/2012 10:45	9/3/2012 22:15	11.5	0.003	1.07	0.003	0.230	0.434	0.24	0.232	0.071	0.115	9/3/2012 11:00	9/3/2012 16:15	5.25
19	9/4/2012 3:00	9/4/2012 9:15	6.25	0.004	0.50	0.008	0.297	0.379	0.11	0.277	0.078	0.098	9/4/2012 4:00	9/4/2012 7:00	3
20	9/4/2012 10:15	9/5/2012 11:30	25.25	0.021	1.52	0.014	0.750	0.985	0.29	0.325	0.087	0.107	9/4/2012 11:00	9/5/2012 0:45	13.75
21	9/18/2012 17:00	9/19/2012 1:15	8.25	0.002	0.83	0.003	0.211	0.411	0.31	0.210	0.086	0.083	9/18/2012 17:00	9/18/2012 21:00	4
22	10/29/2012 6:15	10/30/2012 5:15	23	0.010	2.03	0.005	0.279	0.465	0.09	0.239	0.065	0.103	10/29/2012 6:30	10/30/2012 4:00	21.5
23	11/7/2012 11:30	11/8/2012 4:45	17.25	0.003	0.54	0.006	0.109	0.292	0.03	0.186	0.070	0.086	11/7/2012 11:45	11/8/2012 1:15	13.5
24	11/27/2012 6:15	11/28/2012 4:45	22.5	0.006	0.63	0.010	0.127	0.320	0.02	0.200	0.054	0.105	11/27/2012 6:30	11/27/2012 16:00	9.5
25	12/7/2012 22:15	12/8/2012 5:15	7	0.002	0.30	0.008	0.127	0.212	0.06	0.142	0.064	0.027	12/7/2012 22:15	12/8/2012 1:45	3.5
26	12/9/2012 8:30	12/10/2012 5:00	20.5	0.002	0.38	0.006	0.144	0.398	0.04	0.176	0.065	0.094	12/9/2012 8:45	12/10/2012 2:30	17.75
27	1/14/2013 20:30	1/15/2013 7:30	11	0.003	0.42	0.007	0.136	0.375	0.06	0.204	0.101	0.059	1/14/2013 20:45	1/15/2013 2:45	6
28	1/15/2013 21:30	1/16/2013 21:45	24.25	0.007	1.06	0.007	0.180	0.438	0.07	0.260	0.111	0.104	1/15/2013 21:30	1/16/2013 12:15	14.75
29	1/30/2013 21:45	2/1/2013 5:15	31.5	0.012	1.14	0.011	0.268	0.486	0.30	0.288	0.141	0.086	1/30/2013 21:45	1/31/2013 21:15	23.5
30	2/8/2013 8:15	2/9/2013 7:30	23.25	0.007	0.45	0.016	0.212	0.523	0.02	0.300	0.155	0.097	2/8/2013 8:15	2/9/2013 3:00	18.75
31	2/26/2013 19:15	2/27/2013 21:00	25.75	0.010	0.68	0.015	0.222	0.517	0.07	0.316	0.151	0.104	2/26/2013 19:15	2/27/2013 11:45	16.5
32	3/7/2013 16:30	3/8/2013 17:15	24.75	0.004	0.63	0.006	0.126	0.436	0.03	0.265	0.136	0.104	3/7/2013 16:30	3/8/2013 13:45	21.25
33	3/12/2013 3:15	3/13/2013 7:45	28.5	0.013	0.98	0.013	0.307	0.602	0.08	0.303	0.131	0.100	3/12/2013 3:30	3/12/2013 15:45	12.25
34	3/18/2013 18:00	3/19/2013 22:30	28.5	0.011	0.92	0.012	0.218	0.483	0.06	0.313	0.148	0.105	3/18/2013 18:15	3/19/2013 19:15	25
35	3/25/2013 7:00	3/25/2013 22:30	15.5	0.005	0.62	0.009	0.231	0.505	0.05	0.338	0.146	0.136	3/25/2013 7:15	3/25/2013 16:30	9.25
		Average:	18.9	0.006	0.78	0.008	0.253	0.474	0.15	0.243	0.094	0.096			11.5

MBE_1 Bensalem Township
End of Interplex Drive, Kay and Poquessing Creek
Pipe Size: 12" dia. Tributary Drainage Area: 241 acres Tributary Service Population: 879

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Maximum Value:	33.0	0.021	2.03	0.016	0.766	0.985	0.50	0.338	0.155	0.139			25.0
		Minimum Value:	6.3	0.001	0.21	0.003	0.095	0.212	0.02	0.142	0.054	0.027			0.25
		Standard Deviation:	7.9	0.005	0.40	0.004	0.169	0.166	0.12	0.054	0.030	0.022			7.0
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_1 Bensalem Township

End of Interplex Drive, Kay and Poquessing Creek

Pipe Size: 12" dia. Tributary Drainage Area: 241 acres Tributary Service Population: 879

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/12/2013 7:00	4/13/2013 12:00	29	0.013	1.18	0.011	0.191	0.570	0.11	0.400	0.246	0.085	4/12/2013 7:15	4/12/2013 23:30	16.25
2	4/19/2013 21:15	4/20/2013 8:15	11	0.001	0.46	0.003	0.072	0.430	0.06	0.306	0.248	0.039	4/19/2013 21:30	4/20/2013 3:00	5.5
3	4/29/2013 3:45	4/29/2013 23:30	19.75	0.003	0.36	0.009	0.136	0.471	0.02	0.335	0.212	0.096	4/29/2013 3:45	4/29/2013 22:45	19
4	5/8/2013 8:00	5/8/2013 20:00	12	0.003	0.55	0.005	0.115	0.422	0.12	0.347	0.202	0.111	5/8/2013 8:00	5/8/2013 18:30	10.5
5	5/9/2013 4:00	5/9/2013 19:15	15.25	0.003	0.40	0.008	0.170	0.467	0.09	0.351	0.216	0.103	5/9/2013 4:15	5/9/2013 6:45	2.5
6	5/10/2013 22:45	5/11/2013 15:45	17	0.002	0.71	0.003	0.126	0.484	0.09	0.315	0.223	0.070	5/10/2013 23:00	5/11/2013 15:30	16.5
7	5/23/2013 15:30	5/24/2013 6:15	14.75	0.003	0.71	0.004	0.096	0.297	0.25	0.196	0.107	0.058	5/23/2013 15:30	5/24/2013 2:00	10.5
8	6/3/2013 6:00	6/3/2013 22:30	16.5	0.005	1.25	0.004	0.271	0.532	0.62	0.299	0.144	0.107	6/3/2013 6:00	6/3/2013 17:15	11.25
9	6/6/2013 19:45	6/9/2013 16:00	68.25	0.041	3.57	0.012	0.479	0.692	0.28	0.293	0.123	0.075	6/6/2013 20:00	6/8/2013 2:15	30.25
10	6/10/2013 7:15	6/12/2013 22:15	63	0.031	2.05	0.015	0.470	0.733	0.26	0.354	0.190	0.088	6/10/2013 7:15	6/11/2013 1:00	17.75
11	6/13/2013 9:30	6/14/2013 3:00	17.5	0.003	0.48	0.007	0.079	0.434	0.20	0.344	0.230	0.084	6/13/2013 9:30	6/14/2013 2:15	16.75
12	6/18/2013 13:00	6/18/2013 23:45	10.75	0.001	0.35	0.004	0.068	0.406	0.03	0.337	0.228	0.091	6/18/2013 13:15	6/18/2013 20:15	7
13	7/1/2013 8:00	7/1/2013 19:00	11	0.002	0.29	0.008	0.097	0.410	0.07	0.329	0.184	0.113	7/1/2013 8:00	7/1/2013 15:15	7.25
14	7/12/2013 15:45	7/14/2013 18:30	50.75	0.018	1.53	0.012	0.362	0.613	0.37	0.301	0.171	0.074	7/12/2013 15:45	7/13/2013 20:00	28.25
15	7/22/2013 18:30	7/24/2013 3:15	32.75	0.011	1.44	0.008	0.210	0.404	0.48	0.282	0.155	0.073	7/22/2013 18:30	7/23/2013 18:15	23.75
16	7/28/2013 15:15	7/29/2013 4:45	13.5	0.001	0.49	0.003	0.274	0.479	0.10	0.189	0.119	0.053	7/28/2013 15:30	7/29/2013 2:30	11
17	8/1/2013 6:45	8/2/2013 16:15	33.5	0.006	0.91	0.006	0.100	0.322	0.14	0.221	0.103	0.092	8/1/2013 6:45	8/1/2013 15:00	8.25
18	8/8/2013 0:00	8/8/2013 7:00	7	0.001	0.48	0.002	0.067	0.260	0.15	0.169	0.116	0.031	8/8/2013 0:15	8/8/2013 2:15	2
19	8/9/2013 15:45	8/9/2013 23:00	7.25	0.001	0.32	0.002	0.061	0.290	0.09	0.241	0.138	0.087	8/9/2013 15:45	8/9/2013 18:00	2.25
20	8/13/2013 5:15	8/14/2013 9:45	28.5	0.009	2.30	0.004	0.529	0.751	0.77	0.229	0.096	0.085	8/13/2013 5:15	8/13/2013 9:45	4.5
21	8/22/2013 6:30	8/22/2013 22:30	16	0.003	0.52	0.006	0.095	0.345	0.19	0.259	0.124	0.107	8/22/2013 6:30	8/22/2013 17:30	11
22	8/28/2013 9:45	8/28/2013 22:45	13	0.003	0.44	0.007	0.106	0.332	0.06	0.258	0.120	0.103	8/28/2013 9:45	8/28/2013 16:00	6.25
23	9/2/2013 10:45	9/3/2013 8:30	21.75	0.005	0.82	0.006	0.283	0.544	0.41	0.229	0.119	0.076	9/2/2013 11:00	9/3/2013 8:30	21.5
24	9/21/2013 20:15	9/22/2013 21:15	25	0.005	1.27	0.004	0.129	0.296	0.26	0.179	0.075	0.073	9/21/2013 20:15	9/22/2013 3:00	6.75
25	10/11/2013 3:15	10/11/2013 20:00	16.75	0.002	0.76	0.003	0.120	0.287	0.23	0.164	0.044	0.096	10/11/2013 3:30	10/11/2013 18:00	14.5
26	11/26/2013 14:15	11/28/2013 18:15	52	0.018	2.55	0.007	0.215	0.331	0.16	0.167	0.029	0.083	11/26/2013 14:15	11/27/2013 17:00	26.75
27	12/6/2013 5:00	12/8/2013 1:15	44.25	0.006	1.02	0.006	0.144	0.281	0.05	0.162	0.058	0.083	12/6/2013 5:15	12/7/2013 2:30	21.25
28	12/8/2013 11:30	12/10/2013 5:30	42	0.009	1.11	0.008	0.128	0.313	0.06	0.163	0.055	0.074	12/8/2013 11:45	12/9/2013 10:15	22.5
29	12/10/2013 7:30	12/11/2013 4:45	21.25	0.002	0.39	0.004	0.106	0.287	0.04	0.147	0.054	0.081	12/10/2013 7:30	12/10/2013 18:00	10.5
30	12/14/2013 16:00	12/16/2013 5:00	37	0.010	0.84	0.012	0.154	0.331	0.07	0.159	0.051	0.065	12/14/2013 16:15	12/15/2013 1:00	8.75
31	12/23/2013 3:45	12/24/2013 5:15	25.5	0.005	0.59	0.008	0.085	0.230	0.09	0.139	0.031	0.077	12/23/2013 3:45	12/23/2013 20:30	16.75
32	12/29/2013 8:30	12/30/2013 17:00	32.5	0.010	1.30	0.008	0.222	0.364	0.12	0.194	0.057	0.088	12/29/2013 8:45	12/29/2013 16:15	7.5
33	1/5/2014 21:30	1/8/2014 0:15	50.75	0.015	0.51	0.029	0.171	0.343	0.09	0.183	0.058	0.080	1/5/2014 21:30	1/6/2014 13:15	15.75
34	1/10/2014 19:45	1/13/2014 4:15	56.5	0.015	0.80	0.019	0.194	0.349	0.10	0.189	0.078	0.068	1/10/2014 20:00	1/11/2014 23:45	27.75
35	2/5/2014 0:00	2/7/2014 14:15	62.25	0.022	1.53	0.014	0.167	0.360	0.09	0.227	0.091	0.080	2/5/2014 0:00	2/5/2014 12:00	12
36	2/13/2014 0:30	2/16/2014 5:15	76.75	0.019	1.84	0.010	0.170	0.355	0.10	0.211	0.098	0.074	2/13/2014 0:30	2/15/2014 16:45	64.25

MBE_1 Bensalem Township

End of Interplex Drive, Kay and Poquessing Creek

Pipe Size: 12" dia. Tributary Drainage Area: 241 acres Tributary Service Population: 879

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
37	2/19/2014 9:30	2/20/2014 7:30	22	0.004	0.38	0.010	0.063	0.299	0.08	0.222	0.118	0.078	2/19/2014 9:30	2/19/2014 12:15	2.75
38	3/19/2014 14:15	3/20/2014 15:30	25.25	0.005	0.84	0.006	0.107	0.281	0.16	0.200	0.085	0.082	3/19/2014 14:15	3/19/2014 22:30	8.25
		Average:	29.5	0.008	0.98	0.008	0.175	0.405	0.17	0.244	0.126	0.081			14.6
		Maximum Value:	76.8	0.041	3.57	0.029	0.53	0.75	0.77	0.400	0.248	0.113			64.3
		Minimum Value:	7.0	0.001	0.29	0.002	0.061	0.230	0.02	0.139	0.029	0.031			2.00
		Standard Deviation:	18.7	0.009	0.72	0.005	0.117	0.132	0.16	0.073	0.065	0.018			11.4
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_2 Bensalem Township

Dunks Ferry Road and Mechanicsville Road

Pipe Size: 10" dia. Tributary Drainage Area: 212.3 acres Tributary Service Population: 1,894

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/1/2012 18:15	4/2/2012 6:00	11.75	0.031	0.18	0.167	0.243	0.500	0.04	0.319	0.163	0.057	4/1/2012 18:30	4/2/2012 2:30	8
2	4/22/2012 10:00	4/23/2012 23:00	37	0.245	2.14	0.115	1.04	1.32	0.12	0.517	0.163	0.098	4/22/2012 10:15	4/23/2012 18:15	32
3	5/1/2012 4:00	5/1/2012 12:45	8.75	0.005	0.28	0.017	0.167	0.400	0.08	0.231	0.106	0.105	5/1/2012 4:15	5/1/2012 10:15	6
4	5/9/2012 3:00	5/9/2012 22:45	19.75	0.025	0.28	0.090	0.160	0.430	0.06	0.282	0.129	0.105	5/9/2012 3:15	5/9/2012 22:45	19.5
5	5/10/2012 0:15	5/10/2012 12:30	12.25	0.015	0.18	0.083	0.143	0.420	0.02	0.255	0.131	0.078	5/10/2012 0:30	5/10/2012 4:45	4.25
6	6/1/2012 20:45	6/2/2012 23:15	26.5	0.082	0.49	0.167	1.16	1.35	0.23	0.372	0.181	0.072	6/1/2012 20:45	6/2/2012 2:15	5.5
7	6/12/2012 10:00	6/13/2012 1:30	15.5	0.028	0.61	0.046	0.224	0.510	0.06	0.341	0.165	0.107	6/12/2012 10:15	6/12/2012 23:30	13.25
8	6/22/2012 20:00	6/23/2012 0:00	4	0.006	0.19	0.032	0.127	0.400	0.06	0.329	0.185	0.088	6/22/2012 20:45	6/22/2012 22:45	2
9	7/5/2012 0:00	7/5/2012 2:15	2.25	0.007	0.40	0.016	0.583	0.725	0.26	0.236	0.108	0.027	7/5/2012 0:15	7/5/2012 1:30	1.25
10	8/17/2012 22:00	8/18/2012 9:45	11.75	0.008	0.48	0.016	0.108	0.329	0.11	0.235	0.165	0.045	8/17/2012 22:30	8/18/2012 7:45	9.25
11	8/27/2012 10:15	8/27/2012 22:45	12.5	0.010	0.54	0.018	0.079	0.375	0.17	0.313	0.166	0.118	8/27/2012 10:15	8/27/2012 18:00	7.75
12	9/3/2012 11:30	9/4/2012 1:30	14	0.013	0.86	0.016	0.093	0.338	0.33	0.277	0.148	0.092	9/3/2012 11:45	9/3/2012 16:30	4.75
13	9/4/2012 3:45	9/5/2012 7:30	27.75	0.163	2.54	0.064	0.771	1.03	0.37	0.474	0.158	0.089	9/4/2012 4:00	9/4/2012 19:00	15
14	9/8/2012 17:00	9/8/2012 22:15	5.25	0.002	0.23	0.007	0.059	0.305	0.04	0.265	0.167	0.086	9/8/2012 17:00	9/8/2012 22:00	5
15	9/18/2012 17:00	9/19/2012 9:45	16.75	0.009	0.85	0.010	0.063	0.319	0.24	0.248	0.143	0.085	9/18/2012 17:15	9/18/2012 21:00	3.75
16	9/22/2012 20:00	9/23/2012 3:30	7.5	0.003	0.26	0.011	0.076	0.322	0.11	0.226	0.162	0.050	9/22/2012 20:00	9/22/2012 22:30	2.5
17	10/19/2012 9:45	10/20/2012 1:15	15.5	0.014	0.98	0.014	0.122	0.384	0.23	0.306	0.173	0.098	10/19/2012 9:45	10/19/2012 14:45	5
18	10/29/2012 6:15	10/30/2012 6:00	23.75	0.075	1.99	0.038	0.591	0.864	0.11	0.373	0.157	0.094	10/29/2012 6:30	10/30/2012 4:00	21.5
19	11/7/2012 11:30	11/8/2012 11:15	23.75	0.020	0.56	0.035	0.110	0.411	0.03	0.299	0.173	0.094	11/7/2012 11:45	11/8/2012 1:15	13.5
20	11/13/2012 2:15	11/13/2012 16:15	14	0.002	0.24	0.007	0.066	0.340	0.09	0.259	0.162	0.092	11/13/2012 3:00	11/13/2012 12:30	9.5
21	11/27/2012 5:45	11/27/2012 22:30	16.75	0.013	0.64	0.021	0.070	0.350	0.02	0.291	0.141	0.120	11/27/2012 6:15	11/27/2012 16:00	9.75
22	12/7/2012 22:15	12/8/2012 14:30	16.25	0.023	0.28	0.080	0.133	0.396	0.06	0.288	0.172	0.062	12/7/2012 22:15	12/8/2012 1:00	2.75
23	12/9/2012 8:30	12/10/2012 9:30	25	0.019	0.39	0.048	0.109	0.332	0.05	0.255	0.138	0.088	12/9/2012 8:45	12/10/2012 2:30	17.75
24	12/18/2012 0:45	12/18/2012 13:00	12.25	0.011	0.38	0.029	0.107	0.325	0.15	0.236	0.121	0.081	12/18/2012 1:15	12/18/2012 2:15	1
25	12/20/2012 21:30	12/22/2012 8:30	35	0.091	1.52	0.060	0.609	0.832	0.10	0.303	0.129	0.072	12/20/2012 21:30	12/21/2012 8:00	10.5
26	12/26/2012 13:30	12/28/2012 6:30	41	0.123	1.28	0.096	0.670	0.930	0.11	0.349	0.145	0.088	12/26/2012 13:30	12/27/2012 9:30	20
27	1/14/2013 21:30	1/15/2013 19:45	22.25	0.023	0.33	0.070	0.167	0.324	0.03	0.256	0.124	0.092	1/14/2013 21:30	1/15/2013 2:45	5.25
28	1/15/2013 21:45	1/17/2013 10:45	37	0.091	1.00	0.091	0.497	0.663	0.07	0.309	0.127	0.087	1/15/2013 21:45	1/16/2013 12:00	14.25
29	1/30/2013 21:45	2/1/2013 6:45	33	0.069	1.03	0.067	0.469	0.617	0.23	0.295	0.133	0.081	1/30/2013 21:45	1/31/2013 6:00	8.25
30	2/8/2013 8:00	2/9/2013 7:30	23.5	0.010	0.45	0.022	0.095	0.331	0.02	0.244	0.150	0.079	2/8/2013 8:00	2/9/2013 3:00	19
31	2/26/2013 19:30	2/27/2013 18:45	23.25	0.030	0.66	0.046	0.235	0.379	0.07	0.285	0.142	0.093	2/26/2013 19:30	2/27/2013 11:45	16.25
32	3/7/2013 22:00	3/8/2013 19:00	21	0.015	0.43	0.035	0.083	0.350	0.03	0.247	0.135	0.084	3/7/2013 23:45	3/8/2013 13:30	13.75
33	3/12/2013 3:30	3/12/2013 20:15	16.75	0.041	0.97	0.042	0.566	0.810	0.10	0.343	0.144	0.107	3/12/2013 3:30	3/12/2013 17:15	13.75
34	3/18/2013 18:15	3/19/2013 17:15	23	0.023	0.76	0.031	0.205	0.380	0.05	0.307	0.174	0.094	3/18/2013 18:30	3/19/2013 11:30	17
		Average:	19.3	0.040	0.72	0.050	0.294	0.532	0.11	0.299	0.149	0.086			10.54
		Maximum Value:	41.0	0.245	2.54	0.167	1.16	1.35	0.37	0.517	0.185	0.120			32.0

MBE_2 Bensalem Township
Dunks Ferry Road and Mechanicsville Road
Pipe Size: 10" dia. Tributary Drainage Area: 212.3 acres Tributary Service Population: 1,894

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Minimum Value:	2.3	0.002	0.18	0.007	0.059	0.305	0.02	0.226	0.106	0.027			1.00
		Standard Deviation:	9.7	0.053	0.58	0.042	0.293	0.286	0.09	0.064	0.021	0.020			7.12
		Weighted Mean R-Value*:				0.055									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_2 Bensalem Township

Dunks Ferry Road and Hechanicsville Road

Pipe Size: 10" dia. Tributary Drainage Area: 212 acres Tributary Service Population: 1,894

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/10/2013 20:30	4/11/2013 11:30	15	0.006	0.43	0.014	0.131	0.356	0.20	0.262	0.097	0.108	4/10/2013 20:45	4/11/2013 0:00	3.25
2	4/12/2013 7:45	4/13/2013 8:15	24.5	0.018	1.19	0.016	0.304	0.510	0.15	0.323	0.098	0.121	4/12/2013 8:00	4/12/2013 23:30	15.5
3	4/19/2013 21:30	4/20/2013 9:00	11.5	0.008	0.42	0.020	0.166	0.361	0.05	0.275	0.106	0.068	4/19/2013 21:30	4/20/2013 3:00	5.5
4	4/29/2013 6:15	4/29/2013 21:15	15	0.003	0.26	0.010	0.073	0.339	0.02	0.287	0.089	0.175	4/29/2013 6:30	4/29/2013 21:15	14.75
5	5/8/2013 9:15	5/9/2013 19:15	34	0.009	0.86	0.011	0.203	0.354	0.12	0.253	0.074	0.141	5/8/2013 9:30	5/9/2013 6:45	21.25
6	5/10/2013 22:45	5/12/2013 4:00	29.25	0.012	0.63	0.019	0.196	0.341	0.08	0.259	0.084	0.120	5/10/2013 23:00	5/12/2013 3:15	28.25
7	6/27/2013 18:30	6/28/2013 15:15	20.75	0.008	0.68	0.012	0.124	0.539	0.15	0.406	0.228	0.124	6/27/2013 18:30	6/27/2013 22:00	3.5
8	6/30/2013 12:00	6/30/2013 18:45	6.75	0.002	0.55	0.003	0.112	0.517	0.19	0.460	0.225	0.197	6/30/2013 12:00	6/30/2013 16:15	4.25
9	7/1/2013 8:45	7/1/2013 19:15	10.5	0.004	0.34	0.011	0.187	0.557	0.08	0.442	0.225	0.168	7/1/2013 8:45	7/1/2013 16:30	7.75
10	7/3/2013 21:45	7/4/2013 5:00	7.25	0.004	0.21	0.017	0.107	0.389	0.12	0.334	0.225	0.040	7/3/2013 21:45	7/3/2013 22:45	1
11	7/12/2013 16:15	7/13/2013 7:30	15.25	0.009	0.82	0.011	0.137	0.534	0.23	0.403	0.228	0.095	7/12/2013 16:15	7/12/2013 22:30	6.25
12	7/13/2013 16:00	7/15/2013 17:00	49	0.025	0.75	0.034	0.658	1.07	0.42	0.427	0.220	0.136	7/13/2013 16:15	7/13/2013 19:45	3.5
13	7/28/2013 16:00	7/29/2013 21:45	29.75	0.009	0.51	0.018	0.188	0.513	0.14	0.317	0.134	0.141	7/28/2013 16:15	7/29/2013 2:30	10.25
14	8/1/2013 6:30	8/3/2013 0:30	42	0.028	0.89	0.031	0.525	0.780	0.16	0.364	0.130	0.143	8/1/2013 6:45	8/1/2013 15:00	8.25
15	8/8/2013 0:30	8/8/2013 23:00	22.5	0.009	0.52	0.017	0.339	0.497	0.24	0.330	0.141	0.135	8/8/2013 0:30	8/8/2013 17:00	16.5
16	8/9/2013 15:00	8/10/2013 3:45	12.75	0.005	0.22	0.022	0.164	0.480	0.08	0.303	0.136	0.114	8/9/2013 15:00	8/9/2013 18:15	3.25
17	8/13/2013 5:00	8/16/2013 0:15	67.25	0.104	2.12	0.049	3.65	3.94	0.70	0.479	0.127	0.139	8/13/2013 5:15	8/13/2013 10:00	4.75
18	8/22/2013 6:30	8/22/2013 22:45	16.25	0.002	0.30	0.008	0.181	0.506	0.12	0.341	0.150	0.171	8/22/2013 6:30	8/22/2013 17:30	11
19	8/28/2013 9:45	8/28/2013 20:15	10.5	0.005	0.54	0.009	0.167	0.483	0.08	0.380	0.146	0.169	8/28/2013 9:45	8/28/2013 16:00	6.25
20	9/2/2013 10:30	9/2/2013 19:00	8.5	0.005	0.27	0.019	0.196	0.504	0.05	0.382	0.134	0.164	9/2/2013 10:30	9/2/2013 13:30	3
21	9/12/2013 18:45	9/13/2013 9:00	14.25	0.004	0.50	0.008	0.187	0.519	0.11	0.295	0.151	0.106	9/12/2013 19:00	9/13/2013 3:30	8.5
22	9/21/2013 20:30	9/22/2013 21:15	24.75	0.013	1.09	0.012	0.309	0.579	0.19	0.323	0.108	0.141	9/21/2013 20:45	9/22/2013 2:15	5.5
23	10/7/2013 8:30	10/7/2013 20:30	12	0.006	0.46	0.013	0.200	0.527	0.11	0.363	0.123	0.171	10/7/2013 9:00	10/7/2013 17:15	8.25
24	10/11/2013 3:00	10/12/2013 17:15	38.25	0.019	0.83	0.023	0.490	0.791	0.24	0.341	0.132	0.141	10/11/2013 3:00	10/11/2013 18:00	15
25	11/1/2013 7:45	11/1/2013 17:45	10	0.002	0.20	0.012	0.095	0.395	0.11	0.316	0.118	0.165	11/1/2013 8:00	11/1/2013 10:30	2.5
26	11/26/2013 14:15	11/28/2013 4:30	38.25	0.060	2.41	0.025	0.711	0.918	0.14	0.418	0.079	0.123	11/26/2013 14:15	11/27/2013 17:00	26.75
27	12/6/2013 5:15	12/8/2013 3:00	45.75	0.033	0.92	0.036	0.362	0.564	0.05	0.375	0.133	0.141	12/6/2013 5:15	12/7/2013 2:30	21.25
28	12/8/2013 11:45	12/11/2013 16:00	76.25	0.076	1.53	0.050	0.665	0.961	0.05	0.421	0.148	0.135	12/8/2013 11:45	12/10/2013 18:00	54.25
29	12/14/2013 15:45	12/16/2013 23:15	55.5	0.041	0.86	0.048	0.320	0.689	0.07	0.414	0.171	0.140	12/14/2013 16:00	12/15/2013 1:00	9
30	12/23/2013 4:15	12/25/2013 4:30	48.25	0.041	0.61	0.066	0.482	0.771	0.07	0.398	0.152	0.130	12/23/2013 4:15	12/24/2013 17:45	37.5
31	12/29/2013 8:15	12/31/2013 5:00	44.75	0.080	1.25	0.064	1.61	1.94	0.11	0.527	0.142	0.139	12/29/2013 8:15	12/29/2013 16:15	8
32	1/2/2014 17:45	1/3/2014 4:45	11	0.001	0.33	0.003	0.122	0.393	0.01	0.248	0.141	0.093	1/2/2014 17:45	1/3/2014 4:30	10.75
33	1/5/2014 21:30	1/8/2014 4:00	54.5	0.076	0.39	0.193	1.17	1.51	0.03	0.470	0.158	0.121	1/5/2014 21:30	1/6/2014 13:15	15.75
34	1/10/2014 5:45	1/12/2014 19:30	61.75	0.070	0.94	0.075	1.41	1.78	0.09	0.482	0.178	0.147	1/10/2014 5:45	1/11/2014 23:45	42
35	2/3/2014 2:15	2/7/2014 15:45	109.5	0.210	2.62	0.080	1.62	1.91	0.08	0.529	0.134	0.131	2/3/2014 2:15	2/5/2014 12:15	58
36	2/13/2014 0:30	2/17/2014 5:00	100.5	0.104	1.83	0.057	0.609	0.923	0.10	0.474	0.202	0.129	2/13/2014 0:30	2/15/2014 16:15	63.75

MBE_2 Bensalem Township

Dunks Ferry Road and Hechanicsville Road

Pipe Size: 10" dia. Tributary Drainage Area: 212 acres Tributary Service Population: 1,894

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	2/19/2014 10:15	2/20/2014 5:15	19	0.022	0.36	0.061	0.359	0.815	0.08	0.618	0.355	0.101	2/19/2014 10:15	2/19/2014 12:15	2
38	2/21/2014 14:00	2/22/2014 3:30	13.5	0.039	0.19	0.202	1.23	2.07	0.08	1.19	0.680	0.112	2/21/2014 14:15	2/21/2014 17:45	3.5
39	3/12/2014 19:30	3/13/2014 11:30	16	0.005	0.22	0.022	0.155	0.532	0.07	0.359	0.203	0.113	3/12/2014 19:30	3/12/2014 21:45	2.25
40	3/19/2014 16:00	3/20/2014 16:15	24.25	0.022	0.60	0.036	0.413	0.749	0.07	0.456	0.201	0.131	3/19/2014 16:15	3/19/2014 22:30	6.25
41	3/29/2014 9:15	4/4/2014 19:15	154	0.264	2.57	0.103	2.18	2.49	0.12	0.539	0.165	0.137	3/29/2014 9:30	4/4/2014 3:45	138.25
42	4/7/2014 17:00	4/8/2014 20:30	27.5	0.017	0.44	0.038	0.237	0.537	0.04	0.394	0.172	0.138	4/7/2014 17:00	4/8/2014 6:00	13
43	4/15/2014 10:30	4/16/2014 18:15	31.75	0.017	0.60	0.028	0.227	0.635	0.05	0.433	0.223	0.138	4/15/2014 10:30	4/16/2014 0:15	13.75
44	4/25/2014 23:00	4/27/2014 0:00	25	0.013	0.55	0.023	0.221	0.609	0.17	0.395	0.189	0.136	4/25/2014 23:00	4/26/2014 1:45	2.75
45	4/29/2014 16:00	5/9/2014 1:00	225	0.383	5.32	0.072	2.01	2.21	0.20	0.604	0.236	0.133	4/29/2014 16:15	5/8/2014 8:30	208.25
46	5/10/2014 14:00	5/13/2014 23:45	81.75	0.052	0.98	0.053	0.617	1.09	0.30	0.512	0.287	0.138	5/10/2014 14:00	5/11/2014 0:15	10.25
47	5/16/2014 9:15	5/17/2014 16:15	31	0.015	0.63	0.024	0.350	0.744	0.06	0.457	0.247	0.143	5/16/2014 9:30	5/16/2014 21:15	11.75
48	6/9/2014 2:00	6/10/2014 8:30	30.5	0.013	0.73	0.018	0.197	0.536	0.07	0.337	0.156	0.123	6/9/2014 2:00	6/10/2014 8:30	30.5
49	6/10/2014 17:45	6/13/2014 0:00	54.25	0.072	2.41	0.030	2.54	2.90	1.20	0.469	0.154	0.133	6/10/2014 18:30	6/12/2014 21:30	51
50	6/13/2014 1:45	6/13/2014 23:00	21.25	0.012	0.34	0.036	0.228	0.555	0.09	0.370	0.150	0.141	6/13/2014 2:00	6/13/2014 18:15	16.25
51	6/25/2014 23:30	6/26/2014 18:45	19.25	0.004	0.53	0.008	0.142	0.349	0.18	0.230	0.075	0.124	6/25/2014 23:45	6/26/2014 2:00	2.25
		Average:	38.6	0.040	0.90	0.037	0.574	0.893	0.15	0.408	0.172	0.133			21.1
		Maximum Value:	225.0	0.383	5.32	0.202	3.65	3.94	1.20	1.19	0.680	0.197			208.3
		Minimum Value:	6.8	0.001	0.19	0.003	0.073	0.339	0.01	0.230	0.074	0.040			1.00
		Standard Deviation:	39.4	0.070	0.90	0.040	0.727	0.745	0.19	0.144	0.092	0.026			35.3
		Weighted Mean R-Value*:				0.045									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_3 Bensalem Township

Emerson Lane and Evelyn Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 90.3 acres Tributary Service Population: 554

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/25/2010 15:30	2/26/2010 4:00	12.5	0.003	0.15	0.017	0.030	0.118	0.010	0.089	0.045	0.032	2/25/2010 17:00	2/26/2010 2:15	9.25
2	3/12/2010 19:30	3/13/2010 2:15	6.75	0.002	0.38	0.004	0.030	0.096	0.038	0.080	0.034	0.031	3/12/2010 19:30	3/13/2010 2:00	6.5
3	3/14/2010 21:15	3/16/2010 7:00	33.75	0.013	0.34	0.037	0.063	0.135	0.059	0.093	0.033	0.039	3/14/2010 21:30	3/15/2010 21:00	23.5
4	3/25/2010 23:30	3/26/2010 6:00	6.5	0.002	0.16	0.010	0.029	0.096	0.035	0.076	0.046	0.016	3/25/2010 23:45	3/26/2010 5:45	6
5	4/25/2010 0:30	4/25/2010 13:00	12.5	0.003	0.64	0.005	0.045	0.173	0.062	0.136	0.082	0.038	4/25/2010 0:30	4/25/2010 10:30	10
6	4/25/2010 22:00	4/27/2010 4:45	30.75	0.009	1.10	0.009	0.060	0.196	0.067	0.138	0.082	0.038	4/25/2010 22:15	4/26/2010 18:45	20.5
7	5/3/2010 4:15	5/4/2010 4:30	24.25	0.006	0.81	0.008	0.056	0.216	0.129	0.143	0.082	0.045	5/3/2010 4:15	5/3/2010 10:30	6.25
8	5/11/2010 18:30	5/12/2010 10:00	15.5	0.003	0.60	0.006	0.036	0.165	0.085	0.125	0.074	0.038	5/11/2010 18:30	5/12/2010 4:30	10
9	7/10/2010 8:45	7/10/2010 22:00	13.25	0.006	0.72	0.009	0.131	0.254	0.087	0.131	0.047	0.057	7/10/2010 8:45	7/10/2010 14:15	5.5
10	7/14/2010 3:00	7/14/2010 9:15	6.25	0.002	0.63	0.003	0.087	0.155	0.276	0.118	0.056	0.044	7/14/2010 3:15	7/14/2010 6:00	2.75
11	7/19/2010 8:30	7/20/2010 5:15	20.75	0.004	0.31	0.013	0.060	0.182	0.087	0.108	0.054	0.043	7/19/2010 9:00	7/19/2010 20:00	11
12	7/21/2010 23:00	7/22/2010 3:30	4.5	0.001	0.19	0.006	0.034	0.110	0.075	0.089	0.059	0.013	7/21/2010 23:00	7/22/2010 0:00	1
13	7/25/2010 15:00	7/25/2010 19:30	4.5	0.001	0.51	0.003	0.064	0.168	0.210	0.123	0.059	0.047	7/25/2010 15:00	7/25/2010 17:00	2
14	8/11/2010 1:15	8/11/2010 4:30	3.25	0.001	0.15	0.004	0.080	0.148	0.074	0.078	0.059	0.007	8/11/2010 1:30	8/11/2010 3:15	1.75
15	9/22/2010 20:45	9/23/2010 0:30	3.75	0.001	0.30	0.002	0.040	0.114	0.152	0.087	0.047	0.030	9/22/2010 20:45	9/22/2010 23:15	2.5
16	9/27/2010 4:45	9/27/2010 19:00	14.25	0.001	0.37	0.003	0.059	0.166	0.082	0.121	0.058	0.059	9/27/2010 5:00	9/27/2010 18:30	13.5
17	9/30/2010 4:00	9/30/2010 8:45	4.75	0.002	0.72	0.002	0.083	0.179	0.204	0.125	0.057	0.049	9/30/2010 4:15	9/30/2010 7:15	3
18	9/30/2010 19:15	10/1/2010 0:30	5.25	0.003	0.84	0.003	0.138	0.235	0.230	0.121	0.057	0.035	9/30/2010 19:15	9/30/2010 23:45	4.5
19	10/5/2010 13:15	10/5/2010 19:15	6	0.001	0.19	0.006	0.035	0.153	0.043	0.124	0.059	0.053	10/5/2010 13:15	10/5/2010 15:30	2.25
20	10/14/2010 12:00	10/15/2010 4:30	16.5	0.005	0.74	0.007	0.079	0.177	0.064	0.106	0.051	0.038	10/14/2010 12:15	10/14/2010 20:15	8
21	10/19/2010 2:00	10/19/2010 12:00	10	0.004	0.43	0.009	0.092	0.219	0.035	0.118	0.049	0.047	10/19/2010 2:00	10/19/2010 8:00	6
22	10/27/2010 2:45	10/27/2010 19:45	17	0.003	0.23	0.013	0.066	0.176	0.040	0.114	0.051	0.052	10/27/2010 3:00	10/27/2010 16:15	13.25
23	11/25/2010 10:00	11/26/2010 0:30	14.5	0.002	0.27	0.008	0.067	0.204	0.027	0.124	0.063	0.051	11/25/2010 10:15	11/25/2010 19:30	9.25
24	11/30/2010 23:45	12/2/2010 1:00	25.25	0.014	1.09	0.013	0.141	0.262	0.135	0.133	0.057	0.044	12/1/2010 0:45	12/1/2010 13:30	12.75
25	12/11/2010 23:00	12/12/2010 12:15	13.25	0.002	0.77	0.002	0.073	0.197	0.121	0.098	0.057	0.034	12/11/2010 23:00	12/12/2010 10:00	11
26	12/12/2010 17:30	12/13/2010 4:15	10.75	0.004	0.40	0.010	0.133	0.233	0.041	0.109	0.060	0.026	12/12/2010 17:45	12/13/2010 2:15	8.5
		Average:	12.9	0.004	0.50	0.008	0.070	0.174	0.095	0.112	0.057	0.039			8.1
		Maximum Value:	33.8	0.014	1.10	0.037	0.141	0.262	0.276	0.143	0.082	0.059			23.5
		Minimum Value:	3.3	0.001	0.15	0.002	0.029	0.096	0.010	0.076	0.033	0.007			1.00
		Standard Deviation:	8.4	0.003	0.28	0.007	0.034	0.046	0.069	0.020	0.013	0.013			5.6
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_3 Bensalem Township

Emerson Lane and Evelyn Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 90.3 acres Tributary Service Population: 554

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/27/2012 6:00	1/27/2012 19:45	13.75	0.005	0.34	0.016	0.077	0.220	0.07	0.155	0.057	0.075	1/27/2012 6:00	1/27/2012 11:30	5.5
2	2/11/2012 3:45	2/12/2012 1:45	22	0.005	0.21	0.026	0.052	0.180	0.03	0.117	0.048	0.055	2/11/2012 4:00	2/11/2012 22:45	18.75
3	5/1/2012 3:30	5/1/2012 19:45	16.25	0.003	0.36	0.009	0.078	0.200	0.15	0.118	0.038	0.068	5/1/2012 3:30	5/1/2012 10:15	6.75
4	5/9/2012 0:00	5/10/2012 10:15	34.25	0.008	0.50	0.015	0.363	0.490	0.05	0.102	0.037	0.052	5/9/2012 0:00	5/10/2012 4:45	28.75
5	5/15/2012 8:30	5/19/2012 0:00	87.5	0.037	1.98	0.019	0.269	0.320	0.23	0.117	0.037	0.056	5/15/2012 8:45	5/16/2012 4:45	20
6	5/21/2012 1:30	5/22/2012 20:00	42.5	0.007	0.48	0.015	0.052	0.190	0.07	0.115	0.048	0.057	5/21/2012 1:30	5/22/2012 9:45	32.25
7	5/27/2012 4:30	5/28/2012 5:15	24.75	0.003	0.33	0.010	0.056	0.190	0.07	0.109	0.052	0.049	5/27/2012 4:30	5/27/2012 22:00	17.5
8	6/1/2012 19:45	6/2/2012 18:00	22.25	0.008	0.54	0.015	0.132	0.200	0.25	0.124	0.053	0.051	6/1/2012 20:00	6/2/2012 2:45	6.75
		Average:	32.9	0.010	0.59	0.015	0.135	0.249	0.11	0.120	0.046	0.058			17.0
		Maximum Value:	87.5	0.037	1.98	0.026	0.363	0.490	0.25	0.155	0.057	0.075			32.3
		Minimum Value:	13.8	0.003	0.21	0.009	0.052	0.180	0.03	0.102	0.037	0.049			5.50
		Standard Deviation:	24.0	0.011	0.57	0.005	0.117	0.107	0.09	0.016	0.008	0.009			10.2
		Weighted Mean R-Value*:				0.016									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_3 Bensalem Township

Emerson Lane and Evelyn Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 90.3 acres Tributary Service Population: 554

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	3/19/2014 14:15	3/22/2014 4:30	62.25	0.065	0.58	0.113	0.172	0.317	0.10	0.202	0.094	0.046	3/19/2014 14:15	3/19/2014 22:30	8.25
2	3/29/2014 9:15	4/2/2014 5:00	91.75	0.073	2.50	0.029	0.477	0.618	0.11	0.176	0.076	0.053	3/29/2014 9:30	3/31/2014 7:00	45.5
3	4/7/2014 16:45	4/9/2014 22:00	53.25	0.015	0.48	0.033	0.074	0.221	0.05	0.152	0.085	0.050	4/7/2014 17:00	4/8/2014 6:15	13.25
4	4/15/2014 10:15	4/16/2014 22:15	36	0.017	0.58	0.029	0.173	0.281	0.04	0.147	0.066	0.053	4/15/2014 10:15	4/16/2014 0:00	13.75
5	4/25/2014 19:30	4/26/2014 16:00	20.5	0.005	0.62	0.008	0.061	0.153	0.20	0.102	0.038	0.050	4/25/2014 19:30	4/26/2014 1:30	6
6	6/9/2014 0:30	6/10/2014 11:00	34.5	0.016	0.80	0.021	0.077	0.218	0.11	0.143	0.066	0.050	6/9/2014 0:30	6/10/2014 8:30	32
7	6/10/2014 17:15	6/15/2014 0:00	102.75	0.071	1.86	0.038	0.583	0.701	0.54	0.160	0.069	0.050	6/10/2014 17:45	6/13/2014 18:15	72.5
		Average:	57.3	0.037	1.06	0.039	0.231	0.358	0.16	0.155	0.071	0.050			27.3
		Maximum Value:	102.8	0.073	2.50	0.113	0.583	0.701	0.54	0.202	0.094	0.053			72.5
		Minimum Value:	20.5	0.005	0.48	0.008	0.061	0.153	0.04	0.102	0.038	0.046			6.00
		Standard Deviation:	30.6	0.031	0.79	0.034	0.212	0.213	0.17	0.031	0.018	0.002			24.5
		Weighted Mean R-Value*:				0.035									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_4 Bensalem Township
Red Lion Road and Frankford Avenue
Pipe Size: 12" dia. Tributary Drainage Area: 192.7 acres Tributary Service Population: 1,377

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 5:30	11.25	0.002	0.19	0.011	0.073	0.300	0.04	0.200	0.105	0.071	4/1/2012 18:30	4/2/2012 2:15	7.75
2	4/21/2012 21:45	4/22/2012 1:30	3.75	0.001	0.16	0.005	0.075	0.260	0.11	0.193	0.095	0.074	4/21/2012 21:45	4/21/2012 22:30	0.75
3	4/22/2012 10:00	4/23/2012 21:15	35.25	0.033	2.13	0.015	0.470	0.680	0.12	0.319	0.091	0.112	4/22/2012 10:15	4/23/2012 18:15	32
4	5/1/2012 3:00	5/1/2012 19:45	16.75	0.002	0.36	0.006	0.184	0.380	0.17	0.193	0.075	0.100	5/1/2012 3:30	5/1/2012 10:15	6.75
5	7/14/2012 3:15	7/14/2012 11:15	8	0.002	0.27	0.008	0.097	0.273	0.03	0.169	0.076	0.061	7/14/2012 4:15	7/14/2012 10:30	6.25
6	7/15/2012 21:30	7/16/2012 12:30	15	0.008	0.80	0.010	0.619	0.799	0.50	0.226	0.081	0.076	7/15/2012 21:45	7/16/2012 0:15	2.5
7	7/26/2012 19:45	7/27/2012 13:30	17.75	0.004	0.44	0.009	0.217	0.457	0.22	0.214	0.099	0.087	7/26/2012 20:00	7/27/2012 0:30	4.5
8	7/28/2012 11:00	7/29/2012 10:00	23	0.009	0.58	0.015	0.279	0.523	0.23	0.241	0.101	0.093	7/28/2012 13:00	7/28/2012 22:30	9.5
9	8/4/2012 13:30	8/5/2012 6:30	17	0.007	0.40	0.018	0.378	0.632	0.27	0.256	0.117	0.085	8/4/2012 13:45	8/4/2012 14:30	0.75
10	8/5/2012 18:45	8/6/2012 16:00	21.25	0.010	0.57	0.017	0.219	0.417	0.14	0.256	0.109	0.090	8/5/2012 18:45	8/6/2012 2:15	7.5
11	8/10/2012 9:15	8/10/2012 23:15	14	0.004	0.31	0.013	0.184	0.416	0.11	0.265	0.107	0.122	8/10/2012 10:45	8/10/2012 16:30	5.75
12	8/27/2012 10:15	8/27/2012 17:45	7.5	0.002	0.34	0.006	0.170	0.353	0.22	0.207	0.055	0.120	8/27/2012 10:15	8/27/2012 15:30	5.25
13	8/28/2012 6:00	8/28/2012 8:45	2.75	0.001	0.14	0.004	0.078	0.239	0.03	0.183	0.054	0.103	8/28/2012 6:00	8/28/2012 7:30	1.5
14	9/3/2012 10:00	9/4/2012 1:00	15	0.008	0.88	0.009	0.540	0.788	0.22	0.276	0.074	0.133	9/3/2012 10:15	9/3/2012 15:45	5.5
15	9/4/2012 4:00	9/4/2012 10:30	6.5	0.009	0.79	0.012	0.763	0.842	0.18	0.337	0.075	0.081	9/4/2012 4:15	9/4/2012 6:45	2.5
16	9/4/2012 11:30	9/5/2012 10:15	22.75	0.023	1.28	0.018	0.814	1.005	0.28	0.303	0.080	0.095	9/4/2012 11:45	9/5/2012 6:45	19
17	9/5/2012 12:00	9/6/2012 1:15	13.25	0.009	0.44	0.020	0.596	0.810	0.15	0.287	0.086	0.118	9/5/2012 12:00	9/5/2012 14:15	2.25
18	9/8/2012 17:15	9/8/2012 23:30	6.25	0.000	0.21	0.002	0.081	0.296	0.05	0.225	0.098	0.118	9/8/2012 17:15	9/8/2012 22:00	4.75
19	9/18/2012 3:30	9/18/2012 8:00	4.5	0.001	0.10	0.006	0.064	0.217	0.04	0.117	0.054	0.045	9/18/2012 3:30	9/18/2012 6:00	2.5
20	9/18/2012 17:00	9/19/2012 0:15	7.25	0.005	0.80	0.006	0.222	0.413	0.21	0.255	0.049	0.124	9/18/2012 17:15	9/18/2012 21:00	3.75
21	9/22/2012 19:45	9/23/2012 11:00	15.25	0.006	0.62	0.009	0.336	0.528	0.33	0.175	0.062	0.066	9/22/2012 20:00	9/22/2012 22:30	2.5
22	10/2/2012 11:00	10/2/2012 16:45	5.75	0.001	0.12	0.009	0.182	0.367	0.03	0.203	0.059	0.119	10/2/2012 11:00	10/2/2012 14:00	3
23	10/7/2012 10:45	10/8/2012 0:15	13.5	0.003	0.16	0.018	0.090	0.295	0.02	0.217	0.055	0.136	10/7/2012 11:00	10/7/2012 21:00	10
24	10/15/2012 13:15	10/15/2012 23:00	9.75	0.004	0.36	0.010	0.441	0.620	0.20	0.230	0.057	0.125	10/15/2012 13:30	10/15/2012 21:45	8.25
25	10/19/2012 9:45	10/20/2012 6:15	20.5	0.009	0.92	0.010	0.575	0.764	0.23	0.210	0.064	0.090	10/19/2012 9:45	10/19/2012 14:30	4.75
26	10/28/2012 15:30	10/28/2012 21:00	5.5	0.001	0.13	0.010	0.068	0.286	0.03	0.252	0.085	0.138	10/28/2012 15:30	10/28/2012 18:45	3.25
27	10/29/2012 6:00	10/30/2012 18:15	36.25	0.043	2.20	0.020	0.616	0.809	0.12	0.321	0.070	0.103	10/29/2012 6:00	10/30/2012 9:15	27.25
28	11/7/2012 11:45	11/8/2012 13:45	26	0.009	0.60	0.015	0.151	0.353	0.03	0.207	0.065	0.099	11/7/2012 11:45	11/8/2012 0:30	12.75
29	11/27/2012 6:15	11/27/2012 20:30	14.25	0.004	0.64	0.006	0.115	0.273	0.02	0.186	0.031	0.122	11/27/2012 6:30	11/27/2012 16:00	9.5
30	12/7/2012 21:45	12/8/2012 8:00	10.25	0.004	0.36	0.010	0.145	0.238	0.07	0.122	0.038	0.040	12/7/2012 21:45	12/8/2012 1:45	4
31	12/9/2012 8:45	12/10/2012 6:15	21.5	0.001	0.37	0.003	0.063	0.249	0.05	0.148	0.038	0.105	12/9/2012 8:45	12/10/2012 2:30	17.75
32	12/18/2012 1:00	12/18/2012 14:00	13	0.003	0.31	0.010	0.169	0.236	0.14	0.145	0.037	0.079	12/18/2012 1:15	12/18/2012 13:45	12.5
33	12/20/2012 21:30	12/22/2012 19:00	45.5	0.042	1.47	0.029	0.631	0.700	0.12	0.244	0.033	0.094	12/20/2012 21:30	12/21/2012 8:00	10.5
34	12/26/2012 13:30	12/28/2012 7:00	41.5	0.042	1.38	0.031	0.512	0.676	0.12	0.247	0.027	0.091	12/26/2012 13:30	12/27/2012 9:45	20.25
35	12/29/2012 10:00	12/29/2012 18:45	8.75	0.002	0.22	0.008	0.098	0.279	0.02	0.218	0.043	0.151	12/29/2012 10:30	12/29/2012 16:30	6
36	1/11/2013 16:15	1/12/2013 4:15	12	0.002	0.47	0.004	0.116	0.313	0.07	0.168	0.061	0.088	1/11/2013 16:30	1/11/2013 21:15	4.75

MBE_4 Bensalem Township
Red Lion Road and Frankford Avenue
Pipe Size: 12" dia. Tributary Drainage Area: 192.7 acres Tributary Service Population: 1,377

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	1/14/2013 21:30	1/15/2013 12:00	14.5	0.004	0.32	0.013	0.136	0.256	0.03	0.199	0.087	0.077	1/14/2013 21:30	1/15/2013 2:45	5.25
38	1/15/2013 21:30	1/17/2013 16:00	42.5	0.036	1.01	0.036	0.434	0.531	0.07	0.293	0.095	0.092	1/15/2013 21:30	1/16/2013 12:00	14.5
39	1/28/2013 12:45	1/28/2013 20:15	7.5	0.002	0.20	0.011	0.074	0.288	0.03	0.249	0.091	0.123	1/28/2013 12:45	1/28/2013 19:45	7
40	1/30/2013 21:30	2/1/2013 6:45	33.25	0.025	1.04	0.024	0.610	0.703	0.18	0.269	0.093	0.083	1/30/2013 21:45	1/31/2013 6:00	8.25
41	2/8/2013 6:15	2/9/2013 7:30	25.25	0.004	0.41	0.011	0.095	0.283	0.02	0.191	0.079	0.090	2/8/2013 6:30	2/9/2013 3:00	20.5
42	2/11/2013 4:30	2/12/2013 16:30	36	0.018	0.37	0.049	0.176	0.386	0.04	0.248	0.085	0.099	2/11/2013 4:30	2/11/2013 9:15	4.75
43	2/13/2013 18:45	2/14/2013 15:00	20.25	0.006	0.19	0.032	0.095	0.323	0.02	0.232	0.102	0.092	2/13/2013 18:45	2/14/2013 0:30	5.75
44	2/19/2013 11:15	2/19/2013 23:45	12.5	0.000	0.18	0.002	0.074	0.331	0.02	0.245	0.118	0.123	2/19/2013 11:30	2/19/2013 18:00	6.5
45	2/26/2013 19:15	2/28/2013 2:15	31	0.017	0.69	0.024	0.182	0.333	0.07	0.259	0.094	0.097	2/26/2013 19:15	2/27/2013 11:45	16.5
46	3/7/2013 14:45	3/8/2013 18:00	27.25	0.002	0.32	0.005	0.060	0.285	0.02	0.205	0.100	0.098	3/7/2013 14:45	3/8/2013 13:15	22.5
47	3/12/2013 3:30	3/14/2013 3:00	47.5	0.036	0.94	0.039	0.475	0.670	0.09	0.276	0.083	0.097	3/12/2013 3:30	3/12/2013 16:00	12.5
48	3/16/2013 10:00	3/16/2013 22:45	12.75	0.005	0.14	0.036	0.114	0.344	0.02	0.286	0.097	0.141	3/16/2013 10:15	3/16/2013 18:00	7.75
49	3/18/2013 18:15	3/20/2013 8:30	38.25	0.036	0.77	0.047	0.256	0.442	0.04	0.296	0.089	0.090	3/18/2013 18:30	3/19/2013 18:45	24.25
50	3/25/2013 6:30	3/26/2013 9:30	27	0.016	0.57	0.028	0.176	0.390	0.04	0.273	0.098	0.099	3/25/2013 6:45	3/25/2013 16:15	9.5
51	3/31/2013 15:15	4/1/2013 0:00	8.75	0.001	0.20	0.005	0.071	0.302	0.04	0.230	0.092	0.125	3/31/2013 15:30	3/31/2013 22:45	7.25
		Average:	18.7	0.010	0.57	0.015	0.264	0.450	0.11	0.231	0.077	0.100			9.0
		Maximum Value:	47.5	0.043	2.20	0.049	0.814	1.005	0.50	0.337	0.118	0.151			32.0
		Minimum Value:	2.8	0.000	0.10	0.002	0.060	0.217	0.02	0.117	0.027	0.040			0.75
		Standard Deviation:	11.9	0.013	0.47	0.012	0.214	0.206	0.10	0.050	0.024	0.024			6.9
		Weighted Mean R-Value*:				0.018									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_4 Bensalem Township

Red Lion Road and Frankford Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 192.7 acres Tributary Service Population: 1,377

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 14:15	17.75	0.004	0.38	0.013	0.114	0.257	0.13	0.145	0.052	0.064	4/10/2013 20:45	4/11/2013 0:00	3.25
2	4/12/2013 7:45	4/15/2013 20:00	84.25	0.035	1.32	0.026	0.298	0.434	0.14	0.181	0.052	0.077	4/12/2013 8:00	4/12/2013 23:30	15.5
3	4/19/2013 21:45	4/20/2013 22:00	24.25	0.004	0.42	0.011	0.075	0.244	0.05	0.161	0.062	0.076	4/19/2013 21:45	4/20/2013 3:45	6
4	4/29/2013 1:30	4/30/2013 6:45	29.25	0.002	0.35	0.007	0.032	0.180	0.02	0.125	0.052	0.063	4/29/2013 3:30	4/30/2013 1:45	22.25
5	5/8/2013 5:30	5/10/2013 18:00	60.5	0.011	0.76	0.015	0.177	0.262	0.09	0.143	0.045	0.075	5/8/2013 5:45	5/9/2013 6:45	25
6	5/10/2013 22:00	5/13/2013 23:30	73.5	0.015	0.75	0.020	0.119	0.264	0.14	0.149	0.050	0.074	5/10/2013 22:45	5/12/2013 6:00	31.25
7	5/18/2013 16:00	5/20/2013 2:15	34.25	0.006	0.33	0.017	0.063	0.239	0.04	0.136	0.040	0.075	5/18/2013 16:30	5/19/2013 18:30	26
8	5/28/2013 9:30	5/29/2013 1:30	16	0.002	0.30	0.006	0.049	0.193	0.04	0.135	0.040	0.082	5/28/2013 9:30	5/28/2013 22:00	12.5
9	6/3/2013 0:45	6/4/2013 7:30	30.75	0.008	1.21	0.007	0.234	0.376	0.28	0.140	0.044	0.063	6/3/2013 1:00	6/3/2013 17:30	16.5
10	6/6/2013 19:45	6/10/2013 3:45	80	0.079	3.56	0.022	0.570	0.708	0.30	0.253	0.058	0.072	6/6/2013 20:00	6/8/2013 2:15	30.25
11	6/10/2013 6:45	6/12/2013 15:45	57	0.072	2.35	0.031	0.759	0.900	0.29	0.298	0.064	0.074	6/10/2013 7:15	6/11/2013 0:45	17.5
12	6/13/2013 9:15	6/14/2013 1:30	16.25	0.003	0.38	0.008	0.100	0.259	0.14	0.174	0.067	0.082	6/13/2013 9:30	6/14/2013 1:15	15.75
13	6/18/2013 12:45	6/19/2013 9:30	20.75	0.003	0.28	0.010	0.056	0.215	0.03	0.137	0.052	0.069	6/18/2013 12:45	6/18/2013 20:30	7.75
14	6/27/2013 18:00	6/29/2013 2:15	32.25	0.007	0.56	0.012	0.290	0.443	0.09	0.150	0.052	0.071	6/27/2013 18:30	6/28/2013 20:00	25.5
15	6/30/2013 13:00	6/30/2013 20:45	7.75	0.001	0.23	0.003	0.045	0.202	0.07	0.170	0.052	0.101	6/30/2013 13:15	6/30/2013 16:15	3
16	7/1/2013 8:30	7/2/2013 6:15	21.75	0.002	0.36	0.006	0.148	0.285	0.09	0.134	0.052	0.069	7/1/2013 8:45	7/1/2013 16:30	7.75
17	7/12/2013 15:15	7/13/2013 1:45	10.5	0.006	0.87	0.007	0.277	0.413	0.20	0.200	0.049	0.078	7/12/2013 15:45	7/12/2013 22:30	6.75
18	7/13/2013 16:00	7/15/2013 15:30	47.5	0.030	0.87	0.035	8.17	8.31	0.63	0.199	0.046	0.073	7/13/2013 16:15	7/13/2013 19:45	3.5
19	7/22/2013 17:45	7/25/2013 16:15	70.5	0.022	1.91	0.012	0.779	0.843	0.82	0.160	0.049	0.071	7/22/2013 17:45	7/23/2013 18:15	24.5
20	7/28/2013 16:00	7/31/2013 3:30	59.5	0.018	0.99	0.018	0.238	0.377	0.15	0.154	0.045	0.070	7/28/2013 16:15	7/29/2013 2:30	10.25
21	8/1/2013 6:30	8/5/2013 1:00	90.5	0.024	0.96	0.025	0.291	0.432	0.21	0.180	0.070	0.077	8/1/2013 6:30	8/3/2013 13:45	55.25
22	8/7/2013 23:45	8/8/2013 11:45	12	0.002	0.40	0.006	0.148	0.260	0.20	0.165	0.088	0.055	8/8/2013 0:15	8/8/2013 3:30	3.25
23	8/28/2013 9:30	8/30/2013 5:00	43.5	0.005	0.49	0.011	0.141	0.237	0.10	0.104	0.020	0.070	8/28/2013 9:45	8/28/2013 16:15	6.5
24	9/12/2013 18:00	9/13/2013 8:15	14.25	0.003	0.52	0.005	0.169	0.207	0.15	0.107	0.022	0.060	9/12/2013 19:00	9/13/2013 2:45	7.75
25	9/21/2013 20:30	9/23/2013 2:15	29.75	0.010	1.18	0.008	0.294	0.354	0.20	0.125	0.015	0.071	9/21/2013 20:45	9/22/2013 3:00	6.25
26	10/7/2013 8:30	10/7/2013 20:30	12	0.004	0.44	0.010	0.094	0.228	0.14	0.174	0.037	0.091	10/7/2013 8:45	10/7/2013 17:15	8.5
27	10/11/2013 3:00	10/12/2013 16:15	37.25	0.009	1.12	0.008	0.314	0.449	0.28	0.150	0.046	0.075	10/11/2013 3:00	10/11/2013 18:15	15.25
		Average:	38.3	0.014	0.86	0.013	0.520	0.651	0.19	0.161	0.049	0.073			15.3
		Maximum Value:	90.5	0.079	3.56	0.035	8.17	8.31	0.82	0.298	0.088	0.101			55.3
		Minimum Value:	7.8	0.001	0.23	0.003	0.032	0.180	0.02	0.104	0.015	0.055			3.00
		Standard Deviation:	25.1	0.020	0.74	0.008	1.54	1.54	0.18	0.041	0.015	0.009			11.9
		Weighted Mean R-Value*:				0.017									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_5 Bensalem Township

Grant Avenue and James Street

Pipe Size: 24" dia. Tributary Drainage Area: 1,024 acres Tributary Service Population: 2,563

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:30	4/2/2012 5:15	10.75	0.001	0.19	0.007	0.623	1.33	0.05	0.745	0.567	0.094	4/1/2012 18:30	4/2/2012 2:30	8
2	4/22/2012 10:00	4/24/2012 14:15	52.25	0.019	2.16	0.009	0.879	1.65	0.12	0.976	0.559	0.177	4/22/2012 10:15	4/23/2012 18:15	32
3	5/1/2012 4:15	5/1/2012 10:15	6	0.001	0.35	0.003	0.372	1.12	0.14	0.797	0.512	0.182	5/1/2012 4:15	5/1/2012 9:15	5
4	5/3/2012 2:15	5/3/2012 8:15	6	0.001	0.13	0.005	0.466	1.20	0.03	0.739	0.558	0.104	5/3/2012 2:15	5/3/2012 5:00	2.75
5	5/9/2012 0:15	5/9/2012 8:45	8.5	0.001	0.27	0.002	0.540	1.42	0.04	0.778	0.637	0.096	5/9/2012 0:30	5/9/2012 8:00	7.5
6	5/9/2012 22:30	5/10/2012 10:00	11.5	0.002	0.24	0.008	0.611	1.49	0.02	0.847	0.627	0.112	5/9/2012 22:30	5/10/2012 4:45	6.25
7	5/14/2012 15:45	5/15/2012 6:15	14.5	0.002	0.18	0.011	0.660	1.27	0.03	0.814	0.596	0.130	5/14/2012 15:45	5/15/2012 3:45	12
8	5/15/2012 8:45	5/15/2012 19:45	11	0.005	0.61	0.008	0.936	1.79	0.11	1.14	0.597	0.251	5/15/2012 8:45	5/15/2012 19:00	10.25
9	5/16/2012 0:45	5/17/2012 0:45	24	0.010	0.98	0.011	1.08	1.72	0.16	1.05	0.589	0.175	5/16/2012 0:45	5/16/2012 4:30	3.75
10	5/22/2012 0:15	5/22/2012 11:30	11.25	0.002	0.20	0.008	0.556	1.31	0.02	0.776	0.544	0.137	5/22/2012 0:30	5/22/2012 7:00	6.5
11	5/24/2012 7:15	5/25/2012 1:00	17.75	0.001	0.36	0.003	0.524	1.29	0.19	0.791	0.537	0.212	5/24/2012 7:30	5/24/2012 21:00	13.5
12	5/27/2012 4:45	5/27/2012 10:00	5.25	0.001	0.40	0.002	0.642	1.32	0.13	0.777	0.501	0.153	5/27/2012 5:00	5/27/2012 7:30	2.5
13	5/29/2012 20:15	5/30/2012 0:00	3.75	0.000	0.15	0.003	0.407	1.08	0.07	0.711	0.500	0.140	5/29/2012 20:15	5/29/2012 22:30	2.25
14	6/1/2012 20:45	6/2/2012 13:30	16.75	0.003	0.57	0.005	0.777	1.29	0.25	0.731	0.473	0.140	6/1/2012 20:45	6/2/2012 2:15	5.5
15	6/12/2012 9:45	6/13/2012 3:45	18	0.001	0.53	0.002	0.572	1.17	0.06	0.653	0.432	0.179	6/12/2012 10:00	6/13/2012 1:30	15.5
16	7/5/2012 0:15	7/5/2012 6:45	6.5	0.001	0.17	0.005	0.365	0.807	0.14	0.557	0.418	0.057	7/5/2012 0:30	7/5/2012 3:45	3.25
17	7/14/2012 4:00	7/14/2012 11:15	7.25	0.001	0.24	0.003	0.596	1.36	0.03	0.707	0.472	0.160	7/14/2012 4:15	7/14/2012 10:30	6.25
18	7/15/2012 21:30	7/16/2012 14:45	17.25	0.005	0.79	0.006	0.906	1.52	0.45	0.837	0.502	0.154	7/15/2012 21:45	7/16/2012 0:15	2.5
19	7/18/2012 17:45	7/18/2012 20:45	3	0.000	0.17	0.003	0.662	1.42	0.12	0.848	0.526	0.226	7/18/2012 17:45	7/18/2012 18:00	0.25
20	7/20/2012 1:15	7/20/2012 17:00	15.75	0.003	0.53	0.005	0.572	1.34	0.11	0.790	0.499	0.183	7/20/2012 1:30	7/20/2012 11:15	9.75
21	7/26/2012 19:45	7/27/2012 5:00	9.25	0.002	0.43	0.004	0.894	1.42	0.20	0.577	0.355	0.084	7/26/2012 20:00	7/27/2012 0:30	4.5
22	7/28/2012 13:00	7/29/2012 3:15	14.25	0.005	0.51	0.009	1.05	1.57	0.10	0.680	0.303	0.156	7/28/2012 13:15	7/28/2012 22:30	9.25
23	8/4/2012 13:45	8/4/2012 17:15	3.5	0.001	0.18	0.004	0.445	1.04	0.09	0.725	0.371	0.222	8/4/2012 14:00	8/4/2012 14:45	0.75
24	8/5/2012 18:45	8/6/2012 13:15	18.5	0.004	0.65	0.006	0.594	1.22	0.15	0.663	0.374	0.150	8/5/2012 18:45	8/6/2012 2:30	7.75
25	8/10/2012 10:45	8/10/2012 20:00	9.25	0.001	0.37	0.003	0.773	1.35	0.16	0.642	0.317	0.244	8/10/2012 11:00	8/10/2012 16:45	5.75
26	8/14/2012 10:00	8/14/2012 19:45	9.75	0.004	0.58	0.006	0.798	1.51	0.14	0.915	0.423	0.249	8/14/2012 10:15	8/14/2012 17:30	7.25
27	8/27/2012 10:15	8/27/2012 18:15	8	0.002	0.40	0.006	0.574	1.16	0.21	0.754	0.315	0.254	8/27/2012 10:15	8/27/2012 15:30	5.25
28	8/28/2012 5:30	8/28/2012 10:30	5	0.001	0.16	0.003	0.654	1.14	0.04	0.594	0.304	0.217	8/28/2012 5:45	8/28/2012 7:30	1.75
29	9/3/2012 9:45	9/4/2012 2:15	16.5	0.004	0.80	0.005	0.729	1.26	0.16	0.661	0.325	0.180	9/3/2012 9:45	9/3/2012 15:30	5.75
30	9/4/2012 3:45	9/7/2012 1:00	69.25	0.029	2.26	0.013	2.14	2.65	0.23	0.831	0.367	0.181	9/4/2012 4:00	9/6/2012 10:45	54.75
31	9/8/2012 17:15	9/9/2012 0:45	7.5	0.001	0.27	0.002	0.511	1.04	0.06	0.625	0.420	0.152	9/8/2012 17:15	9/8/2012 22:00	4.75
32	9/18/2012 17:15	9/19/2012 1:00	7.75	0.002	0.83	0.003	0.510	1.08	0.28	0.687	0.337	0.162	9/18/2012 17:15	9/18/2012 21:00	3.75
33	9/22/2012 19:45	9/23/2012 15:45	20	0.006	0.65	0.010	1.12	1.68	0.42	0.754	0.387	0.151	9/22/2012 20:00	9/22/2012 22:30	2.5
34	9/26/2012 17:15	9/27/2012 9:00	15.75	0.001	0.19	0.004	0.714	1.34	0.07	0.660	0.497	0.133	9/26/2012 17:15	9/27/2012 7:45	14.5
35	10/7/2012 10:45	10/8/2012 2:45	16	0.003	0.15	0.018	0.977	1.54	0.02	0.666	0.386	0.169	10/7/2012 11:00	10/7/2012 21:00	10
36	10/15/2012 15:45	10/15/2012 23:30	7.75	0.001	0.32	0.003	0.616	1.20	0.22	0.644	0.355	0.201	10/15/2012 15:45	10/15/2012 21:00	5.25

MBE_5 Bensalem Township
Grant Avenue and James Street
Pipe Size: 24" dia. Tributary Drainage Area: 1,024 acres Tributary Service Population: 2,563

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	10/19/2012 9:45	10/20/2012 3:15	17.5	0.004	0.89	0.005	0.706	1.30	0.25	0.695	0.336	0.189	10/19/2012 9:45	10/19/2012 15:00	5.25
38	10/28/2012 15:15	10/28/2012 20:00	4.75	0.000	0.13	0.002	0.458	1.07	0.03	0.653	0.403	0.207	10/28/2012 15:30	10/28/2012 18:45	3.25
39	10/29/2012 6:00	10/31/2012 10:45	52.75	0.040	2.15	0.018	2.08	2.75	0.12	1.12	0.441	0.180	10/29/2012 6:00	10/30/2012 4:00	22
40	11/7/2012 11:15	11/8/2012 5:00	17.75	0.002	0.63	0.003	0.724	1.48	0.03	0.746	0.509	0.162	11/7/2012 11:30	11/8/2012 1:30	14
41	1/11/2013 16:15	1/12/2013 5:30	13.25	0.002	0.47	0.005	0.659	1.21	0.06	0.681	0.434	0.129	1/11/2013 16:30	1/11/2013 21:15	4.75
42	1/15/2013 21:15	1/17/2013 15:15	42	0.020	0.99	0.020	1.08	1.86	0.06	0.998	0.519	0.167	1/15/2013 21:30	1/16/2013 12:00	14.5
43	1/28/2013 12:45	1/28/2013 19:15	6.5	0.001	0.20	0.006	0.786	1.60	0.03	0.930	0.570	0.244	1/28/2013 12:45	1/28/2013 17:00	4.25
44	1/30/2013 21:45	2/1/2013 5:45	32	0.012	0.98	0.012	1.45	2.11	0.16	0.998	0.605	0.146	1/30/2013 21:45	1/31/2013 21:30	23.75
45	2/8/2013 6:00	2/9/2013 5:30	23.5	0.002	0.45	0.004	0.636	1.49	0.02	0.858	0.623	0.179	2/8/2013 6:15	2/9/2013 3:00	20.75
46	2/11/2013 4:15	2/11/2013 16:00	11.75	0.002	0.36	0.007	0.480	1.40	0.04	0.991	0.642	0.218	2/11/2013 4:30	2/11/2013 9:15	4.75
47	2/13/2013 19:00	2/14/2013 3:15	8.25	0.001	0.19	0.004	0.308	1.13	0.02	0.821	0.659	0.106	2/13/2013 19:15	2/14/2013 0:45	5.5
48	2/26/2013 19:15	2/27/2013 21:45	26.5	0.006	0.70	0.009	0.765	1.63	0.08	0.942	0.617	0.176	2/26/2013 19:15	2/27/2013 11:45	16.5
49	3/6/2013 9:00	3/7/2013 3:00	18	0.000	0.12	0.003	0.719	1.29	0.01	0.670	0.470	0.189	3/6/2013 9:00	3/6/2013 23:30	14.5
50	3/7/2013 14:15	3/8/2013 17:15	27	0.001	0.38	0.004	0.579	1.27	0.03	0.681	0.464	0.184	3/7/2013 14:45	3/8/2013 13:30	22.75
51	3/12/2013 3:15	3/13/2013 14:00	34.75	0.009	0.95	0.010	0.767	1.48	0.10	0.811	0.449	0.181	3/12/2013 3:30	3/12/2013 16:00	12.5
52	3/16/2013 10:00	3/16/2013 21:00	11	0.001	0.14	0.004	0.597	1.29	0.02	0.719	0.463	0.224	3/16/2013 10:15	3/16/2013 18:00	7.75
53	3/18/2013 18:15	3/20/2013 4:30	34.25	0.011	0.78	0.014	0.807	1.47	0.04	0.886	0.517	0.154	3/18/2013 18:30	3/19/2013 18:45	24.25
54	3/25/2013 6:45	3/26/2013 4:15	21.5	0.004	0.59	0.007	0.736	1.52	0.04	0.856	0.539	0.183	3/25/2013 6:45	3/25/2013 16:30	9.75
		Average:	16.8	0.005	0.54	0.006	0.744	1.41	0.11	0.781	0.477	0.170			9.8
		Maximum Value:	69.3	0.040	2.26	0.020	2.14	2.75	0.45	1.14	0.659	0.254			54.8
		Minimum Value:	3.0	0.000	0.12	0.002	0.308	0.807	0.01	0.557	0.303	0.057			0.25
		Standard Deviation:	13.4	0.007	0.48	0.004	0.344	0.344	0.10	0.135	0.101	0.044			9.3
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_5 Bensalem Township

Grant Avenue and James Street

Pipe Size: 24" dia. Tributary Drainage Area: 1,024 acres Tributary Service Population: 2,563

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 4:15	8	0.001	0.37	0.003	0.800	1.59	0.14	0.952	0.723	0.129	4/10/2013 20:30	4/11/2013 0:00	3.5
2	4/12/2013 8:00	4/14/2013 0:45	40.75	0.023	1.29	0.018	2.70	3.52	0.19	1.43	0.782	0.270	4/12/2013 8:00	4/12/2013 23:30	15.5
3	4/19/2013 21:30	4/20/2013 14:15	16.75	0.004	0.41	0.011	0.921	1.85	0.05	1.22	0.840	0.203	4/19/2013 21:30	4/20/2013 4:00	6.5
4	4/29/2013 3:45	4/30/2013 1:30	21.75	0.005	0.33	0.015	1.20	2.17	0.02	1.22	0.778	0.292	4/29/2013 3:45	4/30/2013 1:15	21.5
5	5/8/2013 8:45	5/10/2013 1:30	40.75	0.016	0.88	0.018	2.18	3.37	0.12	1.30	0.759	0.286	5/8/2013 8:45	5/9/2013 6:45	22
6	5/10/2013 22:15	5/12/2013 7:15	33	0.015	0.71	0.022	1.38	2.40	0.18	1.24	0.743	0.189	5/10/2013 22:45	5/12/2013 6:00	31.25
7	5/28/2013 9:30	5/28/2013 20:45	11.25	0.003	0.28	0.009	0.669	1.75	0.04	1.21	0.690	0.368	5/28/2013 9:30	5/28/2013 19:30	10
8	6/2/2013 23:00	6/4/2013 0:15	25.25	0.009	0.95	0.010	1.74	2.83	0.21	1.24	0.737	0.260	6/2/2013 23:00	6/3/2013 16:30	17.5
9	6/27/2013 18:30	6/28/2013 2:30	8	0.006	0.81	0.008	1.70	2.85	0.24	1.53	0.810	0.194	6/27/2013 18:30	6/27/2013 20:45	2.25
10	6/30/2013 13:30	6/30/2013 21:15	7.75	0.003	0.29	0.009	0.929	1.97	0.12	1.27	0.779	0.273	6/30/2013 13:30	6/30/2013 16:15	2.75
11	7/12/2013 15:45	7/13/2013 9:15	17.5	0.014	0.85	0.017	1.37	2.22	0.20	1.24	0.492	0.210	7/12/2013 16:00	7/12/2013 22:30	6.5
12	7/13/2013 17:00	7/14/2013 9:45	16.75	0.007	0.59	0.012	1.54	2.23	0.37	0.974	0.506	0.176	7/13/2013 17:00	7/13/2013 19:45	2.75
13	7/22/2013 17:30	7/25/2013 0:45	55.25	0.070	2.64	0.026	3.55	4.43	0.71	1.60	0.489	0.266	7/22/2013 17:45	7/23/2013 18:30	24.75
14	7/28/2013 16:00	7/29/2013 10:30	18.5	0.012	0.92	0.013	1.50	2.32	0.12	1.29	0.648	0.208	7/28/2013 16:15	7/29/2013 2:30	10.25
15	8/1/2013 6:45	8/2/2013 3:30	20.75	0.013	0.86	0.016	1.92	2.97	0.21	1.38	0.664	0.288	8/1/2013 6:45	8/1/2013 15:00	8.25
16	8/8/2013 0:15	8/8/2013 8:15	8	0.003	0.44	0.006	0.803	1.59	0.22	0.963	0.594	0.138	8/8/2013 0:30	8/8/2013 3:30	3
17	8/13/2013 5:00	8/15/2013 12:45	55.75	0.037	1.42	0.026	3.49	4.46	0.47	1.30	0.577	0.278	8/13/2013 5:00	8/13/2013 10:00	5
18	8/22/2013 6:30	8/22/2013 20:00	13.5	0.004	0.44	0.010	1.34	2.34	0.13	1.18	0.596	0.367	8/22/2013 6:30	8/22/2013 17:30	11
19	8/28/2013 10:15	8/28/2013 20:30	10.25	0.003	0.45	0.007	0.974	1.84	0.07	1.08	0.507	0.371	8/28/2013 10:15	8/28/2013 16:15	6
20	9/21/2013 20:30	9/22/2013 15:15	18.75	0.011	1.14	0.009	1.73	2.21	0.17	0.987	0.408	0.201	9/21/2013 20:45	9/22/2013 2:30	5.75
21	10/7/2013 8:30	10/8/2013 4:45	20.25	0.007	0.45	0.015	1.26	2.04	0.14	0.953	0.456	0.270	10/7/2013 8:45	10/7/2013 17:30	8.75
22	10/11/2013 2:45	10/12/2013 5:45	27	0.012	0.93	0.013	1.67	2.48	0.24	0.970	0.415	0.254	10/11/2013 2:45	10/11/2013 18:15	15.5
23	12/6/2013 5:00	12/7/2013 6:45	25.75	0.006	0.82	0.007	1.16	2.01	0.06	0.910	0.493	0.265	12/6/2013 5:15	12/7/2013 2:30	21.25
24	12/8/2013 11:30	12/10/2013 4:45	41.25	0.024	1.12	0.022	1.49	2.24	0.05	1.16	0.526	0.241	12/8/2013 11:45	12/9/2013 10:15	22.5
25	12/14/2013 15:45	12/15/2013 7:15	15.5	0.007	0.90	0.007	1.23	1.80	0.08	0.951	0.496	0.168	12/14/2013 16:00	12/15/2013 1:15	9.25
26	12/23/2013 4:00	12/24/2013 5:30	25.5	0.007	0.73	0.010	0.841	1.75	0.10	0.985	0.534	0.258	12/23/2013 4:15	12/23/2013 20:45	16.5
27	12/29/2013 8:15	12/31/2013 6:45	46.5	0.033	1.20	0.027	1.75	2.58	0.11	1.21	0.492	0.246	12/29/2013 8:15	12/29/2013 16:15	8
28	1/2/2014 17:15	1/3/2014 17:45	24.5	0.003	0.35	0.009	1.08	1.91	0.02	0.941	0.580	0.274	1/2/2014 17:30	1/3/2014 4:45	11.25
29	1/5/2014 21:30	1/7/2014 6:45	33.25	0.021	0.32	0.066	1.97	3.07	0.04	1.39	0.743	0.224	1/5/2014 21:30	1/6/2014 13:15	15.75
30	4/7/2014 13:15	4/8/2014 21:00	31.75	0.005	0.51	0.009	0.957	2.21	0.05	1.59	1.20	0.289	4/7/2014 13:15	4/8/2014 6:00	16.75
31	4/15/2014 10:15	4/16/2014 14:15	28	0.009	0.55	0.016	0.901	2.16	0.03	1.46	0.971	0.286	4/15/2014 10:15	4/16/2014 0:15	14
32	4/25/2014 23:45	4/26/2014 21:15	21.5	0.007	0.61	0.011	1.04	2.03	0.16	1.33	0.886	0.229	4/26/2014 0:00	4/26/2014 1:45	1.75
33	5/10/2014 14:00	5/12/2014 1:15	35.25	0.014	0.56	0.025	1.22	2.66	0.19	1.64	1.14	0.221	5/10/2014 14:15	5/11/2014 0:15	10
34	5/16/2014 10:15	5/17/2014 7:00	20.75	0.003	0.47	0.007	0.852	1.99	0.05	1.27	0.909	0.253	5/16/2014 10:15	5/16/2014 21:15	11
35	5/27/2014 18:00	5/29/2014 4:30	34.5	0.007	0.43	0.017	0.884	1.79	0.07	0.886	0.507	0.239	5/27/2014 18:15	5/28/2014 15:45	21.5
36	6/9/2014 3:30	6/15/2014 8:30	149	0.035	3.23	0.011	1.19	2.04	0.39	0.910	0.495	0.258	6/9/2014 3:30	6/13/2014 18:30	111

MBE_5 Bensalem Township

Grant Avenue and James Street

Pipe Size: 24" dia. Tributary Drainage Area: 1,024 acres Tributary Service Population: 2,563

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	6/25/2014 23:30	6/26/2014 14:45	15.25	0.004	0.54	0.008	0.808	1.55	0.15	0.828	0.392	0.244	6/25/2014 23:45	6/26/2014 2:00	2.25
		Average:	28.2	0.013	0.80	0.015	1.43	2.36	0.16	1.19	0.658	0.248			14.4
		Maximum Value:	149.0	0.070	3.23	0.066	3.55	4.46	0.71	1.64	1.20	0.371			111.0
		Minimum Value:	7.8	0.001	0.28	0.003	0.669	1.55	0.02	0.828	0.392	0.129			1.75
		Standard Deviation:	24.0	0.013	0.60	0.011	0.674	0.695	0.14	0.222	0.197	0.055			17.9
		Weighted Mean R-Value*:				0.016									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_6 Bensalem Township
1200 Gravel Pike at Poquessing Creek
Pipe Size: 16" dia. Tributary Drainage Area: 742 acres Tributary Service Population: 4,567

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/22/2012 10:00	4/23/2012 23:30	37.5	0.025	2.14	0.012	1.47	2.06	0.117	0.856	0.192	0.347	4/22/2012 10:15	4/23/2012 18:15	32
2	5/1/2012 4:15	5/1/2012 12:30	8.25	0.001	0.37	0.004	0.396	1.06	0.115	0.620	0.239	0.294	5/1/2012 4:15	5/1/2012 10:15	6
3	5/9/2012 3:00	5/9/2012 20:45	17.75	0.002	0.24	0.008	0.372	0.930	0.041	0.553	0.197	0.301	5/9/2012 3:00	5/9/2012 8:00	5
4	5/9/2012 22:15	5/11/2012 3:00	28.75	0.004	0.24	0.018	0.263	0.810	0.022	0.541	0.196	0.275	5/9/2012 22:15	5/10/2012 4:45	6.5
5	5/15/2012 9:00	5/15/2012 23:45	14.75	0.005	0.67	0.007	0.713	1.36	0.098	0.798	0.281	0.368	5/15/2012 9:00	5/15/2012 19:00	10
6	5/16/2012 0:45	5/16/2012 23:45	23	0.018	1.09	0.016	2.22	2.54	0.162	1.00	0.330	0.298	5/16/2012 0:45	5/16/2012 4:45	4
7	5/21/2012 4:15	5/21/2012 8:30	4.25	0.001	0.16	0.004	0.205	0.830	0.082	0.534	0.271	0.190	5/21/2012 4:15	5/21/2012 5:15	1
8	5/22/2012 1:15	5/22/2012 19:45	18.5	0.003	0.20	0.014	0.257	0.970	0.022	0.618	0.272	0.273	5/22/2012 1:15	5/22/2012 7:00	5.75
9	5/24/2012 7:30	5/24/2012 12:45	5.25	0.001	0.25	0.004	0.310	1.06	0.167	0.767	0.273	0.411	5/24/2012 7:30	5/24/2012 8:30	1
10	5/27/2012 4:45	5/27/2012 11:00	6.25	0.002	0.36	0.005	0.505	0.890	0.105	0.596	0.258	0.214	5/27/2012 5:00	5/27/2012 7:00	2
11	5/29/2012 19:15	5/30/2012 1:30	6.25	0.001	0.14	0.006	0.148	0.790	0.062	0.658	0.256	0.341	5/29/2012 20:15	5/29/2012 22:30	2.25
12	6/1/2012 20:30	6/2/2012 21:15	24.75	0.007	0.53	0.014	0.844	1.14	0.255	0.694	0.229	0.321	6/1/2012 20:45	6/2/2012 2:15	5.5
13	6/3/2012 13:45	6/4/2012 5:15	15.5	0.003	0.20	0.015	0.269	0.900	0.092	0.610	0.229	0.290	6/3/2012 14:15	6/4/2012 3:45	13.5
14	6/12/2012 9:45	6/13/2012 17:45	32	0.007	0.58	0.012	0.568	1.14	0.069	0.618	0.208	0.303	6/12/2012 9:45	6/12/2012 23:45	14
15	6/22/2012 19:00	6/23/2012 3:15	8.25	0.002	0.28	0.007	0.301	0.820	0.076	0.586	0.179	0.297	6/22/2012 19:15	6/22/2012 22:45	3.5
16	7/5/2012 0:00	7/5/2012 5:30	5.5	0.001	0.25	0.006	0.743	1.01	0.194	0.361	0.162	0.075	7/5/2012 0:15	7/5/2012 3:45	3.5
17	7/15/2012 19:45	7/16/2012 6:15	10.5	0.004	0.89	0.004	0.949	1.45	0.467	0.532	0.167	0.188	7/15/2012 21:45	7/16/2012 0:15	2.5
18	7/20/2012 1:30	7/20/2012 18:45	17.25	0.003	0.61	0.004	0.300	0.924	0.128	0.518	0.180	0.268	7/20/2012 1:30	7/20/2012 10:15	8.75
19	7/28/2012 21:45	7/29/2012 8:00	10.25	0.001	0.13	0.008	0.193	0.732	0.108	0.398	0.210	0.137	7/28/2012 21:45	7/28/2012 22:30	0.75
20	8/4/2012 13:45	8/4/2012 20:15	6.5	0.002	0.20	0.008	0.465	1.10	0.135	0.746	0.193	0.433	8/4/2012 14:00	8/4/2012 14:45	0.75
21	8/5/2012 18:45	8/6/2012 19:30	24.75	0.008	0.77	0.011	0.604	0.986	0.169	0.665	0.215	0.289	8/5/2012 18:45	8/6/2012 2:30	7.75
22	8/10/2012 10:30	8/10/2012 16:15	5.75	0.001	0.30	0.004	0.313	0.886	0.138	0.674	0.221	0.350	8/10/2012 10:45	8/10/2012 12:15	1.5
23	8/12/2012 2:45	8/12/2012 8:15	5.5	0.000	0.13	0.002	0.076	0.417	0.102	0.305	0.235	0.044	8/12/2012 3:15	8/12/2012 3:45	0.5
24	8/14/2012 10:15	8/15/2012 6:45	20.5	0.004	0.55	0.007	0.526	1.10	0.109	0.579	0.225	0.268	8/14/2012 10:15	8/15/2012 2:00	15.75
25	8/17/2012 22:00	8/18/2012 10:15	12.25	0.002	0.43	0.006	0.327	0.718	0.105	0.428	0.161	0.174	8/17/2012 22:30	8/18/2012 7:45	9.25
26	8/27/2012 10:15	8/28/2012 2:15	16	0.003	0.45	0.007	0.429	0.946	0.190	0.557	0.135	0.329	8/27/2012 10:15	8/27/2012 15:15	5
27	9/3/2012 10:00	9/3/2012 22:15	12.25	0.005	0.92	0.005	0.990	1.71	0.275	0.851	0.194	0.458	9/3/2012 10:15	9/3/2012 15:45	5.5
28	9/4/2012 4:00	9/5/2012 8:45	28.75	0.024	2.32	0.010	2.56	3.10	0.490	0.919	0.241	0.274	9/4/2012 4:15	9/4/2012 19:15	15
29	9/5/2012 11:30	9/6/2012 0:00	12.5	0.003	0.27	0.010	0.558	1.17	0.084	0.743	0.278	0.358	9/5/2012 12:00	9/5/2012 12:45	0.75
30	9/8/2012 17:15	9/8/2012 23:45	6.5	0.001	0.22	0.004	0.168	0.905	0.042	0.765	0.319	0.390	9/8/2012 17:15	9/8/2012 22:00	4.75
31	9/18/2012 17:00	9/19/2012 15:15	22.25	0.005	0.85	0.006	0.581	1.22	0.236	0.614	0.211	0.288	9/18/2012 17:15	9/18/2012 21:00	3.75
32	9/22/2012 19:30	9/23/2012 13:15	17.75	0.003	0.53	0.006	0.539	1.15	0.309	0.569	0.222	0.268	9/22/2012 20:00	9/22/2012 22:30	2.5
33	10/15/2012 13:30	10/15/2012 20:45	7.25	0.003	0.41	0.006	0.953	1.42	0.267	0.684	0.158	0.353	10/15/2012 13:30	10/15/2012 18:00	4.5
34	10/19/2012 9:30	10/19/2012 22:45	13.25	0.006	0.96	0.007	1.15	1.65	0.227	0.734	0.125	0.374	10/19/2012 9:45	10/19/2012 14:45	5
35	10/28/2012 15:30	10/28/2012 23:45	8.25	0.002	0.12	0.012	0.213	0.815	0.029	0.659	0.182	0.388	10/28/2012 15:30	10/28/2012 18:45	3.25
36	11/7/2012 11:45	11/8/2012 23:45	36	0.007	0.60	0.012	0.295	0.858	0.029	0.558	0.145	0.313	11/7/2012 11:45	11/8/2012 1:30	13.75
37	11/27/2012 6:00	11/29/2012 6:30	48.5	0.008	0.65	0.012	0.366	0.876	0.024	0.508	0.142	0.287	11/27/2012 6:15	11/27/2012 16:00	9.75
38	12/7/2012 22:00	12/8/2012 13:00	15	0.003	0.32	0.009	0.312	0.805	0.066	0.491	0.155	0.244	12/7/2012 22:15	12/8/2012 2:00	3.75

MBE_6 Bensalem Township
1200 Gravel Pike at Poquessing Creek
Pipe Size: 16" dia. Tributary Drainage Area: 742 acres Tributary Service Population: 4,567

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
39	12/9/2012 8:45	12/10/2012 16:45	32	0.005	0.37	0.013	0.222	0.921	0.043	0.590	0.180	0.339	12/9/2012 8:45	12/10/2012 2:30	17.75
40	12/18/2012 0:45	12/18/2012 18:30	17.75	0.003	0.36	0.007	0.541	0.730	0.149	0.476	0.146	0.260	12/18/2012 1:15	12/18/2012 15:45	14.5
41	12/20/2012 21:30	12/22/2012 20:15	46.75	0.026	1.51	0.017	1.64	2.21	0.139	0.759	0.187	0.302	12/20/2012 21:30	12/21/2012 8:00	10.5
42	12/26/2012 13:30	12/28/2012 6:45	41.25	0.031	1.35	0.023	1.53	2.22	0.116	0.912	0.275	0.272	12/26/2012 13:30	12/27/2012 9:45	20.25
43	12/29/2012 10:30	12/30/2012 8:00	21.5	0.005	0.22	0.021	0.329	1.10	0.016	0.719	0.308	0.307	12/29/2012 10:30	12/29/2012 16:45	6.25
44	1/11/2013 16:30	1/12/2013 19:15	26.75	0.004	0.45	0.010	0.337	0.947	0.061	0.581	0.181	0.323	1/11/2013 16:30	1/11/2013 21:15	4.75
45	1/14/2013 21:30	1/15/2013 9:00	11.5	0.002	0.32	0.008	0.273	0.734	0.029	0.531	0.227	0.202	1/14/2013 21:30	1/15/2013 2:45	5.25
46	1/15/2013 21:30	1/17/2013 10:15	36.75	0.022	1.00	0.022	1.10	1.38	0.066	0.798	0.249	0.267	1/15/2013 21:30	1/16/2013 12:00	14.5
47	1/28/2013 12:45	1/28/2013 21:30	8.75	0.002	0.21	0.009	0.186	0.770	0.029	0.679	0.219	0.358	1/28/2013 12:45	1/28/2013 17:00	4.25
48	1/30/2013 21:45	2/2/2013 0:15	50.5	0.021	1.05	0.020	1.20	1.41	0.191	0.710	0.219	0.293	1/30/2013 21:45	2/1/2013 10:15	36.5
49	2/8/2013 8:00	2/9/2013 8:00	24	0.004	0.44	0.009	0.228	0.819	0.024	0.631	0.271	0.279	2/8/2013 8:00	2/9/2013 3:00	19
50	2/11/2013 4:45	2/12/2013 10:45	30	0.009	0.33	0.029	0.413	1.18	0.043	0.767	0.324	0.290	2/11/2013 5:00	2/11/2013 9:15	4.25
51	2/13/2013 19:00	2/14/2013 12:45	17.75	0.001	0.18	0.008	0.137	0.902	0.023	0.652	0.338	0.275	2/13/2013 19:15	2/14/2013 0:45	5.5
52	2/19/2013 11:30	2/19/2013 23:30	12	0.002	0.18	0.009	0.194	0.856	0.014	0.706	0.279	0.361	2/19/2013 11:45	2/19/2013 18:00	6.25
53	2/23/2013 9:15	2/24/2013 0:00	14.75	0.003	0.11	0.023	0.197	0.983	0.011	0.755	0.226	0.444	2/23/2013 9:30	2/23/2013 23:45	14.25
54	2/26/2013 19:15	3/1/2013 11:45	64.5	0.015	0.70	0.021	0.444	0.956	0.074	0.656	0.263	0.284	2/26/2013 19:15	2/28/2013 8:15	37
55	3/8/2013 5:00	3/8/2013 20:45	15.75	0.003	0.25	0.010	0.193	0.804	0.025	0.659	0.238	0.342	3/8/2013 5:00	3/8/2013 13:30	8.5
56	3/12/2013 3:30	3/15/2013 1:15	69.75	0.022	0.94	0.023	0.964	1.53	0.108	0.727	0.279	0.297	3/12/2013 3:30	3/14/2013 6:45	51.25
57	3/16/2013 11:00	3/16/2013 22:00	11	0.001	0.13	0.008	0.139	0.923	0.019	0.815	0.312	0.460	3/16/2013 11:00	3/16/2013 18:00	7
58	3/18/2013 18:15	3/22/2013 0:00	77.75	0.024	0.75	0.032	0.557	1.12	0.043	0.760	0.316	0.297	3/18/2013 18:30	3/19/2013 11:30	17
59	3/25/2013 6:15	3/27/2013 23:30	65.25	0.014	0.60	0.024	0.469	1.15	0.043	0.747	0.331	0.310	3/25/2013 6:45	3/25/2013 16:30	9.75
		Average:	22.2	0.007	0.54	0.011	0.572	1.134	0.113	0.653	0.228	0.299			9.4
		Maximum Value:	77.8	0.031	2.32	0.032	2.56	3.10	0.490	1.00	0.338	0.460			51.3
		Minimum Value:	4.3	0.000	0.11	0.002	0.076	0.417	0.011	0.305	0.125	0.044			0.50
		Standard Deviation:	17.3	0.008	0.45	0.007	0.502	0.477	0.101	0.136	0.056	0.079			9.8
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_6 Bensalem Township
Gravel Pike at Pouquessing Creek
Pipe Size: 16" dia. Tributary Drainage Area: 742 acres Tributary Service Population: 4,567

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 7:45	11.5	0.002	0.43	0.004	0.119	0.356	0.16	0.258	0.103	0.087	4/10/2013 20:30	4/11/2013 0:00	3.5
2	4/12/2013 21:45	4/13/2013 8:45	11	0.004	0.38	0.011	0.313	0.510	0.12	0.346	0.090	0.067	4/12/2013 22:00	4/12/2013 23:30	1.5
3	4/19/2013 21:30	4/20/2013 8:30	11	0.003	0.41	0.006	0.176	0.343	0.05	0.272	0.096	0.066	4/19/2013 21:30	4/20/2013 3:45	6.25
4	4/29/2013 3:30	4/29/2013 21:45	18.25	0.001	0.34	0.004	0.114	0.339	0.02	0.280	0.082	0.162	4/29/2013 3:30	4/29/2013 21:15	17.75
5	5/10/2013 22:45	5/11/2013 19:30	20.75	0.002	0.57	0.004	0.205	0.341	0.13	0.267	0.072	0.140	5/10/2013 23:00	5/11/2013 19:15	20.25
6	6/27/2013 18:30	6/28/2013 15:15	20.75	0.003	0.58	0.005	0.138	0.539	0.20	0.406	0.214	0.130	6/27/2013 18:30	6/27/2013 20:45	2.25
7	7/12/2013 16:00	7/13/2013 7:45	15.75	0.002	0.88	0.003	0.136	0.534	0.20	0.403	0.226	0.105	7/12/2013 16:15	7/12/2013 22:30	6.25
8	7/13/2013 18:00	7/14/2013 8:00	14	0.005	0.84	0.006	0.655	1.068	0.55	0.471	0.221	0.087	7/13/2013 18:00	7/13/2013 19:45	1.75
9	7/28/2013 16:15	7/29/2013 15:00	22.75	0.002	0.77	0.003	0.212	0.513	0.10	0.313	0.136	0.129	7/28/2013 16:15	7/29/2013 2:30	10.25
10	8/1/2013 6:45	8/3/2013 0:45	42	0.007	0.92	0.008	0.518	0.780	0.16	0.363	0.129	0.150	8/1/2013 6:45	8/1/2013 15:00	8.25
11	8/8/2013 0:15	8/8/2013 9:15	9	0.001	0.45	0.003	0.321	0.497	0.27	0.329	0.159	0.090	8/8/2013 0:30	8/8/2013 3:30	3
12	8/13/2013 4:45	8/15/2013 0:15	43.5	0.025	1.61	0.016	3.60	3.94	0.46	0.579	0.148	0.147	8/13/2013 5:00	8/13/2013 10:00	5
13	8/28/2013 9:45	8/29/2013 0:15	14.5	0.002	0.53	0.003	0.174	0.483	0.10	0.350	0.134	0.161	8/28/2013 9:45	8/28/2013 16:00	6.25
14	9/2/2013 10:30	9/2/2013 22:00	11.5	0.002	0.18	0.010	0.191	0.504	0.04	0.376	0.131	0.173	9/2/2013 10:30	9/2/2013 13:45	3.25
15	9/21/2013 20:30	9/22/2013 21:15	24.75	0.004	1.17	0.004	0.316	0.579	0.20	0.323	0.105	0.139	9/21/2013 20:45	9/22/2013 2:15	5.5
16	10/7/2013 8:30	10/7/2013 21:00	12.5	0.002	0.44	0.004	0.209	0.527	0.11	0.359	0.114	0.177	10/7/2013 9:00	10/7/2013 17:15	8.25
17	10/11/2013 3:00	10/13/2013 0:15	45.25	0.007	0.91	0.008	0.499	0.791	0.28	0.327	0.103	0.148	10/11/2013 3:00	10/11/2013 18:15	15.25
18	11/26/2013 14:00	11/28/2013 19:15	53.25	0.018	2.26	0.008	0.698	0.918	0.15	0.390	0.085	0.138	11/26/2013 14:00	11/27/2013 17:00	27
19	12/6/2013 5:15	12/8/2013 4:15	47	0.010	0.85	0.012	0.359	0.564	0.06	0.369	0.123	0.143	12/6/2013 5:15	12/7/2013 2:30	21.25
20	12/8/2013 11:45	12/11/2013 1:30	61.75	0.021	1.50	0.014	0.661	0.961	0.05	0.447	0.145	0.138	12/8/2013 11:45	12/10/2013 18:00	54.25
21	12/14/2013 15:30	12/17/2013 3:15	59.75	0.012	0.88	0.014	0.330	0.689	0.08	0.400	0.168	0.132	12/14/2013 16:00	12/15/2013 1:00	9
22	12/23/2013 4:15	12/24/2013 5:15	25	0.008	0.67	0.011	0.472	0.771	0.09	0.432	0.152	0.131	12/23/2013 4:15	12/23/2013 20:45	16.5
23	12/29/2013 8:15	12/31/2013 4:45	44.5	0.022	1.21	0.018	1.61	1.94	0.11	0.529	0.150	0.140	12/29/2013 8:15	12/29/2013 16:15	8
24	1/5/2014 22:00	1/7/2014 23:30	49.5	0.021	0.34	0.061	1.17	1.51	0.05	0.494	0.156	0.133	1/5/2014 22:15	1/6/2014 13:15	15
25	1/11/2014 8:30	1/12/2014 16:30	32	0.020	0.59	0.034	1.45	1.78	0.09	0.614	0.152	0.161	1/11/2014 8:45	1/12/2014 0:30	15.75
26	2/3/2014 2:15	2/4/2014 10:00	31.75	0.006	1.21	0.005	0.205	0.516	0.05	0.344	0.130	0.131	2/3/2014 2:15	2/3/2014 15:00	12.75
27	2/5/2014 0:30	2/7/2014 18:30	66	0.051	1.49	0.034	1.61	1.91	0.08	0.650	0.141	0.135	2/5/2014 0:30	2/5/2014 11:45	11.25
28	2/13/2014 0:30	2/17/2014 16:30	112	0.032	1.84	0.018	0.611	0.923	0.09	0.464	0.189	0.136	2/13/2014 0:30	2/15/2014 16:15	63.75
29	2/19/2014 10:15	2/20/2014 11:00	24.75	0.009	0.36	0.026	0.389	0.815	0.07	0.590	0.274	0.136	2/19/2014 10:15	2/19/2014 12:15	2
30	3/19/2014 15:45	3/20/2014 15:45	24	0.007	0.57	0.011	0.434	0.749	0.11	0.460	0.193	0.135	3/19/2014 15:45	3/19/2014 22:30	6.75
31	3/29/2014 9:15	4/15/2014 0:00	398.75	0.343	3.21	0.107	2.07	2.42	0.11	0.911	0.357	0.139	3/29/2014 9:30	4/8/2014 6:15	236.75
32	4/15/2014 10:00	4/16/2014 23:15	37.25	0.009	0.58	0.015	0.459	1.17	0.04	0.805	0.544	0.146	4/15/2014 10:15	4/16/2014 0:15	14
33	4/25/2014 22:45	4/27/2014 1:30	26.75	0.010	0.61	0.017	0.618	1.11	0.17	0.751	0.435	0.133	4/25/2014 23:00	4/26/2014 1:45	2.75
34	4/29/2014 13:00	5/8/2014 22:15	225.25	0.184	5.19	0.035	3.15	3.76	0.22	1.08	0.550	0.138	4/29/2014 13:15	5/8/2014 9:00	211.75
35	5/10/2014 14:00	5/11/2014 23:00	33	0.008	0.71	0.011	0.549	1.38	0.21	0.901	0.640	0.147	5/10/2014 14:00	5/11/2014 0:15	10.25
36	5/16/2014 9:15	5/17/2014 0:30	15.25	0.005	0.53	0.010	0.407	1.17	0.06	0.909	0.580	0.166	5/16/2014 9:30	5/16/2014 21:15	11.75

MBE_6 Bensalem Township

Gravel Pike at Pouquessing Creek

Pipe Size: 16" dia. Tributary Drainage Area: 742 acres Tributary Service Population: 4,567

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	6/9/2014 2:00	6/15/2014 23:45	165.75	0.051	3.35	0.015	3.32	3.89	0.70	0.665	0.380	0.138	6/9/2014 2:00	6/13/2014 18:15	112.25
38	6/25/2014 23:00	6/26/2014 23:45	24.75	0.006	0.56	0.011	0.765	1.14	0.19	0.579	0.326	0.133	6/25/2014 23:45	6/26/2014 2:00	2.25
		Average:	50.2	0.024	1.05	0.015	0.769	1.12	0.16	0.495	0.214	0.134			26.0
		Maximum Value:	399	0.343	5.19	0.107	3.60	3.94	0.70	1.08	0.640	0.177			236.8
		Minimum Value:	9.0	0.001	0.18	0.003	0.114	0.339	0.02	0.258	0.072	0.066			1.50
		Standard Deviation:	72.1	0.061	1.00	0.019	0.896	0.950	0.14	0.208	0.152	0.026			51.7
		Weighted Mean R-Value*:				0.023									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_7 Bensalem Township

In road across from Morrow Drive and Belleview Drive

Pipe Size: 12" dia. Tributary Drainage Area: 204 acres Tributary Service Population: 2,110

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	5/1/2012 4:15	5/1/2012 18:15	14	0.002	0.41	0.004	0.066	0.220	0.20	0.165	0.046	0.102	5/1/2012 4:15	5/1/2012 10:15	6
2	5/3/2012 1:45	5/3/2012 6:30	4.75	0.001	0.11	0.010	0.066	0.190	0.04	0.100	0.041	0.030	5/3/2012 2:15	5/3/2012 4:30	2.25
3	5/9/2012 0:00	5/9/2012 15:15	15.25	0.004	0.32	0.014	0.107	0.290	0.07	0.186	0.070	0.077	5/9/2012 0:15	5/9/2012 7:15	7
4	5/9/2012 22:15	5/10/2012 10:15	12	0.005	0.18	0.028	0.160	0.330	0.02	0.180	0.062	0.062	5/9/2012 22:15	5/10/2012 4:45	6.5
5	5/15/2012 8:45	5/15/2012 20:45	12	0.003	0.74	0.005	0.139	0.300	0.10	0.190	0.045	0.108	5/15/2012 8:45	5/15/2012 12:45	4
6	5/16/2012 1:00	5/16/2012 17:30	16.5	0.010	1.20	0.009	0.279	0.330	0.27	0.217	0.053	0.083	5/16/2012 1:15	5/16/2012 4:45	3.5
7	5/21/2012 1:45	5/21/2012 18:15	16.5	0.002	0.21	0.008	0.066	0.240	0.07	0.177	0.076	0.087	5/21/2012 2:00	5/21/2012 11:15	9.25
8	5/22/2012 0:15	5/22/2012 22:45	22.5	0.004	0.20	0.018	0.122	0.280	0.02	0.182	0.075	0.086	5/22/2012 0:30	5/22/2012 9:45	9.25
9	5/24/2012 7:45	5/24/2012 22:45	15	0.001	0.24	0.004	0.055	0.240	0.08	0.194	0.079	0.107	5/24/2012 8:00	5/24/2012 16:45	8.75
10	5/27/2012 4:00	5/27/2012 17:00	13	0.004	0.32	0.012	0.181	0.360	0.08	0.257	0.106	0.112	5/27/2012 4:15	5/27/2012 6:45	2.5
11	6/1/2012 20:00	6/2/2012 19:15	23.25	0.005	0.56	0.010	0.241	0.340	0.33	0.202	0.082	0.090	6/1/2012 20:00	6/2/2012 2:15	6.25
12	6/3/2012 14:00	6/3/2012 22:15	8.25	0.000	0.11	0.004	0.047	0.230	0.05	0.195	0.079	0.108	6/3/2012 14:15	6/3/2012 19:45	5.5
13	6/12/2012 9:45	6/13/2012 15:45	30	0.009	0.63	0.014	0.140	0.320	0.07	0.204	0.077	0.088	6/12/2012 9:45	6/12/2012 23:30	13.75
14	6/22/2012 21:00	6/23/2012 5:00	8	0.001	0.16	0.008	0.060	0.240	0.05	0.149	0.092	0.036	6/22/2012 21:00	6/22/2012 22:30	1.5
15	7/15/2012 20:45	7/16/2012 10:45	14	0.006	1.11	0.006	0.475	0.572	0.48	0.138	0.012	0.066	7/15/2012 21:30	7/16/2012 0:00	2.5
16	7/20/2012 1:30	7/20/2012 19:15	17.75	0.004	0.80	0.005	0.088	0.176	0.21	0.118	0.001	0.086	7/20/2012 1:45	7/20/2012 11:00	9.25
17	7/26/2012 19:30	7/27/2012 6:45	11.25	0.002	0.40	0.005	0.045	0.163	0.19	0.094	0.019	0.054	7/26/2012 19:45	7/27/2012 0:30	4.75
18	8/1/2012 15:45	8/1/2012 21:30	5.75	0.000	0.12	0.004	0.061	0.179	0.04	0.141	0.023	0.107	8/1/2012 16:30	8/1/2012 18:00	1.5
19	8/5/2012 18:45	8/6/2012 9:30	14.75	0.005	0.70	0.007	0.107	0.252	0.15	0.142	0.032	0.068	8/5/2012 18:45	8/6/2012 2:30	7.75
20	8/14/2012 10:00	8/14/2012 23:45	13.75	0.003	0.45	0.007	0.136	0.282	0.12	0.158	0.028	0.101	8/14/2012 10:15	8/14/2012 17:30	7.25
21	8/15/2012 16:30	8/15/2012 19:30	3	0.000	0.11	0.003	0.029	0.169	0.02	0.153	0.029	0.108	8/15/2012 16:30	8/15/2012 18:00	1.5
22	8/17/2012 22:00	8/18/2012 12:30	14.5	0.003	0.59	0.006	0.092	0.244	0.09	0.133	0.027	0.075	8/17/2012 22:30	8/18/2012 7:30	9
23	8/27/2012 8:45	8/27/2012 22:30	13.75	0.005	1.24	0.004	0.424	0.563	0.42	0.191	0.037	0.106	8/27/2012 8:45	8/27/2012 18:00	9.25
24	8/28/2012 5:30	8/28/2012 9:45	4.25	0.001	0.15	0.005	0.046	0.206	0.03	0.174	0.036	0.117	8/28/2012 5:45	8/28/2012 7:30	1.75
25	9/3/2012 11:30	9/3/2012 22:45	11.25	0.005	1.01	0.005	0.258	0.477	0.25	0.229	0.059	0.117	9/3/2012 11:45	9/3/2012 16:15	4.5
26	9/4/2012 3:30	9/5/2012 22:15	42.75	0.027	2.17	0.013	0.511	0.684	0.36	0.229	0.053	0.091	9/4/2012 4:00	9/5/2012 12:15	32.25
27	9/8/2012 16:45	9/9/2012 2:45	10	0.002	0.27	0.007	0.063	0.215	0.04	0.144	0.049	0.071	9/8/2012 17:00	9/8/2012 22:00	5
28	9/18/2012 3:15	9/18/2012 6:00	2.75	0.001	0.18	0.003	0.042	0.117	0.05	0.081	0.026	0.031	9/18/2012 3:30	9/18/2012 5:45	2.25
29	9/18/2012 17:15	9/19/2012 10:30	17.25	0.006	0.83	0.007	0.148	0.291	0.29	0.150	0.029	0.077	9/18/2012 17:15	9/18/2012 21:00	3.75
30	9/22/2012 20:00	9/23/2012 5:00	9	0.001	0.18	0.005	0.047	0.162	0.07	0.091	0.036	0.040	9/22/2012 20:00	9/22/2012 22:30	2.5
31	10/7/2012 10:45	10/8/2012 0:15	13.5	0.001	0.20	0.007	0.054	0.262	0.02	0.171	0.046	0.112	10/7/2012 11:00	10/7/2012 21:15	10.25
32	10/9/2012 4:45	10/9/2012 9:15	4.5	0.001	0.15	0.005	0.070	0.200	0.04	0.166	0.041	0.105	10/9/2012 5:00	10/9/2012 9:15	4.25
33	10/19/2012 9:15	10/19/2012 17:30	8.25	0.004	0.94	0.004	0.197	0.341	0.24	0.188	0.026	0.103	10/19/2012 9:45	10/19/2012 13:45	4
34	10/29/2012 5:30	10/30/2012 10:00	28.5	0.006	2.00	0.003	0.303	0.434	0.10	0.159	0.040	0.089	10/29/2012 6:15	10/30/2012 9:45	27.5
35	11/7/2012 11:00	11/8/2012 17:00	30	0.009	0.55	0.016	0.102	0.265	0.03	0.174	0.048	0.087	11/7/2012 11:30	11/8/2012 1:15	13.75
36	11/27/2012 6:15	11/28/2012 0:15	18	0.004	0.63	0.007	0.090	0.252	0.02	0.178	0.043	0.104	11/27/2012 6:30	11/27/2012 16:00	9.5

MBE_7 Bensalem Township

In road across from Morrow Drive and Belleview Drive

Pipe Size: 12" dia. Tributary Drainage Area: 204 acres Tributary Service Population: 2,110

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	12/7/2012 22:15	12/8/2012 10:30	12.25	0.002	0.28	0.007	0.056	0.253	0.06	0.127	0.047	0.059	12/7/2012 22:15	12/8/2012 1:45	3.5
38	12/9/2012 8:45	12/10/2012 6:00	21.25	0.005	0.38	0.014	0.096	0.279	0.04	0.171	0.044	0.093	12/9/2012 8:45	12/10/2012 2:30	17.75
39	12/18/2012 1:15	12/18/2012 15:15	14	0.003	0.53	0.006	0.155	0.203	0.19	0.150	0.039	0.082	12/18/2012 1:15	12/18/2012 15:15	14
40	1/11/2013 13:00	1/12/2013 4:45	15.75	0.004	0.52	0.008	0.088	0.320	0.05	0.224	0.122	0.069	1/11/2013 13:30	1/11/2013 21:15	7.75
41	1/14/2013 20:45	1/15/2013 17:00	20.25	0.004	0.38	0.009	0.065	0.309	0.05	0.237	0.136	0.079	1/14/2013 20:45	1/15/2013 2:45	6
42	1/15/2013 21:30	1/17/2013 2:30	29	0.017	1.03	0.016	0.202	0.466	0.06	0.293	0.141	0.077	1/15/2013 21:30	1/16/2013 12:15	14.75
43	1/28/2013 13:00	1/29/2013 1:15	12.25	0.002	0.18	0.013	0.084	0.318	0.03	0.257	0.144	0.088	1/28/2013 13:15	1/28/2013 17:00	3.75
44	1/30/2013 21:45	2/1/2013 0:00	26.25	0.012	1.07	0.012	0.245	0.450	0.27	0.288	0.143	0.082	1/30/2013 21:45	1/31/2013 6:30	8.75
45	2/8/2013 6:15	2/9/2013 5:15	23	0.006	0.46	0.013	0.099	0.337	0.02	0.259	0.141	0.083	2/8/2013 6:30	2/9/2013 3:00	20.5
46	2/11/2013 4:45	2/12/2013 4:45	24	0.013	0.32	0.041	0.171	0.438	0.04	0.308	0.150	0.084	2/11/2013 5:00	2/11/2013 9:15	4.25
47	2/13/2013 18:45	2/14/2013 2:45	8	0.001	0.15	0.009	0.061	0.335	0.02	0.253	0.164	0.066	2/13/2013 18:45	2/14/2013 0:45	6
48	2/19/2013 11:30	2/20/2013 0:30	13	0.002	0.21	0.012	0.082	0.344	0.02	0.273	0.153	0.095	2/19/2013 11:45	2/19/2013 18:00	6.25
49	2/26/2013 19:30	2/28/2013 2:45	31.25	0.012	0.67	0.017	0.130	0.411	0.07	0.277	0.149	0.078	2/26/2013 19:30	2/27/2013 11:45	16.25
50	3/7/2013 16:45	3/9/2013 1:00	32.25	0.003	0.65	0.005	0.080	0.312	0.03	0.217	0.119	0.084	3/7/2013 17:00	3/8/2013 13:45	20.75
51	3/12/2013 3:15	3/13/2013 9:45	30.5	0.010	0.97	0.010	0.160	0.372	0.08	0.240	0.113	0.084	3/12/2013 3:30	3/12/2013 17:15	13.75
52	3/18/2013 18:00	3/19/2013 23:00	29	0.014	0.86	0.016	0.165	0.368	0.06	0.279	0.129	0.087	3/18/2013 18:15	3/19/2013 19:00	24.75
53	3/25/2013 6:45	3/26/2013 23:00	40.25	0.014	0.65	0.021	0.123	0.356	0.04	0.263	0.124	0.093	3/25/2013 6:45	3/25/2013 16:30	9.75
		Average:	15.4	0.005	0.54	0.009	0.137	0.301	0.12	0.182	0.064	0.084			7.81
		Maximum Value:	42.8	0.027	2.17	0.041	0.511	0.684	0.48	0.308	0.164	0.117			32.3
		Minimum Value:	2.8	0.000	0.11	0.003	0.029	0.117	0.02	0.081	0.001	0.030			1.50
		Standard Deviation:	8.2	0.005	0.46	0.007	0.112	0.116	0.12	0.053	0.042	0.022			6.4
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_7 Bensalem Township
Morrow Drive and Belleview Drive
Pipe Size: 12" dia. Tributary Drainage Area: 204 acres Tributary Service Population: 2,110

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 9:30	13.25	0.002	0.52	0.005	0.077	0.315	0.15	0.208	0.118	0.066	4/10/2013 20:30	4/11/2013 0:00	3.5
2	4/12/2013 7:00	4/14/2013 13:45	54.75	0.023	1.16	0.020	0.147	0.391	0.10	0.262	0.114	0.093	4/12/2013 7:15	4/12/2013 23:30	16.25
3	4/19/2013 21:30	4/20/2013 17:00	19.5	0.005	0.44	0.012	0.089	0.332	0.06	0.240	0.118	0.087	4/19/2013 21:30	4/20/2013 3:00	5.5
4	4/29/2013 2:15	4/30/2013 1:15	23	0.002	0.35	0.007	0.066	0.260	0.02	0.172	0.069	0.088	4/29/2013 2:15	4/29/2013 22:45	20.5
5	5/8/2013 2:30	5/10/2013 0:00	45.5	0.009	1.02	0.009	0.140	0.299	0.15	0.182	0.068	0.089	5/8/2013 3:15	5/9/2013 6:45	27.5
6	5/10/2013 22:45	5/12/2013 21:45	47	0.013	0.67	0.020	0.122	0.327	0.07	0.198	0.070	0.090	5/10/2013 23:00	5/12/2013 6:15	31.25
7	5/18/2013 22:30	5/19/2013 21:30	23	0.003	0.30	0.011	0.072	0.328	0.04	0.188	0.077	0.091	5/18/2013 22:30	5/19/2013 18:30	20
8	5/28/2013 9:30	5/29/2013 0:00	14.5	0.001	0.28	0.004	0.046	0.221	0.03	0.174	0.064	0.101	5/28/2013 9:30	5/28/2013 22:45	13.25
9	6/2/2013 23:15	6/4/2013 6:30	31.25	0.006	1.42	0.004	0.244	0.435	0.57	0.157	0.060	0.073	6/2/2013 23:15	6/3/2013 16:15	17
10	6/6/2013 19:45	6/9/2013 22:00	74.25	0.046	3.61	0.013	0.389	0.573	0.37	0.241	0.069	0.089	6/6/2013 20:00	6/8/2013 2:15	30.25
11	6/10/2013 7:15	6/12/2013 8:00	48.75	0.026	2.16	0.012	0.284	0.481	0.30	0.244	0.088	0.085	6/10/2013 7:15	6/11/2013 1:30	18.25
12	6/13/2013 9:30	6/13/2013 16:30	7	0.001	0.34	0.002	0.047	0.267	0.18	0.226	0.107	0.104	6/13/2013 9:30	6/13/2013 10:45	1.25
13	6/18/2013 13:00	6/19/2013 0:30	11.5	0.002	0.33	0.005	0.067	0.314	0.03	0.244	0.130	0.093	6/18/2013 13:15	6/18/2013 20:30	7.25
14	6/27/2013 18:30	6/28/2013 18:00	23.5	0.006	0.69	0.009	0.182	0.399	0.17	0.219	0.101	0.084	6/27/2013 18:30	6/28/2013 16:30	22
15	6/30/2013 12:00	7/1/2013 5:45	17.75	0.005	0.55	0.009	0.132	0.356	0.18	0.217	0.104	0.077	6/30/2013 12:00	6/30/2013 16:00	4
16	7/1/2013 8:45	7/1/2013 18:15	9.5	0.001	0.31	0.005	0.098	0.298	0.09	0.229	0.103	0.106	7/1/2013 8:45	7/1/2013 15:15	6.5
17	7/3/2013 21:45	7/4/2013 4:30	6.75	0.002	0.49	0.004	0.078	0.265	0.25	0.171	0.106	0.028	7/3/2013 21:45	7/3/2013 23:30	1.75
18	7/12/2013 15:45	7/13/2013 11:00	19.25	0.006	0.77	0.007	0.093	0.385	0.17	0.232	0.113	0.081	7/12/2013 15:45	7/12/2013 23:00	7.25
19	7/13/2013 16:00	7/14/2013 23:15	31.25	0.008	0.61	0.013	0.214	0.438	0.35	0.237	0.112	0.092	7/13/2013 16:15	7/13/2013 20:00	3.75
20	7/22/2013 18:15	7/23/2013 23:45	29.5	0.005	1.49	0.003	0.216	0.323	0.51	0.209	0.100	0.087	7/22/2013 18:30	7/23/2013 18:15	23.75
21	7/28/2013 16:00	7/29/2013 14:00	22	0.004	0.56	0.008	0.150	0.357	0.18	0.204	0.095	0.083	7/28/2013 16:15	7/29/2013 2:30	10.25
22	8/1/2013 6:45	8/2/2013 17:15	34.5	0.009	0.91	0.009	0.149	0.336	0.17	0.224	0.099	0.092	8/1/2013 6:45	8/1/2013 15:00	8.25
23	8/8/2013 0:15	8/8/2013 11:45	11.5	0.002	0.53	0.003	0.099	0.275	0.17	0.191	0.098	0.072	8/8/2013 0:30	8/8/2013 3:30	3
24	8/13/2013 5:15	8/14/2013 16:45	35.5	0.018	2.27	0.008	0.778	0.987	0.76	0.248	0.089	0.092	8/13/2013 5:15	8/13/2013 9:45	4.5
25	8/28/2013 9:45	8/29/2013 0:00	14.25	0.002	0.47	0.004	0.073	0.296	0.07	0.220	0.103	0.100	8/28/2013 9:45	8/28/2013 16:45	7
26	9/2/2013 10:45	9/2/2013 20:45	10	0.003	0.50	0.006	0.127	0.337	0.19	0.245	0.096	0.107	9/2/2013 11:00	9/2/2013 13:30	2.5
27	9/21/2013 20:30	9/23/2013 7:00	34.5	0.011	1.23	0.009	0.157	0.360	0.27	0.212	0.091	0.078	9/21/2013 20:45	9/22/2013 2:15	5.5
28	10/6/2013 15:45	10/6/2013 20:45	5	0.001	0.22	0.006	0.107	0.305	0.16	0.232	0.093	0.107	10/6/2013 16:15	10/6/2013 17:15	1
29	10/7/2013 8:30	10/8/2013 7:45	23.25	0.003	0.57	0.005	0.083	0.284	0.14	0.193	0.094	0.084	10/7/2013 8:45	10/7/2013 17:15	8.5
30	10/11/2013 2:45	10/12/2013 20:00	41.25	0.011	0.79	0.014	0.169	0.376	0.21	0.226	0.097	0.094	10/11/2013 3:00	10/11/2013 18:00	15
31	11/26/2013 14:15	11/29/2013 4:00	61.75	0.035	2.50	0.014	0.256	0.466	0.17	0.271	0.114	0.082	11/26/2013 14:15	11/27/2013 17:00	26.75
32	12/6/2013 6:45	12/8/2013 5:00	46.25	0.014	0.94	0.015	0.170	0.359	0.05	0.242	0.115	0.087	12/6/2013 6:45	12/7/2013 2:30	19.75
33	12/8/2013 11:30	12/11/2013 14:15	74.75	0.028	1.50	0.019	0.188	0.432	0.05	0.261	0.124	0.087	12/8/2013 11:45	12/10/2013 18:00	54.25
34	12/14/2013 16:00	12/17/2013 2:15	58.25	0.030	0.85	0.035	0.220	0.516	0.07	0.296	0.143	0.085	12/14/2013 16:15	12/15/2013 1:00	8.75
35	12/23/2013 4:30	12/24/2013 4:15	23.75	0.005	0.60	0.009	0.126	0.415	0.08	0.295	0.181	0.085	12/23/2013 4:30	12/23/2013 20:30	16
36	12/29/2013 8:30	12/31/2013 4:15	43.75	0.013	1.28	0.010	0.255	0.541	0.12	0.312	0.184	0.090	12/29/2013 8:45	12/29/2013 16:15	7.5

MBE_7 Bensalem Township

Morrow Drive and Belleview Drive

Pipe Size: 12" dia. Tributary Drainage Area: 204 acres Tributary Service Population: 2,110

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
37	1/5/2014 5:15	1/8/2014 1:45	68.5	0.038	0.66	0.057	0.288	0.610	0.06	0.366	0.203	0.090	1/5/2014 5:15	1/6/2014 13:15	32
38	1/10/2014 7:30	1/13/2014 3:15	67.75	0.025	0.98	0.026	0.205	0.516	0.10	0.340	0.200	0.090	1/10/2014 7:45	1/11/2014 23:45	40
39	1/21/2014 10:15	1/22/2014 4:00	17.75	0.001	0.68	0.002	0.054	0.387	0.03	0.307	0.217	0.079	1/21/2014 10:15	1/21/2014 21:15	11
40	2/3/2014 2:15	2/4/2014 19:00	40.75	0.015	1.11	0.014	0.137	0.483	0.05	0.379	0.241	0.088	2/3/2014 2:15	2/3/2014 15:15	13
41	2/5/2014 0:00	2/8/2014 5:15	77.25	0.066	1.49	0.044	0.505	0.864	0.08	0.434	0.240	0.080	2/5/2014 0:00	2/5/2014 12:15	12.25
42	2/19/2014 9:45	2/20/2014 20:00	34.25	0.009	0.37	0.023	0.204	0.585	0.08	0.407	0.282	0.091	2/19/2014 9:45	2/19/2014 12:15	2.5
43	3/19/2014 14:15	3/21/2014 23:00	56.75	0.026	0.75	0.034	0.214	0.529	0.11	0.353	0.205	0.088	3/19/2014 14:15	3/19/2014 22:30	8.25
44	4/7/2014 13:15	4/8/2014 23:45	34.5	0.010	0.48	0.021	0.108	0.435	0.04	0.359	0.232	0.089	4/7/2014 13:15	4/8/2014 6:15	17
45	4/15/2014 10:15	4/16/2014 8:30	22.25	0.005	0.64	0.007	0.101	0.424	0.05	0.334	0.223	0.082	4/15/2014 10:15	4/15/2014 23:30	13.25
46	4/25/2014 19:30	4/26/2014 12:15	16.75	0.005	0.55	0.008	0.111	0.420	0.19	0.308	0.191	0.081	4/25/2014 19:30	4/26/2014 1:30	6
47	4/29/2014 12:15	5/8/2014 16:00	219.75	0.151	5.28	0.029	4.90	5.10	0.18	0.373	0.196	0.086	4/29/2014 12:45	5/8/2014 9:15	212.5
48	5/10/2014 13:45	5/11/2014 15:15	25.5	0.009	0.94	0.009	0.130	0.450	0.26	0.351	0.213	0.092	5/10/2014 14:00	5/11/2014 0:15	10.25
49	5/16/2014 9:30	5/17/2014 17:00	31.5	0.010	0.66	0.015	0.109	0.453	0.07	0.341	0.204	0.095	5/16/2014 9:30	5/16/2014 21:15	11.75
50	6/9/2014 3:00	6/10/2014 3:15	24.25	0.006	0.79	0.007	0.109	0.435	0.09	0.317	0.202	0.084	6/9/2014 3:15	6/10/2014 0:30	21.25
51	6/10/2014 17:45	6/11/2014 15:00	21.25	0.007	1.27	0.006	0.703	0.998	0.54	0.299	0.170	0.083	6/10/2014 18:30	6/10/2014 19:30	1
52	6/13/2014 1:45	6/14/2014 1:30	23.75	0.006	0.41	0.015	0.103	0.385	0.10	0.279	0.158	0.087	6/13/2014 2:00	6/13/2014 18:15	16.25
53	6/25/2014 23:15	6/26/2014 10:45	11.5	0.002	0.49	0.003	0.062	0.268	0.13	0.197	0.113	0.066	6/25/2014 23:45	6/26/2014 2:00	2.25
		Average:	36.7	0.014	0.96	0.013	0.263	0.509	0.17	0.262	0.136	0.086			17.2
		Maximum Value:	219.8	0.151	5.28	0.057	4.90	5.10	0.76	0.434	0.282	0.107			212.5
		Minimum Value:	5.0	0.001	0.22	0.002	0.046	0.221	0.02	0.157	0.060	0.028			1.00
		Standard Deviation:	34.7	0.023	0.87	0.011	0.664	0.662	0.15	0.067	0.057	0.012			29.4
		Weighted Mean R-Value*:				0.015									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_8 Bensalem Township

Bensalem Country Club

Pipe Size: 12" dia. Tributary Drainage Area: 230 acres Tributary Service Population: 1,318

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/17/2010 10:00	1/19/2010 15:30	53.5	0.043	0.88	0.049	0.417	1.07	0.07	0.662	0.179	0.362	1/17/2010 10:15	1/18/2010 1:45	15.5
2	1/25/2010 3:45	1/27/2010 5:30	49.75	0.064	1.48	0.043	1.12	1.77	0.11	0.753	0.227	0.335	1/25/2010 4:15	1/26/2010 5:15	25
3	3/12/2010 10:45	3/16/2010 22:00	107.25	0.259	3.60	0.072	0.997	1.76	0.16	0.918	0.197	0.359	3/12/2010 11:00	3/15/2010 20:45	81.75
4	3/22/2010 8:45	3/24/2010 14:45	54	0.059	1.12	0.053	0.630	1.08	0.09	0.599	0.081	0.353	3/22/2010 9:15	3/23/2010 17:45	32.5
5	3/28/2010 20:45	4/2/2010 16:45	116	0.241	3.70	0.065	1.33	1.64	0.33	0.753	0.102	0.339	3/28/2010 20:45	3/31/2010 3:45	55
6	4/8/2010 23:15	4/9/2010 17:30	18.25	0.014	0.61	0.023	0.346	0.667	0.13	0.482	0.068	0.298	4/8/2010 23:45	4/9/2010 6:15	6.5
7	5/11/2010 20:15	5/12/2010 8:30	12.25	0.010	0.65	0.016	0.360	0.815	0.08	0.516	0.136	0.253	5/11/2010 20:45	5/12/2010 4:30	7.75
8	5/18/2010 1:00	5/19/2010 13:00	36	0.031	0.74	0.042	0.412	0.917	0.09	0.557	0.108	0.320	5/18/2010 1:15	5/18/2010 15:15	14
9	6/9/2010 12:45	6/10/2010 6:15	17.5	0.012	0.59	0.021	0.215	0.721	0.06	0.488	0.068	0.316	6/9/2010 13:15	6/9/2010 22:30	9.25
10	6/13/2010 13:30	6/14/2010 12:30	23	0.023	1.10	0.021	0.693	1.22	0.37	0.535	0.038	0.345	6/13/2010 14:45	6/13/2010 18:45	4
11	7/10/2010 9:00	7/11/2010 3:30	18.5	0.003	0.40	0.006	0.165	1.16	0.05	0.914	0.486	0.407	7/10/2010 9:30	7/10/2010 14:15	4.75
12	7/13/2010 7:45	7/15/2010 19:30	59.75	0.049	1.70	0.029	0.839	1.73	0.32	0.941	0.457	0.362	7/13/2010 8:15	7/14/2010 22:00	37.75
13	7/16/2010 20:15	7/17/2010 2:00	5.75	0.002	0.23	0.010	0.501	1.37	0.13	0.819	0.439	0.324	7/16/2010 20:15	7/16/2010 20:30	0.25
14	7/19/2010 9:00	7/19/2010 21:45	12.75	0.001	0.22	0.005	0.182	1.17	0.08	0.914	0.449	0.452	7/19/2010 9:00	7/19/2010 20:00	11
15	7/25/2010 14:30	7/26/2010 6:30	16	0.007	0.52	0.013	0.582	1.50	0.23	0.843	0.475	0.305	7/25/2010 15:00	7/25/2010 17:00	2
16	8/22/2010 15:15	8/22/2010 19:45	4.5	0.005	0.49	0.010	0.651	1.54	0.32	1.05	0.429	0.466	8/22/2010 15:30	8/22/2010 17:00	1.5
17	8/23/2010 13:30	8/24/2010 11:00	21.5	0.010	0.29	0.035	0.197	1.14	0.02	0.856	0.451	0.336	8/23/2010 14:00	8/23/2010 22:00	8
18	9/12/2010 7:30	9/13/2010 2:30	19	0.013	0.21	0.061	0.425	1.28	0.04	0.901	0.378	0.421	9/12/2010 7:30	9/12/2010 10:00	2.5
19	9/16/2010 16:30	9/17/2010 19:45	27.25	0.013	0.43	0.030	0.372	1.08	0.05	0.787	0.354	0.362	9/16/2010 16:45	9/17/2010 2:30	9.75
20	9/27/2010 5:00	9/28/2010 12:45	31.75	0.022	0.50	0.045	0.380	1.16	0.17	0.859	0.398	0.355	9/27/2010 5:00	9/28/2010 12:15	31.25
21	9/30/2010 4:15	10/3/2010 1:15	69	0.079	4.11	0.019	1.86	2.28	0.60	0.963	0.430	0.361	9/30/2010 4:15	10/1/2010 14:15	34
22	10/14/2010 12:15	10/15/2010 5:30	17.25	0.010	0.67	0.014	0.290	1.22	0.07	0.855	0.452	0.321	10/14/2010 12:30	10/14/2010 20:30	8
23	10/18/2010 23:30	10/19/2010 23:45	24.25	0.011	0.52	0.021	0.306	1.21	0.05	0.845	0.432	0.344	10/18/2010 23:45	10/19/2010 8:00	8.25
24	10/27/2010 2:30	10/27/2010 20:00	17.5	0.009	0.27	0.034	0.275	1.13	0.06	0.865	0.427	0.360	10/27/2010 3:00	10/27/2010 16:30	13.5
25	11/4/2010 2:30	11/6/2010 2:00	47.5	0.045	1.21	0.037	0.840	1.58	0.05	0.831	0.341	0.349	11/4/2010 2:45	11/5/2010 6:45	28
26	11/16/2010 19:45	11/17/2010 10:00	14.25	0.009	0.38	0.024	0.259	1.17	0.10	0.795	0.419	0.280	11/16/2010 20:00	11/17/2010 4:00	8
27	11/25/2010 10:00	11/26/2010 0:30	14.5	0.011	0.25	0.043	0.402	1.36	0.02	1.05	0.469	0.467	11/25/2010 10:15	11/25/2010 19:30	9.25
28	12/1/2010 0:30	12/2/2010 4:15	27.75	0.027	1.05	0.026	0.756	1.63	0.13	0.911	0.461	0.304	12/1/2010 0:45	12/1/2010 13:45	13
29	12/11/2010 23:15	12/14/2010 5:15	54	0.054	1.17	0.046	0.533	1.48	0.13	0.934	0.465	0.319	12/11/2010 23:15	12/13/2010 1:45	26.5
		Average:	34.1	0.039	1.00	0.031	0.563	1.31	0.14	0.800	0.325	0.351			17.5
		Maximum Value:	116.0	0.259	4.11	0.072	1.86	2.28	0.60	1.05	0.486	0.467			81.8
		Minimum Value:	4.5	0.001	0.21	0.005	0.165	0.667	0.02	0.482	0.038	0.253			0.25
		Standard Deviation:	27.6	0.062	1.05	0.018	0.384	0.351	0.13	0.163	0.158	0.051			18.0
		Weighted Mean R-Value*:				0.039									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_9 Bensalem Township
Tillman Drive and Poquessing Creek
Pipe Size: 10" dia. Tributary Drainage Area: 290 acres Tributary Service Population: 2,023

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	1/17/2010 10:00	1/17/2010 21:45	11.75	0.003	0.86	0.004	0.144	0.470	0.07	0.393	0.225	0.120	1/17/2010 10:15	1/17/2010 21:15	11
2	1/25/2010 4:00	1/26/2010 4:45	24.75	0.014	1.58	0.009	0.643	1.07	0.12	0.504	0.313	0.084	1/25/2010 4:15	1/26/2010 0:30	20.25
3	2/9/2010 19:45	2/11/2010 1:30	29.75	0.006	1.92	0.003	0.150	0.542	0.05	0.392	0.272	0.084	2/9/2010 20:00	2/11/2010 0:00	28
4	2/22/2010 20:15	2/24/2010 22:00	49.75	0.031	1.10	0.028	0.323	0.651	0.04	0.407	0.203	0.087	2/22/2010 20:30	2/23/2010 22:00	25.5
5	2/25/2010 3:45	2/26/2010 16:00	36.25	0.002	0.38	0.005	0.142	0.442	0.02	0.322	0.221	0.091	2/25/2010 3:45	2/26/2010 9:30	29.75
6	3/12/2010 10:30	3/14/2010 0:00	37.5	0.044	2.98	0.015	0.894	1.34	0.17	0.648	0.331	0.095	3/12/2010 10:45	3/13/2010 20:45	34
7	3/22/2010 20:15	3/23/2010 7:45	11.5	0.003	0.41	0.008	0.149	0.534	0.06	0.423	0.308	0.059	3/22/2010 20:15	3/23/2010 0:15	4
8	3/28/2010 20:45	3/29/2010 19:30	22.75	0.018	1.94	0.009	0.722	0.954	0.30	0.465	0.231	0.086	3/28/2010 20:45	3/29/2010 15:30	18.75
9	4/8/2010 23:45	4/9/2010 19:30	19.75	0.005	0.53	0.010	0.111	0.535	0.09	0.424	0.292	0.084	4/8/2010 23:45	4/9/2010 6:15	6.5
10	4/25/2010 0:00	4/25/2010 9:15	9.25	0.002	0.64	0.003	0.122	0.426	0.06	0.353	0.259	0.049	4/25/2010 0:30	4/25/2010 9:15	8.75
11	4/25/2010 22:00	4/27/2010 7:30	33.5	0.005	0.83	0.006	0.116	0.444	0.06	0.366	0.264	0.076	4/25/2010 22:15	4/26/2010 21:00	22.75
12	5/3/2010 6:00	5/3/2010 17:45	11.75	0.003	0.62	0.005	0.126	0.529	0.11	0.443	0.283	0.114	5/3/2010 6:00	5/3/2010 10:00	4
13	5/11/2010 20:30	5/12/2010 13:30	17	0.004	0.68	0.006	0.171	0.477	0.09	0.392	0.268	0.079	5/11/2010 20:45	5/12/2010 4:30	7.75
14	5/14/2010 18:45	5/15/2010 6:15	11.5	0.002	0.25	0.007	0.100	0.493	0.16	0.376	0.291	0.057	5/14/2010 19:00	5/14/2010 23:45	4.75
15	5/18/2010 1:30	5/18/2010 22:30	21	0.003	0.77	0.004	0.089	0.475	0.11	0.379	0.260	0.092	5/18/2010 1:30	5/18/2010 15:15	13.75
16	6/28/2010 15:45	6/28/2010 22:45	7	0.001	0.13	0.011	0.106	0.456	0.08	0.386	0.243	0.104	6/28/2010 15:45	6/28/2010 18:15	2.5
17	7/13/2010 8:15	7/14/2010 21:15	37	0.016	3.10	0.005	0.277	0.617	0.43	0.426	0.248	0.095	7/13/2010 8:15	7/14/2010 5:30	21.25
18	7/21/2010 23:00	7/22/2010 11:45	12.75	0.003	0.29	0.009	0.119	0.457	0.16	0.332	0.224	0.071	7/21/2010 23:00	7/22/2010 0:00	1
19	9/12/2010 7:15	9/12/2010 23:15	16	0.002	0.21	0.011	0.109	0.656	0.04	0.581	0.422	0.132	9/12/2010 7:30	9/12/2010 10:00	2.5
20	9/30/2010 4:00	9/30/2010 15:15	11.25	0.004	0.74	0.005	0.207	0.532	0.19	0.424	0.260	0.103	9/30/2010 4:15	9/30/2010 14:15	10
21	9/30/2010 16:00	10/2/2010 8:15	40.25	0.019	3.89	0.005	0.962	1.22	0.63	0.401	0.235	0.075	9/30/2010 16:15	10/1/2010 14:15	22
22	10/19/2010 2:15	10/19/2010 16:45	14.5	0.003	0.50	0.006	0.105	0.506	0.06	0.423	0.295	0.091	10/19/2010 2:15	10/19/2010 8:00	5.75
23	10/27/2010 3:00	10/27/2010 16:00	13	0.002	0.31	0.006	0.125	0.559	0.07	0.425	0.304	0.094	10/27/2010 3:00	10/27/2010 16:00	13
24	11/25/2010 10:00	11/26/2010 5:30	19.5	0.005	0.25	0.021	0.238	0.683	0.02	0.446	0.308	0.088	11/25/2010 10:15	11/25/2010 19:45	9.5
25	12/1/2010 0:30	12/2/2010 0:30	24	0.008	1.13	0.007	0.287	0.752	0.12	0.496	0.344	0.086	12/1/2010 0:45	12/1/2010 13:45	13
26	12/26/2010 12:45	12/28/2010 2:30	37.75	0.018	1.09	0.016	0.276	0.616	0.03	0.428	0.250	0.088	12/26/2010 12:45	12/27/2010 4:15	15.5
		Average:	22.3	0.009	1.04	0.009	0.262	0.632	0.13	0.425	0.275	0.088			13.7
		Maximum Value:	49.8	0.044	3.89	0.028	0.962	1.34	0.63	0.648	0.422	0.132			34.0
		Minimum Value:	7.0	0.001	0.13	0.003	0.089	0.426	0.02	0.322	0.203	0.049			1.00
		Standard Deviation:	11.7	0.010	0.98	0.006	0.250	0.244	0.14	0.071	0.047	0.018			9.4
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE-9 Bensalem Township

Tillman Drive and Poquessing Creek

Pipe Size: 10" dia. Tributary Drainage Area: 290 acres Tributary Service Population: 2,023

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/19/2013 11:45	2/19/2013 22:00	10.25	0.001	0.20	0.007	0.107	0.419	0.01	0.328	0.150	0.151	2/19/2013 11:45	2/19/2013 18:00	6.25
2	2/26/2013 19:15	2/28/2013 10:15	39	0.010	0.67	0.015	0.137	0.440	0.07	0.307	0.147	0.111	2/26/2013 19:30	2/27/2013 11:45	16.25
3	3/7/2013 16:30	3/9/2013 21:45	53.25	0.007	0.67	0.010	0.194	0.522	0.03	0.325	0.181	0.120	3/7/2013 16:30	3/8/2013 13:45	21.25
4	3/12/2013 3:00	3/14/2013 22:30	67.5	0.017	0.97	0.017	0.218	0.558	0.09	0.356	0.187	0.123	3/12/2013 3:15	3/12/2013 17:15	14
5	3/18/2013 18:15	3/21/2013 9:00	62.75	0.029	0.84	0.035	0.282	0.639	0.06	0.382	0.180	0.114	3/18/2013 18:30	3/19/2013 19:00	24.5
6	3/25/2013 6:30	3/26/2013 7:30	25	0.004	0.66	0.007	0.112	0.437	0.04	0.325	0.173	0.119	3/25/2013 6:45	3/25/2013 16:30	9.75
7	4/10/2013 20:15	4/11/2013 21:15	25	0.004	0.52	0.008	0.132	0.450	0.16	0.328	0.178	0.121	4/10/2013 20:30	4/11/2013 0:00	3.5
8	4/12/2013 7:00	4/14/2013 7:00	48	0.015	1.16	0.013	0.313	0.540	0.10	0.365	0.191	0.116	4/12/2013 7:15	4/12/2013 23:30	16.25
9	4/29/2013 3:30	4/30/2013 2:00	22.5	0.003	0.35	0.009	0.119	0.470	0.02	0.336	0.182	0.126	4/29/2013 3:30	4/30/2013 1:45	22.25
10	5/8/2013 3:15	5/8/2013 22:00	18.75	0.005	0.48	0.010	0.153	0.525	0.13	0.371	0.190	0.133	5/8/2013 5:15	5/8/2013 19:00	13.75
11	5/9/2013 4:00	5/10/2013 1:30	21.5	0.007	0.41	0.017	0.226	0.582	0.09	0.385	0.191	0.131	5/9/2013 4:15	5/9/2013 6:45	2.5
12	5/10/2013 22:45	5/12/2013 7:15	32.5	0.006	0.65	0.010	0.182	0.498	0.07	0.336	0.201	0.098	5/10/2013 23:00	5/12/2013 6:30	31.5
		Average:	35.5	0.009	0.63	0.013	0.181	0.507	0.07	0.345	0.179	0.122			15.1
		Maximum Value:	67.5	0.029	1.16	0.035	0.313	0.639	0.16	0.385	0.201	0.151			32
		Minimum Value:	10.3	0.001	0.20	0.007	0.107	0.419	0.01	0.307	0.147	0.098			2.50
		Standard Deviation:	18.5	0.008	0.27	0.008	0.068	0.067	0.04	0.025	0.016	0.013			8.8
		Weighted Mean R-Value*:				0.014									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_10 Bensalem Township

Colonial Avenue at Poquessing Creek

Pipe Size: 12" dia. Tributary Drainage Area: 37 acres Tributary Service Population: 272

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/22/2012 10:15	4/24/2012 1:30	39.25	0.012	2.13	0.006	0.081	0.080	0.12	0.010	-0.003	0.006	4/22/2012 10:15	4/23/2012 18:15	32
2	5/8/2012 23:45	5/9/2012 15:15	15.5	0.001	0.27	0.003	0.006	0.010	0.04	0.003	-0.003	0.005	5/9/2012 0:00	5/9/2012 7:45	7.75
3	5/9/2012 22:00	5/10/2012 11:15	13.25	0.001	0.23	0.004	0.009	0.010	0.02	0.003	-0.003	0.004	5/9/2012 22:15	5/10/2012 4:45	6.5
4	5/15/2012 8:45	5/20/2012 10:15	121.5	0.020	1.97	0.010	0.093	0.090	0.22	0.007	-0.002	0.006	5/15/2012 8:45	5/16/2012 4:45	20
5	5/21/2012 1:30	5/22/2012 8:30	31	0.002	0.51	0.004	0.006	0.010	0.06	0.005	-0.002	0.005	5/21/2012 1:30	5/22/2012 7:00	29.5
6	6/1/2012 19:45	6/2/2012 23:00	27.25	0.002	0.56	0.003	0.011	0.020	0.25	0.006	-0.002	0.006	6/1/2012 20:00	6/2/2012 2:45	6.75
7	6/12/2012 10:15	6/13/2012 23:30	37.25	0.005	0.58	0.009	0.016	0.020	0.06	0.007	-0.002	0.006	6/12/2012 10:15	6/12/2012 23:45	13.5
8	6/22/2012 19:00	6/23/2012 4:15	9.25	0.001	0.31	0.002	0.007	0.010	0.08	0.003	-0.002	0.003	6/22/2012 19:15	6/22/2012 22:45	3.5
9	8/27/2012 10:00	8/27/2012 21:00	11	0.001	0.32	0.004	0.009	0.016	0.20	0.010	-0.001	0.007	8/27/2012 10:15	8/27/2012 15:30	5.25
10	9/3/2012 9:45	9/9/2012 22:15	156.5	0.044	3.69	0.012	0.075	0.081	0.28	0.011	-0.002	0.006	9/3/2012 9:45	9/8/2012 22:00	132.25
11	9/18/2012 17:15	9/19/2012 13:00	19.75	0.007	0.80	0.008	0.035	0.041	0.21	0.017	0.003	0.005	9/18/2012 17:15	9/18/2012 21:00	3.75
12	9/22/2012 19:30	9/23/2012 2:30	7	0.003	0.61	0.004	0.036	0.048	0.31	0.016	0.004	0.004	9/22/2012 19:45	9/22/2012 22:30	2.75
13	10/15/2012 13:45	10/16/2012 0:00	10.25	0.001	0.33	0.004	0.037	0.049	0.20	0.014	0.004	0.006	10/15/2012 14:00	10/15/2012 21:45	7.75
14	1/11/2013 16:30	1/12/2013 0:45	8.25	0.002	0.47	0.003	0.022	0.030	0.07	0.011	0.001	0.006	1/11/2013 16:30	1/11/2013 21:15	4.75
15	1/14/2013 21:30	1/15/2013 14:30	17	0.002	0.32	0.006	0.022	0.029	0.03	0.008	0.000	0.005	1/14/2013 21:30	1/15/2013 2:45	5.25
16	1/15/2013 21:15	1/18/2013 3:00	53.75	0.010	1.00	0.010	0.023	0.030	0.07	0.010	0.000	0.005	1/15/2013 21:30	1/16/2013 12:00	14.5
17	1/30/2013 20:30	2/1/2013 1:30	29	0.007	1.04	0.006	0.026	0.033	0.18	0.010	0.000	0.005	1/30/2013 21:45	1/31/2013 6:00	8.25
18	2/8/2013 6:15	2/9/2013 5:45	23.5	0.002	0.40	0.006	0.022	0.025	0.02	0.006	-0.001	0.005	2/8/2013 6:30	2/9/2013 3:00	20.5
19	2/11/2013 4:00	2/12/2013 0:30	20.5	0.003	0.37	0.007	0.019	0.025	0.04	0.009	-0.001	0.006	2/11/2013 4:30	2/11/2013 9:15	4.75
20	2/26/2013 19:00	2/28/2013 1:00	30	0.004	0.68	0.006	0.021	0.030	0.07	0.009	0.000	0.005	2/26/2013 19:15	2/27/2013 11:45	16.5
21	3/12/2013 3:30	3/14/2013 0:45	45.25	0.005	0.94	0.005	0.016	0.023	0.09	0.008	0.000	0.006	3/12/2013 3:30	3/12/2013 16:00	12.5
22	3/18/2013 18:15	3/21/2013 1:30	55.25	0.010	0.77	0.013	0.022	0.030	0.04	0.010	0.000	0.005	3/18/2013 18:30	3/19/2013 18:45	24.25
23	3/25/2013 6:45	3/25/2013 18:00	11.25	0.003	0.58	0.005	0.021	0.028	0.04	0.014	0.001	0.007	3/25/2013 6:45	3/25/2013 16:15	9.5
		Average:	34.5	0.006	0.82	0.006	0.028	0.033	0.12	0.009	0.000	0.005			17.0
		Maximum Value:	156.5	0.044	3.69	0.013	0.093	0.090	0.31	0.017	0.004	0.007			132.3
		Minimum Value:	7.0	0.001	0.23	0.002	0.006	0.010	0.02	0.003	-0.003	0.003			2.75
		Standard Deviation:	36.3	0.009	0.80	0.003	0.024	0.023	0.09	0.004	0.002	0.001			26.5
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_10 Bensalem Township

Colonial Avenue at Poquessing Creek

Pipe Size: 12" dia. Tributary Drainage Area: 37 acres Tributary Service Population: 272

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 17:15	20.75	0.004	0.31	0.013	0.019	0.023	0.13	0.007	-0.009	0.011	4/10/2013 20:45	4/11/2013 0:00	3.25
2	4/12/2013 7:00	4/13/2013 17:00	34	0.006	1.33	0.004	0.028	0.039	0.13	0.010	-0.009	0.014	4/12/2013 7:15	4/12/2013 23:30	16.25
3	4/19/2013 21:15	4/20/2013 21:15	24	0.002	0.43	0.005	0.013	0.026	0.05	0.009	-0.008	0.014	4/19/2013 21:30	4/20/2013 3:45	6.25
4	6/13/2013 9:15	6/14/2013 6:45	21.5	0.003	0.41	0.007	0.021	0.029	0.14	0.011	-0.004	0.011	6/13/2013 9:30	6/14/2013 5:45	20.25
5	6/18/2013 12:15	6/18/2013 22:00	9.75	0.001	0.28	0.004	0.017	0.029	0.03	0.014	-0.004	0.015	6/18/2013 12:45	6/18/2013 20:30	7.75
6	7/12/2013 15:45	7/13/2013 9:00	17.25	0.004	0.87	0.005	0.018	0.027	0.20	0.010	-0.007	0.011	7/12/2013 15:45	7/12/2013 22:30	6.75
7	7/13/2013 17:00	7/14/2013 8:00	15	0.004	0.88	0.005	0.053	0.065	0.63	0.009	-0.007	0.010	7/13/2013 17:15	7/13/2013 19:30	2.25
8	10/11/2013 12:00	10/11/2013 19:15	7.25	0.004	0.91	0.004	0.044	0.053	0.28	0.020	-0.006	0.014	10/11/2013 12:00	10/11/2013 18:15	6.25
9	12/6/2013 2:30	12/7/2013 18:00	39.5	0.006	0.83	0.007	0.021	0.034	0.06	0.011	-0.006	0.014	12/6/2013 3:15	12/7/2013 2:30	23.25
10	12/8/2013 11:45	12/10/2013 4:30	40.75	0.008	1.10	0.007	0.025	0.033	0.05	0.012	-0.005	0.013	12/8/2013 11:45	12/9/2013 10:15	22.5
11	12/14/2013 16:00	12/16/2013 0:15	32.25	0.013	0.88	0.015	0.034	0.061	0.08	0.028	0.004	0.015	12/14/2013 16:15	12/15/2013 1:00	8.75
12	12/23/2013 4:00	12/24/2013 3:00	23	0.005	0.69	0.007	0.038	0.054	0.10	0.020	0.002	0.013	12/23/2013 4:15	12/23/2013 20:45	16.5
13	1/6/2014 6:00	1/6/2014 16:15	10.25	0.002	0.26	0.008	0.018	0.034	0.04	0.021	0.001	0.015	1/6/2014 6:15	1/6/2014 13:15	7
14	1/10/2014 7:15	1/10/2014 17:30	10.25	0.002	0.25	0.006	0.024	0.040	0.03	0.021	0.003	0.015	1/10/2014 7:30	1/10/2014 17:00	9.5
15	4/25/2014 23:15	4/26/2014 23:45	24.5	0.007	0.59	0.012	0.029	0.065	0.21	0.032	0.011	0.014	4/25/2014 23:15	4/26/2014 1:30	2.25
16	5/10/2014 14:00	5/11/2014 3:00	13	0.002	0.53	0.004	0.023	0.049	0.18	0.025	0.007	0.013	5/10/2014 14:15	5/11/2014 0:15	10
17	5/16/2014 9:15	5/17/2014 1:15	16	0.006	0.63	0.010	0.039	0.059	0.07	0.030	0.008	0.014	5/16/2014 9:30	5/16/2014 21:15	11.75
18	5/28/2014 9:30	5/28/2014 23:00	13.5	0.007	0.36	0.019	0.052	0.074	0.10	0.034	0.007	0.015	5/28/2014 9:30	5/28/2014 15:30	6
19	6/9/2014 2:00	6/9/2014 23:00	21	0.011	0.67	0.017	0.035	0.059	0.12	0.034	0.008	0.013	6/9/2014 2:00	6/9/2014 20:00	18
20	6/10/2014 17:30	6/12/2014 0:15	30.75	0.018	1.28	0.014	0.114	0.139	0.56	0.034	0.008	0.013	6/10/2014 17:45	6/10/2014 19:30	1.75
21	6/13/2014 1:45	6/13/2014 23:45	22	0.009	0.47	0.020	0.034	0.055	0.08	0.031	0.008	0.013	6/13/2014 2:00	6/13/2014 18:15	16.25
22	6/25/2014 23:15	6/26/2014 4:30	5.25	0.002	0.68	0.003	0.018	0.027	0.24	0.016	0.004	0.002	6/25/2014 23:45	6/26/2014 2:00	2.25
		Average:	20.5	0.006	0.66	0.009	0.033	0.049	0.16	0.020	0.000	0.013			10.2
		Maximum Value:	40.8	0.018	1.33	0.020	0.114	0.139	0.63	0.034	0.011	0.015			23.3
		Minimum Value:	5.3	0.001	0.25	0.003	0.013	0.023	0.03	0.007	-0.009	0.002			1.75
		Standard Deviation:	10.1	0.004	0.32	0.005	0.021	0.025	0.16	0.010	0.007	0.003			6.9
		Weighted Mean R-Value*:				0.009									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_11 Bensalem Township

Ge Water Parking Lot - Somerton Road

Pipe Size: 8" dia. Tributary Drainage Area: 71 acres Tributary Service Population: 0

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/17/2010 10:00	1/18/2010 5:15	19.25	0.014	0.88	0.016	0.136	0.223	0.07	0.121	0.084	0.005	1/17/2010 10:15	1/18/2010 2:45	16.5
2	1/25/2010 4:15	1/28/2010 18:00	85.75	0.131	1.69	0.078	0.330	0.560	0.15	0.278	0.172	0.035	1/25/2010 4:15	1/26/2010 5:15	25
3	2/5/2010 20:45	2/8/2010 13:30	64.75	0.083	2.12	0.039	0.185	0.302	0.07	0.177	0.105	0.013	2/5/2010 21:00	2/6/2010 13:00	16
4	2/9/2010 19:45	2/12/2010 21:15	73.5	0.119	1.97	0.061	0.237	0.372	0.04	0.199	0.091	0.033	2/9/2010 20:00	2/11/2010 0:00	28
5	2/22/2010 20:30	2/26/2010 20:00	95.5	0.279	1.51	0.185	0.350	0.481	0.05	0.241	0.072	0.033	2/22/2010 20:45	2/26/2010 9:30	84.75
6	3/12/2010 10:45	3/17/2010 20:00	129.25	0.208	3.63	0.057	0.293	0.439	0.17	0.233	0.133	0.026	3/12/2010 11:00	3/15/2010 18:00	79
7	3/28/2010 20:30	4/4/2010 6:45	154.25	0.185	3.65	0.051	0.388	0.482	0.18	0.159	0.075	0.028	3/28/2010 20:45	3/31/2010 4:00	55.25
8	4/25/2010 0:15	4/30/2010 16:15	136	0.069	1.44	0.048	0.103	0.180	0.06	0.059	0.007	0.029	4/25/2010 0:30	4/26/2010 21:00	44.5
9	5/3/2010 4:15	5/4/2010 22:00	41.75	0.017	0.65	0.026	0.109	0.149	0.12	0.067	0.011	0.037	5/3/2010 4:15	5/3/2010 10:00	5.75
10	5/11/2010 20:15	5/13/2010 19:00	46.75	0.017	0.67	0.026	0.102	0.182	0.09	0.060	0.009	0.033	5/11/2010 20:15	5/12/2010 4:30	8.25
11	5/18/2010 1:30	5/19/2010 15:30	38	0.013	0.80	0.016	0.091	0.155	0.11	0.049	-0.001	0.034	5/18/2010 1:30	5/18/2010 15:15	13.75
12	6/9/2010 12:30	6/10/2010 9:30	21	0.008	0.64	0.012	0.040	0.090	0.06	0.037	-0.007	0.027	6/9/2010 12:30	6/9/2010 22:45	10.25
13	6/13/2010 13:30	6/14/2010 11:00	21.5	0.005	0.82	0.006	0.049	0.085	0.54	0.022	-0.001	0.012	6/13/2010 14:30	6/13/2010 18:45	4.25
14	7/10/2010 8:45	7/11/2010 9:00	24.25	0.003	0.62	0.006	0.054	0.063	0.19	0.012	-0.004	0.009	7/10/2010 8:45	7/10/2010 13:00	4.25
15	7/12/2010 19:45	7/16/2010 10:15	86.5	0.047	3.05	0.016	0.143	0.207	0.75	0.056	0.001	0.030	7/12/2010 20:00	7/14/2010 22:00	50
		Average:	69.2	0.080	1.61	0.043	0.174	0.265	0.18	0.118	0.050	0.026			29.7
		Maximum Value:	154.3	0.279	3.65	0.185	0.388	0.560	0.75	0.278	0.172	0.037			84.8
		Minimum Value:	19.3	0.003	0.62	0.006	0.040	0.063	0.04	0.012	-0.007	0.005			4.25
		Standard Deviation:	44.7	0.087	1.08	0.045	0.117	0.163	0.20	0.089	0.058	0.010			26.9
		Weighted Mean R-Value*:				0.050									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_12 Bensalem Township

Creekside Apartments, North

Pipe Size: 12" dia. Tributary Drainage Area: 36.2 acres Tributary Service Population: 1,288

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:00	4/2/2012 9:00	15	0.009	0.18	0.048	0.067	0.170	0.05	0.084	0.017	0.054	4/1/2012 18:30	4/2/2012 2:30	8
2	4/21/2012 20:15	4/22/2012 0:45	4.5	0.001	0.20	0.004	0.031	0.090	0.12	0.063	0.005	0.054	4/21/2012 20:15	4/21/2012 22:30	2.25
3	4/22/2012 11:45	4/24/2012 22:45	59	0.055	2.10	0.026	0.083	0.180	0.12	0.101	0.013	0.066	4/22/2012 11:45	4/23/2012 18:15	30.5
4	5/1/2012 3:45	5/1/2012 8:30	4.75	0.002	0.27	0.008	0.044	0.130	0.07	0.101	0.024	0.067	5/1/2012 4:15	5/1/2012 7:30	3.25
5	5/9/2012 0:00	5/9/2012 8:30	8.5	0.003	0.29	0.009	0.035	0.130	0.05	0.069	0.021	0.040	5/9/2012 0:00	5/9/2012 8:15	8.25
6	5/9/2012 22:00	5/10/2012 7:30	9.5	0.005	0.21	0.026	0.050	0.130	0.02	0.071	0.021	0.037	5/9/2012 22:15	5/10/2012 4:45	6.5
7	5/15/2012 8:45	5/15/2012 22:45	14	0.013	0.75	0.018	0.076	0.170	0.10	0.122	0.021	0.078	5/15/2012 8:45	5/15/2012 19:15	10.5
8	5/16/2012 0:15	5/16/2012 22:30	22.25	0.024	1.06	0.023	0.089	0.170	0.22	0.112	0.022	0.064	5/16/2012 0:45	5/16/2012 4:45	4
9	5/21/2012 1:30	5/21/2012 19:15	17.75	0.006	0.27	0.024	0.061	0.150	0.08	0.100	0.027	0.064	5/21/2012 1:30	5/21/2012 11:15	9.75
10	5/22/2012 0:15	5/22/2012 8:30	8.25	0.005	0.20	0.026	0.054	0.140	0.02	0.083	0.028	0.041	5/22/2012 0:30	5/22/2012 7:00	6.5
11	5/24/2012 7:00	5/24/2012 20:00	13	0.001	0.31	0.004	0.048	0.150	0.14	0.110	0.030	0.078	5/24/2012 7:45	5/24/2012 16:45	9
12	5/27/2012 4:30	5/27/2012 17:00	12.5	0.004	0.24	0.017	0.052	0.190	0.06	0.121	0.032	0.081	5/27/2012 4:30	5/27/2012 7:00	2.5
13	6/1/2012 20:15	6/2/2012 14:15	18	0.009	0.49	0.018	0.056	0.170	0.23	0.095	0.024	0.059	6/1/2012 20:30	6/2/2012 2:15	5.75
14	6/12/2012 10:00	6/13/2012 12:30	26.5	0.017	0.63	0.027	0.075	0.170	0.07	0.093	0.015	0.063	6/12/2012 10:15	6/12/2012 23:30	13.25
15	7/5/2012 0:00	7/5/2012 6:00	6	0.004	0.38	0.010	0.029	0.112	0.27	0.056	0.019	0.022	7/5/2012 0:15	7/5/2012 1:30	1.25
16	7/15/2012 21:00	7/16/2012 7:30	10.5	0.004	0.92	0.004	0.076	0.174	0.48	0.070	0.021	0.040	7/15/2012 21:30	7/16/2012 0:00	2.5
17	7/18/2012 17:15	7/18/2012 20:00	2.75	0.000	0.13	0.004	0.021	0.144	0.07	0.125	0.022	0.099	7/18/2012 17:45	7/18/2012 18:00	0.25
18	7/20/2012 1:45	7/20/2012 23:15	21.5	0.010	0.88	0.012	0.061	0.145	0.22	0.102	0.023	0.067	7/20/2012 2:00	7/20/2012 10:15	8.25
19	7/26/2012 19:45	7/27/2012 8:15	12.5	0.002	0.45	0.005	0.046	0.135	0.24	0.078	0.026	0.049	7/26/2012 20:00	7/27/2012 0:30	4.5
20	8/4/2012 14:00	8/4/2012 19:45	5.75	0.001	0.33	0.002	0.032	0.138	0.25	0.111	0.027	0.080	8/4/2012 14:00	8/4/2012 14:45	0.75
21	8/5/2012 18:45	8/6/2012 17:00	22.25	0.013	0.79	0.016	0.056	0.169	0.16	0.100	0.028	0.058	8/5/2012 18:45	8/6/2012 2:30	7.75
22	8/10/2012 10:45	8/10/2012 23:15	12.5	0.004	0.25	0.018	0.057	0.149	0.10	0.113	0.028	0.076	8/10/2012 11:00	8/10/2012 12:15	1.25
23	8/14/2012 10:00	8/14/2012 23:15	13.25	0.006	0.59	0.010	0.070	0.161	0.22	0.113	0.026	0.076	8/14/2012 10:15	8/14/2012 17:30	7.25
24	8/17/2012 22:30	8/18/2012 15:15	16.75	0.005	0.47	0.011	0.039	0.175	0.10	0.096	0.031	0.058	8/17/2012 22:30	8/18/2012 7:45	9.25
25	8/27/2012 10:00	8/27/2012 23:30	13.5	0.005	0.41	0.013	0.095	0.193	0.13	0.108	0.023	0.076	8/27/2012 10:15	8/27/2012 18:00	7.75
26	9/3/2012 10:15	9/6/2012 0:00	61.75	0.072	3.75	0.019	0.116	0.222	0.42	0.123	0.029	0.066	9/3/2012 10:15	9/5/2012 12:45	50.5
27	9/8/2012 16:30	9/9/2012 0:15	7.75	0.002	0.22	0.010	0.058	0.175	0.04	0.114	0.037	0.070	9/8/2012 17:00	9/8/2012 22:00	5
28	9/18/2012 17:15	9/19/2012 10:15	17	0.013	0.85	0.015	0.056	0.173	0.23	0.104	0.027	0.060	9/18/2012 17:15	9/18/2012 21:00	3.75
29	9/22/2012 20:00	9/23/2012 3:30	7.5	0.001	0.27	0.002	0.032	0.139	0.11	0.066	0.027	0.037	9/22/2012 20:00	9/22/2012 22:30	2.5
30	10/15/2012 11:45	10/15/2012 23:30	11.75	0.002	0.34	0.006	0.045	0.171	0.19	0.108	0.028	0.076	10/15/2012 11:45	10/15/2012 21:45	10
31	10/19/2012 9:45	10/20/2012 0:00	14.25	0.006	0.99	0.006	0.070	0.169	0.23	0.107	0.024	0.074	10/19/2012 9:45	10/19/2012 14:45	5
32	10/29/2012 6:15	10/30/2012 16:15	34	0.046	2.02	0.023	0.139	0.281	0.11	0.157	0.060	0.065	10/29/2012 6:30	10/30/2012 4:00	21.5
33	11/7/2012 11:00	11/8/2012 3:15	16.25	0.014	0.57	0.024	0.063	0.193	0.03	0.109	0.028	0.060	11/7/2012 11:30	11/8/2012 1:15	13.75
34	11/13/2012 2:30	11/13/2012 15:00	12.5	0.001	0.23	0.005	0.036	0.154	0.08	0.101	0.036	0.062	11/13/2012 3:00	11/13/2012 12:30	9.5
35	11/27/2012 6:00	11/28/2012 2:00	20	0.015	0.64	0.024	0.071	0.183	0.02	0.113	0.026	0.069	11/27/2012 6:15	11/27/2012 16:00	9.75
36	12/7/2012 22:00	12/8/2012 3:15	5.25	0.003	0.29	0.011	0.060	0.099	0.06	0.060	0.022	0.023	12/7/2012 22:15	12/8/2012 1:15	3

MBE_12 Bensalem Township
Creekside Apartments, North
Pipe Size: 12" dia. Tributary Drainage Area: 36.2 acres Tributary Service Population: 1,288

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	12/9/2012 8:45	12/10/2012 11:00	26.25	0.017	0.39	0.043	0.067	0.181	0.04	0.107	0.022	0.069	12/9/2012 8:45	12/10/2012 2:30	17.75
38	12/18/2012 1:00	12/18/2012 21:00	20	0.005	0.40	0.014	0.062	0.168	0.15	0.094	0.022	0.066	12/18/2012 1:15	12/18/2012 15:45	14.5
39	12/20/2012 21:15	12/22/2012 4:45	31.5	0.025	1.52	0.017	0.080	0.180	0.10	0.099	0.027	0.053	12/20/2012 21:30	12/21/2012 8:00	10.5
40	12/26/2012 13:30	12/27/2012 22:30	33	0.028	1.29	0.022	0.081	0.190	0.11	0.125	0.037	0.068	12/26/2012 13:30	12/27/2012 9:30	20
41	12/29/2012 9:30	12/30/2012 0:00	14.5	0.001	0.22	0.004	0.048	0.188	0.02	0.121	0.038	0.082	12/29/2012 10:30	12/29/2012 16:45	6.25
42	1/11/2013 16:30	1/12/2013 3:45	11.25	0.003	0.44	0.007	0.038	0.147	0.05	0.093	0.031	0.056	1/11/2013 16:30	1/11/2013 21:00	4.5
43	1/14/2013 21:15	1/15/2013 4:45	7.5	0.001	0.34	0.004	0.022	0.119	0.03	0.067	0.037	0.027	1/14/2013 21:30	1/15/2013 2:45	5.25
44	1/15/2013 21:30	1/17/2013 3:15	29.75	0.014	1.01	0.014	0.048	0.177	0.07	0.104	0.037	0.055	1/15/2013 21:30	1/16/2013 12:00	14.5
45	1/30/2013 21:30	2/1/2013 3:30	30	0.025	1.03	0.025	0.094	0.199	0.23	0.110	0.035	0.055	1/30/2013 21:45	1/31/2013 6:00	8.25
46	2/8/2013 8:00	2/9/2013 3:45	19.75	0.008	0.44	0.017	0.046	0.173	0.02	0.106	0.035	0.062	2/8/2013 8:00	2/9/2013 3:00	19
47	2/11/2013 4:15	2/11/2013 14:00	9.75	0.004	0.33	0.011	0.060	0.176	0.04	0.115	0.035	0.071	2/11/2013 4:15	2/11/2013 9:15	5
48	2/19/2013 11:45	2/20/2013 1:00	13.25	0.003	0.18	0.018	0.042	0.171	0.01	0.116	0.040	0.070	2/19/2013 11:45	2/19/2013 18:00	6.25
49	2/26/2013 19:15	2/28/2013 3:45	32.5	0.017	0.66	0.026	0.078	0.190	0.07	0.107	0.038	0.057	2/26/2013 19:15	2/27/2013 11:45	16.5
50	3/7/2013 17:00	3/8/2013 21:30	28.5	0.014	0.46	0.030	0.069	0.173	0.03	0.115	0.037	0.067	3/7/2013 17:00	3/8/2013 13:30	20.5
51	3/12/2013 3:15	3/12/2013 23:30	20.25	0.008	0.97	0.009	0.061	0.175	0.10	0.121	0.039	0.072	3/12/2013 3:30	3/12/2013 17:15	13.75
52	3/18/2013 18:15	3/19/2013 23:00	28.75	0.022	0.76	0.029	0.074	0.184	0.05	0.130	0.046	0.066	3/18/2013 18:30	3/19/2013 11:30	17
53	3/25/2013 6:45	3/25/2013 22:30	15.75	0.010	0.62	0.016	0.061	0.181	0.04	0.141	0.047	0.079	3/25/2013 6:45	3/25/2013 16:30	9.75
54	3/31/2013 14:30	3/31/2013 21:45	7.25	0.002	0.22	0.008	0.045	0.154	0.04	0.119	0.033	0.081	3/31/2013 15:30	3/31/2013 21:30	6
		Average:	17.2	0.011	0.64	0.015	0.059	0.164	0.12	0.100	0.027	0.061			9.1
		Maximum Value:	61.8	0.072	3.75	0.048	0.139	0.281	0.48	0.157	0.060	0.099			50.5
		Minimum Value:	2.8	0.000	0.13	0.002	0.021	0.090	0.01	0.056	0.005	0.022			0.25
		Standard Deviation:	12.0	0.014	0.64	0.010	0.023	0.031	0.10	0.020	0.009	0.016			8.6
		Weighted Mean R-Value*:				0.017									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_12 Bensalem Township

Creekside Apartments North

Pipe Size: 12" dia. Tributary Drainage Area: 36 acres Tributary Service Population: 1,288

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/10/2013 20:30	4/11/2013 14:00	17.5	0.011	0.44	0.026	0.072	0.175	0.21	0.103	0.040	0.047	4/10/2013 20:45	4/11/2013 0:00	3.25
2	4/12/2013 7:15	4/14/2013 3:15	44	0.045	1.23	0.037	0.082	0.192	0.17	0.123	0.043	0.056	4/12/2013 7:15	4/12/2013 23:30	16.25
3	4/19/2013 21:30	4/20/2013 3:15	5.75	0.006	0.42	0.015	0.075	0.140	0.05	0.094	0.046	0.022	4/19/2013 21:30	4/20/2013 3:00	5.5
4	4/29/2013 5:30	4/30/2013 0:15	18.75	0.014	0.29	0.048	0.071	0.186	0.02	0.126	0.044	0.065	4/29/2013 5:45	4/29/2013 23:15	17.5
5	5/8/2013 8:15	5/9/2013 18:00	33.75	0.021	0.91	0.024	0.114	0.209	0.13	0.112	0.040	0.057	5/8/2013 8:15	5/9/2013 6:45	22.5
6	5/10/2013 23:15	5/12/2013 3:45	28.5	0.027	0.62	0.044	0.109	0.222	0.08	0.114	0.042	0.049	5/10/2013 23:15	5/12/2013 3:15	28
7	5/18/2013 15:45	5/19/2013 2:45	11	0.007	0.25	0.027	0.042	0.157	0.04	0.108	0.046	0.048	5/18/2013 15:45	5/19/2013 2:30	10.75
8	5/23/2013 23:30	5/24/2013 17:00	17.5	0.002	0.36	0.006	0.052	0.169	0.17	0.098	0.047	0.048	5/23/2013 23:45	5/24/2013 15:45	16
9	5/28/2013 9:30	5/28/2013 17:00	7.5	0.002	0.27	0.008	0.048	0.160	0.03	0.118	0.052	0.059	5/28/2013 9:30	5/28/2013 15:45	6.25
10	6/3/2013 1:00	6/4/2013 12:15	35.25	0.025	1.19	0.021	0.072	0.196	0.47	0.113	0.043	0.053	6/3/2013 1:15	6/3/2013 16:15	15
11	6/6/2013 19:45	6/9/2013 18:45	71	0.099	3.58	0.028	0.135	0.231	0.31	0.133	0.044	0.056	6/6/2013 20:00	6/8/2013 2:15	30.25
12	6/10/2013 7:15	6/12/2013 2:15	43	0.055	2.14	0.026	0.073	0.199	0.29	0.139	0.053	0.056	6/10/2013 7:15	6/11/2013 1:00	17.75
13	6/13/2013 10:00	6/13/2013 13:30	3.5	0.004	0.13	0.035	0.057	0.174	0.07	0.144	0.059	0.056	6/13/2013 10:15	6/13/2013 10:45	0.5
14	6/18/2013 12:45	6/19/2013 2:30	13.75	0.013	0.32	0.040	0.060	0.188	0.03	0.118	0.042	0.054	6/18/2013 13:00	6/18/2013 20:30	7.5
15	6/27/2013 18:30	6/27/2013 23:15	4.75	0.001	0.64	0.002	0.033	0.134	0.15	0.095	0.018	0.071	6/27/2013 18:30	6/27/2013 22:00	3.5
16	6/30/2013 12:00	6/30/2013 17:00	5	0.004	0.47	0.008	0.034	0.135	0.16	0.112	0.021	0.073	6/30/2013 12:00	6/30/2013 16:15	4.25
17	7/1/2013 8:30	7/1/2013 17:00	8.5	0.005	0.34	0.016	0.046	0.131	0.08	0.096	0.021	0.060	7/1/2013 8:45	7/1/2013 16:30	7.75
18	7/9/2013 17:30	7/9/2013 22:30	5	0.002	0.24	0.008	0.031	0.141	0.17	0.109	0.023	0.078	7/9/2013 17:45	7/9/2013 20:00	2.25
19	7/12/2013 16:15	7/14/2013 16:00	47.75	0.020	1.74	0.011	0.044	0.172	0.50	0.093	0.025	0.058	7/12/2013 16:15	7/13/2013 19:45	27.5
20	7/21/2013 15:15	7/21/2013 20:45	5.5	0.002	0.39	0.005	0.051	0.148	0.20	0.106	0.026	0.072	7/21/2013 16:15	7/21/2013 17:15	1
21	7/22/2013 18:00	7/23/2013 23:45	29.75	0.016	1.96	0.008	0.066	0.171	0.63	0.095	0.025	0.057	7/22/2013 18:00	7/23/2013 18:15	24.25
22	7/28/2013 16:15	7/29/2013 10:00	17.75	0.002	0.49	0.003	0.036	0.132	0.12	0.075	0.022	0.051	7/28/2013 16:15	7/29/2013 2:30	10.25
23	8/1/2013 6:45	8/1/2013 19:30	12.75	0.009	0.90	0.010	0.053	0.138	0.15	0.109	0.025	0.067	8/1/2013 6:45	8/1/2013 17:00	10.25
24	8/8/2013 0:15	8/8/2013 6:00	5.75	0.003	0.50	0.007	0.054	0.129	0.28	0.056	0.018	0.024	8/8/2013 0:30	8/8/2013 3:30	3
25	8/13/2013 5:15	8/13/2013 17:45	12.5	0.008	2.12	0.004	0.162	0.244	0.74	0.103	0.022	0.065	8/13/2013 5:15	8/13/2013 10:00	4.75
26	8/22/2013 6:15	8/22/2013 18:00	11.75	0.002	0.31	0.007	0.041	0.130	0.11	0.090	0.021	0.065	8/22/2013 6:30	8/22/2013 17:30	11
27	8/28/2013 10:00	8/28/2013 17:15	7.25	0.006	0.55	0.011	0.049	0.123	0.08	0.096	0.017	0.059	8/28/2013 10:15	8/28/2013 16:00	5.75
28	9/2/2013 10:45	9/2/2013 16:30	5.75	0.007	0.23	0.033	0.074	0.145	0.04	0.104	0.017	0.056	9/2/2013 11:00	9/2/2013 13:30	2.5
30	9/21/2013 20:30	9/22/2013 10:15	13.75	0.006	1.09	0.006	0.043	0.155	0.20	0.063	0.009	0.043	9/21/2013 20:45	9/22/2013 2:15	5.5
31	10/7/2013 8:30	10/7/2013 19:30	11	0.003	0.46	0.008	0.035	0.132	0.12	0.086	0.013	0.066	10/7/2013 9:00	10/7/2013 17:15	8.25
32	10/11/2013 3:00	10/11/2013 17:00	14	0.007	0.84	0.008	0.059	0.150	0.26	0.082	0.012	0.058	10/11/2013 3:00	10/11/2013 15:30	12.5
33	11/18/2013 0:45	11/18/2013 7:00	6.25	0.002	0.23	0.010	0.038	0.124	0.11	0.053	0.011	0.033	11/18/2013 0:45	11/18/2013 4:15	3.5
34	11/26/2013 14:00	11/27/2013 22:15	32.25	0.022	2.40	0.009	0.090	0.154	0.14	0.087	0.012	0.060	11/26/2013 14:00	11/27/2013 17:00	27
35	12/6/2013 5:00	12/7/2013 6:30	25.5	0.007	0.90	0.008	0.039	0.130	0.05	0.073	0.015	0.052	12/6/2013 5:15	12/7/2013 2:30	21.25
36	12/8/2013 11:45	12/9/2013 16:15	28.5	0.017	1.17	0.014	0.055	0.137	0.05	0.082	0.012	0.056	12/8/2013 11:45	12/9/2013 10:15	22.5
37	12/10/2013 7:45	12/10/2013 13:30	5.75	0.004	0.34	0.013	0.054	0.131	0.03	0.092	0.013	0.061	12/10/2013 8:00	12/10/2013 12:30	4.5

MBE_12 Bensalem Township

Creekside Apartments North

Pipe Size: 12" dia. Tributary Drainage Area: 36 acres Tributary Service Population: 1,288

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
38	12/14/2013 16:30	12/15/2013 8:45	16.25	0.010	0.86	0.012	0.037	0.140	0.07	0.077	0.018	0.044	12/14/2013 16:30	12/15/2013 1:00	8.5
39	12/23/2013 4:15	12/23/2013 17:45	13.5	0.012	0.59	0.020	0.068	0.156	0.07	0.103	0.019	0.064	12/23/2013 4:15	12/23/2013 17:30	13.25
40	12/29/2013 8:15	12/30/2013 4:45	20.5	0.016	1.25	0.013	0.054	0.164	0.11	0.099	0.022	0.059	12/29/2013 8:15	12/29/2013 16:15	8
41	1/2/2014 17:30	1/3/2014 4:00	10.5	0.001	0.32	0.004	0.038	0.129	0.01	0.068	0.021	0.044	1/2/2014 17:45	1/3/2014 4:00	10.25
42	1/5/2014 21:30	1/6/2014 16:15	18.75	0.014	0.38	0.036	0.061	0.142	0.03	0.090	0.026	0.047	1/5/2014 21:30	1/6/2014 13:15	15.75
43	1/10/2014 5:30	1/10/2014 19:15	13.75	0.006	0.24	0.024	0.039	0.136	0.03	0.103	0.026	0.067	1/10/2014 5:45	1/10/2014 19:00	13.25
44	1/11/2014 8:15	1/12/2014 5:00	20.75	0.013	0.60	0.022	0.050	0.177	0.09	0.098	0.026	0.057	1/11/2014 8:30	1/11/2014 23:45	15.25
45	1/21/2014 10:00	1/22/2014 3:45	17.75	0.002	0.68	0.004	0.039	0.123	0.03	0.073	0.018	0.051	1/21/2014 10:15	1/21/2014 21:30	11.25
46	2/3/2014 2:15	2/3/2014 20:15	18	0.009	1.16	0.007	0.053	0.137	0.05	0.092	0.019	0.061	2/3/2014 2:15	2/3/2014 14:45	12.5
47	2/5/2014 0:30	2/6/2014 12:00	35.5	0.048	1.48	0.033	0.089	0.183	0.08	0.108	0.024	0.052	2/5/2014 0:30	2/5/2014 12:15	11.75
48	2/13/2014 0:30	2/14/2014 7:45	31.25	0.014	1.71	0.009	0.062	0.167	0.09	0.090	0.029	0.050	2/13/2014 0:30	2/14/2014 3:15	26.75
49	2/18/2014 3:15	2/18/2014 8:30	5.25	0.002	0.20	0.010	0.033	0.137	0.03	0.099	0.031	0.059	2/18/2014 3:30	2/18/2014 6:45	3.25
50	2/19/2014 10:00	2/19/2014 15:15	5.25	0.003	0.37	0.008	0.035	0.125	0.08	0.103	0.035	0.055	2/19/2014 10:15	2/19/2014 12:15	2
51	3/12/2014 19:15	3/12/2014 22:15	3	0.003	0.22	0.012	0.044	0.144	0.07	0.119	0.023	0.075	3/12/2014 19:30	3/12/2014 21:45	2.25
52	3/19/2014 14:15	3/20/2014 7:15	17	0.016	0.60	0.027	0.054	0.161	0.07	0.095	0.021	0.052	3/19/2014 14:15	3/19/2014 22:30	8.25
53	3/29/2014 9:00	3/31/2014 14:45	53.75	0.047	2.38	0.020	0.080	0.211	0.12	0.105	0.026	0.058	3/29/2014 9:15	3/31/2014 7:00	45.75
54	4/15/2014 10:15	4/16/2014 6:45	20.5	0.007	0.60	0.012	0.067	0.176	0.05	0.086	0.026	0.052	4/15/2014 10:15	4/16/2014 0:15	14
55	4/29/2014 18:30	5/6/2014 14:45	164.25	0.296	5.25	0.056	1.40	1.42	0.21	0.112	0.015	0.055	4/29/2014 18:45	5/4/2014 13:15	114.5
56	5/10/2014 13:45	5/11/2014 9:15	19.5	0.015	0.98	0.015	0.096	0.177	0.28	0.080	0.013	0.049	5/10/2014 14:00	5/11/2014 0:15	10.25
58	6/9/2014 1:45	6/10/2014 8:15	30.5	0.009	0.73	0.013	0.067	0.129	0.07	0.069	0.009	0.053	6/9/2014 2:00	6/10/2014 0:45	22.75
59	6/10/2014 17:45	6/12/2014 0:00	30.25	0.020	2.24	0.009	0.237	0.331	1.21	0.082	0.009	0.057	6/10/2014 18:30	6/10/2014 19:30	1
		Average:	21.6	0.018	0.93	0.017	0.087	0.183	0.16	0.097	0.026	0.056			13.9
		Maximum Value:	164.3	0.296	5.25	0.056	1.40	1.42	1.21	0.144	0.059	0.078			114.50
		Minimum Value:	3.0	0.001	0.13	0.002	0.031	0.123	0.01	0.053	0.009	0.022			0.50
		Standard Deviation:	23.8	0.041	0.92	0.013	0.180	0.171	0.20	0.019	0.013	0.010			16.36
		Weighted Mean R-Value*:				0.020									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MBE_15 Bensalem Township

Knights Roads and Poquessing Creek

Pipe Size: 9.5" dia. Tributary Drainage Area: 145 acres Tributary Service Population: 849

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/17/2010 10:00	1/19/2010 5:45	43.75	0.021	0.89	0.024	0.220	0.312	0.07	0.126	0.027	0.054	1/17/2010 10:15	1/18/2010 1:45	15.5
2	1/25/2010 4:00	1/27/2010 4:30	48.5	0.044	1.49	0.029	0.494	0.614	0.12	0.178	0.036	0.057	1/25/2010 4:15	1/26/2010 5:15	25
3	2/5/2010 20:15	2/6/2010 18:30	22.25	0.005	2.18	0.002	0.092	0.216	0.06	0.123	0.057	0.047	2/5/2010 21:00	2/6/2010 13:15	16.25
4	2/22/2010 20:30	2/25/2010 2:00	53.5	0.054	1.05	0.051	0.386	0.545	0.04	0.240	0.089	0.056	2/22/2010 20:45	2/25/2010 1:15	52.5
5	2/25/2010 3:15	2/26/2010 11:15	32	0.020	0.40	0.051	0.233	0.412	0.01	0.208	0.091	0.056	2/25/2010 3:30	2/26/2010 9:45	30.25
6	3/12/2010 10:30	3/17/2010 2:45	112.25	0.193	3.61	0.053	0.521	0.640	0.16	0.274	0.059	0.053	3/12/2010 10:45	3/15/2010 17:45	79
7	3/22/2010 8:45	3/24/2010 22:30	61.75	0.047	1.14	0.042	0.367	0.499	0.08	0.205	0.071	0.062	3/22/2010 9:15	3/23/2010 17:45	32.5
8	3/28/2010 21:15	3/30/2010 4:15	31	0.047	1.94	0.024	0.621	0.690	0.33	0.262	0.070	0.049	3/28/2010 21:30	3/29/2010 21:15	23.75
9	3/30/2010 6:45	4/1/2010 17:00	58.25	0.099	1.73	0.057	0.494	0.653	0.07	0.301	0.079	0.062	3/30/2010 6:45	3/31/2010 3:45	21
10	4/8/2010 23:30	4/9/2010 21:45	22.25	0.010	0.59	0.018	0.198	0.300	0.12	0.172	0.070	0.058	4/8/2010 23:45	4/9/2010 6:15	6.5
11	4/25/2010 0:30	4/25/2010 12:30	12	0.005	0.66	0.008	0.132	0.216	0.06	0.122	0.049	0.032	4/25/2010 0:30	4/25/2010 10:30	10
12	4/25/2010 20:15	4/27/2010 20:30	48.25	0.028	0.93	0.030	0.167	0.297	0.05	0.160	0.049	0.057	4/25/2010 20:15	4/26/2010 21:00	24.75
13	5/3/2010 4:00	5/3/2010 15:45	11.75	0.007	0.69	0.010	0.291	0.424	0.11	0.179	0.053	0.069	5/3/2010 4:15	5/3/2010 10:00	5.75
14	5/11/2010 20:30	5/12/2010 19:30	23	0.008	0.66	0.013	0.144	0.221	0.08	0.116	0.025	0.057	5/11/2010 20:45	5/12/2010 4:30	7.75
15	5/18/2010 1:00	5/18/2010 19:30	18.5	0.006	0.74	0.008	0.140	0.271	0.10	0.134	0.045	0.059	5/18/2010 1:15	5/18/2010 15:15	14
16	5/30/2010 0:30	5/30/2010 6:30	6	0.001	0.14	0.011	0.054	0.121	0.07	0.074	0.043	0.007	5/30/2010 1:00	5/30/2010 4:15	3.25
17	6/9/2010 13:15	6/10/2010 1:00	11.75	0.003	0.60	0.006	0.110	0.243	0.06	0.156	0.063	0.065	6/9/2010 13:15	6/9/2010 22:30	9.25
18	6/13/2010 13:30	6/14/2010 16:45	27.25	0.020	1.10	0.018	0.284	0.409	0.40	0.185	0.060	0.057	6/13/2010 14:45	6/13/2010 19:00	4.25
19	7/13/2010 8:15	7/15/2010 6:15	46	0.027	1.84	0.015	0.280	0.394	0.31	0.138	0.025	0.058	7/13/2010 8:15	7/14/2010 22:00	37.75
20	7/19/2010 8:15	7/19/2010 23:15	15	0.005	0.23	0.023	0.254	0.363	0.07	0.137	0.028	0.076	7/19/2010 9:00	7/19/2010 20:00	11
21	7/21/2010 22:30	7/22/2010 3:00	4.5	0.002	0.27	0.008	0.131	0.200	0.20	0.089	0.020	0.024	7/21/2010 23:00	7/22/2010 0:00	1
22	7/25/2010 14:30	7/25/2010 21:45	7.25	0.003	0.53	0.006	0.159	0.266	0.24	0.148	0.043	0.064	7/25/2010 15:00	7/25/2010 17:00	2
23	8/22/2010 15:00	8/22/2010 20:00	5	0.003	0.41	0.006	0.211	0.348	0.25	0.178	0.063	0.066	8/22/2010 15:30	8/22/2010 17:15	1.75
24	8/23/2010 14:00	8/24/2010 1:30	11.5	0.005	0.30	0.015	0.112	0.220	0.03	0.148	0.050	0.061	8/23/2010 14:00	8/23/2010 22:00	8
25	9/16/2010 16:45	9/17/2010 7:30	14.75	0.006	0.45	0.013	0.101	0.221	0.08	0.127	0.047	0.041	9/16/2010 17:00	9/17/2010 2:30	9.5
26	9/26/2010 23:15	9/27/2010 22:00	22.75	0.001	0.47	0.003	0.146	0.279	0.15	0.110	0.048	0.057	9/26/2010 23:30	9/27/2010 18:30	19
27	9/30/2010 4:00	9/30/2010 15:00	11	0.007	0.60	0.012	0.177	0.248	0.17	0.189	0.058	0.069	9/30/2010 4:15	9/30/2010 8:45	4.5
28	9/30/2010 16:15	10/1/2010 22:30	30.25	0.039	3.66	0.011	0.683	0.744	0.64	0.241	0.060	0.059	9/30/2010 16:15	10/1/2010 14:15	22
29	10/5/2010 12:45	10/5/2010 20:00	7.25	0.003	0.16	0.019	0.107	0.257	0.04	0.177	0.059	0.078	10/5/2010 12:45	10/5/2010 15:45	3
30	10/14/2010 12:15	10/15/2010 0:45	12.5	0.009	0.67	0.013	0.195	0.324	0.07	0.201	0.065	0.068	10/14/2010 12:30	10/14/2010 20:30	8
31	10/18/2010 23:30	10/19/2010 16:15	16.75	0.012	0.53	0.023	0.245	0.341	0.05	0.156	0.033	0.054	10/18/2010 23:45	10/19/2010 8:00	8.25
32	10/27/2010 3:00	10/27/2010 20:15	17.25	0.003	0.25	0.012	0.092	0.226	0.05	0.142	0.061	0.066	10/27/2010 3:00	10/27/2010 16:30	13.5
33	11/4/2010 2:45	11/5/2010 7:15	28.5	0.019	1.22	0.015	0.190	0.348	0.05	0.188	0.074	0.052	11/4/2010 2:45	11/5/2010 6:45	28
34	12/1/2010 0:30	12/2/2010 5:45	29.25	0.015	1.06	0.014	0.185	0.343	0.12	0.159	0.060	0.049	12/1/2010 0:45	12/1/2010 13:45	13
35	12/11/2010 22:45	12/13/2010 15:15	40.5	0.015	1.18	0.013	0.163	0.266	0.13	0.136	0.051	0.049	12/11/2010 23:15	12/13/2010 1:45	26.5
		Average:	27.5	0.023	0.98	0.019	0.239	0.356	0.13	0.168	0.054	0.056			17.1

MBE_15 Bensalem Township
Knights Roads and Poquessing Creek
Pipe Size: 9.5" dia. Tributary Drainage Area: 145 acres Tributary Service Population: 849

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Maximum Value:	112.3	0.193	3.66	0.057	0.683	0.744	0.64	0.301	0.091	0.078			79.0
		Minimum Value:	4.5	0.001	0.14	0.002	0.054	0.121	0.01	0.074	0.020	0.007			1.00
		Standard Deviation:	21.8	0.036	0.84	0.015	0.156	0.156	0.13	0.051	0.018	0.014			15.9
		Weighted Mean R-Value*:				0.023									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MB_1 Bucks County Mag-Mater

Totem Road

Pipe Size: 42" dia. Tributary Drainage Area: 24,992 acres Tributary Service Population: 96,028

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2012 19:30	1/15/2012 7:30	84	0.031	1.63	0.019	20.1	37.8	0.14	25.8	15.0	4.86	1/11/2012 19:45	1/13/2012 8:45	37
2	1/17/2012 10:15	1/18/2012 12:30	26.25	0.003	0.23	0.012	4.15	26.65	0.03	22.6	16.1	4.73	1/17/2012 10:15	1/17/2012 14:45	4.5
3	1/23/2012 11:15	1/25/2012 10:30	47.25	0.011	0.28	0.041	18.1	40.08	0.05	24.8	16.2	4.65	1/23/2012 11:15	1/23/2012 18:00	6.75
4	1/27/2012 6:00	1/29/2012 7:30	49.5	0.011	0.46	0.023	12.6	35.29	0.13	25.0	16.5	5.03	1/27/2012 6:00	1/27/2012 11:45	5.75
5	2/24/2012 2:45	2/25/2012 6:00	27.25	0.001	0.31	0.005	8.61	24.32	0.04	17.7	12.4	4.40	2/24/2012 2:45	2/24/2012 19:15	16.5
6	2/29/2012 10:15	3/2/2012 7:15	45	0.011	0.89	0.012	12.0	30.19	0.05	21.1	12.4	4.85	2/29/2012 10:30	3/1/2012 9:30	23
7	3/2/2012 20:15	3/4/2012 8:00	35.75	0.005	0.31	0.016	7.17	29.16	0.03	20.3	13.0	5.03	3/2/2012 20:30	3/3/2012 10:00	13.5
8	3/31/2012 0:30	3/31/2012 21:00	20.5	0.002	0.44	0.005	12.8	31.62	0.05	17.3	10.4	5.26	3/31/2012 0:30	3/31/2012 5:30	5
9	4/22/2012 10:00	4/25/2012 14:00	76	0.030	2.15	0.014	24.9	42.55	0.11	21.5	10.1	5.02	4/22/2012 10:15	4/23/2012 7:00	20.75
10	5/1/2012 4:15	5/4/2012 4:15	72	0.004	0.67	0.006	3.38	20.69	0.11	16.1	10.6	4.65	5/1/2012 4:15	5/3/2012 5:00	48.75
11	5/9/2012 3:30	5/11/2012 23:15	67.75	0.006	0.51	0.011	3.51	19.91	0.07	16.1	10.1	4.63	5/9/2012 3:30	5/10/2012 4:45	25.25
12	5/14/2012 16:00	5/19/2012 0:00	104	0.020	1.54	0.013	13.3	29.28	0.09	18.1	10.2	4.77	5/14/2012 16:15	5/16/2012 5:00	36.75
13	5/21/2012 1:30	5/23/2012 0:00	46.5	0.002	0.41	0.006	2.21	19.87	0.03	16.2	10.7	4.61	5/21/2012 1:45	5/22/2012 7:00	29.25
14	5/24/2012 13:30	5/26/2012 16:30	51	0.008	0.92	0.009	7.79	24.66	0.31	18.4	10.8	4.88	5/24/2012 13:45	5/25/2012 18:15	28.5
15	5/27/2012 4:15	5/29/2012 15:30	59.25	0.010	0.69	0.015	11.9	32.87	0.20	19.4	11.7	4.82	5/27/2012 4:15	5/27/2012 22:15	18
16	5/29/2012 20:15	5/31/2012 13:45	41.5	0.002	0.20	0.011	6.82	26.87	0.07	17.9	12.6	4.42	5/29/2012 20:15	5/30/2012 4:00	7.75
17	6/1/2012 22:15	6/2/2012 19:30	21.25	0.003	0.60	0.005	6.99	23.37	0.18	19.3	11.8	5.18	6/1/2012 22:15	6/2/2012 2:30	4.25
18	6/12/2012 10:00	6/14/2012 1:30	39.5	0.003	0.56	0.006	3.27	20.21	0.04	17.2	10.6	5.26	6/12/2012 10:15	6/13/2012 1:30	15.25
19	6/22/2012 16:45	6/23/2012 14:15	21.5	0.002	0.81	0.003	5.84	20.17	0.41	15.8	9.66	4.27	6/22/2012 17:00	6/22/2012 22:45	5.75
20	7/15/2012 16:15	7/18/2012 8:30	64.25	0.005	0.89	0.006	7.09	21.56	0.27	14.6	8.36	4.82	7/15/2012 16:15	7/16/2012 15:00	22.75
21	7/20/2012 0:00	7/21/2012 14:45	38.75	0.006	1.22	0.005	19.4	31.1	0.20	15.5	8.86	4.27	7/20/2012 0:00	7/20/2012 11:30	11.5
22	7/26/2012 19:30	7/27/2012 21:00	25.5	0.002	0.38	0.004	7.34	22.51	0.15	14.6	8.82	4.76	7/26/2012 19:45	7/27/2012 0:30	4.75
23	7/28/2012 13:00	7/29/2012 14:15	25.25	0.003	0.73	0.004	3.54	22.38	0.17	16.4	8.76	5.74	7/28/2012 13:15	7/28/2012 22:45	9.5
24	8/3/2012 17:30	8/5/2012 4:00	34.5	0.003	0.57	0.006	4.50	21.12	0.12	15.8	8.74	5.56	8/3/2012 17:45	8/4/2012 15:00	21.25
25	8/5/2012 18:45	8/8/2012 0:00	53.25	0.006	0.81	0.008	13.8	29.81	0.28	16.1	9.13	4.97	8/5/2012 18:45	8/6/2012 3:15	8.5
26	8/10/2012 10:00	8/11/2012 0:00	14	0.002	0.30	0.007	18.3	30.97	0.08	18.2	9.40	6.32	8/10/2012 10:15	8/10/2012 16:30	6.25
27	8/14/2012 10:15	8/17/2012 1:00	62.75	0.003	0.52	0.007	3.29	20.48	0.09	15.2	9.23	5.03	8/14/2012 10:15	8/15/2012 19:00	32.75
28	8/17/2012 22:30	8/19/2012 13:00	38.5	0.003	0.70	0.005	12.8	30.89	0.08	14.9	8.81	4.68	8/17/2012 22:30	8/18/2012 7:45	9.25
29	8/27/2012 8:45	8/30/2012 3:00	66.25	0.008	0.88	0.009	16.1	28.21	0.14	15.5	8.52	4.96	8/27/2012 8:45	8/28/2012 7:30	22.75
30	9/3/2012 11:30	9/7/2012 23:45	108.25	0.036	2.09	0.017	20.8	32.57	0.19	18.6	8.31	4.87	9/3/2012 11:45	9/6/2012 10:30	70.75
31	9/18/2012 2:45	9/20/2012 15:00	60.25	0.007	0.89	0.008	18.0	32.79	0.17	14.8	8.59	4.40	9/18/2012 2:45	9/18/2012 21:15	18.5
32	10/15/2012 13:15	10/16/2012 18:00	28.75	0.002	0.36	0.005	3.71	17.67	0.08	14.0	8.01	4.99	10/15/2012 13:15	10/15/2012 21:15	8
33	10/19/2012 9:30	10/20/2012 20:00	34.5	0.005	0.94	0.005	14.0	29.81	0.20	15.9	8.05	5.59	10/19/2012 9:45	10/19/2012 15:15	5.5
34	10/28/2012 15:30	11/3/2012 1:30	130	0.026	2.04	0.013	20.7	35.25	0.09	17.0	8.78	4.94	10/28/2012 15:30	11/2/2012 19:15	123.75
35	11/7/2012 11:30	11/10/2012 0:15	60.75	0.007	0.58	0.013	18.2	32.96	0.02	16.1	9.09	5.04	11/7/2012 11:45	11/8/2012 1:15	13.5
36	11/13/2012 3:00	11/14/2012 6:30	27.5	0.001	0.24	0.006	5.31	22.33	0.07	14.3	9.25	4.21	11/13/2012 3:00	11/13/2012 12:30	9.5

MB_1 Bucks County Mag-Mater
Totem Road
Pipe Size: 42" dia. Tributary Drainage Area: 24,992 acres Tributary Service Population: 96,028

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	11/27/2012 6:15	11/29/2012 14:00	55.75	0.005	0.64	0.008	5.39	20.04	0.02	15.0	8.91	4.53	11/27/2012 6:30	11/27/2012 16:00	9.5
38	12/7/2012 22:15	12/8/2012 23:30	25.25	0.002	0.29	0.006	2.24	20	0.05	15.0	8.25	5.58	12/7/2012 22:15	12/8/2012 22:30	24.25
39	12/9/2012 8:45	12/10/2012 23:45	39	0.003	0.39	0.009	2.60	20.22	0.04	16.3	9.15	5.69	12/9/2012 8:45	12/10/2012 2:30	17.75
40	12/18/2012 1:00	12/20/2012 0:00	47	0.004	0.44	0.008	17.8	33.52	0.17	15.3	9.42	4.60	12/18/2012 1:15	12/18/2012 15:45	14.5
41	12/20/2012 21:30	12/24/2012 6:45	81.25	0.031	1.72	0.018	26.6	37.71	0.12	21.9	10.6	5.12	12/20/2012 21:30	12/21/2012 8:00	10.5
42	12/26/2012 13:30	12/30/2012 17:00	99.5	0.031	1.47	0.021	19.3	34.43	0.11	22.5	12.4	5.03	12/26/2012 13:30	12/29/2012 17:15	75.75
43	1/11/2013 16:15	1/13/2013 7:30	39.25	0.004	0.55	0.006	5.15	22.72	0.06	17.6	10.9	5.19	1/11/2013 16:15	1/11/2013 21:15	5
44	1/14/2013 19:45	1/19/2013 0:15	100.5	0.028	1.33	0.021	20.0	36.07	0.06	21.5	12.3	4.73	1/14/2013 20:00	1/16/2013 12:15	40.25
45	1/30/2013 21:45	2/2/2013 21:30	71.75	0.017	1.09	0.015	25.3	38.88	0.25	21.1	12.4	4.94	1/30/2013 21:45	2/1/2013 10:00	36.25
46	2/8/2013 8:00	2/10/2013 0:30	40.5	0.003	0.50	0.006	15.1	33.57	0.03	18.9	12.0	5.67	2/8/2013 8:00	2/9/2013 3:00	19
47	2/11/2013 4:15	2/13/2013 12:30	56.25	0.008	0.32	0.024	5.64	25.01	0.03	20.1	13.6	4.34	2/11/2013 4:15	2/11/2013 9:15	5
48	2/26/2013 19:30	3/2/2013 0:00	76.5	0.013	0.65	0.021	30.6	49.42	0.06	20.1	12.5	4.75	2/26/2013 19:30	2/27/2013 13:00	17.5
49	3/7/2013 23:30	3/9/2013 15:15	39.75	0.003	0.51	0.006	10.6	28.86	0.02	17.5	12.0	4.36	3/7/2013 23:45	3/8/2013 13:30	13.75
50	3/12/2013 3:30	3/16/2013 0:00	92.5	0.023	0.94	0.024	23.1	41.77	0.10	21.6	13.0	4.65	3/12/2013 3:30	3/13/2013 17:00	37.5
51	3/18/2013 18:15	3/22/2013 18:30	96.25	0.025	0.86	0.029	20.0	34.69	0.05	23.0	14.2	4.66	3/18/2013 18:30	3/19/2013 19:15	24.75
52	3/25/2013 6:45	3/29/2013 0:15	89.5	0.010	0.56	0.018	13.0	32.92	0.04	20.5	13.9	4.78	3/25/2013 6:45	3/25/2013 16:30	9.75
		Average:	55.4	0.010	0.77	0.011	12.2	29.0	0.11	18.2	10.9	4.91			21.4
		Maximum Value:	130.0	0.036	2.15	0.041	30.6	49.4	0.41	25.8	16.5	6.32			123.8
		Minimum Value:	14.0	0.001	0.20	0.003	2.21	17.7	0.02	14.0	8.01	4.21			4.25
		Standard Deviation:	28.2	0.010	0.49	0.008	7.54	7.25	0.08	3.07	2.26	0.427			21.2
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MB_1 Bucks County Mag-Mater
Totem Road
Pipe Size: 42" dia. Tributary Drainage Area: 24,992 acres Tributary Service Population: 96,028

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:00	4/11/2013 14:00	18	0.001	0.59	0.003	2.53	20.9	0.19	17.6	12.2	4.12	4/10/2013 20:00	4/11/2013 0:45	4.75
2	4/12/2013 7:15	4/15/2013 4:45	69.5	0.014	1.11	0.013	24.7	40.4	0.08	21.7	13.0	5.46	4/12/2013 7:15	4/12/2013 23:45	16.5
3	4/19/2013 21:45	4/20/2013 21:30	23.75	0.002	0.42	0.005	3.02	23.5	0.06	19.2	12.4	5.43	4/19/2013 21:45	4/20/2013 3:00	5.25
4	5/8/2013 9:00	5/9/2013 3:30	18.5	0.002	0.29	0.006	4.55	21.0	0.05	18.3	11.1	5.75	5/8/2013 9:00	5/9/2013 1:45	16.75
5	5/9/2013 5:00	5/10/2013 21:00	40	0.004	0.38	0.010	3.92	21.6	0.08	17.2	11.1	4.59	5/9/2013 5:00	5/9/2013 7:00	2
6	5/10/2013 22:45	5/14/2013 0:45	74	0.009	0.94	0.010	23.8	34.8	0.09	18.4	11.1	5.27	5/10/2013 23:00	5/12/2013 6:30	31.5
7	5/23/2013 15:00	5/25/2013 16:30	49.5	0.004	0.76	0.006	13.0	29.9	0.21	16.4	10.2	4.78	5/23/2013 15:00	5/25/2013 1:30	34.5
8	5/28/2013 10:45	5/29/2013 0:15	13.5	0.001	0.25	0.004	5.36	21.3	0.03	18.2	10.6	6.34	5/28/2013 11:00	5/28/2013 22:45	11.75
9	6/3/2013 1:00	6/5/2013 14:00	61	0.007	1.04	0.007	15.1	31.2	0.27	16.6	10.4	4.35	6/3/2013 1:15	6/3/2013 17:45	16.5
10	6/6/2013 19:45	6/17/2013 0:30	244.75	0.161	6.38	0.025	40.6	55.8	0.26	29.5	13.8	5.03	6/6/2013 20:00	6/14/2013 18:45	190.75
11	6/18/2013 11:30	6/19/2013 15:00	27.5	0.003	0.44	0.006	23.7	47.1	0.07	23.3	16.8	4.94	6/18/2013 11:45	6/18/2013 20:30	8.75
12	6/27/2013 16:30	6/29/2013 16:30	48	0.009	1.02	0.009	11.3	31.0	0.17	20.7	13.0	4.72	6/27/2013 16:45	6/28/2013 20:00	27.25
13	7/1/2013 8:00	7/2/2013 13:00	29	0.003	0.38	0.009	10.6	30.7	0.08	20.8	14.4	4.54	7/1/2013 8:00	7/2/2013 12:00	28
14	7/3/2013 21:30	7/4/2013 7:15	9.75	0.000	0.21	0.002	1.72	22.6	0.05	19.0	14.4	3.80	7/3/2013 21:30	7/3/2013 23:45	2.25
15	7/12/2013 16:00	7/13/2013 18:15	26.25	0.005	0.84	0.006	13.3	31.8	0.11	20.1	11.9	5.16	7/12/2013 16:15	7/13/2013 18:15	26
16	7/13/2013 18:45	7/16/2013 12:15	65.5	0.008	0.58	0.014	18.5	31.5	0.29	19.4	12.4	4.92	7/13/2013 18:45	7/13/2013 20:15	1.5
17	7/21/2013 15:30	7/27/2013 15:30	144	0.039	2.46	0.016	26.0	39.7	0.51	20.3	11.1	4.79	7/21/2013 15:30	7/23/2013 18:15	50.75
18	7/28/2013 15:30	7/30/2013 15:15	47.75	0.005	0.53	0.010	7.42	26.2	0.08	18.8	11.9	5.08	7/28/2013 15:45	7/29/2013 2:30	10.75
19	8/1/2013 7:15	8/3/2013 16:00	56.75	0.011	0.81	0.013	20.9	40.2	0.06	19.4	11.6	4.70	8/1/2013 7:15	8/3/2013 13:45	54.5
20	8/8/2013 0:00	8/9/2013 1:15	25.25	0.002	0.40	0.004	7.08	20.4	0.09	17.4	11.7	4.72	8/8/2013 0:00	8/8/2013 23:30	23.5
21	8/13/2013 5:15	8/16/2013 23:30	90.25	0.025	2.24	0.011	20.0	35.9	0.63	20.4	11.2	4.68	8/13/2013 5:15	8/13/2013 10:00	4.75
22	8/22/2013 6:30	8/24/2013 0:00	41.5	0.005	0.81	0.006	13.6	30.5	0.23	17.8	11.1	4.89	8/22/2013 6:30	8/22/2013 17:30	11
23	8/28/2013 10:15	8/29/2013 2:00	15.75	0.001	0.49	0.003	2.61	19.9	0.06	18.5	11.0	6.17	8/28/2013 10:15	8/28/2013 19:30	9.25
24	9/21/2013 20:30	9/23/2013 2:15	29.75	0.004	1.23	0.004	5.82	21.0	0.19	17.4	9.23	5.83	9/21/2013 20:45	9/22/2013 2:30	5.75
25	10/6/2013 16:15	10/8/2013 4:00	35.75	0.004	0.61	0.006	4.15	18.8	0.12	15.6	8.48	5.48	10/6/2013 16:15	10/7/2013 17:15	25
26	10/11/2013 3:00	10/12/2013 19:00	40	0.005	0.67	0.008	14.6	29.6	0.11	16.1	9.24	4.74	10/11/2013 3:15	10/11/2013 17:45	14.5
27	11/1/2013 8:45	11/1/2013 23:45	15	0.001	0.28	0.004	5.47	19.6	0.16	15.3	8.27	5.88	11/1/2013 8:45	11/1/2013 10:30	1.75
28	11/26/2013 14:15	11/30/2013 7:30	89.25	0.032	2.51	0.013	22.7	35.5	0.15	19.5	8.97	4.68	11/26/2013 14:15	11/27/2013 17:15	27
29	12/6/2013 5:00	12/8/2013 8:15	51.25	0.009	0.93	0.009	11.4	25.5	0.06	16.8	9.20	4.83	12/6/2013 5:15	12/7/2013 2:30	21.25
30	12/8/2013 11:45	12/13/2013 6:45	115	0.026	1.37	0.019	40.0	56.4	0.05	18.9	10.3	4.95	12/8/2013 11:45	12/12/2013 6:15	90.5
31	12/14/2013 15:15	12/17/2013 16:45	73.5	0.012	0.90	0.014	10.2	31.3	0.06	19.8	11.8	5.28	12/14/2013 15:30	12/17/2013 15:45	72.25
32	12/23/2013 4:15	12/25/2013 7:15	51	0.014	0.57	0.024	13.2	32.9	0.06	22.5	13.8	4.39	12/23/2013 4:30	12/23/2013 20:30	16
33	12/29/2013 8:45	1/1/2014 8:00	71.25	0.026	1.27	0.021	16.4	36.2	0.12	23.8	12.8	4.97	12/29/2013 8:45	12/31/2013 15:00	54.25
34	1/5/2014 6:00	1/9/2014 15:45	105.75	0.033	0.62	0.053	16.0	37.5	0.04	24.7	14.8	4.78	1/5/2014 6:00	1/6/2014 13:15	31.25
35	1/10/2014 8:00	1/13/2014 22:00	86	0.020	0.93	0.021	15.7	41.3	0.08	26.3	17.2	5.30	1/10/2014 8:00	1/12/2014 0:15	40.25
36	2/3/2014 2:45	2/8/2014 13:45	131	0.055	2.53	0.022	23.6	44.2	0.09	25.3	14.0	4.47	2/3/2014 2:45	2/5/2014 12:15	57.5

MB_1 Bucks County Mag-Mater

Totem Road

Pipe Size: 42" dia. Tributary Drainage Area: 24,992 acres Tributary Service Population: 96,028

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	2/13/2014 0:30	2/16/2014 14:00	85.5	0.023	1.75	0.013	11.0	32.1	0.09	25.2	16.1	4.66	2/13/2014 0:30	2/15/2014 16:45	64.25
38	3/19/2014 15:30	3/22/2014 15:15	71.75	0.013	0.73	0.018	7.48	29.3	0.10	23.1	15.5	4.63	3/19/2014 15:30	3/19/2014 22:45	7.25
39	4/15/2014 9:30	4/17/2014 0:00	38.5	0.005	1.03	0.005	9.74	32.2	0.15	23.6	16.3	5.15	4/15/2014 9:45	4/15/2014 23:30	13.75
40	4/25/2014 19:15	4/26/2014 16:00	20.75	0.002	0.49	0.004	3.74	23.8	0.12	19.4	13.3	4.55	4/25/2014 19:15	4/26/2014 1:15	6
41	4/29/2014 12:30	5/7/2014 0:15	179.75	0.148	5.21	0.028	41.5	61.6	0.34	34.7	16.3	5.00	4/29/2014 12:30	5/4/2014 13:45	121.25
42	5/10/2014 13:30	5/11/2014 12:15	22.75	0.005	0.91	0.006	30.9	59.2	0.22	27.6	18.5	5.47	5/10/2014 13:30	5/11/2014 0:00	10.5
43	5/16/2014 8:15	5/17/2014 14:00	29.75	0.007	1.46	0.005	31.2	49.6	0.16	25.3	16.7	4.56	5/16/2014 8:15	5/16/2014 18:15	10
44	6/13/2014 0:30	6/14/2014 18:45	42.25	0.008	0.63	0.013	14.4	27.8	0.10	20.4	12.7	4.74	6/13/2014 0:30	6/13/2014 17:45	17.25
45	6/25/2014 15:45	6/28/2014 2:15	58.5	0.006	0.94	0.006	4.60	20.7	0.18	17.7	11.2	4.89	6/25/2014 15:45	6/26/2014 2:00	10.25
		Average:	59.6	0.017	1.13	0.011	14.8	32.8	0.14	20.6	12.5	4.97			29.0
		Maximum Value:	244.8	0.161	6.38	0.053	41.5	61.6	0.63	34.7	18.5	6.34			190.8
		Minimum Value:	9.8	0.000	0.21	0.002	1.72	18.8	0.03	15.3	8.27	3.80			1.50
		Standard Deviation:	46.5	0.032	1.18	0.009	10.5	11.2	0.12	3.98	2.52	0.508			35.3
		Weighted Mean R-Value*:				0.015									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_1 CheltenhamTownship

Cheltenham Avenue

Pipe Size: 16" dia. Tributary Drainage Area: 203 acres Tributary Service Population: 3,533

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/22/2012 8:15	4/23/2012 4:30	20.25	0.015	2.14	0.007	0.338	1.01	0.12	0.715	0.413	0.205	4/22/2012 8:15	4/23/2012 4:15	20
2	5/1/2012 4:00	5/1/2012 13:15	9.25	0.004	0.22	0.020	0.314	0.915	0.07	0.678	0.420	0.196	5/1/2012 4:15	5/1/2012 10:00	5.75
3	5/4/2012 20:30	5/5/2012 4:30	8	0.002	0.34	0.007	0.394	1.05	0.17	0.554	0.407	0.106	5/4/2012 21:45	5/4/2012 23:45	2
4	5/9/2012 3:00	5/9/2012 13:30	10.5	0.003	0.31	0.011	0.186	0.866	0.07	0.688	0.468	0.178	5/9/2012 3:00	5/9/2012 7:00	4
5	5/15/2012 8:30	5/17/2012 3:30	43	0.027	2.77	0.010	0.903	1.41	0.37	0.736	0.475	0.178	5/15/2012 8:45	5/16/2012 4:30	19.75
6	5/22/2012 2:00	5/22/2012 10:00	8	0.005	0.18	0.028	0.255	0.882	0.02	0.663	0.432	0.148	5/22/2012 2:00	5/22/2012 9:45	7.75
7	5/24/2012 13:00	5/24/2012 17:30	4.5	0.001	0.38	0.003	0.234	0.780	0.24	0.585	0.359	0.192	5/24/2012 14:00	5/24/2012 14:45	0.75
8	5/27/2012 4:30	5/28/2012 5:00	24.5	0.014	0.71	0.020	0.404	0.850	0.23	0.672	0.410	0.186	5/27/2012 4:30	5/27/2012 7:00	2.5
9	5/29/2012 18:30	5/30/2012 13:45	19.25	0.009	0.54	0.017	0.393	1.08	0.31	0.650	0.419	0.170	5/29/2012 20:00	5/30/2012 3:15	7.25
10	6/1/2012 19:30	6/2/2012 18:00	22.5	0.013	0.48	0.027	0.218	0.858	0.09	0.679	0.419	0.183	6/1/2012 19:30	6/2/2012 2:15	6.75
11	6/12/2012 9:30	6/13/2012 11:30	26	0.014	0.73	0.019	0.217	0.876	0.06	0.679	0.429	0.179	6/12/2012 9:30	6/12/2012 23:15	13.75
12	6/22/2012 16:45	6/23/2012 17:30	24.75	0.011	0.90	0.012	0.293	0.939	0.28	0.668	0.423	0.187	6/22/2012 17:00	6/22/2012 22:30	5.5
13	7/15/2012 20:15	7/16/2012 19:30	23.25	0.008	0.96	0.008	0.430	1.04	0.56	0.587	0.368	0.173	7/15/2012 21:30	7/15/2012 23:45	2.25
14	7/19/2012 23:45	7/20/2012 23:15	23.5	0.012	1.16	0.010	0.582	1.02	0.48	0.598	0.359	0.173	7/19/2012 23:45	7/20/2012 9:30	9.75
15	8/5/2012 18:30	8/6/2012 18:45	24.25	0.011	0.70	0.016	0.218	0.730	0.15	0.542	0.303	0.177	8/5/2012 18:30	8/6/2012 2:00	7.5
16	8/11/2012 17:45	8/12/2012 17:30	23.75	0.012	0.72	0.017	0.351	0.915	0.21	0.565	0.311	0.188	8/11/2012 17:45	8/11/2012 22:15	4.5
17	8/14/2012 8:45	8/15/2012 16:15	31.5	0.014	0.78	0.018	0.870	1.42	0.23	0.557	0.317	0.181	8/14/2012 10:00	8/15/2012 16:00	30
18	8/17/2012 21:00	8/18/2012 16:45	19.75	0.004	0.71	0.006	0.234	0.821	0.15	0.544	0.343	0.173	8/17/2012 22:00	8/18/2012 7:15	9.25
19	8/27/2012 8:30	8/28/2012 16:00	31.5	0.008	0.74	0.011	0.273	0.770	0.18	0.473	0.258	0.182	8/27/2012 8:45	8/28/2012 7:15	22.5
20	9/3/2012 8:30	9/5/2012 23:30	63	0.036	2.43	0.015	0.419	0.820	0.35	0.485	0.223	0.186	9/3/2012 9:30	9/5/2012 14:15	52.75
21	9/8/2012 16:45	9/9/2012 12:45	20	0.005	0.27	0.020	0.144	0.640	0.04	0.467	0.258	0.173	9/8/2012 17:00	9/8/2012 22:30	5.5
22	9/18/2012 2:30	9/19/2012 21:15	42.75	0.009	1.00	0.009	0.358	0.840	0.23	0.475	0.263	0.183	9/18/2012 2:45	9/19/2012 1:45	23
23	10/19/2012 9:15	10/19/2012 19:15	10	0.001	0.57	0.003	0.168	0.620	0.15	0.465	0.246	0.200	10/19/2012 9:45	10/19/2012 14:00	4.25
24	10/28/2012 15:15	10/31/2012 6:15	63	0.029	2.80	0.010	0.483	0.920	0.15	0.483	0.250	0.173	10/28/2012 16:00	10/30/2012 20:00	52
25	11/7/2012 11:30	11/8/2012 3:45	16.25	0.004	0.45	0.008	0.115	0.645	0.02	0.482	0.283	0.171	11/7/2012 11:45	11/8/2012 1:15	13.5
26	11/27/2012 6:00	11/28/2012 4:30	22.5	0.006	0.64	0.010	0.114	0.634	0.02	0.480	0.260	0.182	11/27/2012 6:00	11/27/2012 15:45	9.75
27	12/7/2012 21:45	12/8/2012 5:45	8	0.002	0.24	0.008	0.079	0.507	0.05	0.374	0.272	0.070	12/7/2012 21:45	12/8/2012 1:45	4
28	12/9/2012 8:30	12/10/2012 16:00	31.5	0.010	0.31	0.031	0.194	0.758	0.04	0.528	0.286	0.203	12/9/2012 8:45	12/9/2012 23:30	14.75
29	12/20/2012 21:00	12/22/2012 17:30	44.5	0.026	2.02	0.013	0.326	0.921	0.20	0.568	0.314	0.175	12/20/2012 21:00	12/21/2012 7:15	10.25
30	12/26/2012 13:15	12/27/2012 19:15	30	0.017	1.16	0.015	0.219	0.697	0.10	0.526	0.266	0.184	12/26/2012 13:15	12/27/2012 9:15	20
31	1/11/2013 15:45	1/12/2013 6:00	14.25	0.004	0.40	0.011	0.163	0.664	0.05	0.464	0.285	0.139	1/11/2013 16:00	1/11/2013 21:00	5
32	1/14/2013 21:00	1/15/2013 14:45	17.75	0.004	0.39	0.011	0.117	0.619	0.04	0.472	0.281	0.158	1/14/2013 21:00	1/15/2013 2:30	5.5
33	1/15/2013 21:30	1/17/2013 18:45	45.25	0.021	1.04	0.020	0.171	0.685	0.07	0.521	0.288	0.172	1/15/2013 21:30	1/16/2013 12:15	14.75
34	1/30/2013 18:00	2/1/2013 19:45	49.75	0.023	1.30	0.018	0.344	0.744	0.22	0.570	0.330	0.178	1/30/2013 18:00	2/1/2013 10:00	40
35	2/8/2013 6:15	2/9/2013 5:30	23.25	0.004	0.34	0.013	0.107	0.696	0.02	0.510	0.314	0.171	2/8/2013 6:30	2/9/2013 3:15	20.75
36	2/26/2013 19:15	2/27/2013 21:45	26.5	0.011	0.68	0.017	0.163	0.669	0.08	0.490	0.248	0.186	2/26/2013 19:15	2/27/2013 11:15	16

MC_1 CheltenhamTownship

Cheltenham Avenue

Pipe Size: 16" dia. Tributary Drainage Area: 203 acres Tributary Service Population: 3,533

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	3/12/2013 3:00	3/13/2013 23:15	44.25	0.022	1.06	0.021	0.219	0.790	0.07	0.606	0.353	0.187	3/12/2013 3:00	3/13/2013 17:00	38
38	3/18/2013 18:00	3/19/2013 23:00	29	0.013	0.89	0.015	0.202	0.811	0.05	0.595	0.347	0.189	3/18/2013 18:00	3/19/2013 11:15	17.25
39	3/25/2013 5:15	3/26/2013 2:45	21.5	0.014	0.60	0.023	0.215	0.810	0.04	0.664	0.383	0.195	3/25/2013 5:15	3/25/2013 20:15	15
		Average:	26.2	0.011	0.87	0.014	0.293	0.839	0.15	0.566	0.335	0.175			14.4
		Maximum Value:	63.0	0.036	2.80	0.031	0.903	1.42	0.56	0.736	0.475	0.205			52.8
		Minimum Value:	4.5	0.001	0.18	0.003	0.079	0.507	0.02	0.374	0.223	0.070			0.75
		Standard Deviation:	14.3	0.008	0.68	0.007	0.181	0.191	0.13	0.088	0.070	0.025			12.9
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_1 CheltenhamTownship

Cheltenham Avenue

Pipe Size: 16" dia. Tributary Drainage Area: 203 acres Tributary Service Population: 3,533

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 8:45	12.5	0.004	0.52	0.007	0.179	0.902	0.21	0.605	0.387	0.178	4/10/2013 20:15	4/10/2013 23:45	3.5
2	4/12/2013 7:00	4/13/2013 22:45	39.75	0.018	0.96	0.019	0.183	0.874	0.11	0.669	0.370	0.238	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:30	4/20/2013 17:30	20	0.009	0.56	0.016	0.160	0.756	0.06	0.581	0.311	0.210	4/19/2013 21:30	4/20/2013 2:45	5.25
4	4/29/2013 1:15	4/29/2013 22:30	21.25	0.010	0.49	0.021	0.582	1.10	0.02	0.549	0.259	0.225	4/29/2013 1:15	4/29/2013 22:15	21
5	5/7/2013 22:00	5/10/2013 3:00	53	0.016	1.32	0.012	0.366	0.944	0.19	0.593	0.348	0.204	5/7/2013 22:15	5/9/2013 6:45	32.5
6	5/10/2013 22:30	5/12/2013 12:45	38.25	0.022	1.12	0.020	0.301	0.837	0.13	0.665	0.385	0.204	5/10/2013 22:30	5/12/2013 6:15	31.75
7	5/23/2013 16:00	5/24/2013 20:30	28.5	0.006	0.81	0.008	0.252	0.841	0.27	0.626	0.372	0.225	5/23/2013 16:15	5/24/2013 15:30	23.25
8	5/28/2013 9:15	5/28/2013 16:30	7.25	0.004	0.29	0.013	0.183	0.764	0.03	0.653	0.359	0.226	5/28/2013 9:30	5/28/2013 16:15	6.75
9	6/3/2013 0:30	6/4/2013 2:15	25.75	0.004	1.39	0.003	0.300	0.970	0.33	0.558	0.334	0.201	6/3/2013 0:30	6/3/2013 17:15	16.75
10	6/6/2013 19:00	6/9/2013 0:45	53.75	0.022	3.53	0.006	0.475	0.988	0.26	0.583	0.310	0.219	6/6/2013 19:15	6/8/2013 2:00	30.75
11	6/13/2013 8:15	6/14/2013 0:30	16.25	0.009	0.54	0.016	0.213	0.941	0.29	0.772	0.453	0.249	6/13/2013 9:30	6/14/2013 0:15	14.75
12	6/18/2013 12:45	6/19/2013 5:45	17	0.003	0.32	0.009	0.074	0.862	0.04	0.665	0.454	0.190	6/18/2013 12:45	6/18/2013 20:45	8
13	6/26/2013 19:30	6/27/2013 6:00	10.5	0.004	0.39	0.010	0.311	1.08	0.19	0.626	0.426	0.150	6/26/2013 20:30	6/26/2013 23:30	3
14	6/27/2013 17:00	6/28/2013 5:00	12	0.009	1.17	0.008	0.405	1.16	0.39	0.704	0.425	0.177	6/27/2013 17:30	6/27/2013 21:45	4.25
15	7/12/2013 15:30	7/14/2013 4:00	36.5	0.010	1.07	0.009	0.194	0.852	0.15	0.645	0.398	0.212	7/12/2013 15:30	7/13/2013 20:00	28.5
16	7/22/2013 18:30	7/24/2013 6:45	36.25	0.009	1.33	0.007	0.454	0.901	0.33	0.633	0.398	0.201	7/22/2013 18:30	7/23/2013 18:00	23.5
17	8/1/2013 6:15	8/2/2013 18:00	35.75	0.015	0.78	0.019	0.175	0.750	0.10	0.582	0.299	0.227	8/1/2013 6:30	8/1/2013 15:15	8.75
18	8/7/2013 23:00	8/8/2013 18:00	19	0.006	0.53	0.011	0.202	0.752	0.16	0.544	0.314	0.191	8/8/2013 0:30	8/8/2013 16:30	16
19	8/13/2013 4:45	8/14/2013 1:30	20.75	0.015	2.39	0.006	0.787	1.51	0.67	0.691	0.350	0.245	8/13/2013 5:00	8/13/2013 9:45	4.75
20	8/22/2013 11:15	8/22/2013 22:00	10.75	0.002	0.35	0.005	0.299	0.844	0.22	0.605	0.317	0.267	8/22/2013 13:00	8/22/2013 17:00	4
21	8/28/2013 11:00	8/28/2013 21:15	10.25	0.006	1.01	0.006	0.551	1.15	0.37	0.696	0.361	0.264	8/28/2013 11:30	8/28/2013 19:15	7.75
22	9/2/2013 9:00	9/3/2013 18:45	33.75	0.011	1.05	0.011	0.374	1.01	0.31	0.660	0.394	0.222	9/2/2013 9:00	9/2/2013 13:15	4.25
23	9/12/2013 18:45	9/13/2013 9:15	14.5	0.002	0.56	0.004	0.149	0.794	0.17	0.544	0.326	0.196	9/12/2013 18:45	9/13/2013 3:15	8.5
24	9/21/2013 20:15	9/23/2013 15:00	42.75	0.023	1.06	0.022	0.295	0.881	0.21	0.578	0.299	0.207	9/21/2013 20:15	9/22/2013 4:00	7.75
25	10/6/2013 15:30	10/6/2013 22:45	7.25	0.004	0.24	0.016	0.167	0.685	0.17	0.574	0.229	0.274	10/6/2013 16:30	10/6/2013 17:45	1.25
26	10/7/2013 12:45	10/8/2013 13:00	24.25	0.004	0.57	0.008	0.185	0.709	0.11	0.457	0.219	0.214	10/7/2013 12:45	10/7/2013 17:00	4.25
27	10/10/2013 3:45	10/10/2013 21:00	17.25	0.005	0.36	0.014	0.147	0.675	0.04	0.518	0.228	0.251	10/10/2013 3:45	10/10/2013 14:45	11
28	10/11/2013 3:15	10/13/2013 6:00	50.75	0.032	1.35	0.024	0.303	0.824	0.15	0.551	0.261	0.207	10/11/2013 3:30	10/11/2013 18:30	15
29	11/26/2013 14:00	11/28/2013 16:15	50.25	0.039	2.85	0.014	0.417	0.811	0.16	0.547	0.230	0.215	11/26/2013 14:00	11/27/2013 17:30	27.5
30	12/6/2013 2:15	12/8/2013 0:00	45.75	0.024	1.00	0.024	0.201	0.748	0.05	0.543	0.249	0.225	12/6/2013 2:15	12/7/2013 2:30	24.25
31	12/8/2013 11:30	12/11/2013 23:30	84	0.045	1.47	0.031	0.273	0.807	0.06	0.528	0.234	0.223	12/8/2013 11:45	12/11/2013 6:45	67
32	12/14/2013 16:00	12/16/2013 15:00	47	0.036	0.84	0.042	0.310	0.934	0.09	0.585	0.270	0.214	12/14/2013 16:15	12/15/2013 1:00	8.75
33	12/23/2013 4:00	12/24/2013 17:00	37	0.009	0.54	0.016	0.192	0.701	0.10	0.534	0.281	0.222	12/23/2013 4:15	12/23/2013 19:45	15.5
34	12/29/2013 8:15	12/30/2013 16:15	32	0.035	1.20	0.030	0.560	1.14	0.09	0.667	0.285	0.235	12/29/2013 8:15	12/29/2013 16:15	8
35	1/2/2014 17:45	1/3/2014 5:30	11.75	0.012	0.33	0.036	0.278	0.913	0.02	0.627	0.325	0.169	1/2/2014 17:45	1/3/2014 4:30	10.75
36	1/5/2014 5:45	1/7/2014 20:00	62.25	0.045	0.92	0.049	0.306	1.02	0.10	0.702	0.375	0.231	1/5/2014 5:45	1/6/2014 13:00	31.25

MC_1 CheltenhamTownship

Cheltenham Avenue

Pipe Size: 16" dia. Tributary Drainage Area: 203 acres Tributary Service Population: 3,533

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	1/10/2014 7:30	1/13/2014 6:45	71.25	0.049	1.02	0.048	0.477	1.25	0.07	0.746	0.438	0.216	1/10/2014 7:30	1/12/2014 0:15	40.75
38	1/21/2014 10:15	1/22/2014 20:45	34.5	0.010	0.65	0.015	0.221	0.907	0.03	0.680	0.414	0.228	1/21/2014 10:15	1/21/2014 21:15	11
39	2/3/2014 2:15	2/7/2014 17:30	111.25	0.046	2.78	0.017	0.270	0.746	0.10	0.443	0.175	0.213	2/3/2014 2:15	2/5/2014 12:15	58
40	2/13/2014 0:30	2/15/2014 18:30	66	0.045	1.83	0.025	0.261	0.849	0.08	0.631	0.327	0.214	2/13/2014 0:30	2/15/2014 16:30	64
41	3/19/2014 14:15	3/22/2014 19:15	77	0.033	0.87	0.039	0.531	0.815	0.11	0.542	0.263	0.221	3/19/2014 14:15	3/19/2014 22:00	7.75
42	3/29/2014 9:30	4/13/2014 14:00	364.5	0.378	3.64	0.104	0.584	1.21	0.16	0.757	0.402	0.217	3/29/2014 9:30	4/8/2014 6:30	237
43	4/15/2014 9:45	4/16/2014 18:45	33	0.006	1.04	0.006	0.297	0.990	0.14	0.705	0.459	0.222	4/15/2014 9:45	4/15/2014 23:30	13.75
44	4/25/2014 19:00	4/26/2014 19:30	24.5	0.011	0.49	0.023	0.195	0.969	0.11	0.713	0.425	0.228	4/25/2014 19:15	4/26/2014 1:15	6
45	4/29/2014 13:00	5/14/2014 10:15	357.25	0.692	6.04	0.115	1.85	2.26	0.35	0.880	0.408	0.216	4/29/2014 13:15	5/11/2014 0:00	274.75
46	5/16/2014 8:00	5/17/2014 16:15	32.25	0.015	1.62	0.009	0.347	0.965	0.15	0.682	0.393	0.228	5/16/2014 8:00	5/16/2014 18:15	10.25
47	5/22/2014 16:00	5/23/2014 18:00	26	0.013	0.55	0.024	0.595	1.20	0.36	0.628	0.344	0.217	5/22/2014 17:30	5/23/2014 2:30	9
48	5/27/2014 18:00	5/29/2014 13:30	43.5	0.019	1.35	0.014	0.341	0.874	0.21	0.569	0.301	0.212	5/27/2014 18:00	5/28/2014 15:45	21.75
49	6/9/2014 1:15	6/10/2014 18:00	40.75	0.037	2.05	0.018	2.05	2.61	0.54	0.604	0.274	0.209	6/9/2014 1:15	6/10/2014 8:15	31
50	6/13/2014 0:00	6/14/2014 19:00	43	0.033	0.93	0.036	0.647	0.973	0.24	0.611	0.296	0.214	6/13/2014 0:30	6/13/2014 17:45	17.25
51	6/25/2014 16:15	6/26/2014 18:00	25.75	0.016	0.72	0.022	0.321	0.828	0.14	0.621	0.321	0.218	6/25/2014 16:15	6/26/2014 2:00	9.75
		Average:	47.8	0.038	1.19	0.021	0.388	0.978	0.18	0.621	0.335	0.217			26.8
		Maximum Value:	364.5	0.692	6.04	0.115	2.05	2.61	0.67	0.880	0.459	0.274			274.8
		Minimum Value:	7.3	0.002	0.24	0.003	0.074	0.675	0.02	0.443	0.175	0.150			1.25
		Standard Deviation:	67.3	0.107	1.04	0.021	0.354	0.342	0.13	0.081	0.070	0.023			49.2
		Weighted Mean R-Value*:				0.032									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_2 Cheltenham Township

Tookany Circle

Pipe Size: 36" dia. Tributary Drainage Area: 8,444 acres Tributary Service Population: 64,742

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/22/2012 8:15	4/25/2012 0:00	63.75	0.020	2.15	0.009	7.83	19.8	0.12	12.5	6.83	3.93	4/22/2012 8:15	4/23/2012 18:00	33.75
2	5/1/2012 4:00	5/1/2012 14:15	10.25	0.002	0.30	0.006	2.65	13.6	0.07	11.1	6.63	3.51	5/1/2012 4:15	5/1/2012 10:00	5.75
3	5/4/2012 21:15	5/5/2012 2:15	5	0.001	0.28	0.003	2.51	13.0	0.12	10.6	6.11	3.72	5/4/2012 21:45	5/4/2012 23:45	2
4	5/9/2012 2:30	5/9/2012 13:15	10.75	0.003	0.33	0.008	3.68	14.2	0.07	11.2	6.77	3.07	5/9/2012 3:00	5/9/2012 7:15	4.25
5	5/9/2012 21:45	5/11/2012 0:00	26.25	0.005	0.19	0.028	3.84	13.8	0.02	11.3	6.68	3.57	5/9/2012 21:45	5/10/2012 4:00	6.25
6	5/15/2012 8:30	5/18/2012 0:30	64	0.021	2.46	0.009	9.09	17.2	0.25	12.4	6.90	3.72	5/15/2012 8:45	5/16/2012 4:30	19.75
7	5/21/2012 1:30	5/21/2012 10:45	9.25	0.002	0.22	0.009	2.14	13.7	0.06	10.8	7.08	2.56	5/21/2012 1:45	5/21/2012 10:30	8.75
8	5/22/2012 2:00	5/22/2012 13:15	11.25	0.003	0.19	0.015	2.80	14.3	0.02	11.6	7.22	3.01	5/22/2012 2:00	5/22/2012 9:45	7.75
9	5/24/2012 7:15	5/25/2012 19:30	36.25	0.007	0.56	0.012	4.31	15.6	0.22	12.2	7.37	3.82	5/24/2012 7:15	5/25/2012 4:15	21
10	5/27/2012 4:30	5/28/2012 6:30	26	0.007	0.98	0.007	10.7	18.8	0.28	12.4	7.26	3.63	5/27/2012 4:30	5/27/2012 7:00	2.5
11	5/29/2012 20:00	5/30/2012 23:45	27.75	0.005	0.40	0.012	3.37	15.4	0.22	12.0	7.43	3.63	5/29/2012 20:00	5/30/2012 3:30	7.5
12	6/1/2012 20:00	6/2/2012 13:00	17	0.004	0.47	0.008	2.64	14.2	0.08	11.8	7.23	3.34	6/1/2012 20:00	6/2/2012 2:15	6.25
13	6/12/2012 9:30	6/13/2012 14:15	28.75	0.007	0.68	0.010	3.37	14.4	0.05	11.5	6.54	3.68	6/12/2012 9:30	6/12/2012 23:15	13.75
14	6/22/2012 17:00	6/23/2012 9:00	16	0.003	0.58	0.005	3.43	13.1	0.16	9.98	6.14	2.93	6/22/2012 17:00	6/22/2012 22:30	5.5
15	7/14/2012 3:45	7/14/2012 22:45	19	0.003	0.25	0.012	4.00	11.7	0.04	10.1	5.04	4.23	7/14/2012 3:45	7/14/2012 12:45	9
16	7/15/2012 21:30	7/17/2012 10:30	37	0.006	0.92	0.007	5.45	15.3	0.56	9.56	5.29	3.31	7/15/2012 21:30	7/16/2012 0:00	2.5
17	7/19/2012 23:45	7/21/2012 10:00	34.25	0.008	0.95	0.009	6.77	13.1	0.33	9.75	5.29	3.15	7/19/2012 23:45	7/20/2012 9:30	9.75
18	7/26/2012 19:45	7/27/2012 16:15	20.5	0.003	0.29	0.011	3.62	10.8	0.13	9.05	4.76	3.42	7/26/2012 20:00	7/27/2012 0:15	4.25
19	8/5/2012 18:30	8/6/2012 22:30	28	0.006	0.64	0.010	4.20	11.7	0.17	9.98	5.01	3.77	8/5/2012 18:30	8/6/2012 2:00	7.5
20	8/10/2012 9:45	8/10/2012 18:45	9	0.002	0.54	0.003	2.90	12.7	0.17	10.7	5.28	4.35	8/10/2012 9:45	8/10/2012 12:15	2.5
21	8/11/2012 17:30	8/12/2012 10:30	17	0.002	0.93	0.002	3.15	12.1	0.21	9.03	5.02	3.32	8/11/2012 17:45	8/11/2012 22:15	4.5
22	8/14/2012 10:00	8/15/2012 22:00	36	0.005	0.88	0.006	3.20	13.3	0.17	10.2	5.62	3.79	8/14/2012 10:15	8/15/2012 18:00	31.75
23	8/17/2012 22:00	8/18/2012 13:30	15.5	0.006	0.69	0.009	4.98	11.6	0.15	10.3	4.95	3.24	8/17/2012 22:15	8/18/2012 7:15	9
24	8/27/2012 8:00	8/28/2012 22:45	38.75	0.008	0.75	0.010	4.85	14.6	0.27	10.1	5.14	3.86	8/27/2012 8:00	8/28/2012 7:15	23.25
25	9/3/2012 9:30	9/5/2012 23:45	62.25	0.024	2.50	0.010	11.6	17.1	0.40	10.8	5.03	3.70	9/3/2012 9:30	9/5/2012 14:15	52.75
26	9/8/2012 16:45	9/9/2012 1:15	8.5	0.001	0.27	0.002	2.42	12.2	0.04	10.1	4.98	4.73	9/8/2012 17:00	9/8/2012 22:30	5.5
27	9/18/2012 3:30	9/18/2012 12:15	8.75	0.002	0.23	0.010	4.17	11.2	0.09	9.53	4.95	3.15	9/18/2012 3:30	9/18/2012 10:15	6.75
28	9/18/2012 17:00	9/19/2012 13:30	20.5	0.005	0.79	0.007	3.54	13.1	0.24	9.72	4.93	3.42	9/18/2012 17:00	9/18/2012 21:00	4
29	10/2/2012 10:15	10/2/2012 22:15	12	0.001	0.23	0.006	2.33	11.6	0.06	9.89	4.95	4.33	10/2/2012 10:15	10/2/2012 15:45	5.5
30	10/15/2012 12:45	10/15/2012 22:00	9.25	0.001	0.31	0.005	1.86	9.64	0.06	8.71	3.57	4.27	10/15/2012 12:45	10/15/2012 20:45	8
31	10/19/2012 9:30	10/19/2012 22:15	12.75	0.003	0.60	0.004	4.02	12.0	0.13	8.81	3.24	4.42	10/19/2012 9:30	10/19/2012 14:15	4.75
32	10/29/2012 6:30	10/31/2012 16:00	57.5	0.019	2.56	0.008	9.63	17.3	0.15	9.15	3.63	3.65	10/29/2012 6:30	10/30/2012 20:15	37.75
33	11/7/2012 11:30	11/8/2012 5:15	17.75	0.004	0.44	0.009	3.23	10.3	0.02	8.56	3.94	3.43	11/7/2012 11:45	11/8/2012 1:15	13.5
34	11/13/2012 2:30	11/13/2012 19:00	16.5	0.004	0.28	0.016	4.13	10.5	0.04	8.46	3.59	3.43	11/13/2012 2:45	11/13/2012 12:00	9.25
35	12/7/2012 21:45	12/8/2012 8:00	10.25	0.002	0.25	0.007	2.70	10.5	0.05	8.62	5.49	2.12	12/7/2012 21:45	12/8/2012 1:45	4
36	12/9/2012 8:45	12/10/2012 16:45	32	0.006	0.32	0.018	3.98	13.4	0.04	10.7	5.54	4.15	12/9/2012 8:45	12/10/2012 2:15	17.5

MC_2 Cheltenham Township

Tookany Circle

Pipe Size: 36" dia. Tributary Drainage Area: 8,444 acres Tributary Service Population: 64,742

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	12/18/2012 0:45	12/18/2012 23:45	23	0.003	0.36	0.007	3.33	11.9	0.11	10.2	6.06	3.53	12/18/2012 0:45	12/18/2012 15:30	14.75
38	12/20/2012 21:00	12/22/2012 19:45	46.75	0.022	2.06	0.011	8.72	19.3	0.20	12.2	5.91	3.70	12/20/2012 21:00	12/21/2012 7:30	10.5
39	12/26/2012 13:30	12/27/2012 19:30	30	0.014	1.15	0.012	5.87	15.8	0.10	12.1	5.98	3.64	12/26/2012 13:30	12/27/2012 9:15	19.75
40	12/29/2012 11:15	12/30/2012 2:15	15	0.001	0.23	0.007	2.00	12.7	0.02	11.4	5.92	4.90	12/29/2012 11:15	12/29/2012 16:00	4.75
41	1/15/2013 21:30	1/18/2013 18:30	69	0.020	1.04	0.019	8.09	13.9	0.06	10.9	5.80	3.48	1/15/2013 21:30	1/18/2013 6:15	56.75
42	1/30/2013 18:00	2/1/2013 22:45	52.75	0.013	1.32	0.010	6.38	13.9	0.23	11.4	6.43	3.60	1/30/2013 18:00	2/1/2013 10:00	40
43	2/8/2013 6:00	2/9/2013 7:45	25.75	0.004	0.35	0.012	3.61	12.7	0.02	10.5	6.14	3.45	2/8/2013 6:00	2/9/2013 3:15	21.25
44	2/11/2013 4:15	2/12/2013 16:30	36.25	0.008	0.38	0.022	4.23	13.6	0.04	11.0	6.16	3.57	2/11/2013 4:15	2/11/2013 8:45	4.5
45	2/26/2013 19:15	2/28/2013 14:30	43.25	0.013	0.70	0.018	6.78	14.2	0.08	11.1	6.07	3.45	2/26/2013 19:15	2/28/2013 8:15	37
46	3/12/2013 3:00	3/13/2013 16:45	37.75	0.015	1.05	0.014	5.43	16.1	0.07	12.1	6.48	3.47	3/12/2013 3:00	3/12/2013 16:30	13.5
47	3/18/2013 17:45	3/20/2013 8:30	38.75	0.012	0.89	0.013	4.93	15.5	0.05	12.0	7.05	3.31	3/18/2013 17:45	3/19/2013 18:45	25
48	3/25/2013 5:15	3/26/2013 18:45	37.5	0.007	0.58	0.013	3.28	14.3	0.04	12.0	7.23	3.69	3/25/2013 5:15	3/25/2013 20:15	15
		Average:	27.7	0.007	0.74	0.010	4.62	13.8	0.13	10.6	5.76	3.61			14.2
		Maximum Value:	69.0	0.024	2.56	0.028	11.6	19.8	0.56	12.5	7.43	4.90			56.8
		Minimum Value:	5.0	0.001	0.19	0.002	1.86	9.64	0.02	8.46	3.24	2.12			2.00
		Standard Deviation:	16.9	0.006	0.63	0.005	2.35	2.32	0.11	1.17	1.09	0.50			13.2
		Weighted Mean R-Value*:				0.010									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_2 CheltenhamTownship
Tookany Circle
Pipe Size: 36" dia. Tributary Drainage Area: 8,444 acres Tributary Service Population: 64,742

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 6:00	9.75	0.001	0.57	0.002	2.04	13.7	0.18	10.9	9.00	1.17	4/10/2013 20:15	4/10/2013 23:45	3.5
2	4/12/2013 7:15	4/13/2013 19:15	36	0.006	0.99	0.006	3.57	15.4	0.13	12.2	8.72	2.58	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:30	4/20/2013 17:30	20	0.003	0.55	0.005	3.13	14.0	0.05	12.1	8.96	2.45	4/19/2013 21:30	4/20/2013 2:45	5.25
4	4/29/2013 1:45	4/30/2013 1:30	23.75	0.003	0.48	0.007	2.33	14.0	0.03	11.7	9.10	1.86	4/29/2013 2:00	4/30/2013 1:15	23.25
5	5/9/2013 1:30	5/10/2013 11:00	33.5	0.005	0.52	0.010	3.41	14.1	0.08	11.4	8.85	1.75	5/9/2013 1:30	5/9/2013 6:45	5.25
6	5/10/2013 22:30	5/11/2013 21:00	22.5	0.005	1.01	0.005	4.15	14.0	0.13	11.9	8.18	2.56	5/10/2013 22:30	5/11/2013 19:30	21
7	5/18/2013 16:00	5/19/2013 22:45	30.75	0.001	0.33	0.003	2.44	14.1	0.03	11.2	8.45	2.63	5/18/2013 16:15	5/19/2013 16:45	24.5
8	5/28/2013 9:30	5/28/2013 21:30	12	0.001	0.27	0.004	1.62	12.8	0.03	11.8	8.90	2.34	5/28/2013 9:30	5/28/2013 16:30	7
9	6/3/2013 5:45	6/4/2013 0:00	18.25	0.003	1.13	0.002	6.26	14.6	0.29	9.72	6.64	2.27	6/3/2013 5:45	6/3/2013 17:15	11.5
10	6/6/2013 19:15	6/10/2013 4:00	80.75	0.042	3.57	0.012	10.4	18.8	0.23	11.3	6.14	2.28	6/6/2013 19:15	6/8/2013 2:00	30.75
11	6/10/2013 7:00	6/15/2013 18:15	131.25	0.045	2.38	0.019	9.17	18.2	0.34	11.0	7.09	2.03	6/10/2013 7:15	6/14/2013 19:15	108
12	6/18/2013 12:30	6/19/2013 2:00	13.5	0.003	0.32	0.010	2.46	12.1	0.06	10.5	7.24	2.01	6/18/2013 12:30	6/18/2013 20:45	8.25
13	6/27/2013 17:45	6/29/2013 0:30	30.75	0.006	1.24	0.005	6.72	15.5	0.40	9.27	6.06	2.10	6/27/2013 17:45	6/28/2013 21:30	27.75
14	6/30/2013 12:30	6/30/2013 23:45	11.25	0.001	0.24	0.006	1.82	10.6	0.03	9.36	5.75	2.96	6/30/2013 12:30	6/30/2013 23:30	11
15	7/1/2013 5:30	7/1/2013 21:30	16	0.003	0.29	0.009	2.07	10.8	0.10	9.25	6.12	2.27	7/1/2013 5:45	7/1/2013 15:00	9.25
16	7/12/2013 15:45	7/13/2013 9:00	17.25	0.004	0.85	0.004	3.76	11.7	0.13	8.43	5.40	1.86	7/12/2013 15:45	7/12/2013 23:15	7.5
17	7/13/2013 16:15	7/14/2013 0:00	7.75	0.001	0.21	0.005	4.19	12.7	0.07	9.00	5.17	3.12	7/13/2013 16:15	7/13/2013 19:45	3.5
18	7/22/2013 18:30	7/24/2013 12:30	42	0.006	1.13	0.005	7.36	13.5	0.35	8.27	5.68	1.81	7/22/2013 18:30	7/23/2013 17:45	23.25
19	7/28/2013 15:00	7/30/2013 0:00	33	0.004	0.34	0.012	2.81	11.1	0.06	8.31	5.51	2.10	7/28/2013 15:15	7/29/2013 2:30	11.25
20	8/1/2013 6:30	8/2/2013 9:15	26.75	0.004	0.74	0.006	3.24	11.1	0.09	8.50	5.72	1.93	8/1/2013 6:30	8/1/2013 15:15	8.75
21	8/8/2013 0:00	8/8/2013 8:15	8.25	0.001	0.37	0.003	3.29	9.72	0.11	7.10	5.43	0.902	8/8/2013 0:15	8/8/2013 3:00	2.75
22	8/13/2013 5:00	8/14/2013 22:45	41.75	0.012	2.50	0.005	10.1	18.0	0.56	8.75	5.18	2.00	8/13/2013 5:00	8/13/2013 9:45	4.75
23	8/22/2013 5:45	8/23/2013 4:30	22.75	0.002	0.55	0.004	2.14	9.61	0.16	7.72	5.24	1.94	8/22/2013 6:00	8/22/2013 17:00	11
24	8/28/2013 9:45	8/29/2013 20:00	34.25	0.005	0.95	0.005	5.55	13.0	0.36	7.95	5.18	1.98	8/28/2013 9:45	8/28/2013 19:15	9.5
25	9/2/2013 9:15	9/3/2013 22:00	36.75	0.010	0.93	0.011	8.48	15.7	0.31	8.20	4.72	2.02	9/2/2013 9:30	9/2/2013 14:45	5.25
26	9/12/2013 18:45	9/13/2013 21:15	26.5	0.004	0.60	0.007	3.85	9.91	0.18	7.62	4.77	2.04	9/12/2013 18:45	9/13/2013 3:15	8.5
27	9/21/2013 20:00	9/22/2013 18:45	22.75	0.005	1.11	0.004	4.17	11.5	0.20	7.72	4.11	2.48	9/21/2013 20:00	9/22/2013 3:30	7.5
28	10/6/2013 16:30	10/7/2013 10:00	17.5	0.003	0.36	0.009	3.14	10.6	0.10	7.63	4.72	1.90	10/6/2013 16:30	10/7/2013 9:45	17.25
29	10/7/2013 11:00	10/8/2013 8:45	21.75	0.005	0.59	0.008	4.13	10.8	0.12	7.81	4.81	1.74	10/7/2013 11:00	10/7/2013 17:00	6
30	10/10/2013 3:45	10/10/2013 22:45	19	0.002	0.32	0.005	1.46	8.93	0.03	7.33	4.77	2.08	10/10/2013 3:45	10/10/2013 14:45	11
31	10/11/2013 2:15	10/13/2013 1:00	46.75	0.013	1.34	0.010	6.13	13.0	0.15	8.28	4.37	2.39	10/11/2013 2:15	10/11/2013 18:30	16.25
		Average:	29.5	0.007	0.86	0.007	4.37	13.0	0.16	9.43	6.32	2.11			15.0
		Maximum Value:	131.3	0.045	3.57	0.019	10.4	18.8	0.56	12.2	9.10	3.12			108.0
		Minimum Value:	7.8	0.001	0.21	0.002	1.46	8.93	0.03	7.10	4.11	0.902			2.75

MC_2 CheltenhamTownship

Tookany Circle

Pipe Size: 36" dia. Tributary Drainage Area: 8,444 acres Tributary Service Population: 64,742

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
		Standard Deviation:	23.8	0.010	0.75	0.004	2.53	2.55	0.13	1.68	1.63	0.443			18.8
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_3 CheltenhamTownship

Filmore Street

Pipe Size: 10" dia. Tributary Drainage Area: 139 acres Tributary Service Population: 1,208

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/22/2012 8:45	4/23/2012 19:45	35	0.014	2.08	0.007	0.100	0.377	0.13	0.300	0.162	0.102	4/22/2012 8:45	4/23/2012 17:30	32.75
2	5/15/2012 8:30	5/18/2012 18:30	82	0.059	2.91	0.020	0.320	0.555	0.50	0.323	0.168	0.089	5/15/2012 8:45	5/16/2012 4:30	19.75
3	5/24/2012 12:45	5/24/2012 17:15	4.5	0.002	0.39	0.005	0.095	0.371	0.29	0.322	0.179	0.102	5/24/2012 14:00	5/24/2012 14:45	0.75
4	5/27/2012 4:15	5/27/2012 10:30	6.25	0.009	0.68	0.013	0.250	0.474	0.24	0.380	0.172	0.082	5/27/2012 4:15	5/27/2012 7:00	2.75
5	5/29/2012 20:00	5/30/2012 7:15	11.25	0.005	0.40	0.013	0.115	0.375	0.27	0.311	0.212	0.057	5/29/2012 20:00	5/30/2012 3:30	7.5
6	6/12/2012 9:30	6/13/2012 23:45	38.25	0.027	0.73	0.037	0.192	0.600	0.06	0.445	0.287	0.094	6/12/2012 9:45	6/12/2012 23:15	13.5
7	6/22/2012 17:15	6/23/2012 19:45	26.5	0.009	0.63	0.014	0.121	0.570	0.26	0.466	0.339	0.097	6/22/2012 17:15	6/22/2012 22:30	5.25
8	7/14/2012 4:00	7/14/2012 17:30	13.5	0.004	0.25	0.015	0.082	0.470	0.04	0.374	0.242	0.108	7/14/2012 4:15	7/14/2012 12:45	8.5
9	7/15/2012 20:30	7/16/2012 23:00	26.5	0.015	0.98	0.015	0.340	0.650	0.48	0.352	0.215	0.086	7/15/2012 21:30	7/16/2012 0:00	2.5
10	7/20/2012 0:30	7/21/2012 2:30	26	0.017	1.05	0.016	0.418	0.750	0.37	0.413	0.273	0.083	7/20/2012 0:30	7/20/2012 10:15	9.75
11	7/26/2012 19:45	7/27/2012 18:00	22.25	0.004	0.36	0.011	0.106	0.500	0.16	0.377	0.276	0.084	7/26/2012 20:00	7/27/2012 0:45	4.75
12	7/28/2012 12:45	7/29/2012 2:00	13.25	0.004	0.31	0.013	0.108	0.510	0.20	0.398	0.269	0.101	7/28/2012 13:00	7/28/2012 22:15	9.25
13	8/1/2012 16:45	8/2/2012 3:00	10.25	0.005	0.49	0.011	0.153	0.560	0.21	0.409	0.283	0.078	8/1/2012 17:00	8/1/2012 17:30	0.5
14	8/5/2012 18:30	8/7/2012 2:00	31.5	0.007	0.85	0.008	0.177	0.560	0.27	0.413	0.310	0.083	8/5/2012 18:30	8/6/2012 2:15	7.75
15	8/10/2012 10:00	8/11/2012 1:45	15.75	0.006	0.36	0.017	0.116	0.490	0.09	0.408	0.274	0.099	8/10/2012 10:15	8/10/2012 12:15	2
16	8/11/2012 16:45	8/12/2012 3:30	10.75	0.003	0.32	0.011	0.160	0.570	0.19	0.380	0.275	0.076	8/11/2012 17:15	8/11/2012 22:15	5
17	8/14/2012 10:00	8/14/2012 23:00	13	0.007	0.61	0.011	0.121	0.520	0.15	0.446	0.291	0.109	8/14/2012 10:15	8/14/2012 17:15	7
18	8/17/2012 21:00	8/19/2012 0:00	27	0.009	0.81	0.011	0.119	0.580	0.20	0.422	0.300	0.092	8/17/2012 22:00	8/18/2012 7:15	9.25
19	8/27/2012 8:00	8/29/2012 2:00	42	0.011	0.95	0.012	0.161	0.560	0.34	0.396	0.282	0.091	8/27/2012 8:00	8/28/2012 7:15	23.25
20	9/3/2012 9:15	9/7/2012 19:00	105.75	0.100	4.61	0.022	0.766	1.04	0.73	0.447	0.269	0.091	9/3/2012 9:45	9/5/2012 14:15	52.5
21	9/8/2012 16:45	9/9/2012 3:15	10.5	0.003	0.25	0.011	0.096	0.490	0.04	0.360	0.259	0.078	9/8/2012 17:00	9/8/2012 22:30	5.5
22	9/18/2012 2:30	9/19/2012 22:15	43.75	0.020	0.95	0.021	0.167	0.560	0.16	0.400	0.268	0.091	9/18/2012 2:45	9/19/2012 2:00	23.25
23	9/22/2012 19:30	9/23/2012 11:45	16.25	0.007	0.30	0.024	0.092	0.530	0.13	0.384	0.272	0.073	9/22/2012 19:30	9/22/2012 22:15	2.75
24	10/7/2012 10:30	10/7/2012 22:30	12	0.003	0.22	0.015	0.076	0.470	0.03	0.401	0.249	0.128	10/7/2012 10:30	10/7/2012 21:00	10.5
25	10/15/2012 11:15	10/15/2012 23:45	12.5	0.003	0.24	0.014	0.111	0.450	0.11	0.343	0.214	0.105	10/15/2012 11:15	10/15/2012 21:00	9.75
26	10/19/2012 8:45	10/20/2012 1:15	16.5	0.009	0.77	0.011	0.152	0.460	0.21	0.350	0.199	0.102	10/19/2012 9:45	10/19/2012 14:15	4.5
27	10/28/2012 15:45	10/31/2012 22:45	79	0.054	2.51	0.022	0.366	0.690	0.16	0.369	0.218	0.089	10/28/2012 15:45	10/30/2012 16:45	49
28	11/7/2012 11:15	11/8/2012 23:15	36	0.011	0.51	0.021	0.114	0.435	0.03	0.329	0.208	0.094	11/7/2012 11:15	11/8/2012 0:45	13.5
29	11/27/2012 6:00	11/28/2012 7:15	25.25	0.008	0.63	0.013	0.087	0.406	0.02	0.344	0.227	0.088	11/27/2012 6:00	11/27/2012 16:00	10
30	12/7/2012 21:45	12/8/2012 18:15	20.5	0.007	0.24	0.027	0.099	0.424	0.06	0.322	0.203	0.089	12/7/2012 21:45	12/8/2012 1:45	4
31	12/9/2012 8:30	12/11/2012 7:45	47.25	0.023	0.43	0.055	0.129	0.469	0.03	0.346	0.210	0.092	12/9/2012 8:45	12/11/2012 6:45	46
32	12/18/2012 0:30	12/18/2012 22:45	22.25	0.004	0.47	0.009	0.083	0.410	0.16	0.306	0.200	0.089	12/18/2012 1:00	12/18/2012 15:30	14.5
33	12/20/2012 21:15	12/25/2012 15:15	114	0.068	2.07	0.033	0.426	0.716	0.17	0.336	0.191	0.090	12/20/2012 21:30	12/24/2012 21:00	95.5
34	12/26/2012 13:15	12/30/2012 17:45	100.5	0.046	1.49	0.031	0.230	0.552	0.10	0.333	0.201	0.091	12/26/2012 13:15	12/29/2012 17:00	75.75
35	1/11/2013 13:15	1/12/2013 18:45	29.5	0.008	0.44	0.018	0.080	0.424	0.07	0.324	0.202	0.097	1/11/2013 13:15	1/11/2013 21:00	7.75

MC_3 CheltenhamTownship

Filmore Street

Pipe Size: 10" dia. Tributary Drainage Area: 139 acres Tributary Service Population: 1,208

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	1/14/2013 20:45	1/18/2013 20:15	95.5	0.033	1.44	0.023	0.145	0.452	0.07	0.329	0.211	0.087	1/14/2013 20:45	1/16/2013 12:15	39.5
37	1/30/2013 22:00	2/1/2013 19:15	45.25	0.021	1.29	0.016	0.262	0.516	0.24	0.371	0.245	0.085	1/30/2013 22:30	2/1/2013 10:00	35.5
38	2/8/2013 6:00	2/9/2013 18:15	36.25	0.007	0.40	0.016	0.099	0.497	0.02	0.352	0.235	0.100	2/8/2013 6:00	2/9/2013 3:15	21.25
39	2/11/2013 4:15	2/12/2013 23:45	43.5	0.020	0.37	0.055	0.119	0.473	0.04	0.382	0.246	0.094	2/11/2013 4:15	2/11/2013 9:00	4.75
40	2/26/2013 19:15	2/27/2013 21:30	26.25	0.011	0.68	0.015	0.116	0.485	0.08	0.373	0.248	0.089	2/26/2013 19:15	2/27/2013 11:45	16.5
41	3/8/2013 0:30	3/8/2013 23:30	23	0.007	0.25	0.028	0.108	0.461	0.03	0.379	0.261	0.090	3/8/2013 0:30	3/8/2013 13:30	13
42	3/12/2013 3:15	3/13/2013 21:30	42.25	0.019	1.04	0.018	0.120	0.487	0.09	0.401	0.268	0.093	3/12/2013 3:30	3/13/2013 17:15	37.75
43	3/18/2013 18:00	3/22/2013 19:30	97.5	0.060	0.90	0.066	0.125	0.516	0.06	0.408	0.265	0.087	3/18/2013 18:00	3/19/2013 11:15	17.25
44	3/25/2013 6:00	3/27/2013 9:45	51.75	0.015	0.59	0.025	0.111	0.510	0.04	0.400	0.285	0.089	3/25/2013 6:00	3/26/2013 21:45	39.75
		Average:	36.6	0.018	0.87	0.020	0.171	0.522	0.17	0.373	0.242	0.091			18.7
		Maximum Value:	114.0	0.100	4.61	0.066	0.766	1.04	0.73	0.466	0.339	0.128			95.5
		Minimum Value:	4.5	0.002	0.22	0.005	0.076	0.371	0.02	0.300	0.162	0.057			0.50
		Standard Deviation:	29.2	0.021	0.84	0.013	0.129	0.116	0.15	0.041	0.042	0.011			20.4
		Weighted Mean R-Value*:				0.021									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MC_3 CheltenhamTownship

Filmore Street

Pipe Size: 10" dia. Tributary Drainage Area: 139 acres Tributary Service Population: 1,208

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 19:30	4/11/2013 13:00	17.5	0.005	0.50	0.009	0.086	0.459	0.17	0.354	0.263	0.067	4/10/2013 20:30	4/11/2013 0:00	3.5
2	4/12/2013 7:00	4/14/2013 21:00	62	0.022	1.05	0.021	0.139	0.500	0.10	0.392	0.276	0.085	4/12/2013 7:15	4/12/2013 23:30	16.25
3	4/19/2013 21:30	4/20/2013 11:30	14	0.004	0.53	0.008	0.103	0.484	0.05	0.341	0.255	0.059	4/19/2013 21:30	4/20/2013 3:00	5.5
4	5/7/2013 21:45	5/8/2013 21:30	23.75	0.003	0.66	0.004	0.047	0.382	0.11	0.314	0.230	0.074	5/7/2013 22:00	5/8/2013 19:30	21.5
5	5/9/2013 1:00	5/10/2013 19:15	42.25	0.008	0.60	0.013	0.127	0.417	0.09	0.322	0.231	0.075	5/9/2013 1:30	5/9/2013 13:15	11.75
6	5/10/2013 22:30	5/12/2013 22:45	48.25	0.013	0.94	0.014	0.137	0.454	0.14	0.338	0.232	0.081	5/10/2013 22:30	5/12/2013 6:15	31.75
7	5/23/2013 15:00	5/24/2013 17:45	26.75	0.006	0.84	0.007	0.170	0.431	0.42	0.314	0.218	0.076	5/23/2013 16:00	5/24/2013 15:30	23.5
8	6/2/2013 23:15	6/5/2013 22:45	71.5	0.021	1.76	0.012	0.292	0.603	0.56	0.284	0.183	0.074	6/2/2013 23:15	6/3/2013 17:15	18
9	6/6/2013 17:30	6/21/2013 17:45	360.25	0.360	6.88	0.052	0.392	0.650	0.27	0.385	0.218	0.076	6/6/2013 17:45	6/18/2013 20:45	291
10	6/27/2013 17:30	6/29/2013 17:15	47.75	0.017	1.09	0.016	0.198	0.571	0.30	0.368	0.258	0.078	6/27/2013 18:15	6/28/2013 20:00	25.75
11	7/1/2013 6:30	7/2/2013 9:30	27	0.008	0.48	0.017	0.172	0.532	0.28	0.361	0.255	0.078	7/1/2013 6:45	7/1/2013 15:15	8.5
12	7/3/2013 21:15	7/4/2013 8:30	11.25	0.003	0.23	0.012	0.182	0.523	0.14	0.321	0.261	0.038	7/3/2013 21:45	7/3/2013 23:00	1.25
13	7/12/2013 15:30	7/14/2013 21:30	54	0.009	1.40	0.007	0.156	0.499	0.22	0.346	0.247	0.084	7/12/2013 15:30	7/13/2013 20:00	28.5
14	7/22/2013 18:00	7/24/2013 9:30	39.5	0.013	1.25	0.011	0.223	0.480	0.35	0.341	0.240	0.071	7/22/2013 18:45	7/23/2013 18:00	23.25
15	8/1/2013 6:30	8/2/2013 23:45	41.25	0.016	0.93	0.017	0.168	0.489	0.12	0.349	0.232	0.082	8/1/2013 6:30	8/1/2013 15:00	8.5
16	8/8/2013 0:15	8/9/2013 0:30	24.25	0.003	0.75	0.005	0.122	0.398	0.28	0.329	0.243	0.074	8/8/2013 0:30	8/8/2013 16:45	16.25
17	8/13/2013 5:00	8/16/2013 17:45	84.75	0.033	2.07	0.016	0.448	0.784	0.73	0.330	0.218	0.077	8/13/2013 5:00	8/13/2013 9:45	4.75
18	8/28/2013 10:45	8/29/2013 5:15	18.5	0.005	0.62	0.009	0.144	0.443	0.17	0.300	0.207	0.066	8/28/2013 11:30	8/28/2013 19:15	7.75
19	9/21/2013 20:00	9/23/2013 22:00	50	0.019	1.27	0.015	0.128	0.418	0.35	0.312	0.199	0.078	9/21/2013 20:00	9/22/2013 4:00	8
20	10/7/2013 13:15	10/8/2013 10:30	21.25	0.006	0.53	0.012	0.086	0.386	0.09	0.304	0.204	0.072	10/7/2013 13:15	10/7/2013 17:15	4
21	10/11/2013 3:15	10/12/2013 17:00	37.75	0.012	1.49	0.008	0.202	0.500	0.23	0.322	0.212	0.081	10/11/2013 3:30	10/11/2013 18:30	15
22	11/26/2013 14:00	12/4/2013 19:15	197.25	0.076	2.66	0.029	0.309	0.496	0.15	0.304	0.191	0.078	11/26/2013 14:00	11/27/2013 17:45	27.75
23	12/6/2013 5:00	12/7/2013 18:00	37	0.013	1.00	0.013	0.091	0.432	0.05	0.322	0.206	0.085	12/6/2013 5:00	12/7/2013 2:30	21.5
24	12/8/2013 11:30	12/11/2013 22:30	83	0.026	1.52	0.017	0.140	0.450	0.06	0.324	0.217	0.079	12/8/2013 11:45	12/11/2013 6:45	67
25	12/14/2013 15:45	12/16/2013 4:30	36.75	0.014	0.84	0.017	0.124	0.475	0.09	0.329	0.220	0.074	12/14/2013 16:00	12/15/2013 1:00	9
26	12/23/2013 4:15	12/24/2013 3:30	23.25	0.007	0.58	0.012	0.100	0.436	0.12	0.354	0.251	0.076	12/23/2013 4:15	12/23/2013 19:15	15
27	12/29/2013 8:15	12/31/2013 18:15	58	0.033	1.25	0.027	0.188	0.542	0.10	0.378	0.243	0.083	12/29/2013 8:15	12/31/2013 15:00	54.75
28	1/5/2014 5:30	1/9/2014 0:00	90.5	0.046	0.87	0.053	0.200	0.584	0.13	0.392	0.266	0.080	1/5/2014 5:45	1/6/2014 12:30	30.75
29	1/10/2014 5:30	1/15/2014 23:00	137.5	0.036	1.21	0.029	0.160	0.552	0.09	0.392	0.289	0.079	1/10/2014 5:45	1/14/2014 19:30	109.75
30	1/21/2014 10:15	1/23/2014 22:45	60.5	0.007	0.68	0.010	0.096	0.476	0.03	0.373	0.285	0.078	1/21/2014 10:15	1/21/2014 21:15	11
31	2/3/2014 1:45	2/4/2014 22:45	45	0.014	1.21	0.012	0.107	0.456	0.05	0.366	0.260	0.078	2/3/2014 2:00	2/3/2014 15:15	13.25
32	2/5/2014 0:30	2/10/2014 23:00	142.5	0.093	1.64	0.057	0.271	0.630	0.09	0.411	0.275	0.077	2/5/2014 0:30	2/9/2014 21:00	116.5
33	2/13/2014 2:45	2/17/2014 21:45	115	0.033	1.81	0.018	0.146	0.521	0.09	0.394	0.290	0.079	2/13/2014 2:45	2/15/2014 16:30	61.75
34	2/19/2014 9:30	2/20/2014 0:15	14.75	0.006	0.41	0.015	0.085	0.493	0.12	0.432	0.308	0.087	2/19/2014 9:30	2/19/2014 12:15	2.75
35	3/12/2014 18:00	3/13/2014 6:15	12.25	0.003	0.36	0.009	0.118	0.570	0.13	0.414	0.334	0.054	3/12/2014 19:15	3/12/2014 21:45	2.5

MC_3 CheltenhamTownship

Filmore Street

Pipe Size: 10" dia. Tributary Drainage Area: 139 acres Tributary Service Population: 1,208

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	3/19/2014 14:15	3/22/2014 22:30	80.25	0.033	0.87	0.038	0.153	0.568	0.13	0.427	0.311	0.078	3/19/2014 14:15	3/19/2014 22:15	8
37	3/29/2014 9:00	4/10/2014 21:45	300.75	0.275	3.81	0.072	0.282	0.683	0.24	0.480	0.320	0.078	3/29/2014 9:15	4/8/2014 6:30	237.25
38	4/15/2014 10:15	4/17/2014 21:45	59.5	0.017	0.91	0.019	0.130	0.568	0.10	0.444	0.339	0.078	4/15/2014 10:15	4/15/2014 23:30	13.25
39	4/29/2014 12:30	5/14/2014 22:00	369.5	0.448	6.13	0.073	0.658	1.10	0.28	0.545	0.359	0.076	4/29/2014 12:30	5/11/2014 0:00	275.5
40	5/16/2014 8:15	5/19/2014 22:00	85.75	0.033	1.53	0.022	0.224	0.686	0.20	0.502	0.386	0.081	5/16/2014 8:15	5/19/2014 17:15	81
41	5/22/2014 16:00	5/23/2014 19:45	27.75	0.007	0.40	0.019	0.098	0.572	0.23	0.474	0.372	0.078	5/22/2014 17:15	5/23/2014 19:45	26.5
42	5/28/2014 9:15	5/30/2014 6:15	45	0.017	0.97	0.017	0.134	0.567	0.20	0.449	0.344	0.072	5/28/2014 9:30	5/28/2014 14:30	5
43	6/9/2014 3:30	6/12/2014 0:00	68.5	0.024	1.98	0.012	0.383	0.809	0.39	0.418	0.309	0.078	6/9/2014 3:30	6/10/2014 21:15	41.75
44	6/12/2014 12:45	6/14/2014 14:00	49.25	0.022	0.78	0.028	0.103	0.513	0.14	0.419	0.303	0.076	6/12/2014 13:00	6/13/2014 17:45	28.75
		Average:	74.2	0.042	1.35	0.020	0.182	0.536	0.19	0.372	0.263	0.076			41.7
		Maximum Value:	369.5	0.448	6.88	0.073	0.658	1.10	0.73	0.545	0.386	0.087			291.0
		Minimum Value:	11.3	0.003	0.23	0.004	0.047	0.382	0.03	0.284	0.183	0.038			1.25
		Standard Deviation:	83.2	0.091	1.32	0.017	0.114	0.130	0.14	0.059	0.051	0.008			67.5
		Weighted Mean R-Value*:				0.032									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MD-1 Delaware County (DELCORA)

Point of Connection magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2011 2:15	4/2/2011 3:00	24.75	0.004	0.28	0.015	18.4	43.4	0.01	29.4	17.7	7.03	4/1/2011 2:15	4/1/2011 17:15	15
2	4/5/2011 5:45	4/5/2011 23:30	17.75	0.001	0.27	0.005	9.14	32.6	0.08	28.9	18.3	8.47	4/5/2011 6:15	4/5/2011 14:00	7.75
3	4/8/2011 9:30	4/10/2011 5:15	43.75	0.011	0.78	0.015	33.3	61.2	0.03	32.0	17.4	7.71	4/8/2011 9:30	4/8/2011 21:30	12
4	4/12/2011 10:00	4/15/2011 3:45	65.75	0.016	0.84	0.019	24.4	51.5	0.08	32.2	18.5	7.31	4/12/2011 10:15	4/13/2011 17:45	31.5
5	4/16/2011 11:45	4/21/2011 20:30	128.75	0.071	2.45	0.029	75.6	101	0.23	42.7	20.3	7.47	4/16/2011 11:45	4/20/2011 0:15	84.5
6	4/23/2011 1:30	4/24/2011 16:15	38.75	0.007	0.45	0.016	13.2	46.7	0.05	33.8	21.4	7.32	4/23/2011 1:30	4/24/2011 1:00	23.5
7	4/27/2011 13:45	4/28/2011 4:30	14.75	0.001	0.19	0.007	12.5	41.8	0.08	30.1	20.4	7.17	4/27/2011 14:15	4/27/2011 17:30	3.25
8	4/28/2011 12:00	4/29/2011 19:45	31.75	0.004	0.28	0.013	21.1	50.2	0.14	30.5	19.9	7.52	4/28/2011 12:00	4/29/2011 18:00	30
9	5/4/2011 5:15	5/5/2011 12:30	31.25	0.005	0.49	0.011	16.5	45.1	0.05	30.1	18.5	7.05	5/4/2011 5:15	5/4/2011 14:00	8.75
10	5/14/2011 23:30	5/17/2011 0:00	48.5	0.006	1.14	0.006	12.3	36.6	0.22	27.9	17.1	7.32	5/14/2011 23:45	5/16/2011 21:15	45.5
11	5/17/2011 2:45	5/18/2011 1:30	22.75	0.003	0.30	0.011	17.1	39.1	0.08	28.6	17.4	7.26	5/17/2011 2:45	5/17/2011 22:15	19.5
12	5/18/2011 4:15	5/19/2011 12:30	32.25	0.003	0.26	0.013	7.55	33.9	0.05	27.2	17.5	6.82	5/18/2011 4:15	5/18/2011 21:00	16.75
13	5/19/2011 15:15	5/21/2011 4:45	37.5	0.006	0.50	0.013	22.7	48.4	0.13	29.4	17.8	7.09	5/19/2011 15:30	5/20/2011 21:00	29.5
14	5/23/2011 0:30	5/24/2011 0:15	23.75	0.001	0.21	0.005	5.64	30.9	0.04	26.1	17.8	7.05	5/23/2011 0:30	5/23/2011 20:45	20.25
15	6/9/2011 19:30	6/10/2011 19:00	23.5	0.003	0.27	0.010	22.4	47.1	0.14	24.6	14.5	7.07	6/9/2011 20:00	6/9/2011 20:45	0.75
16	6/11/2011 22:45	6/13/2011 3:00	28.25	0.002	0.37	0.006	7.91	29.2	0.07	23.7	14.2	7.30	6/11/2011 23:00	6/12/2011 17:15	18.25
17	6/14/2011 17:45	6/15/2011 3:45	10	0.001	0.20	0.003	4.00	28.1	0.04	23.1	14.3	7.25	6/14/2011 17:45	6/14/2011 20:00	2.25
18	6/16/2011 21:30	6/18/2011 13:15	39.75	0.011	1.22	0.009	60.1	76.5	0.20	27.8	14.1	6.65	6/16/2011 21:30	6/17/2011 17:15	19.75
19	6/22/2011 3:00	6/23/2011 2:00	23	0.001	0.12	0.005	3.37	26.1	0.04	22.0	14.0	7.24	6/22/2011 3:30	6/22/2011 8:15	4.75
20	6/28/2011 10:45	6/29/2011 15:15	28.5	0.001	0.33	0.003	8.97	32.8	0.13	22.0	13.6	7.43	6/28/2011 11:00	6/28/2011 22:45	11.75
21	7/8/2011 13:45	7/10/2011 13:00	47.25	0.017	1.42	0.012	62.6	83.6	0.37	29.9	12.9	7.29	7/8/2011 14:30	7/8/2011 20:45	6.25
22	7/25/2011 18:00	7/26/2011 23:45	29.75	0.004	1.00	0.004	18.5	41.0	0.18	23.3	12.2	7.50	7/25/2011 18:00	7/25/2011 21:30	3.5
23	8/1/2011 16:45	8/2/2011 19:30	26.75	0.002	0.30	0.007	22.2	42.1	0.12	20.9	11.5	7.19	8/1/2011 17:45	8/1/2011 18:45	1
24	8/3/2011 21:45	8/5/2011 19:15	45.5	0.009	1.12	0.008	50.8	69.9	0.27	24.1	11.8	6.92	8/3/2011 22:00	8/4/2011 9:00	11
25	8/9/2011 12:00	8/11/2011 19:45	55.75	0.018	2.24	0.008	62.3	82.7	0.57	27.7	11.7	7.28	8/9/2011 12:00	8/9/2011 19:15	7.25
26	8/14/2011 0:45	8/17/2011 18:45	90	0.067	4.13	0.016	72.4	99.3	0.25	41.4	14.4	7.06	8/14/2011 0:45	8/15/2011 21:45	45
27	8/18/2011 5:45	8/21/2011 13:00	79.25	0.049	2.22	0.022	76.2	101	0.31	40.0	16.2	7.29	8/18/2011 6:00	8/21/2011 11:15	77.25
28	8/21/2011 14:15	8/23/2011 15:45	49.5	0.013	1.08	0.012	48.1	74.7	0.18	31.2	16.6	7.35	8/21/2011 14:15	8/21/2011 21:45	7.5
29	8/25/2011 9:45	8/26/2011 20:00	34.25	0.004	0.57	0.007	21.3	48.5	0.13	28.0	17.1	7.68	8/25/2011 9:45	8/25/2011 21:30	11.75
30	8/27/2011 11:30	9/1/2011 5:45	114.25	0.117	6.22	0.019	74.6	103	0.40	55.5	20.6	7.39	8/27/2011 11:45	8/28/2011 12:15	24.5
31	9/5/2011 19:15	9/6/2011 7:30	12.25	0.001	0.52	0.003	6.71	33.8	0.07	30.9	22.4	5.33	9/5/2011 19:15	9/6/2011 4:45	9.5
32	9/6/2011 8:15	9/15/2011 1:00	208.75	0.207	5.74	0.036	75.3	106	0.25	61.1	27.1	7.37	9/6/2011 9:00	9/12/2011 1:15	136.25
33	9/23/2011 8:15	9/27/2011 0:00	87.75	0.046	1.78	0.026	57.9	92.7	0.23	46.3	24.5	7.79	9/23/2011 8:30	9/24/2011 0:30	16
34	9/27/2011 16:15	9/29/2011 2:45	34.5	0.005	0.59	0.008	10.8	39.9	0.05	34.5	23.5	7.31	9/27/2011 16:15	9/29/2011 0:00	31.75
35	9/29/2011 8:15	9/30/2011 12:30	28.25	0.003	0.28	0.010	12.2	44.6	0.11	33.2	23.1	7.43	9/29/2011 9:00	9/29/2011 14:00	5

MD-1 Delaware County (DELCORA)

Point of Connection magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
36	10/1/2011 20:15	10/4/2011 0:15	52	0.008	0.23	0.036	15.5	43.4	0.03	34.0	22.2	7.48	10/1/2011 20:15	10/3/2011 10:00	37.75
37	10/12/2011 8:00	10/13/2011 15:15	31.25	0.001	0.18	0.005	4.49	34.1	0.06	27.8	19.4	7.55	10/12/2011 8:00	10/13/2011 14:00	30
38	10/13/2011 21:00	10/14/2011 11:00	14	0.001	0.08	0.013	5.61	31.1	0.02	26.9	19.2	5.61	10/13/2011 21:15	10/14/2011 4:30	7.25
39	10/14/2011 13:30	10/15/2011 3:45	14.25	0.001	0.34	0.004	6.69	34.7	0.15	28.8	18.8	7.78	10/14/2011 13:45	10/14/2011 17:15	3.5
40	10/19/2011 4:30	10/21/2011 0:30	44	0.014	0.65	0.021	37.1	65.5	0.10	34.0	18.2	7.43	10/19/2011 4:45	10/20/2011 4:45	24
41	10/27/2011 5:15	10/28/2011 3:45	22.5	0.001	0.20	0.006	5.15	32.0	0.02	26.4	17.5	7.50	10/27/2011 5:30	10/27/2011 19:15	13.75
42	10/29/2011 3:30	11/1/2011 11:45	80.25	0.036	1.20	0.030	53.6	84.8	0.08	37.3	18.1	7.24	10/29/2011 3:30	10/29/2011 22:00	18.5
43	11/16/2011 1:15	11/16/2011 9:30	8.25	0.001	0.21	0.004	6.14	26.9	0.04	22.9	16.5	3.38	11/16/2011 1:15	11/16/2011 9:15	8
44	11/16/2011 10:45	11/17/2011 23:45	37	0.007	0.40	0.017	16.5	42.9	0.06	29.3	16.6	7.79	11/16/2011 11:00	11/17/2011 6:15	19.25
45	11/22/2011 12:30	11/27/2011 23:45	131.25	0.078	2.07	0.038	76.6	97.1	0.14	42.7	19.2	7.60	11/22/2011 12:45	11/23/2011 14:30	25.75
46	11/29/2011 9:15	12/1/2011 5:45	44.5	0.014	0.70	0.020	40.4	70.7	0.06	35.8	20.4	7.16	11/29/2011 9:30	11/29/2011 20:30	11
47	12/6/2011 13:30	12/7/2011 0:30	11	0.001	0.12	0.010	9.94	39.4	0.03	32.3	20.5	8.83	12/6/2011 13:45	12/6/2011 18:00	4.25
48	12/7/2011 3:15	12/13/2011 0:15	141	0.079	2.31	0.034	73.1	103	0.10	43.8	21.4	7.35	12/7/2011 3:30	12/8/2011 1:15	21.75
49	12/22/2011 21:15	12/25/2011 8:00	58.75	0.030	1.29	0.024	70.6	92.0	0.13	41.5	20.7	6.82	12/22/2011 21:30	12/23/2011 5:15	7.75
50	12/27/2011 13:00	12/29/2011 6:00	41	0.015	0.74	0.021	41.4	72.3	0.14	38.3	21.5	6.88	12/27/2011 13:15	12/27/2011 19:15	6
51	1/11/2012 19:00	1/14/2012 21:00	74	0.033	1.46	0.022	62.4	85.5	0.11	38.4	19.1	7.38	1/11/2012 19:15	1/13/2012 8:00	36.75
52	1/17/2012 9:15	1/19/2012 5:15	44	0.005	0.26	0.021	18.9	47.9	0.03	30.2	19.6	7.24	1/17/2012 9:30	1/17/2012 14:15	4.75
53	1/21/2012 1:15	1/22/2012 5:45	28.5	0.002	0.39	0.004	9.16	41.2	0.03	27.5	19.2	6.80	1/21/2012 1:15	1/21/2012 13:30	12.25
54	1/23/2012 7:30	1/25/2012 21:45	62.25	0.014	0.29	0.050	24.8	52.6	0.05	33.7	20.0	7.49	1/23/2012 7:30	1/23/2012 17:45	10.25
55	1/27/2012 5:15	1/29/2012 0:15	43	0.009	0.42	0.021	32.5	61.7	0.07	33.5	19.9	8.02	1/27/2012 5:30	1/27/2012 11:15	5.75
56	2/11/2012 8:30	2/12/2012 8:30	24	0.003	0.14	0.024	17.2	46.1	0.04	27.9	16.4	7.73	2/11/2012 8:45	2/11/2012 22:30	13.75
57	2/16/2012 13:45	2/17/2012 6:00	16.25	0.001	0.14	0.007	4.21	29.4	0.02	24.4	16.3	6.53	2/16/2012 14:00	2/16/2012 20:15	6.25
58	2/24/2012 2:30	2/25/2012 6:30	28	0.001	0.25	0.003	4.96	30.0	0.05	23.2	16.1	6.27	2/24/2012 2:45	2/24/2012 19:00	16.25
59	2/29/2012 9:15	3/7/2012 0:00	158.75	0.080	1.48	0.054	54.0	79.2	0.07	36.6	15.6	7.45	2/29/2012 9:30	3/3/2012 9:30	72
60	3/31/2012 0:00	4/1/2012 0:00	24	0.002	0.27	0.007	8.88	32.1	0.05	23.5	13.9	7.45	3/31/2012 0:30	3/31/2012 4:45	4.25
		Average:	48.2	0.019	0.93	0.015	29.5	55.7	0.12	31.7	17.9	7.21			20.3
		Maximum Value:	208.8	0.207	6.22	0.054	76.6	106	0.57	61.1	27.1	8.83			136
		Minimum Value:	8.3	0.001	0.08	0.003	3.37	26.1	0.01	20.9	11.5	3.38			0.75
		Standard Deviation:	39.5	0.035	1.22	0.012	24.7	24.6	0.11	7.86	3.29	0.725			23.2
		Weighted Mean R-Value*:				0.021									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MD-1 Delaware County (DELCORA)

Point of connection magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 23:45	29.5	0.002	0.20	0.011	6.12	28.1	0.03	23.8	14.4	7.47	4/1/2012 18:45	4/2/2012 2:45	8
2	4/22/2012 8:15	4/24/2012 4:30	44.25	0.023	2.15	0.011	59.1	84.4	0.12	36.7	14.9	7.80	4/22/2012 8:15	4/23/2012 7:45	23.5
3	5/1/2012 3:45	5/2/2012 3:30	23.75	0.001	0.15	0.007	6.36	25.7	0.05	21.9	13.7	6.99	5/1/2012 3:45	5/1/2012 10:00	6.25
4	5/3/2012 2:15	5/4/2012 0:30	22.25	0.002	0.19	0.008	6.30	25.7	0.03	22.6	13.7	7.10	5/3/2012 2:15	5/3/2012 5:15	3
5	5/9/2012 2:15	5/11/2012 0:00	45.75	0.006	0.60	0.010	12.6	36.6	0.07	24.2	13.8	7.01	5/9/2012 2:15	5/10/2012 3:45	25.5
6	5/15/2012 7:45	5/16/2012 0:15	16.5	0.007	0.96	0.008	38.7	62.4	0.14	35.2	14.1	8.92	5/15/2012 8:00	5/16/2012 0:15	16.25
7	5/16/2012 0:30	5/17/2012 10:45	34.25	0.017	0.77	0.022	64.2	78.4	0.13	33.6	14.0	6.07	5/16/2012 0:30	5/16/2012 4:00	3.5
8	5/21/2012 21:00	5/23/2012 0:30	27.5	0.002	0.20	0.008	5.21	26.1	0.02	22.4	13.7	7.18	5/21/2012 21:00	5/22/2012 6:45	9.75
9	5/24/2012 7:30	5/25/2012 0:45	17.25	0.002	0.29	0.005	9.16	33.0	0.07	24.8	13.6	8.81	5/24/2012 7:30	5/24/2012 23:45	16.25
10	5/29/2012 20:00	5/30/2012 12:30	16.5	0.001	0.20	0.006	6.73	30.0	0.07	21.1	13.2	6.12	5/29/2012 20:00	5/30/2012 10:15	14.25
11	6/1/2012 19:15	6/2/2012 19:45	24.5	0.003	0.71	0.005	15.0	34.6	0.16	24.2	12.7	7.71	6/1/2012 19:15	6/2/2012 2:15	7
12	6/3/2012 19:30	6/5/2012 0:00	28.5	0.002	0.24	0.007	4.57	27.2	0.07	21.8	12.7	7.34	6/3/2012 19:30	6/4/2012 21:00	25.5
13	6/12/2012 8:30	6/14/2012 20:00	59.5	0.013	0.96	0.014	30.1	52.2	0.06	25.4	12.1	7.31	6/12/2012 8:45	6/13/2012 0:00	15.25
14	6/29/2012 4:45	6/29/2012 19:30	14.75	0.001	0.20	0.005	10.3	23.8	0.12	20.9	11.5	7.44	6/29/2012 5:00	6/29/2012 6:15	1.25
15	7/14/2012 3:45	7/14/2012 19:45	16	0.003	0.57	0.005	22.3	46.9	0.07	24.0	11.0	8.00	7/14/2012 3:45	7/14/2012 12:45	9
16	7/15/2012 20:45	7/17/2012 0:00	27.25	0.003	0.43	0.007	10.3	29.1	0.12	21.3	11.1	7.20	7/15/2012 21:15	7/16/2012 0:00	2.75
17	7/20/2012 0:45	7/21/2012 11:15	34.5	0.002	0.55	0.004	9.59	28.3	0.08	18.9	11.2	5.92	7/20/2012 0:45	7/20/2012 8:30	7.75
18	7/26/2012 19:45	7/27/2012 20:00	24.25	0.002	0.34	0.007	10.2	30.3	0.07	20.0	10.6	6.97	7/26/2012 20:00	7/27/2012 0:30	4.5
19	7/28/2012 16:45	7/29/2012 10:30	17.75	0.002	0.57	0.003	15.1	36.3	0.19	19.2	10.4	6.00	7/28/2012 17:00	7/28/2012 22:00	5
20	8/5/2012 18:00	8/7/2012 0:00	30	0.002	0.36	0.005	6.71	27.6	0.11	19.4	10.4	7.49	8/5/2012 18:15	8/6/2012 2:00	7.75
21	8/10/2012 8:45	8/11/2012 13:15	28.5	0.011	1.60	0.007	62.8	82.9	0.49	27.7	9.85	7.28	8/10/2012 8:45	8/10/2012 15:30	6.75
22	8/11/2012 17:15	8/12/2012 11:30	18.25	0.001	0.32	0.003	2.32	22.7	0.08	17.3	9.85	6.14	8/11/2012 17:15	8/12/2012 1:00	7.75
23	8/14/2012 9:30	8/16/2012 23:30	62	0.010	1.14	0.008	29.9	48.1	0.28	22.1	10.5	7.44	8/14/2012 9:30	8/15/2012 17:30	32
24	8/17/2012 21:30	8/18/2012 19:45	22.25	0.004	0.71	0.006	17.0	30.9	0.09	23.5	10.7	7.48	8/17/2012 21:30	8/18/2012 7:15	9.75
25	8/27/2012 6:30	8/29/2012 4:15	45.75	0.014	0.76	0.018	37.6	57.0	0.13	26.1	10.7	7.24	8/27/2012 6:30	8/28/2012 7:30	25
26	9/2/2012 10:15	9/2/2012 23:30	13.25	0.000	0.22	0.002	10.1	32.0	0.04	21.7	9.61	11.2	9/2/2012 10:15	9/2/2012 23:00	12.75
27	9/3/2012 7:30	9/7/2012 0:15	88.75	0.062	2.57	0.024	78.1	97.2	0.17	37.2	10.9	7.29	9/3/2012 7:30	9/6/2012 10:45	75.25
28	9/8/2012 16:30	9/10/2012 0:00	31.5	0.003	0.47	0.006	10.5	33.0	0.08	22.6	12.0	8.21	9/8/2012 16:30	9/8/2012 22:30	6
29	9/18/2012 1:15	9/18/2012 14:45	13.5	0.002	0.56	0.003	7.98	24.3	0.12	19.6	10.6	5.64	9/18/2012 1:15	9/18/2012 14:00	12.75
30	9/18/2012 16:30	9/20/2012 0:00	31.5	0.013	0.84	0.016	43.7	62.7	0.22	29.4	10.7	7.43	9/18/2012 16:45	9/19/2012 1:45	9
31	9/22/2012 19:00	9/24/2012 2:45	31.75	0.006	0.66	0.009	35.5	56.6	0.17	23.4	10.8	7.72	9/22/2012 19:15	9/22/2012 21:30	2.25
32	9/26/2012 16:45	9/27/2012 23:00	30.25	0.002	0.25	0.009	11.6	32.6	0.04	20.3	11.0	7.40	9/26/2012 17:00	9/27/2012 22:45	29.75
33	10/2/2012 9:45	10/4/2012 0:00	38.25	0.002	0.31	0.007	3.79	24.3	0.06	20.4	11.0	7.74	10/2/2012 10:00	10/3/2012 7:30	21.5
34	10/7/2012 10:30	10/8/2012 23:45	37.25	0.002	0.21	0.009	4.79	26.6	0.03	20.8	11.0	8.43	10/7/2012 10:30	10/8/2012 21:45	35.25
35	10/9/2012 4:30	10/9/2012 23:45	19.25	0.001	0.11	0.012	5.53	23.7	0.02	20.4	10.9	7.78	10/9/2012 4:30	10/9/2012 18:30	14

MD-1 Delaware County (DELCORA)

Point of connection magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
36	10/15/2012 11:00	10/16/2012 23:45	36.75	0.003	0.36	0.009	11.2	29.6	0.07	20.3	10.2	7.69	10/15/2012 11:00	10/15/2012 21:00	10
37	10/19/2012 1:15	10/20/2012 14:45	37.5	0.004	0.70	0.006	19.0	39.1	0.14	20.0	10.2	6.60	10/19/2012 1:15	10/20/2012 0:00	22.75
38	10/28/2012 5:45	11/3/2012 0:00	138.25	0.106	4.26	0.025	84.9	104	0.12	39.3	11.5	7.23	10/28/2012 5:45	11/2/2012 20:00	134.25
39	11/7/2012 11:45	11/9/2012 5:30	41.75	0.005	0.30	0.017	14.5	37.0	0.02	22.9	12.5	6.98	11/7/2012 11:45	11/8/2012 1:30	13.75
40	11/13/2012 2:30	11/14/2012 4:30	26	0.001	0.16	0.007	3.61	25.9	0.03	20.3	12.7	6.47	11/13/2012 2:45	11/13/2012 11:45	9
41	11/27/2012 6:00	11/29/2012 5:15	47.25	0.006	0.54	0.011	15.2	36.5	0.02	21.9	11.6	7.03	11/27/2012 6:00	11/27/2012 15:30	9.5
42	12/7/2012 9:15	12/8/2012 22:00	36.75	0.002	0.30	0.007	10.5	27.5	0.06	21.4	11.6	8.22	12/7/2012 9:30	12/8/2012 1:15	15.75
43	12/9/2012 8:00	12/12/2012 5:15	69.25	0.006	0.40	0.016	12.4	37.1	0.02	21.9	12.1	7.40	12/9/2012 8:00	12/11/2012 6:30	46.5
44	12/18/2012 0:30	12/19/2012 5:00	28.5	0.002	0.21	0.010	10.3	25.1	0.06	20.4	12.1	6.21	12/18/2012 0:30	12/18/2012 15:15	14.75
45	12/20/2012 20:45	12/23/2012 9:30	60.75	0.043	2.15	0.020	84.6	104	0.15	38.2	12.6	6.71	12/20/2012 20:45	12/21/2012 23:30	26.75
46	12/26/2012 12:45	12/30/2012 9:00	92.25	0.042	1.44	0.029	79.5	103	0.10	32.8	13.6	6.94	12/26/2012 12:45	12/29/2012 16:30	75.75
47	1/11/2013 15:30	1/12/2013 23:45	32.25	0.006	0.41	0.014	29.0	51.8	0.05	25.3	12.7	8.04	1/11/2013 15:45	1/11/2013 20:45	5
48	1/14/2013 20:15	1/15/2013 19:45	23.5	0.003	0.38	0.008	11.7	28.2	0.03	24.2	13.8	6.87	1/14/2013 20:15	1/15/2013 2:45	6.5
49	1/15/2013 21:15	1/18/2013 6:30	57.25	0.028	0.95	0.030	58.6	74.4	0.06	34.1	14.2	6.52	1/15/2013 21:30	1/16/2013 11:00	13.5
50	1/30/2013 16:45	2/2/2013 7:45	63	0.025	1.44	0.018	67.2	81.2	0.21	31.7	14.2	6.62	1/30/2013 17:00	2/1/2013 10:00	41
51	2/8/2013 5:45	2/9/2013 7:30	25.75	0.002	0.38	0.005	5.50	29.8	0.02	23.4	14.8	6.60	2/8/2013 5:45	2/9/2013 1:15	19.5
52	2/11/2013 4:00	2/13/2013 5:45	49.75	0.008	0.40	0.021	29.6	52.4	0.05	26.5	15.3	6.69	2/11/2013 4:15	2/11/2013 8:30	4.25
53	2/13/2013 18:15	2/14/2013 20:45	26.5	0.001	0.20	0.007	5.57	29.8	0.02	24.2	15.6	7.15	2/13/2013 18:30	2/14/2013 0:00	5.5
54	2/19/2013 11:00	2/20/2013 5:15	18.25	0.001	0.23	0.006	4.12	28.8	0.02	24.9	15.7	7.27	2/19/2013 11:00	2/19/2013 17:30	6.5
55	2/26/2013 19:00	2/28/2013 10:45	39.75	0.008	0.59	0.014	28.0	50.5	0.06	26.9	14.9	6.51	2/26/2013 19:15	2/28/2013 8:30	37.25
56	3/12/2013 2:45	3/14/2013 14:00	59.25	0.017	0.92	0.019	35.3	57.2	0.07	28.1	13.6	6.70	3/12/2013 2:45	3/14/2013 6:45	52
57	3/16/2013 9:15	3/17/2013 10:15	25	0.001	0.18	0.004	3.84	29.5	0.02	23.0	14.5	7.69	3/16/2013 9:30	3/16/2013 18:00	8.5
58	3/18/2013 17:30	3/21/2013 2:45	57.25	0.014	0.77	0.018	22.8	46.9	0.05	28.8	15.3	7.08	3/18/2013 17:45	3/21/2013 0:00	54.25
59	3/25/2013 5:45	3/27/2013 0:00	42.25	0.008	0.60	0.014	18.5	44.1	0.04	28.2	15.5	7.52	3/25/2013 5:45	3/26/2013 23:15	41.5
		Average:	37.0	0.010	0.69	0.011	23.8	44.1	0.09	24.6	12.2	7.27			18.6
		Maximum Value:	138.3	0.106	4.26	0.030	84.9	104	0.49	39.3	15.6	11.2			134.3
		Minimum Value:	13.3	0.000	0.11	0.002	2.32	22.7	0.02	17.3	9.61	5.64			1.25
		Standard Deviation:	22.7	0.018	0.74	0.007	24.0	23.7	0.08	5.53	1.60	0.892			22.4
		Weighted Mean R-Value*:				0.014									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MD_1 DELCORA Q2-2013 thru Q1-2014

Penrose Avenue magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 11:15	14.75	0.001	0.32	0.004	12.3	35.4	0.17	22.2	13.9	5.68	4/10/2013 20:45	4/10/2013 23:45	3
2	4/12/2013 6:45	4/13/2013 21:15	38.5	0.010	1.00	0.010	30.4	53.8	0.15	29.4	14.2	7.97	4/12/2013 6:45	4/12/2013 23:00	16.25
3	4/19/2013 21:00	4/20/2013 20:15	23.25	0.005	0.66	0.007	22.8	45.1	0.07	27.6	14.5	7.48	4/19/2013 21:00	4/20/2013 3:45	6.75
4	4/29/2013 1:45	4/30/2013 15:00	37.25	0.004	0.46	0.009	9.59	33.2	0.03	22.7	13.2	6.59	4/29/2013 2:00	4/30/2013 5:00	27
5	5/7/2013 22:00	5/9/2013 1:15	27.25	0.004	0.48	0.008	15.7	40.2	0.05	24.1	13.5	7.09	5/7/2013 22:15	5/9/2013 1:00	26.75
6	5/9/2013 2:15	5/10/2013 1:30	23.25	0.005	0.35	0.014	22.7	40.7	0.05	26.5	13.6	7.10	5/9/2013 2:15	5/9/2013 6:00	3.75
7	5/10/2013 22:00	5/12/2013 23:45	49.75	0.010	1.11	0.009	33.3	52.9	0.10	27.2	14.0	7.66	5/10/2013 22:15	5/12/2013 6:00	31.75
8	5/18/2013 19:15	5/19/2013 23:45	28.5	0.002	0.24	0.010	6.94	32.8	0.04	23.4	13.0	7.99	5/18/2013 19:15	5/19/2013 20:30	25.25
9	5/23/2013 15:45	5/24/2013 21:00	29.25	0.005	0.71	0.007	29.8	50.3	0.13	24.9	13.1	7.27	5/23/2013 15:45	5/24/2013 15:15	23.5
10	5/28/2013 9:00	5/29/2013 0:00	15	0.001	0.22	0.005	4.33	25.8	0.02	24.2	13.0	9.14	5/28/2013 9:00	5/28/2013 19:00	10
11	6/2/2013 23:45	6/4/2013 12:15	36.5	0.010	0.98	0.010	45.5	63.9	0.25	26.4	13.0	6.34	6/2/2013 23:45	6/3/2013 16:15	16.5
12	6/6/2013 19:15	6/10/2013 4:15	81	0.086	3.59	0.024	82.1	105	0.15	50.2	14.2	7.29	6/6/2013 19:15	6/8/2013 1:30	30.25
13	6/10/2013 6:00	6/15/2013 13:45	127.75	0.082	2.79	0.029	67.8	91.6	0.46	40.9	16.7	7.01	6/10/2013 6:00	6/14/2013 6:00	96
14	6/18/2013 12:00	6/21/2013 0:00	60	0.022	1.08	0.020	65.1	92.9	0.16	35.5	18.4	7.40	6/18/2013 12:00	6/18/2013 20:30	8.5
15	6/24/2013 14:00	6/25/2013 11:00	21	0.005	0.40	0.013	44.7	70.6	0.16	30.8	17.9	6.52	6/24/2013 14:00	6/24/2013 20:30	6.5
16	6/27/2013 17:00	6/28/2013 14:15	21.25	0.003	0.33	0.010	17.9	43.0	0.10	27.5	16.6	6.83	6/27/2013 17:00	6/27/2013 21:15	4.25
17	6/28/2013 15:30	6/29/2013 12:00	20.5	0.002	0.21	0.010	11.8	36.1	0.05	25.0	16.2	6.11	6/28/2013 15:30	6/28/2013 21:15	5.75
18	6/30/2013 12:00	7/1/2013 2:15	14.25	0.002	0.26	0.007	11.8	39.1	0.04	29.0	15.7	10.1	6/30/2013 12:15	7/1/2013 0:45	12.5
19	7/1/2013 6:00	7/3/2013 7:45	49.75	0.005	0.36	0.013	15.3	39.6	0.04	25.3	15.9	6.88	7/1/2013 6:00	7/3/2013 7:30	49.5
20	7/12/2013 7:30	7/14/2013 2:15	42.75	0.011	1.30	0.008	32.6	57.0	0.10	29.2	14.6	7.94	7/12/2013 7:30	7/13/2013 18:45	35.25
21	7/22/2013 23:30	7/25/2013 4:15	52.75	0.015	1.64	0.009	78.0	94.8	0.38	28.4	13.9	6.70	7/22/2013 23:45	7/23/2013 17:45	18
22	7/28/2013 13:45	7/29/2013 23:15	33.5	0.007	0.78	0.009	41.0	65.2	0.07	27.2	13.7	8.14	7/28/2013 14:00	7/29/2013 2:15	12.25
23	8/1/2013 6:00	8/3/2013 2:30	44.5	0.019	1.05	0.019	60.6	85.1	0.10	32.8	13.6	7.44	8/1/2013 6:00	8/1/2013 16:30	10.5
24	8/7/2013 20:30	8/8/2013 10:15	13.75	0.001	0.21	0.003	5.81	26.0	0.06	20.3	13.6	5.40	8/7/2013 20:45	8/8/2013 2:45	6
25	8/9/2013 14:00	8/10/2013 12:00	22	0.003	0.22	0.012	20.4	41.7	0.10	22.8	13.2	6.24	8/9/2013 14:00	8/9/2013 17:15	3.25
26	8/13/2013 4:30	8/15/2013 1:30	45	0.022	2.21	0.010	78.8	101	0.45	34.3	14.0	7.34	8/13/2013 4:30	8/13/2013 9:30	5
27	8/28/2013 9:45	8/31/2013 1:00	63.25	0.012	1.17	0.010	49.4	72.8	0.31	25.2	12.5	7.44	8/28/2013 9:45	8/30/2013 3:00	41.25
28	9/2/2013 9:00	9/5/2013 18:45	81.75	0.024	1.40	0.017	68.8	90.9	0.31	27.7	12.7	7.23	9/2/2013 9:00	9/2/2013 16:00	7
29	9/12/2013 18:30	9/13/2013 11:30	17	0.002	0.54	0.004	14.9	30.2	0.27	22.5	12.8	6.18	9/12/2013 18:30	9/13/2013 8:30	14
30	9/21/2013 19:15	9/23/2013 23:30	52.25	0.011	1.30	0.009	43.6	61.1	0.23	25.1	11.9	7.53	9/21/2013 19:15	9/22/2013 3:15	8
31	10/7/2013 7:00	10/7/2013 23:45	16.75	0.003	0.50	0.005	13.9	33.0	0.12	24.5	11.2	8.87	10/7/2013 7:30	10/7/2013 16:45	9.25
32	10/10/2013 3:15	10/13/2013 2:30	71.25	0.024	1.76	0.014	56.6	69.5	0.17	28.6	12.2	7.22	10/10/2013 3:30	10/11/2013 21:00	41.5
33	11/26/2013 10:45	11/28/2013 20:45	58	0.038	2.95	0.013	66.8	85.3	0.13	36.7	11.9	7.36	11/26/2013 11:00	11/27/2013 17:15	30.25
34	12/6/2013 1:45	12/8/2013 6:45	53	0.010	0.93	0.011	16.5	34.9	0.05	24.2	12.3	6.64	12/6/2013 2:00	12/7/2013 2:15	24.25
35	12/8/2013 11:30	12/11/2013 11:45	72.25	0.025	1.34	0.019	46.7	71.2	0.05	30.6	13.8	7.35	12/8/2013 11:45	12/10/2013 12:00	48.25

MD_1 DELCORA Q2-2013 thru Q1-2014

Penrose Avenue magmeter site

Pipe Size: 66" dia. Tributary Drainage Area: 41,340 acres Tributary Service Population: 277,202

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	12/14/2013 15:45	12/17/2013 6:15	62.5	0.021	0.87	0.024	37.5	55.9	0.09	30.7	14.6	7.19	12/14/2013 15:45	12/17/2013 5:00	61.25
37	12/23/2013 3:45	12/24/2013 21:30	41.75	0.011	0.57	0.019	29.9	53.8	0.07	30.2	16.1	7.16	12/23/2013 3:45	12/24/2013 17:15	37.5
38	12/29/2013 7:15	1/1/2014 5:45	70.5	0.026	1.20	0.022	63.3	89.4	0.09	32.9	15.6	7.34	12/29/2013 7:30	12/31/2013 15:00	55.5
39	1/5/2014 5:30	1/8/2014 5:15	71.75	0.030	0.81	0.037	70.4	88.5	0.09	36.0	17.4	7.21	1/5/2014 5:45	1/6/2014 13:00	31.25
40	1/10/2014 6:45	1/13/2014 5:15	70.5	0.024	1.12	0.021	49.6	79.4	0.07	35.8	19.3	7.51	1/10/2014 6:45	1/11/2014 23:00	40.25
41	2/3/2014 2:15	2/4/2014 21:00	42.75	0.012	1.14	0.010	33.2	57.1	0.05	30.7	16.5	6.92	2/3/2014 2:15	2/3/2014 16:00	13.75
42	2/5/2014 0:15	2/10/2014 6:45	126.5	0.108	1.67	0.065	70.4	97.3	0.09	49.4	19.4	6.97	2/5/2014 0:30	2/9/2014 21:00	116.5
43	2/12/2014 23:45	2/17/2014 5:00	101.25	0.039	1.55	0.025	43.5	73.6	0.06	39.0	21.7	7.06	2/13/2014 0:00	2/15/2014 16:00	64
44	2/19/2014 9:00	2/20/2014 5:15	20.25	0.008	0.35	0.024	39.4	74.6	0.07	45.4	26.8	7.47	2/19/2014 9:00	2/19/2014 12:00	3
45	3/12/2014 19:00	3/13/2014 11:15	16.25	0.003	0.25	0.012	13.1	43.7	0.05	31.9	20.9	6.04	3/12/2014 19:15	3/12/2014 21:15	2
46	3/19/2014 14:30	3/21/2014 19:45	53.25	0.011	0.65	0.017	49.8	78.9	0.11	31.9	19.1	7.10	3/19/2014 14:45	3/19/2014 21:45	7
47	3/29/2014 8:45	4/6/2014 23:45	207	0.103	2.65	0.039	72.0	99.4	0.13	39.3	18.5	7.47	3/29/2014 9:00	4/4/2014 23:45	158.75
48	4/7/2014 11:00	4/10/2014 0:00	61	0.009	0.56	0.017	21.9	51.7	0.04	32.4	20.8	7.45	4/7/2014 11:00	4/8/2014 6:00	19
49	4/15/2014 9:45	4/18/2014 20:30	82.75	0.015	1.23	0.012	27.8	57.7	0.16	31.6	19.4	7.25	4/15/2014 9:45	4/15/2014 23:30	13.75
50	4/25/2014 18:30	4/26/2014 18:00	23.5	0.003	0.51	0.005	12.1	37.0	0.14	28.3	17.9	7.40	4/25/2014 18:30	4/26/2014 16:15	21.75
51	4/29/2014 11:30	5/13/2014 1:30	326	0.180	5.78	0.031	83.1	105	0.23	40.8	18.7	7.24	4/29/2014 11:45	5/10/2014 23:45	276
52	5/16/2014 5:45	5/22/2014 11:30	149.75	0.061	2.38	0.026	76.0	104	0.17	38.1	19.9	7.17	5/16/2014 5:45	5/21/2014 22:15	136.5
53	5/22/2014 15:45	5/24/2014 11:45	44	0.004	0.35	0.011	7.39	37.4	0.05	28.7	19.9	6.53	5/22/2014 15:45	5/23/2014 21:00	29.25
54	5/27/2014 17:45	5/30/2014 11:15	65.5	0.009	0.80	0.011	21.9	50.5	0.13	29.6	19.3	6.78	5/27/2014 17:45	5/28/2014 15:15	21.5
55	6/8/2014 23:30	6/14/2014 17:30	138	0.017	1.54	0.011	27.2	51.9	0.08	26.9	16.6	6.94	6/8/2014 23:45	6/13/2014 17:15	113.5
56	6/19/2014 1:30	6/20/2014 20:15	42.75	0.005	0.47	0.011	29.7	47.8	0.19	25.6	15.7	6.77	6/19/2014 1:30	6/19/2014 16:45	15.25
57	6/25/2014 14:15	6/28/2014 5:45	63.5	0.006	0.76	0.009	23.0	46.0	0.22	24.4	14.8	6.85	6/25/2014 14:15	6/26/2014 2:00	11.75
		Average:	58.6	0.021	1.09	0.015	37.6	61.3	0.13	30.2	15.7	7.18			34.5
		Maximum Value:	326.0	0.180	5.78	0.065	83.1	105	0.46	50.2	26.8	10.1			276.0
		Minimum Value:	13.8	0.001	0.21	0.003	4.33	25.8	0.02	20.3	11.2	5.40			2.0
		Standard Deviation:	52.2	0.032	0.99	0.010	23.4	23.6	0.10	6.58	3.10	0.76			46.9
		Weighted Mean R-Value*:				0.019									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_1 Lower Merion Township
2490 North 51st Street at City Line Ave.
Pipe Size: 24" dia. Tributary Drainage Area: 2,671 acres Tributary Service Population: 15,278

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/22/2012 9:45	4/24/2012 3:15	41.5	0.023	2.28	0.010	3.00	3.75	0.11	2.30	0.750	0.591	4/22/2012 9:45	4/23/2012 17:15	31.5
2	5/1/2012 3:45	5/1/2012 12:30	8.75	0.004	0.20	0.018	1.70	3.13	0.05	2.09	0.658	0.700	5/1/2012 3:45	5/1/2012 10:00	6.25
3	5/3/2012 2:15	5/3/2012 9:30	7.25	0.004	0.21	0.020	2.47	3.35	0.05	2.20	0.649	0.539	5/3/2012 2:30	5/3/2012 5:00	2.5
4	5/4/2012 21:45	5/5/2012 4:00	6.25	0.002	0.22	0.011	2.39	3.35	0.09	1.62	0.648	0.324	5/4/2012 21:45	5/4/2012 23:45	2
5	5/9/2012 3:30	5/9/2012 9:00	5.5	0.003	0.33	0.009	2.07	3.63	0.10	2.32	0.778	0.607	5/9/2012 4:00	5/9/2012 7:00	3
6	5/9/2012 22:00	5/10/2012 8:45	10.75	0.006	0.26	0.023	2.40	3.37	0.02	2.18	0.778	0.429	5/9/2012 22:15	5/10/2012 4:00	5.75
7	5/15/2012 8:15	5/15/2012 22:45	14.5	0.010	0.74	0.014	3.09	4.70	0.12	2.62	0.733	0.695	5/15/2012 8:15	5/15/2012 12:15	4
8	5/16/2012 0:15	5/16/2012 8:45	8.5	0.008	0.98	0.008	3.21	4.09	0.33	2.76	0.713	0.408	5/16/2012 0:30	5/16/2012 4:15	3.75
9	5/24/2012 14:00	5/24/2012 16:15	2.25	0.001	0.26	0.006	1.74	2.87	0.15	2.26	0.599	0.524	5/24/2012 14:00	5/24/2012 15:15	1.25
10	5/27/2012 3:45	5/27/2012 9:15	5.5	0.001	0.49	0.002	1.49	3.00	0.14	1.34	0.562	0.422	5/27/2012 3:45	5/27/2012 7:15	3.5
11	6/1/2012 20:00	6/2/2012 6:30	10.5	0.004	0.84	0.004	2.15	3.19	0.31	1.55	0.596	0.361	6/1/2012 20:00	6/2/2012 2:15	6.25
12	6/4/2012 12:00	6/4/2012 21:45	9.75	0.002	0.32	0.006	1.43	2.69	0.11	1.61	0.665	0.633	6/4/2012 12:15	6/4/2012 21:00	8.75
13	6/12/2012 9:00	6/13/2012 4:45	19.75	0.009	0.92	0.010	2.01	3.23	0.06	2.05	0.721	0.527	6/12/2012 9:00	6/12/2012 23:00	14
14	6/22/2012 17:00	6/23/2012 0:00	7	0.004	1.20	0.004	2.70	4.05	0.26	2.44	0.656	0.697	6/22/2012 17:00	6/22/2012 22:15	5.25
15	7/26/2012 19:30	7/27/2012 2:45	7.25	0.001	0.40	0.002	1.22	2.58	0.24	1.25	0.570	0.462	7/26/2012 19:45	7/27/2012 0:30	4.75
16	8/10/2012 7:30	8/10/2012 17:00	9.5	0.003	0.78	0.004	1.91	3.37	0.27	2.00	0.654	0.751	8/10/2012 7:30	8/10/2012 12:00	4.5
17	8/11/2012 17:30	8/11/2012 23:30	6	0.001	0.29	0.005	1.93	3.33	0.12	1.77	0.646	0.713	8/11/2012 17:45	8/11/2012 20:15	2.5
18	8/14/2012 9:45	8/14/2012 19:15	9.5	0.003	0.52	0.005	1.93	3.27	0.25	1.77	0.617	0.635	8/14/2012 9:45	8/14/2012 17:15	7.5
19	8/17/2012 21:15	8/18/2012 9:30	12.25	0.005	0.84	0.006	2.51	3.07	0.22	1.51	0.418	0.405	8/17/2012 21:30	8/18/2012 6:45	9.25
20	8/27/2012 7:30	8/27/2012 14:30	7	0.003	0.65	0.004	1.90	3.34	0.20	2.00	0.488	0.801	8/27/2012 8:00	8/27/2012 12:45	4.75
21	9/3/2012 8:00	9/3/2012 20:30	12.5	0.006	0.46	0.012	2.42	3.65	0.11	2.06	0.569	0.705	9/3/2012 9:00	9/3/2012 18:45	9.75
22	9/4/2012 2:15	9/4/2012 7:00	4.75	0.002	0.24	0.008	2.13	2.93	0.13	1.56	0.593	0.255	9/4/2012 3:00	9/4/2012 4:30	1.5
23	9/4/2012 12:30	9/4/2012 22:00	9.5	0.005	0.40	0.014	2.18	3.27	0.11	2.23	0.614	0.634	9/4/2012 13:00	9/4/2012 18:00	5
24	9/5/2012 11:45	9/5/2012 18:15	6.5	0.005	0.32	0.016	2.55	3.79	0.12	2.61	0.647	0.576	9/5/2012 11:45	9/5/2012 14:15	2.5
25	9/8/2012 16:30	9/9/2012 1:15	8.75	0.006	0.34	0.018	2.54	3.74	0.06	2.43	0.587	0.641	9/8/2012 16:30	9/8/2012 22:30	6
26	9/18/2012 2:00	9/18/2012 6:45	4.75	0.002	0.24	0.007	1.63	2.81	0.05	1.38	0.572	0.209	9/18/2012 2:00	9/18/2012 6:00	4
27	9/18/2012 16:00	9/18/2012 22:30	6.5	0.005	0.84	0.006	2.52	3.78	0.23	2.61	0.575	0.679	9/18/2012 16:45	9/18/2012 20:45	4
28	9/22/2012 18:45	9/22/2012 23:30	4.75	0.003	0.46	0.006	2.36	3.48	0.21	2.19	0.539	0.692	9/22/2012 19:15	9/22/2012 21:30	2.25
29	9/26/2012 23:15	9/27/2012 10:15	11	0.002	0.26	0.008	2.00	2.98	0.10	1.41	0.600	0.479	9/26/2012 23:30	9/27/2012 8:45	9.25
30	10/2/2012 10:30	10/2/2012 16:30	6	0.005	0.24	0.019	2.40	3.57	0.08	2.51	0.566	0.603	10/2/2012 10:30	10/2/2012 15:15	4.75
31	10/7/2012 10:30	10/7/2012 22:45	12.25	0.005	0.23	0.022	2.07	3.45	0.04	2.03	0.570	0.746	10/7/2012 10:30	10/7/2012 21:00	10.5
32	10/15/2012 12:00	10/15/2012 23:15	11.25	0.003	0.24	0.011	2.42	3.53	0.03	1.62	0.596	0.629	10/15/2012 12:00	10/15/2012 20:30	8.5
33	10/19/2012 8:15	10/19/2012 15:15	7	0.003	0.68	0.005	1.76	3.13	0.19	2.04	0.499	0.747	10/19/2012 9:30	10/19/2012 14:00	4.5
34	10/28/2012 15:30	10/28/2012 22:30	7	0.004	0.25	0.014	1.75	3.24	0.03	2.21	0.628	0.711	10/28/2012 15:45	10/28/2012 20:45	5
35	10/29/2012 3:15	10/31/2012 0:00	44.75	0.025	3.28	0.008	2.64	4.10	0.13	2.27	0.706	0.601	10/29/2012 3:45	10/30/2012 20:30	40.75
36	11/13/2012 2:30	11/13/2012 13:45	11.25	0.003	0.26	0.010	2.50	3.83	0.08	1.65	0.631	0.616	11/13/2012 2:45	11/13/2012 12:00	9.25

ML_1 Lower Merion Township
2490 North 51st Street at City Line Ave.
Pipe Size: 24" dia. Tributary Drainage Area: 2,671 acres Tributary Service Population: 15,278

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	11/27/2012 5:45	11/27/2012 17:15	11.5	0.006	0.61	0.010	2.45	3.68	0.02	2.32	0.634	0.732	11/27/2012 5:45	11/27/2012 15:45	10
38	12/7/2012 21:45	12/8/2012 3:45	6	0.001	0.20	0.006	1.64	2.51	0.05	1.24	0.538	0.333	12/7/2012 21:45	12/8/2012 1:30	3.75
39	12/9/2012 8:00	12/10/2012 0:00	16	0.006	0.28	0.020	2.24	3.47	0.03	1.92	0.531	0.757	12/9/2012 8:00	12/9/2012 23:15	15.25
40	12/18/2012 0:30	12/18/2012 16:30	16	0.004	0.22	0.017	2.29	3.91	0.09	1.62	0.659	0.539	12/18/2012 0:30	12/18/2012 15:15	14.75
41	12/20/2012 21:00	12/22/2012 8:15	35.25	0.026	2.26	0.011	4.56	5.95	0.18	2.34	0.558	0.508	12/20/2012 21:00	12/21/2012 23:30	26.5
42	12/26/2012 13:15	12/27/2012 14:30	25.25	0.020	1.21	0.017	2.95	4.37	0.10	2.64	0.673	0.570	12/26/2012 13:15	12/27/2012 9:15	20
43	1/11/2013 15:45	1/12/2013 0:45	9	0.006	0.36	0.016	2.25	3.75	0.06	2.44	0.678	0.646	1/11/2013 16:15	1/11/2013 21:00	4.75
44	1/14/2013 20:45	1/15/2013 4:00	7.25	0.005	0.36	0.013	2.09	3.60	0.04	2.19	0.760	0.335	1/14/2013 20:45	1/15/2013 2:30	5.75
45	1/15/2013 21:15	1/16/2013 16:00	18.75	0.018	1.01	0.017	3.66	4.63	0.07	2.94	0.778	0.538	1/15/2013 21:30	1/16/2013 11:15	13.75
46	1/30/2013 17:15	1/31/2013 11:15	18	0.012	1.43	0.009	2.91	3.70	0.28	2.55	0.790	0.569	1/30/2013 17:15	1/31/2013 5:45	12.5
47	2/8/2013 5:45	2/9/2013 5:00	23.25	0.010	0.33	0.031	2.66	3.51	0.02	2.16	0.772	0.610	2/8/2013 5:45	2/9/2013 1:30	19.75
48	2/11/2013 4:15	2/11/2013 13:45	9.5	0.004	0.38	0.011	1.63	3.51	0.05	2.30	0.808	0.721	2/11/2013 4:15	2/11/2013 8:30	4.25
49	2/13/2013 18:30	2/14/2013 3:45	9.25	0.005	0.22	0.023	1.81	3.16	0.02	2.17	0.801	0.447	2/13/2013 18:30	2/14/2013 0:00	5.5
50	2/26/2013 18:45	2/27/2013 11:45	17	0.012	0.63	0.019	2.59	3.77	0.06	2.47	0.687	0.564	2/26/2013 19:00	2/27/2013 10:45	15.75
51	3/12/2013 2:30	3/13/2013 4:30	26	0.007	1.02	0.007	2.62	3.28	0.06	1.60	0.588	0.530	3/12/2013 2:45	3/12/2013 16:30	13.75
52	3/16/2013 9:00	3/16/2013 20:45	11.75	0.005	0.27	0.019	1.88	3.29	0.04	2.13	0.521	0.832	3/16/2013 9:15	3/16/2013 17:30	8.25
53	3/18/2013 17:30	3/19/2013 11:30	18	0.013	0.83	0.016	3.54	4.22	0.06	2.48	0.618	0.571	3/18/2013 17:45	3/19/2013 10:45	17
54	3/25/2013 5:45	3/25/2013 19:15	13.5	0.008	0.49	0.017	1.98	3.37	0.05	2.38	0.618	0.725	3/25/2013 6:00	3/25/2013 15:45	9.75
		Average:	12.4	0.006	0.62	0.012	2.31	3.52	0.11	2.08	0.637	0.579			8.9
		Maximum Value:	44.8	0.026	3.28	0.031	4.56	5.95	0.33	2.94	0.808	0.832			40.8
		Minimum Value:	2.3	0.001	0.20	0.002	1.215	2.51	0.02	1.243	0.418	0.209			1.25
		Standard Deviation:	8.7	0.006	0.59	0.006	0.596	0.569	0.08	0.419	0.088	0.143			7.6
		Weighted Mean R-Value*:				0.010									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_1 Lower Merion Township

2490 North 51st Street at City Line Ave.

Pipe Size: 24" dia. Tributary Drainage Area: 2,671 acres Tributary Service Population: 15,278

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/7/2014 12:30	4/8/2014 22:30	34	0.005	0.52	0.009	2.55	4.70	0.04	2.58	1.60	0.735	4/7/2014 12:30	4/8/2014 7:00	18.5
2	4/15/2014 9:45	4/16/2014 17:45	32	0.008	1.26	0.007	2.40	4.65	0.16	2.67	1.51	0.711	4/15/2014 9:45	4/15/2014 23:15	13.5
3	4/25/2014 18:30	4/26/2014 19:45	25.25	0.005	0.49	0.009	3.12	5.26	0.14	2.26	1.08	0.863	4/25/2014 18:30	4/26/2014 16:15	21.75
4	4/29/2014 12:15	5/8/2014 18:45	222.5	0.123	5.52	0.022	6.22	8.40	0.32	3.28	1.59	0.732	4/29/2014 12:30	5/8/2014 8:00	211.5
5	5/10/2014 15:00	5/11/2014 8:00	17	0.006	0.29	0.021	2.38	4.83	0.10	3.00	1.68	0.691	5/10/2014 15:00	5/11/2014 0:00	9
6	5/16/2014 7:30	5/21/2014 13:15	125.75	0.038	2.33	0.016	3.84	6.04	0.22	3.17	1.89	0.754	5/16/2014 7:30	5/21/2014 8:15	120.75
7	5/27/2014 18:00	5/29/2014 21:45	51.75	0.007	1.16	0.006	2.45	4.80	0.24	2.83	1.87	0.729	5/27/2014 18:00	5/28/2014 14:30	20.5
8	6/9/2014 2:30	6/11/2014 23:00	68.5	0.002	0.64	0.003	2.68	5.23	0.12	2.45	1.67	0.732	6/9/2014 2:45	6/10/2014 20:30	41.75
9	6/12/2014 0:15	6/14/2014 9:45	57.5	0.003	0.49	0.007	2.65	4.81	0.05	2.35	1.51	0.743	6/12/2014 0:30	6/13/2014 17:00	40.5
10	6/19/2014 1:45	6/20/2014 0:45	23	0.002	0.26	0.007	1.96	4.57	0.06	2.38	1.51	0.735	6/19/2014 2:00	6/19/2014 16:45	14.75
11	6/25/2014 23:15	6/26/2014 20:30	21.25	0.002	0.57	0.003	1.73	3.90	0.24	2.25	1.42	0.707	6/25/2014 23:15	6/26/2014 2:00	2.75
		Average:	61.7	0.018	1.23	0.010	2.91	5.20	0.15	2.66	1.57	0.739			46.8
		Maximum Value:	222.5	0.123	5.52	0.022	6.22	8.40	0.32	3.28	1.89	0.863			211.5
		Minimum Value:	17.0	0.002	0.26	0.003	1.73	3.90	0.04	2.25	1.08	0.691			2.75
		Standard Deviation:	61.8	0.036	1.54	0.007	1.23	1.18	0.09	0.365	0.221	0.045			63.5
		Weighted Mean R-Value*:				0.015									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML-2 Lower Merion Township

59th Street

Pipe Size: 8" dia. Tributary Drainage Area: 55 acres Tributary Service Population: 379

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	8/17/2007 14:15	8/18/2007 1:15	11	0.009	0.42	0.022	0.241	0.305	0.18	0.074	-0.013	0.056	8/17/2007 14:15	8/17/2007 20:45	6.5
2	8/19/2007 13:15	8/19/2007 22:45	9.5	0.015	0.60	0.025	0.160	0.225	0.05	0.119	0.013	0.050	8/19/2007 13:15	8/19/2007 22:00	8.75
3	8/20/2007 0:30	8/20/2007 7:45	7.25	0.015	0.42	0.035	0.330	0.348	0.17	0.100	0.011	0.017	8/20/2007 0:30	8/20/2007 5:00	4.5
4	8/20/2007 16:00	8/21/2007 16:00	24	0.045	1.15	0.039	0.329	0.415	0.09	0.129	0.009	0.053	8/20/2007 16:15	8/21/2007 12:30	20.25
5	8/21/2007 21:00	8/22/2007 7:30	10.5	0.024	0.79	0.031	0.400	0.458	0.17	0.118	0.007	0.027	8/21/2007 21:00	8/22/2007 0:00	3
6	9/11/2007 12:00	9/11/2007 22:00	10	0.009	0.31	0.028	0.089	0.226	0.16	0.161	0.060	0.070	9/11/2007 12:00	9/11/2007 16:15	4.25
7	10/9/2007 20:30	10/10/2007 2:30	6	0.008	0.59	0.013	0.110	0.193	0.20	0.113	0.023	0.044	10/9/2007 20:45	10/10/2007 1:15	4.5
8	10/11/2007 1:30	10/13/2007 10:45	57.25	0.069	1.39	0.049	0.218	0.306	0.12	0.102	0.012	0.047	10/11/2007 1:30	10/12/2007 5:45	28.25
9	10/19/2007 22:15	10/20/2007 3:45	5.5	0.004	0.45	0.009	0.104	0.149	0.23	0.082	0.031	0.026	10/19/2007 22:15	10/20/2007 1:00	2.75
10	10/24/2007 17:15	10/25/2007 14:45	21.5	0.016	0.49	0.034	0.187	0.251	0.04	0.086	0.007	0.051	10/24/2007 17:15	10/25/2007 14:00	20.75
11	10/26/2007 13:15	10/28/2007 7:00	41.75	0.039	2.63	0.015	0.211	0.264	0.19	0.064	-0.009	0.040	10/26/2007 13:15	10/27/2007 12:30	23.25
12	11/15/2007 7:00	11/15/2007 21:30	14.5	0.011	0.54	0.020	0.155	0.310	0.18	0.170	0.072	0.071	11/15/2007 7:15	11/15/2007 15:00	7.75
		Average:	18.2	0.022	0.81	0.027	0.211	0.288	0.15	0.110	0.019	0.046			11.2
		Maximum Value:	57.3	0.069	2.63	0.049	0.400	0.458	0.23	0.170	0.072	0.071			28
		Minimum Value:	5.5	0.004	0.31	0.009	0.089	0.149	0.04	0.064	-0.013	0.017			2.75
		Standard Deviation:	16.0	0.019	0.66	0.012	0.099	0.089	0.06	0.033	0.025	0.017			9.2
		Weighted Mean R-Value*:				0.027									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML-2 Lower Merion Township

59th Street

Pipe Size: 8" dia. Tributary Drainage Area: 55 acres Tributary Service Population: 379

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/24/2010 23:30	4/25/2010 10:45	11.25	0.003	0.48	0.007	0.037	0.051	0.04	0.032	0.014	0.007	4/24/2010 23:45	4/25/2010 10:45	11
2	4/25/2010 21:45	4/26/2010 3:45	6	0.004	0.38	0.009	0.054	0.077	0.07	0.042	0.014	0.007	4/25/2010 21:45	4/26/2010 1:30	3.75
3	4/26/2010 6:00	4/27/2010 5:15	23.25	0.007	0.66	0.010	0.033	0.061	0.05	0.037	0.014	0.013	4/26/2010 6:00	4/27/2010 1:30	19.5
4	5/3/2010 3:45	5/4/2010 5:45	26	0.006	1.06	0.005	0.041	0.073	0.17	0.037	0.018	0.011	5/3/2010 4:00	5/3/2010 9:45	5.75
5	5/11/2010 18:15	5/12/2010 11:15	17	0.005	0.54	0.010	0.039	0.056	0.12	0.030	0.009	0.011	5/11/2010 18:30	5/12/2010 7:45	13.25
6	5/18/2010 1:00	5/18/2010 10:15	9.25	0.004	0.40	0.009	0.034	0.050	0.05	0.027	0.005	0.008	5/18/2010 1:15	5/18/2010 8:45	7.5
7	5/18/2010 11:30	5/18/2010 19:30	8	0.002	0.20	0.011	0.038	0.060	0.04	0.031	0.005	0.016	5/18/2010 11:45	5/18/2010 15:00	3.25
		Average:	14.4	0.004	0.53	0.009	0.039	0.061	0.08	0.034	0.011	0.010			9.1
		Maximum Value:	26.0	0.007	1.06	0.011	0.054	0.077	0.17	0.042	0.018	0.016			20
		Minimum Value:	6.0	0.002	0.20	0.005	0.033	0.050	0.04	0.027	0.005	0.007			3.25
		Standard Deviation:	7.8	0.002	0.27	0.002	0.007	0.010	0.05	0.005	0.005	0.003			5.9
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML-2 Lower Merion Township

59th Street

Pipe Size: 8" dia. Tributary Drainage Area: 55 acres Tributary Service Population: 379

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/19/2013 11:00	2/20/2013 2:00	15	0.004	0.20	0.020	0.090	0.147	0.01	0.067	0.023	0.035	2/19/2013 11:15	2/19/2013 17:30	6.25
2	2/26/2013 19:00	2/27/2013 11:15	16.25	0.015	0.62	0.025	0.185	0.235	0.06	0.080	0.022	0.024	2/26/2013 19:15	2/27/2013 10:45	15.5
3	3/12/2013 2:45	3/13/2013 9:30	30.75	0.011	1.02	0.011	0.074	0.135	0.07	0.059	0.020	0.026	3/12/2013 3:00	3/12/2013 16:45	13.75
4	3/16/2013 10:15	3/16/2013 23:15	13	0.004	0.22	0.018	0.053	0.100	0.04	0.060	0.017	0.032	3/16/2013 10:15	3/16/2013 17:00	6.75
5	3/18/2013 18:00	3/20/2013 1:45	31.75	0.014	0.80	0.017	0.055	0.096	0.06	0.062	0.017	0.029	3/18/2013 18:00	3/19/2013 11:00	17
6	3/25/2013 5:45	3/26/2013 8:30	26.75	0.014	0.43	0.033	0.103	0.175	0.04	0.071	0.024	0.028	3/25/2013 5:45	3/25/2013 15:45	10
7	4/10/2013 20:15	4/11/2013 10:15	14	0.008	0.60	0.013	0.192	0.249	0.25	0.062	0.021	0.021	4/10/2013 20:30	4/10/2013 23:45	3.25
8	4/12/2013 7:00	4/12/2013 18:15	11.25	0.017	0.61	0.028	0.188	0.250	0.11	0.115	0.019	0.040	4/12/2013 7:15	4/12/2013 13:30	6.25
9	4/12/2013 21:30	4/13/2013 5:30	8	0.012	0.55	0.021	0.314	0.365	0.17	0.086	0.020	0.014	4/12/2013 21:30	4/12/2013 23:15	1.75
10	4/19/2013 21:15	4/20/2013 6:30	9.25	0.010	0.63	0.015	0.183	0.231	0.07	0.071	0.020	0.013	4/19/2013 21:30	4/20/2013 2:45	5.25
11	4/29/2013 1:45	4/30/2013 7:00	29.25	0.010	0.53	0.020	0.136	0.203	0.05	0.056	0.019	0.025	4/29/2013 2:00	4/30/2013 5:15	27.25
12	5/8/2013 6:45	5/8/2013 14:15	7.5	0.010	0.61	0.016	0.208	0.257	0.18	0.091	0.004	0.041	5/8/2013 6:45	5/8/2013 12:45	6
13	5/9/2013 2:30	5/9/2013 9:45	7.25	0.009	0.47	0.019	0.120	0.125	0.08	0.065	0.003	0.016	5/9/2013 2:45	5/9/2013 6:15	3.5
14	5/10/2013 22:30	5/11/2013 21:15	22.75	0.032	1.03	0.031	0.270	0.273	0.16	0.063	-0.009	0.022	5/10/2013 22:30	5/11/2013 18:45	20.25
		Average:	17.3	0.012	0.60	0.020	0.155	0.203	0.10	0.072	0.016	0.026			10.2
		Maximum Value:	31.8	0.032	1.03	0.033	0.314	0.365	0.25	0.115	0.024	0.041			27
		Minimum Value:	7.3	0.004	0.20	0.011	0.053	0.096	0.01	0.056	-0.009	0.013			1.75
		Standard Deviation:	9.1	0.007	0.24	0.007	0.079	0.077	0.07	0.016	0.010	0.009			7.5
		Weighted Mean R-Value*:				0.020									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_3 Lower Merion Township
63rd Street
Pipe Size: 14" dia. Tributary Drainage Area: 618 acres Tributary Service Population: 3,782

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:45	4/2/2012 6:45	12	0.001	0.17	0.008	0.120	0.537	0.03	0.424	0.277	0.104	4/1/2012 18:45	4/2/2012 2:15	7.5
2	4/22/2012 8:15	4/26/2012 0:00	87.75	0.028	2.20	0.013	0.611	1.04	0.11	0.536	0.245	0.164	4/22/2012 8:15	4/23/2012 17:45	33.5
3	5/1/2012 3:45	5/1/2012 18:45	15	0.001	0.23	0.006	0.121	0.658	0.09	0.454	0.250	0.168	5/1/2012 3:45	5/1/2012 10:00	6.25
4	5/3/2012 2:15	5/3/2012 12:30	10.25	0.001	0.23	0.005	0.106	0.680	0.03	0.452	0.260	0.146	5/3/2012 2:30	5/3/2012 5:15	2.75
5	5/4/2012 21:45	5/5/2012 5:15	7.5	0.001	0.14	0.005	0.104	0.528	0.04	0.377	0.265	0.077	5/4/2012 21:45	5/4/2012 23:45	2
6	5/9/2012 2:45	5/9/2012 20:45	18	0.001	0.36	0.004	0.183	0.574	0.09	0.387	0.192	0.163	5/9/2012 2:45	5/9/2012 6:45	4
7	5/9/2012 22:00	5/10/2012 15:15	17.25	0.002	0.27	0.007	0.170	0.590	0.03	0.384	0.194	0.144	5/9/2012 22:15	5/10/2012 4:00	5.75
8	5/15/2012 8:15	5/15/2012 23:45	15.5	0.005	0.79	0.007	0.410	0.835	0.12	0.522	0.192	0.198	5/15/2012 8:15	5/15/2012 12:30	4.25
9	5/16/2012 1:00	5/18/2012 19:30	66.5	0.018	0.84	0.022	0.814	1.02	0.25	0.464	0.201	0.152	5/16/2012 1:15	5/16/2012 4:15	3
10	5/22/2012 2:00	5/22/2012 10:45	8.75	0.001	0.15	0.005	0.094	0.579	0.02	0.375	0.209	0.128	5/22/2012 2:00	5/22/2012 7:15	5.25
11	5/24/2012 13:45	5/25/2012 6:45	17	0.002	0.35	0.006	0.284	0.667	0.24	0.375	0.207	0.121	5/24/2012 14:00	5/24/2012 21:15	7.25
12	6/1/2012 19:30	6/2/2012 13:15	17.75	0.003	0.81	0.003	0.262	0.608	0.23	0.387	0.195	0.131	6/1/2012 19:30	6/2/2012 2:15	6.75
13	6/3/2012 19:45	6/4/2012 9:00	13.25	0.001	0.08	0.015	0.143	0.544	0.07	0.346	0.185	0.123	6/3/2012 20:00	6/4/2012 4:30	8.5
14	6/4/2012 11:15	6/5/2012 13:45	26.5	0.003	0.39	0.008	0.222	0.577	0.11	0.381	0.177	0.159	6/4/2012 12:15	6/4/2012 21:00	8.75
15	6/12/2012 11:00	6/14/2012 17:45	54.75	0.010	0.97	0.011	0.273	0.655	0.07	0.418	0.185	0.157	6/12/2012 11:00	6/12/2012 23:00	12
16	6/22/2012 18:00	6/23/2012 9:00	15	0.010	1.57	0.006	1.41	1.76	0.39	0.524	0.155	0.102	6/22/2012 18:15	6/22/2012 22:15	4
17	7/14/2012 2:00	7/14/2012 14:15	12.25	0.001	0.36	0.003	0.108	0.531	0.04	0.345	0.182	0.124	7/14/2012 3:45	7/14/2012 12:15	8.5
18	7/15/2012 21:00	7/16/2012 17:45	20.75	0.003	0.63	0.004	0.294	0.652	0.28	0.378	0.177	0.148	7/15/2012 21:30	7/16/2012 0:00	2.5
19	7/20/2012 0:15	7/20/2012 20:15	20	0.004	1.11	0.004	0.562	0.727	0.51	0.373	0.143	0.146	7/20/2012 1:00	7/20/2012 8:30	7.5
20	7/26/2012 19:00	7/27/2012 6:15	11.25	0.001	0.37	0.003	0.219	0.595	0.21	0.305	0.166	0.103	7/26/2012 19:45	7/27/2012 0:30	4.75
21	7/28/2012 21:45	7/29/2012 7:00	9.25	0.001	0.33	0.003	0.169	0.506	0.17	0.267	0.163	0.063	7/28/2012 21:45	7/28/2012 22:00	0.25
22	8/5/2012 18:15	8/6/2012 6:15	12	0.001	0.30	0.005	0.107	0.467	0.06	0.303	0.147	0.109	8/5/2012 18:30	8/6/2012 2:15	7.75
23	8/10/2012 9:15	8/11/2012 9:00	23.75	0.004	0.67	0.006	0.301	0.657	0.20	0.348	0.141	0.133	8/10/2012 9:45	8/10/2012 12:00	2.25
24	8/14/2012 9:45	8/15/2012 6:30	20.75	0.001	0.47	0.003	0.100	0.471	0.13	0.307	0.145	0.139	8/14/2012 9:45	8/15/2012 1:45	16
25	8/17/2012 21:45	8/18/2012 18:45	21	0.004	0.86	0.005	0.364	0.685	0.21	0.366	0.150	0.138	8/17/2012 21:45	8/18/2012 7:00	9.25
26	8/27/2012 8:00	8/27/2012 17:45	9.75	0.002	0.90	0.003	0.504	0.865	0.35	0.422	0.124	0.205	8/27/2012 8:00	8/27/2012 16:45	8.75
27	8/28/2012 5:45	8/28/2012 12:15	6.5	0.001	0.15	0.005	0.158	0.526	0.04	0.398	0.133	0.219	8/28/2012 5:45	8/28/2012 7:30	1.75
28	9/3/2012 8:45	9/6/2012 15:15	78.5	0.015	2.02	0.007	0.475	0.857	0.27	0.408	0.169	0.162	9/3/2012 9:00	9/5/2012 14:15	53.25
29	9/8/2012 16:45	9/9/2012 6:00	13.25	0.001	0.37	0.002	0.120	0.515	0.07	0.331	0.189	0.118	9/8/2012 17:00	9/8/2012 22:30	5.5
30	9/18/2012 4:00	9/18/2012 12:30	8.5	0.001	0.22	0.005	0.165	0.589	0.06	0.443	0.218	0.174	9/18/2012 4:15	9/18/2012 12:15	8
31	9/18/2012 16:30	9/20/2012 0:00	31.5	0.006	0.84	0.007	0.330	0.731	0.23	0.457	0.222	0.161	9/18/2012 16:45	9/19/2012 1:45	9
32	9/22/2012 18:45	9/24/2012 1:00	30.25	0.004	0.63	0.006	0.383	0.831	0.27	0.444	0.241	0.154	9/22/2012 19:15	9/22/2012 21:15	2
33	10/2/2012 10:15	10/3/2012 1:00	14.75	0.001	0.22	0.006	0.095	0.474	0.08	0.404	0.187	0.181	10/2/2012 10:15	10/2/2012 14:15	4
34	10/7/2012 10:30	10/8/2012 1:00	14.5	0.002	0.23	0.011	0.149	0.549	0.03	0.445	0.178	0.198	10/7/2012 10:30	10/7/2012 21:00	10.5
35	10/15/2012 11:15	10/16/2012 0:00	12.75	0.001	0.25	0.005	0.126	0.440	0.07	0.384	0.161	0.182	10/15/2012 11:15	10/15/2012 20:30	9.25
36	10/19/2012 1:30	10/21/2012 7:00	53.5	0.006	0.96	0.006	0.396	0.778	0.20	0.339	0.158	0.135	10/19/2012 1:30	10/19/2012 23:00	21.5

ML_3 Lower Merion Township

63rd Street

Pipe Size: 14" dia. Tributary Drainage Area: 618 acres Tributary Service Population: 3,782

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	10/28/2012 15:45	11/2/2012 2:15	106.5	0.049	3.45	0.014	0.833	1.18	0.12	0.561	0.220	0.155	10/28/2012 15:45	10/30/2012 20:15	52.5
38	11/7/2012 12:30	11/8/2012 14:00	25.5	0.004	0.37	0.011	0.216	0.718	0.03	0.516	0.295	0.156	11/7/2012 12:30	11/8/2012 1:30	13
39	11/13/2012 2:15	11/13/2012 13:45	11.5	0.001	0.24	0.004	0.094	0.647	0.06	0.438	0.253	0.150	11/13/2012 2:45	11/13/2012 11:45	9
40	11/27/2012 6:15	11/28/2012 12:30	30.25	0.006	0.58	0.011	0.244	0.698	0.02	0.498	0.246	0.171	11/27/2012 6:30	11/27/2012 15:45	9.25
41	12/9/2012 8:30	12/10/2012 17:15	32.75	0.005	0.27	0.018	0.166	0.678	0.04	0.473	0.242	0.174	12/9/2012 8:45	12/10/2012 0:45	16
42	12/11/2012 4:30	12/11/2012 12:00	7.5	0.001	0.10	0.008	0.109	0.627	0.03	0.474	0.247	0.184	12/11/2012 4:30	12/11/2012 6:30	2
43	12/18/2012 0:30	12/19/2012 0:00	23.5	0.003	0.23	0.012	0.178	0.628	0.11	0.448	0.247	0.155	12/18/2012 0:30	12/18/2012 15:15	14.75
44	1/11/2013 17:45	1/12/2013 8:15	14.5	0.001	0.31	0.003	0.096	0.502	0.06	0.333	0.204	0.100	1/11/2013 17:45	1/11/2013 20:45	3
45	1/14/2013 21:00	1/15/2013 8:00	11	0.001	0.35	0.003	0.111	0.548	0.03	0.355	0.213	0.098	1/14/2013 21:00	1/15/2013 2:30	5.5
46	1/15/2013 22:15	1/20/2013 17:00	114.75	0.032	0.99	0.033	0.536	0.797	0.07	0.504	0.242	0.149	1/15/2013 22:15	1/18/2013 6:15	56
47	1/28/2013 12:30	1/29/2013 0:00	11.5	0.001	0.16	0.009	0.094	0.556	0.02	0.483	0.254	0.179	1/28/2013 12:45	1/28/2013 17:00	4.25
48	1/30/2013 17:45	2/4/2013 8:45	111	0.031	1.45	0.021	0.798	1.04	0.29	0.512	0.252	0.147	1/30/2013 17:45	2/3/2013 23:30	101.75
49	2/8/2013 5:45	2/9/2013 20:15	38.5	0.005	0.35	0.014	0.183	0.633	0.02	0.494	0.279	0.164	2/8/2013 5:45	2/9/2013 1:15	19.5
50	2/11/2013 4:15	2/13/2013 0:15	44	0.005	0.39	0.012	0.163	0.777	0.05	0.521	0.311	0.165	2/11/2013 4:15	2/11/2013 8:30	4.25
51	2/13/2013 18:30	2/14/2013 15:15	20.75	0.001	0.21	0.006	0.096	0.668	0.02	0.513	0.333	0.155	2/13/2013 18:30	2/13/2013 23:45	5.25
52	2/19/2013 11:15	2/20/2013 3:00	15.75	0.001	0.22	0.006	0.088	0.569	0.02	0.479	0.290	0.158	2/19/2013 11:15	2/19/2013 17:30	6.25
53	2/26/2013 19:15	3/1/2013 18:30	71.25	0.012	0.63	0.019	0.232	0.720	0.06	0.493	0.273	0.154	2/26/2013 19:15	2/27/2013 13:15	18
54	3/12/2013 3:00	3/15/2013 20:45	89.75	0.021	1.02	0.021	0.407	0.849	0.07	0.535	0.282	0.156	3/12/2013 3:00	3/13/2013 16:45	37.75
55	3/16/2013 9:15	3/17/2013 4:00	18.75	0.001	0.25	0.005	0.109	0.597	0.04	0.498	0.299	0.172	3/16/2013 9:30	3/16/2013 17:30	8
56	3/18/2013 16:30	3/23/2013 18:15	121.75	0.027	0.82	0.033	0.334	0.809	0.06	0.550	0.307	0.153	3/18/2013 17:45	3/20/2013 21:15	51.5
57	3/25/2013 6:00	3/28/2013 6:30	72.5	0.009	0.48	0.019	0.252	0.746	0.05	0.516	0.312	0.154	3/25/2013 6:00	3/26/2013 20:30	38.5
		Average:	31.9	0.006	0.60	0.009	0.277	0.689	0.12	0.429	0.217	0.149			13.9
		Maximum Value:	122	0.049	3.45	0.033	1.41	1.76	0.51	0.561	0.333	0.219			101.8
		Minimum Value:	6.5	0.001	0.08	0.002	0.088	0.440	0.02	0.267	0.124	0.063			0.25
		Standard Deviation:	30.8	0.010	0.59	0.007	0.242	0.212	0.11	0.074	0.053	0.030			18.3
		Weighted Mean R-Value*:				0.011									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML-3 Lower Merion Township Q2-2013 thru Q1-2014

63rd Street

Pipe Size: 14" dia. Tributary Drainage Area: 618 acres Tributary Service Population: 3,782

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 4:45	8.25	0.001	0.48	0.002	0.214	0.660	0.28	0.390	0.259	0.082	4/10/2013 20:45	4/10/2013 23:45	3
2	4/12/2013 7:00	4/14/2013 23:45	64.75	0.016	1.19	0.013	0.681	1.16	0.21	0.551	0.298	0.154	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:15	4/20/2013 17:45	20.5	0.003	0.63	0.005	0.199	0.695	0.07	0.527	0.335	0.131	4/19/2013 21:30	4/20/2013 2:45	5.25
4	4/28/2013 22:30	4/30/2013 14:30	40	0.006	0.56	0.011	0.212	0.704	0.04	0.476	0.266	0.146	4/28/2013 22:30	4/30/2013 5:15	30.75
5	5/7/2013 21:45	5/10/2013 4:15	54.5	0.009	1.30	0.007	0.302	0.766	0.20	0.476	0.269	0.142	5/7/2013 21:45	5/9/2013 6:15	32.5
6	5/10/2013 22:30	5/13/2013 22:00	71.5	0.020	1.18	0.017	0.450	0.828	0.19	0.570	0.313	0.144	5/10/2013 22:30	5/12/2013 6:00	31.5
7	5/18/2013 15:30	5/20/2013 1:00	33.5	0.004	0.36	0.010	0.122	0.625	0.05	0.470	0.279	0.147	5/18/2013 15:30	5/19/2013 17:45	26.25
8	5/23/2013 16:15	5/25/2013 17:30	49.25	0.006	1.19	0.005	0.520	0.925	0.36	0.462	0.263	0.147	5/23/2013 16:15	5/24/2013 22:15	30
9	5/28/2013 9:00	5/29/2013 2:30	17.5	0.003	0.29	0.011	0.152	0.602	0.05	0.506	0.273	0.163	5/28/2013 9:00	5/28/2013 19:45	10.75
10	6/3/2013 0:00	6/4/2013 9:30	33.5	0.007	1.33	0.006	0.654	1.10	0.57	0.460	0.231	0.140	6/3/2013 0:00	6/3/2013 18:00	18
11	6/6/2013 19:00	6/17/2013 11:00	256	0.149	6.50	0.023	1.19	1.62	0.45	0.692	0.310	0.147	6/6/2013 19:15	6/16/2013 18:30	239.25
12	6/18/2013 12:30	6/19/2013 15:00	26.5	0.004	0.74	0.005	0.216	0.743	0.23	0.570	0.357	0.154	6/18/2013 12:45	6/18/2013 20:30	7.75
13	6/30/2013 12:30	6/30/2013 20:00	7.5	0.001	0.22	0.003	0.118	0.598	0.03	0.529	0.299	0.191	6/30/2013 12:30	6/30/2013 15:30	3
14	7/1/2013 6:45	7/1/2013 20:15	13.5	0.001	0.21	0.006	0.115	0.597	0.03	0.533	0.291	0.203	7/1/2013 6:45	7/1/2013 14:15	7.5
15	7/12/2013 7:30	7/13/2013 21:00	37.5	0.011	1.46	0.008	0.354	0.776	0.16	0.516	0.231	0.161	7/12/2013 7:30	7/13/2013 18:15	34.75
16	7/22/2013 20:00	7/24/2013 4:15	32.25	0.004	1.04	0.003	0.538	0.755	0.43	0.380	0.198	0.138	7/22/2013 20:00	7/23/2013 17:45	21.75
17	7/28/2013 14:00	7/29/2013 8:45	18.75	0.001	0.25	0.006	0.091	0.493	0.11	0.348	0.177	0.140	7/28/2013 14:00	7/29/2013 2:30	12.5
18	8/1/2013 6:15	8/3/2013 17:15	59	0.012	1.04	0.011	0.415	0.759	0.14	0.392	0.154	0.157	8/1/2013 6:30	8/3/2013 13:15	54.75
19	8/8/2013 0:00	8/9/2013 0:00	24	0.002	0.44	0.004	0.150	0.469	0.34	0.323	0.142	0.153	8/8/2013 0:15	8/8/2013 15:00	14.75
20	8/12/2013 11:45	8/15/2013 6:30	66.75	0.011	1.94	0.006	0.976	1.41	0.38	0.366	0.153	0.146	8/12/2013 11:45	8/13/2013 9:30	21.75
21	8/28/2013 6:45	8/30/2013 19:15	60.5	0.010	1.31	0.008	0.887	1.24	0.68	0.384	0.154	0.163	8/28/2013 6:45	8/29/2013 11:45	29
22	9/2/2013 10:15	9/5/2013 0:00	61.75	0.019	1.78	0.011	1.34	1.75	0.61	0.572	0.285	0.161	9/2/2013 10:30	9/2/2013 14:30	4
23	9/12/2013 9:30	9/14/2013 10:00	48.5	0.006	0.81	0.007	0.498	0.863	0.26	0.528	0.335	0.144	9/12/2013 9:30	9/13/2013 7:30	22
24	9/21/2013 19:30	9/23/2013 22:00	50.5	0.014	1.21	0.012	0.544	0.942	0.23	0.567	0.303	0.149	9/21/2013 19:30	9/22/2013 3:30	8
25	10/7/2013 12:30	10/8/2013 0:00	11.5	0.003	0.45	0.006	0.334	0.788	0.10	0.554	0.282	0.174	10/7/2013 12:30	10/7/2013 17:00	4.5
26	10/10/2013 3:30	10/12/2013 22:00	66.5	0.020	2.05	0.010	0.568	0.918	0.29	0.573	0.296	0.155	10/10/2013 3:45	10/11/2013 19:00	39.25
27	11/26/2013 11:00	11/30/2013 6:00	91	0.043	3.09	0.014	0.973	1.22	0.17	0.604	0.268	0.147	11/26/2013 11:15	11/27/2013 17:30	30.25
28	12/6/2013 2:00	12/7/2013 21:15	43.25	0.012	0.99	0.013	0.306	0.690	0.06	0.546	0.279	0.151	12/6/2013 2:15	12/7/2013 2:15	24
29	12/8/2013 11:30	12/12/2013 13:00	97.5	0.027	1.35	0.020	0.369	0.925	0.06	0.585	0.318	0.154	12/8/2013 11:45	12/10/2013 17:30	53.75
30	12/14/2013 15:45	12/17/2013 4:15	60.5	0.020	0.76	0.026	0.396	0.842	0.08	0.637	0.365	0.142	12/14/2013 15:45	12/15/2013 0:45	9
31	12/23/2013 3:45	12/24/2013 18:30	38.75	0.008	0.60	0.013	0.366	0.938	0.11	0.627	0.386	0.161	12/23/2013 3:45	12/24/2013 17:15	37.5
32	12/29/2013 8:00	1/1/2014 6:45	70.75	0.034	1.19	0.028	0.603	1.16	0.09	0.716	0.372	0.152	12/29/2013 8:00	12/31/2013 14:30	54.5
33	1/2/2014 10:00	1/3/2014 5:30	19.5	0.006	0.47	0.012	0.190	0.732	0.03	0.623	0.369	0.135	1/2/2014 17:30	1/3/2014 4:15	10.75
34	1/5/2014 5:45	1/8/2014 4:15	70.5	0.016	0.86	0.019	0.422	1.07	0.12	0.595	0.351	0.152	1/5/2014 5:45	1/6/2014 12:45	31
35	1/10/2014 7:30	1/12/2014 15:00	55.5	0.017	1.08	0.016	0.367	0.855	0.11	0.600	0.325	0.148	1/10/2014 7:30	1/12/2014 0:00	40.5

ML-3 Lower Merion Township Q2-2013 thru Q1-2014

63rd Street

Pipe Size: 14" dia. Tributary Drainage Area: 618 acres Tributary Service Population: 3,782

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	2/3/2014 2:00	2/8/2014 7:15	125.25	0.054	2.75	0.020	0.657	1.39	0.10	0.836	0.516	0.147	2/3/2014 2:00	2/5/2014 11:45	57.75
37	2/13/2014 0:15	2/16/2014 22:00	93.75	0.020	1.72	0.011	0.277	0.902	0.09	0.686	0.456	0.147	2/13/2014 0:30	2/15/2014 16:15	63.75
38	2/19/2014 9:15	2/20/2014 3:30	18.25	0.001	0.32	0.004	0.116	0.862	0.07	0.756	0.577	0.153	2/19/2014 9:30	2/19/2014 12:00	2.5
39	3/12/2014 15:00	3/13/2014 7:30	16.5	0.003	0.28	0.012	0.200	0.962	0.05	0.761	0.550	0.126	3/12/2014 15:15	3/12/2014 21:00	5.75
40	3/19/2014 14:45	3/22/2014 10:00	67.25	0.017	0.89	0.019	0.487	1.22	0.15	0.772	0.530	0.143	3/19/2014 15:00	3/19/2014 22:00	7
41	3/29/2014 9:00	4/15/2014 6:00	405	0.169	3.53	0.048	0.843	1.50	0.22	0.822	0.504	0.149	3/29/2014 9:15	4/15/2014 3:30	402.25
42	4/15/2014 9:45	4/24/2014 8:00	214.25	0.035	1.28	0.027	0.299	1.03	0.15	0.743	0.529	0.149	4/15/2014 9:45	4/22/2014 20:45	179
43	4/25/2014 19:00	4/27/2014 16:45	45.75	0.004	0.50	0.007	0.220	0.883	0.16	0.676	0.506	0.138	4/25/2014 19:15	4/26/2014 16:15	21
44	4/29/2014 12:00	5/14/2014 7:30	355.5	0.203	5.96	0.034	1.38	2.03	0.45	0.892	0.514	0.148	4/29/2014 12:15	5/11/2014 0:00	275.75
45	5/16/2014 7:00	5/25/2014 8:30	217.5	0.061	2.63	0.023	0.758	1.45	0.21	0.775	0.514	0.147	5/16/2014 7:15	5/23/2014 21:15	182
46	5/27/2014 17:30	5/30/2014 19:30	74	0.011	1.05	0.010	0.312	1.00	0.25	0.687	0.474	0.154	5/27/2014 18:00	5/28/2014 14:45	20.75
47	6/9/2014 1:00	6/11/2014 20:45	67.75	0.003	0.52	0.006	0.197	0.763	0.13	0.575	0.405	0.154	6/9/2014 1:15	6/10/2014 20:15	43
48	6/12/2014 0:00	6/15/2014 8:45	80.75	0.009	0.56	0.016	0.189	0.741	0.08	0.576	0.396	0.137	6/12/2014 0:00	6/13/2014 17:00	41
49	6/25/2014 22:15	6/27/2014 6:30	32.25	0.002	0.56	0.004	0.267	0.743	0.27	0.489	0.331	0.129	6/25/2014 23:30	6/26/2014 2:00	2.5
		Average:	73.4	0.023	1.28	0.013	0.450	0.952	0.20	0.577	0.339	0.149			47.4
		Maximum Value:	405.0	0.203	6.50	0.048	1.38	2.03	0.68	0.892	0.577	0.203			402.3
		Minimum Value:	7.5	0.001	0.21	0.002	0.091	0.469	0.03	0.323	0.142	0.082			2.50
		Standard Deviation:	81.8	0.041	1.27	0.009	0.319	0.329	0.16	0.134	0.115	0.017			77.4
		Weighted Mean R-Value*:				0.018									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_4 Lower Merion Township

Pipe Size: 24" dia. Tributary Drainage Area: 7,486 acres Tributary Service Population: 26,716

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	10/14/2010 11:30	10/16/2010 0:15	36.75	0.005	0.81	0.006	2.05	6.64	0.06	5.00	3.06	1.34	10/14/2010 11:45	10/14/2010 19:30	7.75
2	10/18/2010 22:15	10/19/2010 21:15	23	0.002	0.48	0.004	1.43	6.34	0.04	4.87	3.27	1.23	10/18/2010 23:00	10/19/2010 8:00	9
3	10/27/2010 2:15	10/27/2010 22:00	19.75	0.001	0.39	0.004	1.03	5.65	0.07	4.63	2.95	1.33	10/27/2010 2:15	10/27/2010 16:00	13.75
4	11/4/2010 2:00	11/5/2010 14:00	36	0.004	1.32	0.003	1.92	6.81	0.06	4.99	3.23	1.21	11/4/2010 2:15	11/5/2010 5:15	27
5	12/11/2010 22:45	12/13/2010 20:15	45.5	0.006	1.26	0.005	2.52	7.06	0.07	4.94	3.17	1.17	12/11/2010 23:00	12/13/2010 1:15	26.25
6	1/17/2011 21:00	1/20/2011 21:30	72.5	0.009	1.01	0.009	3.17	7.13	0.04	4.85	3.00	1.24	1/17/2011 21:00	1/19/2011 4:15	31.25
7	1/21/2011 0:15	1/21/2011 15:45	15.5	0.000	0.12	0.003	1.21	5.85	0.02	4.39	3.16	1.13	1/21/2011 0:30	1/21/2011 4:30	4
8	2/1/2011 22:15	2/3/2011 19:45	45.5	0.010	0.81	0.013	3.06	7.43	0.05	5.17	2.84	1.22	2/1/2011 22:30	2/2/2011 9:00	10.5
9	2/21/2011 20:15	2/22/2011 20:00	23.75	0.001	0.42	0.004	1.55	6.29	0.03	4.87	3.34	1.23	2/21/2011 20:30	2/22/2011 4:45	8.25
10	2/24/2011 19:15	2/27/2011 18:45	71.5	0.013	0.88	0.015	2.20	7.26	0.06	5.46	3.36	1.18	2/24/2011 19:30	2/25/2011 13:45	18.25
11	2/28/2011 1:45	3/1/2011 3:30	25.75	0.001	0.30	0.005	1.73	6.70	0.07	5.02	3.57	1.17	2/28/2011 2:15	2/28/2011 21:00	18.75
12	3/6/2011 6:30	3/9/2011 17:30	83	0.029	1.97	0.015	5.10	9.39	0.16	6.43	3.45	1.26	3/6/2011 6:45	3/7/2011 1:30	18.75
13	3/10/2011 1:00	3/15/2011 11:00	130	0.043	1.96	0.022	4.22	8.65	0.09	6.32	3.53	1.17	3/10/2011 1:15	3/11/2011 3:00	25.75
14	3/16/2011 0:00	3/17/2011 18:00	42	0.008	0.59	0.014	3.26	7.54	0.08	5.73	3.55	1.21	3/16/2011 0:00	3/16/2011 6:45	6.75
15	3/21/2011 2:15	3/21/2011 11:00	8.75	0.001	0.39	0.003	1.53	6.39	0.06	4.83	3.21	0.957	3/21/2011 2:30	3/21/2011 10:30	8
16	3/23/2011 5:30	3/24/2011 7:30	26	0.002	0.37	0.005	1.74	5.83	0.05	4.66	3.12	1.20	3/23/2011 6:00	3/24/2011 1:45	19.75
17	3/31/2011 16:15	4/2/2011 7:30	39.25	0.004	0.43	0.009	1.87	6.26	0.02	4.51	2.94	1.11	3/31/2011 16:15	4/1/2011 17:30	25.25
18	4/8/2011 9:45	4/9/2011 20:15	34.5	0.005	0.77	0.006	1.90	6.12	0.04	4.69	2.67	1.32	4/8/2011 9:45	4/8/2011 21:30	11.75
19	4/12/2011 10:15	4/14/2011 9:45	47.5	0.005	0.91	0.006	1.96	5.66	0.09	4.51	2.76	1.23	4/12/2011 10:15	4/13/2011 18:00	31.75
20	4/16/2011 11:45	4/19/2011 12:45	73	0.016	2.40	0.007	4.15	8.25	0.19	5.11	2.86	1.20	4/16/2011 12:00	4/19/2011 12:30	72.5
21	5/4/2011 5:00	5/4/2011 21:45	16.75	0.001	0.49	0.002	1.39	5.41	0.04	4.62	2.75	1.54	5/4/2011 5:00	5/4/2011 14:00	9
22	5/14/2011 23:30	5/16/2011 14:15	38.75	0.004	1.14	0.003	1.40	4.69	0.22	3.58	2.00	1.11	5/14/2011 23:45	5/16/2011 2:00	26.25
23	5/17/2011 4:30	5/19/2011 7:30	51	0.002	0.69	0.003	1.25	4.66	0.06	3.28	1.87	1.20	5/17/2011 4:30	5/18/2011 19:30	39
24	5/23/2011 0:15	5/24/2011 8:45	32.5	0.003	0.25	0.011	1.44	4.52	0.03	3.08	1.58	1.07	5/23/2011 0:30	5/23/2011 20:15	19.75
25	6/16/2011 21:15	6/19/2011 14:00	64.75	0.008	0.83	0.010	3.00	5.69	0.13	4.16	2.42	1.14	6/16/2011 21:30	6/17/2011 17:30	20
26	7/8/2011 13:45	7/9/2011 1:00	11.25	0.001	0.50	0.002	1.63	5.98	0.10	4.77	2.80	1.45	7/8/2011 14:00	7/8/2011 20:30	6.5
27	7/25/2011 14:30	7/26/2011 21:00	30.5	0.004	1.41	0.003	3.42	7.84	0.42	4.69	2.78	1.31	7/25/2011 14:45	7/25/2011 21:15	6.5
28	8/9/2011 11:30	8/10/2011 9:00	21.5	0.005	1.60	0.003	4.96	9.44	0.49	5.02	2.73	1.16	8/9/2011 11:45	8/9/2011 19:15	7.5
29	8/14/2011 0:45	8/27/2011 9:00	320.25	0.073	8.64	0.008	4.61	9.04	0.37	5.23	2.93	1.19	8/14/2011 1:15	8/25/2011 20:30	283.25
30	8/27/2011 11:30	9/2/2011 0:00	132.5	0.038	6.48	0.006	5.46	9.87	0.40	5.82	3.17	1.24	8/27/2011 12:00	8/28/2011 12:15	24.25
31	9/5/2011 19:00	9/13/2011 22:00	195	0.053	8.18	0.006	6.42	9.64	0.79	5.68	3.15	1.22	9/5/2011 19:15	9/12/2011 0:30	149.25
32	9/23/2011 9:15	9/24/2011 23:15	38	0.007	1.65	0.004	2.45	5.01	0.26	3.44	1.24	1.32	9/23/2011 9:45	9/24/2011 0:30	14.75
33	9/27/2011 22:45	9/29/2011 0:00	25.25	0.004	0.72	0.006	2.22	4.46	0.16	3.62	1.55	1.23	9/27/2011 23:00	9/28/2011 23:45	24.75
		Average:	56.9	0.011	1.52	0.007	2.64	6.77	0.15	4.79	2.85	1.22			31.1
		Maximum Value:	320.3	0.073	8.64	0.022	6.42	9.87	0.79	6.43	3.57	1.54			283.3
		Minimum Value:	8.8	0.000	0.12	0.002	1.027	4.46	0.02	3.08	1.24	0.957			4.00
		Standard Deviation:	61.4	0.017	2.10	0.005	1.42	1.55	0.17	0.78	0.591	0.106			52.3

ML_4 Lower Merion Township

Pipe Size: 24" dia. Tributary Drainage Area: 7,486 acres Tributary Service Population: 26,716

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Weighted Mean R-Value*:				0.007									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_5 Lower Merion Township
7268 City Line Avenue at 73rd Street
Pipe Size: 16" dia. Tributary Drainage Area: 1,064 acres Tributary Service Population: 8,883

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2012 19:15	1/13/2012 20:00	48.75	0.017	1.62	0.010	1.38	2.24	0.18	0.943	0.448	0.259	1/11/2012 19:15	1/13/2012 8:15	37
2	1/17/2012 9:30	1/18/2012 4:00	18.5	0.002	0.25	0.008	0.257	1.03	0.03	0.805	0.476	0.256	1/17/2012 10:00	1/17/2012 14:30	4.5
3	1/21/2012 1:30	1/21/2012 20:45	19.25	0.001	0.35	0.004	0.151	1.03	0.03	0.742	0.433	0.257	1/21/2012 1:30	1/21/2012 13:00	11.5
4	1/23/2012 7:00	1/26/2012 2:15	67.25	0.011	0.31	0.036	0.486	1.24	0.05	0.854	0.466	0.272	1/23/2012 7:30	1/23/2012 16:30	9
5	1/27/2012 5:45	1/29/2012 3:45	46	0.007	0.54	0.012	0.582	1.43	0.14	0.853	0.484	0.269	1/27/2012 5:45	1/27/2012 11:15	5.5
6	2/11/2012 5:00	2/12/2012 6:30	25.5	0.003	0.25	0.011	0.217	1.09	0.04	0.736	0.419	0.241	2/11/2012 5:00	2/11/2012 22:15	17.25
7	2/24/2012 2:30	2/25/2012 6:00	27.5	0.001	0.27	0.005	0.172	1.07	0.05	0.631	0.371	0.228	2/24/2012 2:45	2/24/2012 19:00	16.25
8	2/29/2012 9:15	3/2/2012 0:00	38.75	0.008	1.04	0.008	0.449	1.21	0.06	0.825	0.398	0.276	2/29/2012 9:30	3/1/2012 0:30	15
9	3/2/2012 19:00	3/3/2012 21:00	26	0.002	0.32	0.007	0.210	1.09	0.04	0.772	0.438	0.273	3/2/2012 19:15	3/3/2012 9:30	14.25
10	3/31/2012 0:30	4/1/2012 0:30	24	0.003	0.32	0.009	0.291	1.08	0.05	0.758	0.418	0.255	3/31/2012 0:30	3/31/2012 3:45	3.25
11	4/21/2012 21:00	4/25/2012 1:45	76.75	0.020	2.39	0.008	1.04	1.72	0.11	0.777	0.346	0.253	4/21/2012 21:00	4/23/2012 7:00	34
12	5/1/2012 3:45	5/1/2012 15:30	11.75	0.001	0.21	0.006	0.216	1.14	0.05	0.703	0.352	0.276	5/1/2012 3:45	5/1/2012 10:00	6.25
13	5/3/2012 2:15	5/3/2012 13:30	11.25	0.001	0.22	0.005	0.189	1.15	0.04	0.682	0.371	0.247	5/3/2012 2:15	5/3/2012 5:15	3
14	5/9/2012 2:30	5/9/2012 20:15	17.75	0.004	0.37	0.012	0.372	1.21	0.10	0.743	0.319	0.257	5/9/2012 2:45	5/9/2012 7:15	4.5
15	5/15/2012 8:00	5/17/2012 6:00	46	0.013	1.89	0.007	1.79	2.10	0.30	0.738	0.285	0.255	5/15/2012 8:15	5/16/2012 4:00	19.75
16	5/24/2012 8:00	5/25/2012 6:30	22.5	0.003	0.33	0.010	0.241	1.02	0.06	0.672	0.323	0.249	5/24/2012 8:00	5/24/2012 23:45	15.75
17	6/1/2012 19:15	6/3/2012 6:00	34.75	0.006	0.62	0.011	0.412	1.15	0.12	0.703	0.340	0.235	6/1/2012 19:15	6/2/2012 2:15	7
18	6/3/2012 19:30	6/5/2012 5:30	34	0.006	0.52	0.012	0.421	1.17	0.21	0.704	0.348	0.230	6/3/2012 19:45	6/4/2012 21:00	25.25
19	6/12/2012 8:45	6/14/2012 3:45	43	0.010	0.74	0.013	0.515	1.19	0.06	0.722	0.304	0.262	6/12/2012 8:45	6/12/2012 23:00	14.25
20	6/22/2012 17:15	6/23/2012 10:15	17	0.010	0.95	0.010	3.39	4.01	0.31	0.890	0.290	0.206	6/22/2012 17:15	6/22/2012 22:15	5
21	7/15/2012 21:00	7/16/2012 4:45	7.75	0.002	0.61	0.003	0.621	1.21	0.28	0.613	0.323	0.146	7/15/2012 21:15	7/15/2012 23:45	2.5
22	8/5/2012 18:00	8/6/2012 6:00	12	0.001	0.55	0.003	0.289	0.922	0.17	0.550	0.286	0.181	8/5/2012 18:15	8/6/2012 2:15	8
23	8/17/2012 21:30	8/18/2012 11:45	14.25	0.002	0.64	0.003	0.296	0.799	0.09	0.528	0.245	0.196	8/17/2012 21:30	8/18/2012 6:45	9.25
24	8/27/2012 8:00	8/27/2012 17:45	9.75	0.002	0.63	0.003	0.817	1.45	0.14	0.694	0.248	0.324	8/27/2012 8:00	8/27/2012 16:00	8
25	9/3/2012 8:30	9/4/2012 0:30	16	0.004	0.72	0.005	0.451	1.17	0.11	0.756	0.246	0.351	9/3/2012 9:00	9/3/2012 18:45	9.75
26	9/4/2012 2:45	9/5/2012 8:30	29.75	0.002	0.44	0.006	0.248	0.911	0.12	0.552	0.257	0.237	9/4/2012 2:45	9/5/2012 6:15	27.5
27	9/5/2012 11:45	9/6/2012 6:15	18.5	0.003	0.15	0.021	0.502	1.05	0.05	0.597	0.265	0.213	9/5/2012 11:45	9/5/2012 14:15	2.5
28	9/8/2012 16:30	9/9/2012 6:00	13.5	0.002	0.34	0.006	0.360	0.975	0.06	0.571	0.262	0.201	9/8/2012 16:30	9/8/2012 22:30	6
29	9/18/2012 1:45	9/18/2012 16:00	14.25	0.001	0.55	0.002	0.254	0.877	0.17	0.551	0.256	0.239	9/18/2012 2:00	9/18/2012 15:30	13.5
30	9/18/2012 16:15	9/19/2012 10:00	17.75	0.004	0.70	0.006	0.629	1.19	0.16	0.655	0.250	0.247	9/18/2012 16:45	9/19/2012 1:30	8.75
31	9/22/2012 19:00	9/23/2012 5:00	10	0.001	0.27	0.004	0.559	1.13	0.11	0.484	0.218	0.189	9/22/2012 19:15	9/22/2012 21:30	2.25
32	10/2/2012 10:15	10/3/2012 4:30	18.25	0.001	0.32	0.005	0.179	0.810	0.09	0.567	0.269	0.242	10/2/2012 10:15	10/2/2012 15:45	5.5
33	10/3/2012 6:00	10/3/2012 14:45	8.75	0.001	0.09	0.008	0.250	1.09	0.04	0.663	0.258	0.349	10/3/2012 7:00	10/3/2012 7:30	0.5
34	10/7/2012 10:15	10/8/2012 7:15	21	0.004	0.21	0.021	0.369	0.974	0.03	0.659	0.262	0.254	10/7/2012 10:15	10/7/2012 20:45	10.5
35	10/15/2012 11:30	10/16/2012 1:45	14.25	0.002	0.37	0.005	0.203	0.865	0.10	0.652	0.279	0.277	10/15/2012 11:45	10/15/2012 20:30	8.75
36	10/19/2012 9:15	10/20/2012 2:15	17	0.002	0.47	0.005	0.436	1.08	0.13	0.661	0.285	0.289	10/19/2012 9:30	10/19/2012 23:15	13.75

ML_5 Lower Merion Township
7268 City Line Avenue at 73rd Street
Pipe Size: 16" dia. Tributary Drainage Area: 1,064 acres Tributary Service Population: 8,883

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	10/28/2012 15:45	10/31/2012 6:45	63	0.022	3.83	0.006	1.61	2.10	0.13	0.721	0.231	0.242	10/28/2012 15:45	10/30/2012 20:30	52.75
38	11/27/2012 5:45	11/27/2012 22:15	16.5	0.002	0.59	0.003	0.166	0.659	0.02	0.475	0.084	0.323	11/27/2012 5:45	11/27/2012 15:45	10
39	12/7/2012 21:45	12/8/2012 10:30	12.75	0.001	0.22	0.005	0.139	0.641	0.04	0.315	0.089	0.163	12/7/2012 21:45	12/8/2012 1:30	3.75
40	12/9/2012 8:00	12/10/2012 7:45	23.75	0.002	0.29	0.008	0.171	0.713	0.03	0.441	0.108	0.268	12/9/2012 8:15	12/10/2012 0:45	16.5
41	12/20/2012 20:45	12/22/2012 20:30	47.75	0.017	2.47	0.007	1.69	1.94	0.22	0.615	0.102	0.260	12/20/2012 20:45	12/21/2012 23:45	27
42	12/26/2012 13:00	12/28/2012 6:15	41.25	0.010	1.21	0.008	0.829	1.39	0.10	0.563	0.159	0.236	12/26/2012 13:15	12/27/2012 9:15	20
43	1/14/2013 20:15	1/15/2013 7:00	10.75	0.001	0.37	0.003	0.146	0.559	0.04	0.354	0.118	0.162	1/14/2013 20:15	1/15/2013 2:30	6.25
44	1/15/2013 21:15	1/17/2013 21:30	48.25	0.009	1.01	0.009	0.570	0.959	0.07	0.528	0.139	0.257	1/15/2013 21:30	1/16/2013 11:15	13.75
45	1/30/2013 17:45	2/1/2013 8:00	38.25	0.009	1.43	0.006	1.20	1.36	0.28	0.559	0.157	0.239	1/30/2013 17:45	1/31/2013 5:45	12
46	2/13/2013 18:15	2/14/2013 7:30	13.25	0.001	0.22	0.005	0.189	0.650	0.02	0.426	0.179	0.196	2/13/2013 18:30	2/14/2013 0:00	5.5
47	2/26/2013 19:00	2/27/2013 9:00	14	0.002	0.62	0.003	0.227	0.822	0.06	0.469	0.137	0.230	2/26/2013 19:15	2/27/2013 8:45	13.5
48	3/12/2013 2:45	3/14/2013 7:15	52.5	0.009	1.02	0.009	0.483	0.895	0.06	0.528	0.165	0.239	3/12/2013 2:45	3/13/2013 16:45	38
49	3/18/2013 17:45	3/20/2013 11:00	41.25	0.007	0.83	0.008	0.284	0.875	0.06	0.576	0.211	0.256	3/18/2013 17:45	3/19/2013 10:45	17
50	3/25/2013 6:00	3/26/2013 6:45	24.75	0.003	0.49	0.006	0.273	0.806	0.05	0.566	0.231	0.252	3/25/2013 6:00	3/25/2013 15:45	9.75
		Average:	26.9	0.005	0.70	0.008	0.544	1.184	0.10	0.643	0.279	0.246			13.0
		Maximum Value:	76.8	0.022	3.83	0.036	3.39	4.012	0.31	0.943	0.484	0.351			52.8
		Minimum Value:	7.8	0.001	0.09	0.002	0.139	0.559	0.02	0.315	0.084	0.146			0.50
		Standard Deviation:	16.7	0.005	0.70	0.006	0.578	0.548	0.08	0.135	0.107	0.042			10.5
		Weighted Mean R-Value*:				0.007									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_5 Lower Merion Township

7268 City Line Avenue at 73rd Street

Pipe Size: 16" dia. Tributary Drainage Area: 1,064 acres Tributary Service Population: 8,883

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 22:45	26.25	0.001	0.44	0.002	0.198	0.784	0.25	0.459	0.224	0.211	4/10/2013 20:45	4/10/2013 23:45	3
2	4/12/2013 7:00	4/13/2013 19:00	36	0.005	1.17	0.005	0.793	1.30	0.21	0.579	0.253	0.223	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:00	4/20/2013 17:45	20.75	0.002	0.64	0.003	0.175	0.758	0.07	0.508	0.254	0.197	4/19/2013 21:15	4/20/2013 3:00	5.75
4	4/28/2013 22:30	5/1/2013 4:15	53.75	0.005	0.56	0.010	0.253	0.892	0.04	0.492	0.232	0.191	4/28/2013 22:30	4/30/2013 5:15	30.75
5	5/7/2013 21:45	5/10/2013 7:15	57.5	0.004	1.08	0.004	0.273	0.885	0.12	0.451	0.215	0.190	5/7/2013 22:00	5/9/2013 6:15	32.25
6	5/10/2013 22:15	5/13/2013 22:15	72	0.008	1.28	0.007	0.489	1.00	0.19	0.532	0.241	0.210	5/10/2013 22:15	5/12/2013 6:00	31.75
7	5/23/2013 16:15	5/24/2013 18:15	26	0.003	0.98	0.003	0.380	0.758	0.38	0.496	0.211	0.202	5/23/2013 16:15	5/24/2013 15:15	23
8	5/28/2013 9:00	5/29/2013 3:00	18	0.001	0.30	0.005	0.125	0.614	0.04	0.454	0.195	0.204	5/28/2013 9:00	5/28/2013 19:45	10.75
9	6/3/2013 0:00	6/5/2013 1:00	49	0.005	1.11	0.005	0.836	1.43	0.34	0.460	0.187	0.203	6/3/2013 0:00	6/3/2013 17:45	17.75
10	6/6/2013 18:45	6/15/2013 10:45	208	0.078	6.22	0.013	2.43	2.81	0.59	0.689	0.226	0.203	6/6/2013 19:15	6/14/2013 16:45	189.5
11	6/18/2013 12:45	6/19/2013 14:00	25.25	0.002	0.69	0.003	0.354	0.790	0.17	0.504	0.242	0.205	6/18/2013 12:45	6/18/2013 20:30	7.75
12	6/24/2013 14:00	6/29/2013 8:15	114.25	0.007	1.10	0.006	0.192	0.740	0.15	0.447	0.209	0.196	6/24/2013 14:30	6/28/2013 21:15	102.75
13	6/30/2013 11:15	7/2/2013 20:30	57.25	0.002	0.48	0.005	0.123	0.657	0.06	0.430	0.181	0.220	6/30/2013 11:15	7/2/2013 19:15	56
14	7/12/2013 7:15	7/16/2013 7:00	95.75	0.007	1.56	0.005	0.404	0.851	0.15	0.419	0.162	0.207	7/12/2013 7:15	7/13/2013 18:15	35
15	7/22/2013 20:00	7/24/2013 18:15	46.25	0.002	1.05	0.002	0.524	0.713	0.33	0.409	0.174	0.202	7/22/2013 20:00	7/23/2013 17:45	21.75
16	7/28/2013 13:45	7/30/2013 5:15	39.5	0.001	0.33	0.004	0.111	0.659	0.12	0.380	0.161	0.197	7/28/2013 14:00	7/29/2013 2:15	12.25
17	8/1/2013 6:00	8/3/2013 7:45	49.75	0.006	0.98	0.006	0.462	0.828	0.10	0.430	0.154	0.197	8/1/2013 6:15	8/1/2013 16:45	10.5
18	8/8/2013 0:00	8/10/2013 8:15	56.25	0.003	0.58	0.005	0.139	0.674	0.28	0.396	0.178	0.181	8/8/2013 0:15	8/9/2013 17:15	41
19	8/13/2013 5:00	8/16/2013 5:45	72.75	0.008	1.94	0.004	1.89	2.49	0.41	0.450	0.167	0.204	8/13/2013 5:00	8/13/2013 9:30	4.5
20	8/28/2013 9:45	8/31/2013 8:45	71	0.007	1.37	0.005	1.28	1.69	0.48	0.429	0.173	0.192	8/28/2013 9:45	8/30/2013 3:15	41.5
21	9/2/2013 9:45	9/6/2013 18:15	104.5	0.013	2.23	0.006	3.07	3.45	0.71	0.454	0.163	0.205	9/2/2013 10:30	9/2/2013 14:30	4
22	9/12/2013 17:45	9/14/2013 0:00	30.25	0.003	0.79	0.003	0.444	0.738	0.26	0.465	0.194	0.209	9/12/2013 18:30	9/13/2013 7:15	12.75
23	9/21/2013 19:30	9/24/2013 23:00	75.5	0.009	1.36	0.007	0.511	0.936	0.31	0.482	0.183	0.212	9/21/2013 19:30	9/22/2013 3:30	8
24	10/7/2013 12:15	10/8/2013 23:00	34.75	0.002	0.40	0.005	0.194	0.703	0.14	0.422	0.168	0.215	10/7/2013 12:30	10/7/2013 16:45	4.25
25	10/10/2013 3:15	10/18/2013 18:15	207	0.024	2.13	0.011	0.788	1.12	0.37	0.449	0.162	0.207	10/10/2013 3:45	10/18/2013 0:00	188.25
26	11/26/2013 10:45	12/2/2013 22:45	156	0.033	3.15	0.011	1.56	1.77	0.16	0.573	0.217	0.209	11/26/2013 11:00	11/27/2013 17:30	30.5
27	12/6/2013 2:00	12/13/2013 17:45	183.75	0.022	2.37	0.009	0.609	1.24	0.06	0.526	0.236	0.206	12/6/2013 2:00	12/10/2013 16:45	110.75
28	12/14/2013 16:00	12/18/2013 21:30	101.5	0.009	0.82	0.012	0.351	0.900	0.09	0.521	0.245	0.212	12/14/2013 16:15	12/17/2013 15:30	71.25
29	12/23/2013 3:45	12/25/2013 17:45	62	0.010	0.61	0.016	0.543	1.03	0.12	0.561	0.244	0.211	12/23/2013 3:45	12/24/2013 17:15	37.5
30	12/29/2013 7:45	1/4/2014 19:15	155.5	0.026	1.70	0.015	0.936	1.46	0.09	0.587	0.259	0.214	12/29/2013 8:00	1/3/2014 4:00	116
31	1/5/2014 5:30	1/9/2014 22:45	113.25	0.031	0.91	0.034	1.17	1.90	0.13	0.678	0.273	0.217	1/5/2014 5:45	1/6/2014 12:00	30.25
32	1/10/2014 7:15	1/17/2014 19:30	180.25	0.031	1.34	0.023	0.807	1.36	0.09	0.624	0.295	0.209	1/10/2014 7:15	1/16/2014 11:00	147.75
33	1/21/2014 10:15	1/23/2014 21:45	59.5	0.004	0.61	0.006	0.188	0.844	0.03	0.554	0.299	0.212	1/21/2014 10:15	1/21/2014 21:15	11
34	2/3/2014 2:00	2/10/2014 22:30	188.5	0.053	2.87	0.019	1.38	2.04	0.11	0.691	0.287	0.208	2/3/2014 2:00	2/9/2014 21:00	163
35	2/13/2014 0:00	2/16/2014 19:15	91.25	0.014	1.82	0.008	0.442	1.04	0.09	0.653	0.339	0.205	2/13/2014 0:00	2/15/2014 16:15	64.25

ML_5 Lower Merion Township

7268 City Line Avenue at 73rd Street

Pipe Size: 16" dia. Tributary Drainage Area: 1,064 acres Tributary Service Population: 8,883

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	3/19/2014 14:15	3/22/2014 19:00	76.75	0.011	0.83	0.013	0.646	1.32	0.12	0.674	0.373	0.205	3/19/2014 14:15	3/19/2014 22:00	7.75
37	3/29/2014 9:30	4/5/2014 18:15	176.75	0.066	2.89	0.023	1.33	1.97	0.24	0.833	0.365	0.211	3/29/2014 9:30	4/4/2014 23:45	158.25
38	4/7/2014 11:45	4/9/2014 3:15	39.5	0.007	0.54	0.013	0.373	1.17	0.04	0.707	0.387	0.198	4/7/2014 11:45	4/8/2014 7:00	19.25
39	4/15/2014 9:45	4/17/2014 22:15	60.5	0.008	1.23	0.006	0.425	1.03	0.13	0.714	0.412	0.213	4/15/2014 9:45	4/15/2014 23:15	13.5
40	4/25/2014 19:00	4/26/2014 18:45	23.75	0.001	0.52	0.003	0.193	0.852	0.15	0.614	0.366	0.208	4/25/2014 19:15	4/26/2014 16:15	21
41	4/29/2014 12:00	5/13/2014 21:30	345.5	0.149	5.75	0.026	3.40	3.98	0.33	0.903	0.397	0.207	4/29/2014 12:15	5/13/2014 11:45	335.5
42	5/16/2014 6:30	5/23/2014 17:45	179.25	0.040	2.80	0.014	1.65	2.27	0.23	0.806	0.442	0.210	5/16/2014 6:30	5/22/2014 21:30	159
43	5/27/2014 17:45	5/31/2014 17:00	95.25	0.011	1.10	0.010	0.643	1.27	0.30	0.681	0.399	0.204	5/27/2014 17:45	5/28/2014 14:45	21
44	6/8/2014 23:30	6/14/2014 10:15	130.75	0.009	0.99	0.009	0.290	0.980	0.13	0.582	0.335	0.197	6/8/2014 23:45	6/13/2014 16:45	113
45	6/25/2014 23:00	6/27/2014 19:00	44	0.004	0.60	0.006	0.304	0.828	0.27	0.545	0.294	0.196	6/25/2014 23:15	6/26/2014 2:00	2.75
		Average:	91.4	0.017	1.43	0.009	0.749	1.28	0.20	0.549	0.253	0.205			56.5
		Maximum Value:	345.5	0.149	6.22	0.034	3.40	3.98	0.71	0.903	0.442	0.223			335.5
		Minimum Value:	18.0	0.001	0.30	0.002	0.111	0.614	0.03	0.380	0.154	0.181			2.75
		Standard Deviation:	68.1	0.027	1.24	0.007	0.753	0.745	0.15	0.125	0.081	0.008			69.9
		Weighted Mean R-Value*:				0.012									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_6 Lower Merion Township

Conshohocken Avenue

Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2012 19:30	1/13/2012 7:15	35.75	0.012	1.38	0.008	0.071	0.179	0.10	0.107	0.040	0.055	1/11/2012 19:30	1/13/2012 6:00	34.5
2	1/17/2012 9:45	1/17/2012 17:00	7.25	0.003	0.25	0.014	0.088	0.214	0.03	0.134	0.035	0.082	1/17/2012 10:00	1/17/2012 14:30	4.5
3	1/21/2012 1:45	1/21/2012 15:00	13.25	0.005	0.35	0.014	0.068	0.196	0.03	0.102	0.032	0.056	1/21/2012 2:00	1/21/2012 13:15	11.25
4	1/23/2012 10:45	1/24/2012 5:00	18.25	0.002	0.28	0.006	0.056	0.175	0.04	0.103	0.041	0.058	1/23/2012 11:00	1/23/2012 16:45	5.75
5	1/27/2012 5:15	1/27/2012 15:45	10.5	0.003	0.47	0.006	0.082	0.192	0.12	0.123	0.033	0.080	1/27/2012 5:45	1/27/2012 11:15	5.5
6	2/11/2012 6:00	2/11/2012 23:30	17.5	0.004	0.30	0.013	0.062	0.157	0.04	0.093	0.008	0.077	2/11/2012 6:00	2/11/2012 22:30	16.5
7	2/29/2012 10:15	3/1/2012 5:45	19.5	0.012	1.08	0.011	0.063	0.140	0.07	0.066	-0.014	0.058	2/29/2012 10:15	3/1/2012 0:30	14.25
8	3/2/2012 19:00	3/3/2012 12:00	17	0.005	0.34	0.016	0.058	0.140	0.04	0.057	-0.007	0.053	3/2/2012 19:15	3/3/2012 9:45	14.5
9	3/31/2012 0:15	3/31/2012 10:45	10.5	0.003	0.36	0.009	0.049	0.126	0.08	0.056	0.007	0.037	3/31/2012 0:45	3/31/2012 3:45	3
10	4/22/2012 8:15	4/25/2012 0:00	63.75	0.028	2.25	0.012	0.097	0.169	0.12	0.090	0.007	0.066	4/22/2012 8:15	4/23/2012 17:45	33.5
11	5/1/2012 3:45	5/1/2012 13:30	9.75	0.005	0.28	0.017	0.070	0.142	0.12	0.085	-0.003	0.070	5/1/2012 3:45	5/1/2012 10:00	6.25
12	5/3/2012 2:00	5/3/2012 10:15	8.25	0.004	0.23	0.019	0.043	0.122	0.05	0.071	0.003	0.049	5/3/2012 2:30	5/3/2012 5:15	2.75
13	5/4/2012 22:00	5/5/2012 10:30	12.5	0.008	0.15	0.056	0.068	0.146	0.07	0.074	0.009	0.040	5/4/2012 22:15	5/4/2012 23:30	1.25
14	5/9/2012 2:45	5/10/2012 10:15	31.5	0.006	0.64	0.010	0.065	0.177	0.08	0.092	0.024	0.060	5/9/2012 2:45	5/10/2012 4:00	25.25
15	5/14/2012 19:45	5/18/2012 22:30	98.75	0.027	2.01	0.014	0.101	0.190	0.30	0.103	0.029	0.063	5/14/2012 20:00	5/16/2012 4:15	32.25
16	5/21/2012 1:45	5/22/2012 11:30	33.75	0.009	0.28	0.032	0.077	0.172	0.03	0.098	0.029	0.059	5/21/2012 2:30	5/22/2012 8:00	29.5
17	5/29/2012 19:15	5/30/2012 10:30	15.25	0.003	0.33	0.010	0.048	0.167	0.15	0.086	0.027	0.051	5/29/2012 20:00	5/30/2012 2:45	6.75
18	6/1/2012 19:15	6/2/2012 13:45	18.5	0.009	0.90	0.010	0.083	0.199	0.35	0.095	0.021	0.055	6/1/2012 19:15	6/2/2012 2:15	7
19	6/3/2012 14:15	6/4/2012 22:00	31.75	0.015	0.59	0.026	0.072	0.171	0.24	0.101	0.018	0.065	6/3/2012 14:15	6/4/2012 21:00	30.75
20	6/12/2012 9:15	6/13/2012 9:00	23.75	0.008	1.03	0.008	0.065	0.147	0.07	0.083	0.009	0.062	6/12/2012 9:30	6/12/2012 23:00	13.5
21	6/22/2012 15:45	6/24/2012 8:30	40.75	0.017	1.34	0.013	0.165	0.300	0.30	0.112	0.040	0.055	6/22/2012 17:00	6/22/2012 22:15	5.25
22	7/14/2012 4:00	7/14/2012 23:00	19	0.005	0.37	0.012	0.048	0.166	0.04	0.121	0.040	0.071	7/14/2012 4:15	7/14/2012 12:15	8
23	7/15/2012 21:00	7/17/2012 0:00	27	0.009	0.65	0.013	0.073	0.193	0.30	0.112	0.039	0.061	7/15/2012 21:30	7/16/2012 0:00	2.5
24	7/20/2012 0:00	7/21/2012 10:15	34.25	0.010	1.20	0.009	0.089	0.198	0.55	0.084	0.018	0.055	7/20/2012 0:00	7/20/2012 8:45	8.75
25	8/5/2012 18:30	8/6/2012 18:00	23.5	0.010	0.33	0.030	0.086	0.188	0.05	0.090	0.015	0.058	8/5/2012 18:30	8/6/2012 2:15	7.75
26	8/10/2012 8:45	8/10/2012 18:15	9.5	0.005	0.56	0.009	0.086	0.189	0.16	0.120	0.016	0.084	8/10/2012 9:45	8/10/2012 12:00	2.25
27	8/14/2012 9:45	8/16/2012 3:45	42	0.008	0.83	0.009	0.092	0.177	0.28	0.087	0.017	0.063	8/14/2012 9:45	8/15/2012 18:00	32.25
28	8/17/2012 20:45	8/19/2012 5:45	33	0.007	0.79	0.009	0.090	0.181	0.16	0.082	0.023	0.052	8/17/2012 21:45	8/18/2012 7:00	9.25
29	8/27/2012 8:00	8/28/2012 13:45	29.75	0.008	0.86	0.010	0.076	0.186	0.22	0.103	0.026	0.067	8/27/2012 8:00	8/28/2012 7:30	23.5
30	9/3/2012 8:45	9/5/2012 20:00	59.25	0.022	2.49	0.009	0.095	0.198	0.43	0.105	0.026	0.066	9/3/2012 9:00	9/5/2012 14:15	53.25
31	9/8/2012 16:00	9/9/2012 11:30	19.5	0.003	0.39	0.008	0.052	0.159	0.07	0.081	0.022	0.053	9/8/2012 16:45	9/8/2012 22:30	5.75
32	9/18/2012 2:00	9/19/2012 9:45	31.75	0.015	1.14	0.014	0.096	0.207	0.33	0.104	0.027	0.058	9/18/2012 2:00	9/19/2012 1:45	23.75
33	9/26/2012 16:00	9/27/2012 12:45	20.75	0.007	0.32	0.022	0.070	0.182	0.08	0.115	0.042	0.060	9/26/2012 17:15	9/27/2012 7:30	14.25
34	10/2/2012 10:00	10/2/2012 19:15	9.25	0.002	0.21	0.012	0.057	0.194	0.07	0.148	0.056	0.082	10/2/2012 10:15	10/2/2012 14:15	4
35	10/7/2012 10:15	10/8/2012 12:15	26	0.003	0.23	0.013	0.040	0.181	0.03	0.118	0.051	0.063	10/7/2012 10:30	10/7/2012 21:00	10.5

ML_6 Lower Merion Township

Conshohocken Avenue

Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	10/15/2012 10:45	10/15/2012 22:30	11.75	0.003	0.30	0.010	0.059	0.177	0.11	0.135	0.044	0.081	10/15/2012 11:15	10/15/2012 20:30	9.25
37	10/19/2012 1:30	10/20/2012 1:00	23.5	0.004	0.82	0.005	0.057	0.195	0.15	0.118	0.047	0.065	10/19/2012 1:30	10/19/2012 23:15	21.75
38	10/28/2012 15:45	11/4/2012 0:15	152.5	0.058	3.30	0.018	0.089	0.198	0.12	0.119	0.043	0.062	10/28/2012 15:45	10/30/2012 20:30	52.75
39	11/7/2012 11:45	11/8/2012 13:30	25.75	0.006	0.41	0.015	0.074	0.198	0.03	0.120	0.047	0.064	11/7/2012 11:45	11/8/2012 1:30	13.75
40	11/13/2012 2:45	11/13/2012 19:45	17	0.005	0.21	0.024	0.057	0.194	0.04	0.131	0.051	0.069	11/13/2012 2:45	11/13/2012 12:00	9.25
41	11/27/2012 5:45	11/27/2012 23:30	17.75	0.010	0.60	0.017	0.061	0.191	0.02	0.147	0.045	0.080	11/27/2012 6:00	11/27/2012 15:45	9.75
42	12/9/2012 6:45	12/10/2012 5:15	22.5	0.007	0.30	0.024	0.080	0.226	0.04	0.126	0.054	0.060	12/9/2012 6:45	12/9/2012 23:15	16.5
43	12/20/2012 20:45	12/23/2012 23:00	74.25	0.039	2.09	0.019	0.192	0.269	0.19	0.119	0.038	0.061	12/20/2012 20:45	12/21/2012 7:15	10.5
44	12/26/2012 13:00	12/28/2012 21:15	56.25	0.019	1.32	0.014	0.093	0.207	0.10	0.111	0.033	0.065	12/26/2012 13:15	12/27/2012 9:15	20
45	12/29/2012 10:45	12/30/2012 4:45	18	0.001	0.21	0.007	0.061	0.188	0.02	0.095	0.033	0.059	12/29/2012 11:00	12/29/2012 16:45	5.75
		Average:	29.8	0.010	0.77	0.014	0.076	0.184	0.13	0.103	0.028	0.062			15.1
		Maximum Value:	152.5	0.058	3.30	0.056	0.192	0.300	0.55	0.148	0.056	0.084			53.3
		Minimum Value:	7.3	0.001	0.15	0.005	0.040	0.122	0.02	0.056	-0.014	0.037			1.25
		Standard Deviation:	26.4	0.011	0.70	0.009	0.028	0.032	0.12	0.022	0.017	0.010			12.6
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_6 Lower Merion Township
Conshohocken Avenue
Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2013 16:15	1/12/2013 2:15	10	0.006	0.36	0.017	0.065	0.201	0.05	0.135	0.042	0.071	1/11/2013 16:15	1/11/2013 21:00	4.75
2	1/14/2013 21:00	1/15/2013 14:45	17.75	0.006	0.35	0.018	0.061	0.174	0.03	0.101	0.029	0.058	1/14/2013 21:00	1/15/2013 2:30	5.5
3	1/15/2013 21:15	1/17/2013 0:15	27	0.025	1.01	0.025	0.107	0.219	0.06	0.126	0.023	0.067	1/15/2013 21:30	1/16/2013 11:15	13.75
4	1/30/2013 18:00	2/1/2013 0:45	30.75	0.017	1.37	0.012	0.146	0.190	0.31	0.130	0.040	0.070	1/30/2013 18:00	1/31/2013 5:45	11.75
5	2/8/2013 6:00	2/9/2013 3:00	21	0.013	0.33	0.039	0.129	0.265	0.02	0.144	0.044	0.077	2/8/2013 6:00	2/9/2013 1:30	19.5
6	2/11/2013 4:15	2/12/2013 0:45	20.5	0.008	0.40	0.021	0.075	0.204	0.05	0.144	0.050	0.079	2/11/2013 4:15	2/11/2013 8:30	4.25
7	2/19/2013 11:15	2/19/2013 22:00	10.75	0.004	0.20	0.022	0.045	0.197	0.02	0.163	0.055	0.093	2/19/2013 11:15	2/19/2013 17:30	6.25
8	2/26/2013 19:15	2/27/2013 15:30	20.25	0.006	0.63	0.009	0.064	0.177	0.06	0.096	0.023	0.063	2/26/2013 19:15	2/27/2013 13:15	18
9	3/12/2013 3:00	3/12/2013 23:00	20	0.011	1.02	0.011	0.069	0.219	0.06	0.156	0.057	0.078	3/12/2013 3:00	3/12/2013 16:30	13.5
10	3/16/2013 9:15	3/16/2013 18:45	9.5	0.004	0.25	0.018	0.096	0.245	0.04	0.170	0.054	0.098	3/16/2013 9:30	3/16/2013 17:30	8
11	3/18/2013 18:00	3/20/2013 0:15	30.25	0.009	0.82	0.012	0.090	0.243	0.06	0.133	0.051	0.071	3/18/2013 18:00	3/19/2013 11:00	17
12	3/25/2013 6:00	3/25/2013 23:30	17.5	0.011	0.48	0.022	0.114	0.270	0.05	0.174	0.062	0.089	3/25/2013 6:00	3/25/2013 15:45	9.75
13	4/12/2013 6:45	4/13/2013 22:30	39.75	0.016	1.18	0.013	0.102	0.251	0.17	0.154	0.064	0.075	4/12/2013 7:00	4/12/2013 23:15	16.25
14	4/19/2013 20:45	4/21/2013 3:30	30.75	0.013	0.63	0.020	0.095	0.243	0.07	0.123	0.048	0.059	4/19/2013 21:15	4/20/2013 2:45	5.5
15	4/29/2013 1:30	4/29/2013 23:15	21.75	0.007	0.51	0.013	0.090	0.225	0.04	0.156	0.072	0.073	4/29/2013 1:30	4/29/2013 22:30	21
16	5/7/2013 21:45	5/8/2013 20:00	22.25	0.008	0.65	0.012	0.150	0.275	0.17	0.129	0.050	0.066	5/7/2013 21:45	5/8/2013 17:30	19.75
17	5/9/2013 2:30	5/9/2013 20:15	17.75	0.010	0.49	0.020	0.094	0.239	0.08	0.146	0.050	0.075	5/9/2013 2:45	5/9/2013 6:15	3.5
18	5/10/2013 22:15	5/12/2013 0:15	26	0.012	1.09	0.011	0.073	0.207	0.14	0.132	0.051	0.063	5/10/2013 22:30	5/12/2013 0:15	25.75
19	5/23/2013 15:00	5/24/2013 23:45	32.75	0.014	1.21	0.011	0.221	0.302	0.41	0.099	0.010	0.073	5/23/2013 15:00	5/24/2013 22:15	31.25
20	5/28/2013 9:00	5/28/2013 18:00	9	0.006	0.29	0.021	0.103	0.196	0.05	0.110	-0.008	0.093	5/28/2013 9:00	5/28/2013 16:45	7.75
21	6/3/2013 0:15	6/3/2013 21:45	21.5	0.012	1.23	0.010	0.284	0.329	0.59	0.086	-0.004	0.069	6/3/2013 0:30	6/3/2013 18:00	17.5
22	6/6/2013 19:15	6/10/2013 2:45	79.5	0.049	4.14	0.012	0.137	0.213	0.29	0.076	-0.011	0.064	6/6/2013 19:15	6/8/2013 1:45	30.5
23	6/10/2013 5:30	6/12/2013 17:00	59.5	0.019	1.84	0.010	0.110	0.170	0.41	0.069	-0.014	0.071	6/10/2013 6:30	6/11/2013 0:30	18
24	6/13/2013 8:15	6/14/2013 10:15	26	0.009	0.59	0.015	0.079	0.168	0.35	0.071	-0.011	0.070	6/13/2013 9:15	6/14/2013 5:15	20
25	6/18/2013 11:45	6/19/2013 4:15	16.5	0.007	0.76	0.010	0.076	0.172	0.31	0.082	-0.001	0.066	6/18/2013 12:45	6/18/2013 20:45	8
26	6/27/2013 16:45	6/28/2013 6:15	13.5	0.005	0.59	0.008	0.269	0.366	0.36	0.069	0.005	0.051	6/27/2013 17:30	6/27/2013 21:30	4
27	7/1/2013 5:15	7/1/2013 22:00	16.75	0.003	0.21	0.012	0.125	0.235	0.03	0.102	0.008	0.088	7/1/2013 5:15	7/1/2013 14:15	9
28	7/12/2013 7:00	7/13/2013 8:15	25.25	0.012	1.41	0.009	0.079	0.160	0.18	0.077	-0.007	0.065	7/12/2013 7:15	7/12/2013 23:15	16
29	8/28/2013 9:30	8/28/2013 20:45	11.25	0.006	1.46	0.004	0.309	0.408	0.68	0.118	0.005	0.093	8/28/2013 9:45	8/28/2013 19:15	9.5
30	9/2/2013 10:00	9/2/2013 21:30	11.5	0.008	1.03	0.008	0.335	0.438	0.35	0.123	0.003	0.094	9/2/2013 10:45	9/2/2013 14:30	3.75
31	9/12/2013 18:30	9/13/2013 21:15	26.75	0.014	0.81	0.018	0.117	0.189	0.24	0.108	0.017	0.071	9/12/2013 18:45	9/13/2013 7:30	12.75
32	9/21/2013 19:45	9/22/2013 11:15	15.5	0.013	1.14	0.012	0.112	0.198	0.26	0.085	0.005	0.047	9/21/2013 20:00	9/22/2013 3:30	7.5
33	10/7/2013 8:00	10/7/2013 22:00	14	0.003	0.70	0.005	0.074	0.163	0.22	0.094	-0.009	0.094	10/7/2013 8:00	10/7/2013 17:00	9
34	10/10/2013 3:45	10/14/2013 7:45	100	0.042	2.07	0.021	0.156	0.248	0.23	0.074	-0.007	0.065	10/10/2013 3:45	10/11/2013 19:00	39.25
35	11/26/2013 11:15	11/28/2013 5:45	42.5	0.026	3.01	0.009	0.116	0.135	0.18	0.066	-0.023	0.066	11/26/2013 11:15	11/27/2013 17:30	30.25

ML_6 Lower Merion Township

Conshohocken Avenue

Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	12/6/2013 2:15	12/8/2013 6:45	52.5	0.021	0.95	0.022	0.069	0.137	0.06	0.060	-0.016	0.061	12/6/2013 2:15	12/7/2013 2:15	24
37	12/8/2013 11:30	12/10/2013 5:30	42	0.014	1.05	0.013	0.098	0.174	0.06	0.061	-0.017	0.065	12/8/2013 11:45	12/9/2013 10:00	22.25
38	12/14/2013 15:45	12/15/2013 13:45	22	0.017	0.74	0.023	0.091	0.200	0.07	0.086	-0.004	0.061	12/14/2013 15:45	12/15/2013 0:45	9
39	12/23/2013 4:00	12/24/2013 4:45	24.75	0.007	0.58	0.013	0.201	0.312	0.11	0.101	0.024	0.066	12/23/2013 4:15	12/23/2013 19:30	15.25
40	12/29/2013 8:00	12/29/2013 21:00	13	0.012	1.22	0.010	0.088	0.220	0.10	0.160	0.029	0.095	12/29/2013 8:00	12/29/2013 16:00	8
41	1/5/2014 21:00	1/7/2014 5:15	32.25	0.014	0.59	0.023	0.181	0.309	0.09	0.100	0.027	0.057	1/5/2014 21:00	1/6/2014 13:00	16
42	1/10/2014 7:15	1/12/2014 5:00	45.75	0.021	1.07	0.019	0.367	0.491	0.10	0.109	0.025	0.067	1/10/2014 7:15	1/12/2014 0:00	40.75
43	2/4/2014 23:45	2/5/2014 19:45	20	0.016	1.57	0.010	0.161	0.284	0.09	0.116	0.021	0.065	2/4/2014 23:45	2/5/2014 11:45	12
44	3/19/2014 14:00	3/20/2014 19:00	29	0.016	0.92	0.017	0.097	0.221	0.17	0.118	0.026	0.072	3/19/2014 14:00	3/19/2014 22:00	8
45	3/29/2014 9:15	3/31/2014 12:45	51.5	0.032	2.88	0.011	0.105	0.232	0.17	0.121	0.029	0.068	3/29/2014 9:30	3/31/2014 6:45	45.25
46	4/7/2014 12:00	4/8/2014 9:15	21.25	0.007	0.52	0.013	0.134	0.259	0.05	0.102	0.026	0.064	4/7/2014 12:00	4/8/2014 6:00	18
47	4/15/2014 10:00	4/16/2014 3:30	17.5	0.007	1.25	0.006	0.075	0.199	0.20	0.112	0.025	0.072	4/15/2014 10:15	4/15/2014 23:30	13.25
48	4/25/2014 19:15	4/26/2014 3:30	8.25	0.007	0.48	0.014	0.080	0.180	0.13	0.109	0.028	0.051	4/25/2014 19:15	4/26/2014 0:45	5.5
49	4/29/2014 12:15	5/4/2014 0:15	108	0.093	5.49	0.017	0.238	0.356	0.37	0.135	0.033	0.069	4/29/2014 12:30	5/3/2014 21:30	105
50	5/16/2014 6:45	5/16/2014 17:15	10.5	0.008	2.01	0.004	0.220	0.321	0.18	0.119	0.000	0.090	5/16/2014 6:45	5/16/2014 17:00	10.25
51	5/27/2014 17:00	5/28/2014 18:30	25.5	0.027	1.23	0.022	0.162	0.253	0.17	0.110	0.001	0.070	5/27/2014 18:00	5/28/2014 14:45	20.75
52	6/13/2014 0:30	6/13/2014 23:45	23.25	0.009	0.63	0.014	0.114	0.223	0.19	0.090	0.007	0.069	6/13/2014 0:30	6/13/2014 17:15	16.75
53	6/25/2014 22:30	6/26/2014 4:45	6.25	0.003	0.60	0.006	0.082	0.151	0.26	0.054	0.017	0.016	6/25/2014 23:30	6/26/2014 2:00	2.5
		Average:	27.7	0.014	1.09	0.014	0.131	0.239	0.17	0.111	0.021	0.071			16.8
		Maximum Value:	108.0	0.093	5.49	0.039	0.367	0.491	0.68	0.174	0.072	0.098			105.0
		Minimum Value:	6.3	0.003	0.20	0.004	0.045	0.135	0.02	0.054	-0.023	0.016			2.50
		Standard Deviation:	20.7	0.014	0.96	0.007	0.074	0.074	0.15	0.031	0.025	0.014			15.7
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_7 Lower Merion Township

City Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 205 acres Tributary Service Population: 373

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	5/1/2012 3:45	5/1/2012 17:30	13.75	0.011	0.31	0.035	0.798	1.15	0.14	0.363	0.031	0.229	5/1/2012 3:45	5/1/2012 10:00	6.25
2	5/3/2012 2:15	5/3/2012 14:30	12.25	0.008	0.22	0.035	0.672	0.896	0.05	0.327	0.045	0.198	5/3/2012 2:30	5/3/2012 5:00	2.5
3	5/4/2012 22:00	5/5/2012 4:45	6.75	0.005	0.17	0.027	0.597	0.725	0.10	0.172	0.041	0.039	5/4/2012 22:15	5/4/2012 23:30	1.25
4	5/9/2012 3:15	5/9/2012 11:00	7.75	0.009	0.35	0.026	0.817	1.09	0.09	0.358	0.041	0.165	5/9/2012 4:00	5/9/2012 6:45	2.75
5	5/9/2012 22:00	5/10/2012 6:45	8.75	0.006	0.27	0.021	0.660	0.738	0.03	0.163	0.040	0.038	5/9/2012 22:15	5/10/2012 4:00	5.75
6	5/15/2012 8:15	5/15/2012 18:30	10.25	0.005	0.86	0.005	0.817	1.08	0.14	0.329	-0.013	0.281	5/15/2012 8:15	5/15/2012 12:15	4
7	5/16/2012 0:45	5/16/2012 10:15	9.5	0.011	1.15	0.009	0.614	0.784	0.37	0.249	-0.016	0.112	5/16/2012 0:45	5/16/2012 4:15	3.5
8	5/24/2012 14:00	5/24/2012 21:45	7.75	0.005	0.23	0.021	0.495	0.701	0.16	0.230	-0.032	0.181	5/24/2012 14:00	5/24/2012 20:15	6.25
9	5/27/2012 4:00	5/27/2012 10:15	6.25	0.004	0.20	0.019	0.558	0.533	0.08	0.108	-0.032	0.061	5/27/2012 4:45	5/27/2012 7:30	2.75
10	5/29/2012 19:45	5/30/2012 1:30	5.75	0.003	0.34	0.009	0.510	0.598	0.15	0.111	-0.025	0.065	5/29/2012 20:00	5/30/2012 1:15	5.25
11	6/1/2012 19:45	6/2/2012 11:45	16	0.009	1.00	0.009	0.639	0.718	0.42	0.140	0.000	0.066	6/1/2012 20:00	6/2/2012 2:15	6.25
12	6/3/2012 18:45	6/4/2012 3:15	8.5	0.002	0.33	0.008	0.612	0.707	0.18	0.122	0.030	0.053	6/3/2012 19:45	6/3/2012 20:00	0.25
13	6/12/2012 9:30	6/13/2012 5:30	20	0.013	1.00	0.013	0.712	0.979	0.07	0.259	0.014	0.156	6/12/2012 9:30	6/12/2012 23:00	13.5
14	6/22/2012 17:00	6/23/2012 7:15	14.25	0.013	1.13	0.011	0.709	0.865	0.29	0.203	0.011	0.071	6/22/2012 17:00	6/22/2012 22:15	5.25
15	7/14/2012 4:00	7/14/2012 16:15	12.25	0.007	0.38	0.019	0.531	0.684	0.05	0.175	0.013	0.082	7/14/2012 4:15	7/14/2012 12:15	8
16	7/15/2012 21:30	7/16/2012 7:15	9.75	0.006	0.62	0.010	0.503	0.582	0.27	0.151	0.019	0.045	7/15/2012 21:30	7/16/2012 0:00	2.5
17	7/20/2012 0:45	7/20/2012 20:30	19.75	0.007	1.23	0.006	0.919	0.975	0.57	0.251	0.019	0.184	7/20/2012 1:00	7/20/2012 8:45	7.75
18	7/26/2012 19:45	7/27/2012 5:00	9.25	0.005	0.35	0.014	0.504	0.598	0.21	0.139	0.018	0.047	7/26/2012 20:00	7/27/2012 0:45	4.75
19	8/5/2012 18:15	8/6/2012 4:45	10.5	0.005	0.34	0.014	0.525	0.616	0.05	0.109	-0.001	0.050	8/5/2012 18:30	8/6/2012 2:30	8
20	8/10/2012 9:45	8/10/2012 21:00	11.25	0.003	0.56	0.005	0.424	0.772	0.17	0.262	-0.019	0.247	8/10/2012 9:45	8/10/2012 12:00	2.25
21	8/11/2012 17:30	8/12/2012 0:30	7	0.003	0.23	0.015	0.505	0.584	0.10	0.132	-0.015	0.082	8/11/2012 17:45	8/11/2012 22:00	4.25
22	8/14/2012 9:45	8/15/2012 0:30	14.75	0.009	0.83	0.010	0.659	0.946	0.34	0.284	0.005	0.200	8/14/2012 9:45	8/15/2012 0:15	14.5
23	8/17/2012 21:45	8/18/2012 16:00	18.25	0.010	0.76	0.014	0.521	0.619	0.16	0.147	0.002	0.069	8/17/2012 21:45	8/18/2012 7:00	9.25
24	8/27/2012 8:00	8/28/2012 12:30	28.5	0.022	0.81	0.028	0.996	1.37	0.20	0.311	0.020	0.186	8/27/2012 8:00	8/28/2012 7:30	23.5
25	9/3/2012 9:00	9/3/2012 18:00	9	0.009	0.60	0.014	0.719	0.874	0.14	0.294	0.066	0.100	9/3/2012 9:00	9/3/2012 17:45	8.75
26	9/4/2012 3:00	9/5/2012 3:00	24	0.024	1.17	0.021	0.807	1.17	0.26	0.383	0.087	0.161	9/4/2012 3:00	9/4/2012 18:00	15
27	9/5/2012 11:45	9/5/2012 19:45	8	0.006	0.47	0.013	0.918	1.34	0.29	0.450	0.103	0.241	9/5/2012 11:45	9/5/2012 14:15	2.5
28	9/8/2012 16:45	9/9/2012 2:00	9.25	0.003	0.37	0.009	0.758	0.942	0.05	0.234	0.112	0.076	9/8/2012 17:00	9/8/2012 22:30	5.5
29	9/18/2012 16:30	9/19/2012 16:00	23.5	0.020	0.87	0.023	0.949	1.24	0.33	0.373	0.103	0.159	9/18/2012 17:00	9/19/2012 1:45	8.75
30	9/22/2012 19:15	9/23/2012 3:15	8	0.006	0.70	0.009	0.867	1.03	0.33	0.266	0.106	0.061	9/22/2012 19:15	9/22/2012 21:30	2.25
31	10/2/2012 10:15	10/2/2012 15:30	5.25	0.005	0.21	0.024	0.688	1.14	0.08	0.542	0.099	0.317	10/2/2012 10:15	10/2/2012 14:15	4
32	10/7/2012 10:30	10/7/2012 23:45	13.25	0.004	0.23	0.018	0.684	0.874	0.03	0.241	0.110	0.089	10/7/2012 10:30	10/7/2012 21:00	10.5
33	10/15/2012 10:45	10/16/2012 0:45	14	0.003	0.29	0.010	0.719	1.09	0.10	0.311	0.095	0.188	10/15/2012 11:15	10/15/2012 20:30	9.25
34	10/19/2012 9:15	10/19/2012 19:30	10.25	0.009	0.64	0.015	0.793	1.25	0.13	0.486	0.093	0.271	10/19/2012 9:30	10/19/2012 14:00	4.5
35	10/28/2012 15:45	11/3/2012 1:45	130	0.088	3.28	0.027	1.02	1.23	0.13	0.331	0.101	0.139	10/28/2012 15:45	10/30/2012 20:30	52.75
36	11/7/2012 11:45	11/8/2012 5:30	17.75	0.010	0.42	0.024	0.706	1.17	0.03	0.339	0.132	0.134	11/7/2012 11:45	11/8/2012 1:30	13.75

ML_7 Lower Merion Township

City Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 205 acres Tributary Service Population: 373

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	11/27/2012 5:45	11/28/2012 2:15	20.5	0.009	0.60	0.015	0.871	1.28	0.02	0.345	0.102	0.185	11/27/2012 5:45	11/27/2012 15:45	10
38	12/9/2012 6:45	12/10/2012 5:00	22.25	0.010	0.31	0.033	0.731	0.948	0.04	0.257	0.122	0.074	12/9/2012 6:45	12/9/2012 23:15	16.5
39	12/18/2012 0:45	12/19/2012 0:00	23.25	0.010	0.32	0.032	0.820	1.29	0.11	0.344	0.120	0.165	12/18/2012 0:45	12/18/2012 15:15	14.5
40	12/20/2012 20:45	12/24/2012 1:00	76.25	0.031	2.07	0.015	0.798	1.18	0.20	0.228	0.072	0.101	12/20/2012 20:45	12/21/2012 7:15	10.5
41	12/26/2012 13:00	12/28/2012 6:00	41	0.034	1.32	0.026	1.04	1.44	0.10	0.311	0.056	0.143	12/26/2012 13:15	12/27/2012 9:15	20
42	1/11/2013 13:15	1/12/2013 4:15	15	0.009	0.37	0.024	0.699	1.09	0.06	0.313	0.103	0.131	1/11/2013 13:15	1/11/2013 21:00	7.75
43	1/14/2013 21:00	1/15/2013 6:45	9.75	0.003	0.35	0.010	0.606	0.776	0.03	0.178	0.089	0.043	1/14/2013 21:00	1/15/2013 2:30	5.5
44	1/15/2013 21:15	1/17/2013 1:45	28.5	0.014	1.01	0.014	0.660	1.03	0.06	0.271	0.062	0.144	1/15/2013 21:30	1/16/2013 11:15	13.75
45	1/30/2013 17:15	2/1/2013 1:45	32.5	0.022	1.37	0.016	0.702	1.10	0.31	0.350	0.117	0.142	1/30/2013 17:15	1/31/2013 5:45	12.5
46	2/8/2013 5:45	2/9/2013 8:45	27	0.005	0.33	0.016	0.613	1.09	0.02	0.293	0.114	0.154	2/8/2013 5:45	2/9/2013 1:30	19.75
47	2/11/2013 4:30	2/12/2013 4:00	23.5	0.009	0.39	0.022	0.720	1.18	0.05	0.303	0.090	0.164	2/11/2013 4:30	2/11/2013 8:30	4
48	2/26/2013 18:45	2/28/2013 4:15	33.5	0.019	0.64	0.031	0.871	1.24	0.06	0.307	0.098	0.132	2/26/2013 19:00	2/27/2013 13:15	18.25
49	3/12/2013 2:45	3/12/2013 23:30	20.75	0.014	1.02	0.014	0.891	1.35	0.06	0.414	0.139	0.182	3/12/2013 3:00	3/12/2013 14:45	11.75
50	3/16/2013 9:30	3/16/2013 21:45	12.25	0.007	0.26	0.029	0.621	0.811	0.04	0.274	0.094	0.100	3/16/2013 9:30	3/16/2013 17:30	8
51	3/18/2013 17:45	3/19/2013 23:00	29.25	0.016	0.82	0.020	0.715	1.17	0.06	0.325	0.100	0.151	3/18/2013 18:00	3/19/2013 11:00	17
		Average:	19.1	0.011	0.67	0.018	0.711	0.973	0.15	0.272	0.056	0.134			9.4
		Maximum Value:	130.0	0.088	3.28	0.035	1.04	1.44	0.57	0.542	0.139	0.317			52.8
		Minimum Value:	5.3	0.002	0.17	0.005	0.424	0.533	0.02	0.108	-0.032	0.038			0.25
		Standard Deviation:	19.8	0.013	0.54	0.008	0.149	0.249	0.12	0.099	0.051	0.069			8.3
		Weighted Mean R-Value*:				0.017									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

ML_7 Lower Merion Township
City Avenue
Pipe Size: 12" dia. Tributary Drainage Area: 205 acres Tributary Service Population: 373

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:30	4/11/2013 13:15	16.75	0.007	0.48	0.014	0.528	0.840	0.29	0.201	0.033	0.114	4/10/2013 20:45	4/10/2013 23:45	3
2	4/12/2013 7:00	4/13/2013 14:15	31.25	0.013	1.18	0.012	0.580	0.840	0.18	0.211	0.026	0.128	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:15	4/20/2013 22:45	25.5	0.015	0.62	0.024	0.575	0.660	0.07	0.162	0.020	0.066	4/19/2013 21:30	4/20/2013 2:45	5.25
4	4/28/2013 22:30	4/30/2013 1:00	26.5	0.006	0.54	0.012	0.492	0.738	0.04	0.197	0.044	0.121	4/28/2013 22:30	4/30/2013 1:00	26.5
5	5/7/2013 21:30	5/9/2013 23:00	49.5	0.024	1.05	0.023	0.524	0.756	0.14	0.223	0.030	0.128	5/7/2013 21:45	5/9/2013 6:15	32.5
6	5/10/2013 22:30	5/12/2013 6:15	31.75	0.020	1.17	0.017	0.512	0.610	0.15	0.156	0.015	0.058	5/10/2013 22:30	5/12/2013 6:00	31.5
7	5/18/2013 15:45	5/19/2013 19:45	28	0.008	0.39	0.020	0.432	0.552	0.04	0.122	0.021	0.064	5/18/2013 15:45	5/19/2013 17:45	26
8	5/23/2013 15:00	5/25/2013 0:00	33	0.004	1.20	0.003	0.518	0.670	0.46	0.172	0.026	0.130	5/23/2013 15:00	5/24/2013 22:15	31.25
9	5/28/2013 9:15	5/29/2013 1:45	16.5	0.002	0.29	0.008	0.415	0.682	0.05	0.201	0.029	0.154	5/28/2013 9:30	5/28/2013 19:45	10.25
10	6/2/2013 22:30	6/4/2013 5:30	31	0.013	1.23	0.010	0.597	0.781	0.58	0.199	0.040	0.105	6/2/2013 22:45	6/3/2013 18:00	19.25
11	6/6/2013 19:15	6/13/2013 2:15	151	0.074	5.87	0.013	0.539	0.835	0.41	0.219	0.048	0.106	6/6/2013 19:15	6/13/2013 2:00	150.75
12	6/18/2013 12:30	6/19/2013 16:15	27.75	0.008	0.73	0.010	0.521	0.705	0.30	0.234	0.051	0.146	6/18/2013 12:45	6/18/2013 20:45	8
13	6/27/2013 17:30	6/28/2013 17:30	24	0.010	0.56	0.017	0.833	1.20	0.33	0.275	0.087	0.135	6/27/2013 17:45	6/28/2013 17:00	23.25
14	7/12/2013 7:00	7/13/2013 20:45	37.75	0.016	1.32	0.012	0.675	0.870	0.17	0.242	0.068	0.120	7/12/2013 7:15	7/13/2013 18:15	35
15	7/23/2013 0:30	7/23/2013 21:15	20.75	0.015	1.27	0.012	0.709	1.04	0.49	0.312	0.069	0.145	7/23/2013 0:45	7/23/2013 16:00	15.25
16	8/1/2013 6:15	8/2/2013 19:15	37	0.019	0.97	0.019	0.842	1.18	0.11	0.307	0.077	0.163	8/1/2013 6:30	8/1/2013 15:00	8.5
17	8/8/2013 0:15	8/8/2013 18:30	18.25	0.008	0.52	0.016	0.753	1.07	0.27	0.289	0.077	0.152	8/8/2013 0:30	8/8/2013 15:00	14.5
18	8/13/2013 4:30	8/16/2013 0:45	68.25	0.037	2.05	0.018	0.813	1.18	0.51	0.303	0.093	0.138	8/13/2013 4:45	8/13/2013 9:30	4.75
19	8/22/2013 12:00	8/23/2013 3:30	15.5	0.003	0.38	0.009	0.545	0.840	0.19	0.230	0.086	0.114	8/22/2013 12:00	8/22/2013 16:45	4.75
20	8/28/2013 9:45	8/29/2013 22:00	36.25	0.031	1.54	0.020	0.866	1.24	0.64	0.352	0.089	0.150	8/28/2013 9:45	8/29/2013 11:45	26
21	9/2/2013 10:30	9/3/2013 4:15	17.75	0.005	0.78	0.006	0.574	0.732	0.29	0.254	0.093	0.124	9/2/2013 10:30	9/2/2013 14:30	4
22	9/12/2013 18:30	9/14/2013 2:00	31.5	0.012	0.82	0.014	0.728	0.978	0.24	0.262	0.093	0.119	9/12/2013 18:45	9/13/2013 7:30	12.75
23	9/21/2013 19:30	9/23/2013 3:00	31.5	0.019	1.14	0.016	0.618	0.777	0.27	0.218	0.084	0.055	9/21/2013 19:45	9/22/2013 3:45	8
24	10/7/2013 12:30	10/8/2013 17:00	28.5	0.014	0.71	0.020	0.654	1.00	0.25	0.302	0.089	0.147	10/7/2013 12:45	10/7/2013 17:00	4.25
25	10/10/2013 3:45	10/10/2013 20:15	16.5	0.014	0.47	0.030	0.790	1.12	0.06	0.373	0.085	0.176	10/10/2013 3:45	10/10/2013 16:30	12.75
26	10/11/2013 2:45	10/12/2013 22:30	43.75	0.036	1.61	0.023	0.756	1.03	0.26	0.288	0.067	0.109	10/11/2013 2:45	10/11/2013 19:00	16.25
27	11/26/2013 13:30	12/3/2013 0:45	155.25	0.187	2.99	0.063	1.11	1.28	0.18	0.340	0.069	0.110	11/26/2013 13:45	11/27/2013 17:30	27.75
28	12/6/2013 2:15	12/8/2013 0:15	46	0.038	0.97	0.040	0.990	1.31	0.05	0.324	0.106	0.106	12/6/2013 2:15	12/7/2013 2:15	24
29	12/8/2013 11:30	12/11/2013 3:00	63.5	0.097	1.37	0.071	1.27	1.74	0.06	0.470	0.153	0.112	12/8/2013 11:45	12/10/2013 17:30	53.75
30	12/14/2013 15:45	12/15/2013 10:15	18.5	0.013	0.74	0.017	0.810	0.991	0.07	0.270	0.120	0.058	12/14/2013 15:45	12/15/2013 0:45	9
31	12/23/2013 3:45	12/24/2013 1:30	21.75	0.006	0.59	0.011	0.563	0.849	0.12	0.220	0.038	0.143	12/23/2013 3:45	12/23/2013 19:30	15.75
32	12/29/2013 8:00	12/31/2013 23:30	63.5	0.036	1.22	0.029	0.763	0.919	0.10	0.241	0.049	0.116	12/29/2013 8:00	12/31/2013 14:30	54.5
33	1/2/2014 17:30	1/4/2014 5:30	36	0.001	0.42	0.003	0.599	0.821	0.02	0.151	0.036	0.110	1/2/2014 17:45	1/3/2014 4:15	10.5
34	1/5/2014 5:30	1/8/2014 5:00	71.5	0.052	0.83	0.063	0.735	1.04	0.09	0.253	0.050	0.106	1/5/2014 5:45	1/6/2014 13:00	31.25
35	1/10/2014 7:15	1/13/2014 3:00	67.75	0.037	1.06	0.035	0.762	0.875	0.10	0.213	0.051	0.090	1/10/2014 7:15	1/11/2014 17:45	34.5
36	2/3/2014 2:00	2/9/2014 6:45	148.75	0.113	2.74	0.041	0.919	1.03	0.09	0.255	0.036	0.119	2/3/2014 2:00	2/5/2014 11:45	57.75

ML_7 Lower Merion Township
City Avenue
Pipe Size: 12" dia. Tributary Drainage Area: 205 acres Tributary Service Population: 373

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	2/13/2014 0:15	2/16/2014 0:00	71.75	0.028	1.72	0.016	0.702	0.827	0.09	0.184	0.020	0.112	2/13/2014 0:30	2/15/2014 16:15	63.75
38	2/19/2014 9:15	2/20/2014 0:00	14.75	0.010	0.35	0.028	0.664	0.919	0.08	0.304	0.047	0.170	2/19/2014 9:30	2/19/2014 12:00	2.5
39	3/12/2014 15:15	3/13/2014 1:15	10	0.004	0.27	0.016	0.516	0.709	0.06	0.203	0.054	0.093	3/12/2014 15:30	3/12/2014 21:00	5.5
40	3/19/2014 14:00	3/21/2014 4:00	38	0.026	0.92	0.028	0.795	1.10	0.17	0.268	0.061	0.116	3/19/2014 14:00	3/19/2014 22:00	8
41	3/29/2014 9:00	4/2/2014 5:15	92.25	0.089	2.93	0.031	0.734	0.935	0.16	0.270	0.044	0.097	3/29/2014 9:15	3/31/2014 6:45	45.5
42	4/7/2014 12:30	4/9/2014 2:00	37.5	0.024	0.52	0.046	0.615	0.969	0.05	0.259	0.046	0.127	4/7/2014 12:45	4/8/2014 6:00	17.25
43	4/15/2014 9:30	4/17/2014 1:30	40	0.034	1.25	0.027	0.745	0.935	0.21	0.301	0.047	0.140	4/15/2014 9:45	4/15/2014 23:15	13.5
44	4/29/2014 12:15	5/6/2014 4:15	160	0.154	5.45	0.028	0.773	0.971	0.36	0.279	0.041	0.109	4/29/2014 12:30	5/4/2014 13:45	121.25
45	5/10/2014 14:00	5/11/2014 16:15	26.25	0.010	0.46	0.023	0.497	0.629	0.21	0.148	0.031	0.064	5/10/2014 14:00	5/11/2014 0:00	10
46	5/16/2014 7:30	5/18/2014 22:15	62.75	0.023	1.96	0.012	0.604	0.841	0.17	0.190	0.046	0.095	5/16/2014 7:30	5/16/2014 18:00	10.5
47	5/27/2014 18:00	5/30/2014 3:00	57	0.018	1.19	0.015	0.539	0.821	0.18	0.202	0.043	0.118	5/27/2014 18:00	5/28/2014 14:45	20.75
48	6/9/2014 1:00	6/9/2014 18:00	17	0.005	0.27	0.017	0.592	0.861	0.08	0.242	0.046	0.160	6/9/2014 1:15	6/9/2014 17:45	16.5
49	6/13/2014 0:30	6/14/2014 1:30	25	0.010	0.75	0.013	0.532	0.861	0.21	0.229	0.039	0.135	6/13/2014 0:30	6/13/2014 17:15	16.75
		Average:	45.7	0.030	1.22	0.022	0.678	0.921	0.20	0.247	0.057	0.118			24.9
		Maximum Value:	160.0	0.187	5.87	0.071	1.27	1.74	0.64	0.470	0.153	0.176			150.8
		Minimum Value:	10.0	0.001	0.27	0.003	0.415	0.552	0.02	0.122	0.015	0.055			2.50
		Standard Deviation:	37.4	0.038	1.13	0.015	0.170	0.216	0.15	0.065	0.029	0.029			27.8
		Weighted Mean R-Value*:				0.024									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM_1 Lower Moreland Township

Philmont Avenue and Byberry Road

Pipe Size: 10" dia. Tributary Drainage Area: 448 acres Tributary Service Population: 1,748

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/11/2012 4:30	2/12/2012 6:45	26.25	0.002	0.23	0.010	0.115	0.535	0.03	0.375	0.225	0.124	2/11/2012 4:45	2/11/2012 20:15	15.5
2	2/24/2012 2:30	2/25/2012 11:30	33	0.002	0.33	0.008	0.100	0.463	0.04	0.320	0.166	0.132	2/24/2012 2:45	2/25/2012 10:45	32
3	2/29/2012 10:00	3/2/2012 5:30	43.5	0.014	0.94	0.015	0.314	0.526	0.07	0.397	0.167	0.134	2/29/2012 10:15	3/1/2012 9:15	23
4	3/2/2012 20:15	3/3/2012 8:30	12.25	0.003	0.28	0.011	0.151	0.424	0.04	0.339	0.188	0.080	3/2/2012 20:30	3/3/2012 8:15	11.75
5	3/31/2012 0:30	4/1/2012 13:15	36.75	0.006	0.42	0.014	0.156	0.467	0.06	0.293	0.120	0.127	3/31/2012 0:30	3/31/2012 5:15	4.75
6	4/1/2012 18:15	4/2/2012 13:30	19.25	0.003	0.19	0.017	0.152	0.465	0.03	0.303	0.120	0.136	4/1/2012 18:30	4/2/2012 2:30	8
7	4/22/2012 8:15	4/24/2012 20:00	59.75	0.031	2.18	0.014	0.595	0.858	0.12	0.393	0.093	0.151	4/22/2012 8:15	4/23/2012 18:15	34
8	5/1/2012 4:15	5/1/2012 21:15	17	0.002	0.42	0.004	0.198	0.520	0.14	0.302	0.107	0.168	5/1/2012 4:15	5/1/2012 10:15	6
9	5/9/2012 0:15	5/9/2012 19:15	19	0.002	0.36	0.006	0.175	0.503	0.08	0.284	0.113	0.136	5/9/2012 0:30	5/9/2012 7:15	6.75
10	5/9/2012 22:15	5/10/2012 10:15	12	0.003	0.18	0.016	0.154	0.508	0.02	0.299	0.115	0.113	5/9/2012 22:15	5/10/2012 4:30	6.25
11	5/15/2012 8:45	5/15/2012 17:00	8.25	0.003	0.80	0.003	0.296	0.633	0.11	0.405	0.145	0.171	5/15/2012 8:45	5/15/2012 13:00	4.25
12	5/16/2012 0:15	5/17/2012 17:30	41.25	0.013	0.65	0.020	0.598	0.755	0.10	0.375	0.149	0.137	5/16/2012 0:45	5/16/2012 4:45	4
13	5/21/2012 1:00	5/21/2012 10:00	9	0.001	0.21	0.005	0.144	0.464	0.06	0.331	0.185	0.113	5/21/2012 1:45	5/21/2012 7:15	5.5
14	5/21/2012 23:45	5/22/2012 8:30	8.75	0.003	0.20	0.013	0.222	0.564	0.02	0.358	0.182	0.089	5/21/2012 23:45	5/22/2012 7:00	7.25
15	5/24/2012 7:30	5/24/2012 22:30	15	0.001	0.36	0.004	0.130	0.551	0.15	0.379	0.172	0.179	5/24/2012 8:00	5/24/2012 22:15	14.25
16	5/27/2012 3:30	5/27/2012 15:15	11.75	0.003	0.39	0.007	0.235	0.529	0.11	0.382	0.169	0.144	5/27/2012 4:00	5/27/2012 6:30	2.5
17	5/29/2012 20:15	5/30/2012 16:45	20.5	0.005	0.33	0.014	0.209	0.648	0.11	0.422	0.220	0.135	5/29/2012 20:15	5/30/2012 3:45	7.5
18	6/1/2012 22:15	6/2/2012 17:30	19.25	0.004	0.31	0.012	0.212	0.670	0.11	0.449	0.268	0.125	6/1/2012 22:30	6/2/2012 2:00	3.5
19	6/4/2012 12:15	6/4/2012 22:45	10.5	0.002	0.18	0.012	0.113	0.576	0.10	0.509	0.287	0.165	6/4/2012 12:30	6/4/2012 22:45	10.25
20	6/12/2012 9:15	6/14/2012 0:45	39.5	0.010	0.61	0.016	0.258	0.705	0.06	0.487	0.264	0.149	6/12/2012 9:45	6/12/2012 23:45	14
21	6/25/2012 7:15	6/26/2012 4:15	21	0.003	0.16	0.020	0.109	0.496	0.10	0.367	0.176	0.146	6/25/2012 7:30	6/25/2012 11:15	3.75
22	7/4/2012 23:45	7/5/2012 7:15	7.5	0.001	0.27	0.003	0.145	0.391	0.12	0.267	0.176	0.062	7/5/2012 0:15	7/5/2012 3:45	3.5
23	7/14/2012 4:00	7/14/2012 12:00	8	0.001	0.24	0.004	0.128	0.451	0.05	0.321	0.148	0.137	7/14/2012 4:15	7/14/2012 9:15	5
24	7/15/2012 20:45	7/17/2012 0:00	27.25	0.007	0.98	0.008	0.808	1.11	0.38	0.363	0.144	0.141	7/15/2012 21:30	7/15/2012 23:45	2.25
25	7/19/2012 23:45	7/21/2012 18:45	43	0.008	1.00	0.008	0.431	0.758	0.26	0.350	0.161	0.134	7/20/2012 0:00	7/21/2012 7:15	31.25
26	8/1/2012 15:45	8/2/2012 23:45	32	0.004	0.77	0.005	0.362	0.686	0.43	0.359	0.174	0.147	8/1/2012 16:30	8/1/2012 17:45	1.25
27	8/4/2012 13:45	8/5/2012 12:30	22.75	0.001	0.43	0.003	0.130	0.488	0.36	0.333	0.186	0.131	8/4/2012 14:00	8/4/2012 14:30	0.5
28	8/5/2012 18:00	8/7/2012 3:30	33.5	0.007	0.67	0.011	0.206	0.560	0.17	0.375	0.180	0.133	8/5/2012 18:45	8/6/2012 2:15	7.5
29	8/10/2012 9:45	8/10/2012 19:45	10	0.002	0.31	0.005	0.143	0.475	0.11	0.374	0.161	0.165	8/10/2012 9:45	8/10/2012 12:15	2.5
30	8/11/2012 17:15	8/12/2012 23:15	30	0.003	0.64	0.005	0.158	0.496	0.17	0.326	0.156	0.141	8/11/2012 17:30	8/11/2012 22:30	5
31	8/14/2012 10:00	8/17/2012 1:30	63.5	0.009	0.69	0.014	0.210	0.546	0.16	0.341	0.153	0.144	8/14/2012 10:15	8/15/2012 18:00	31.75
32	8/17/2012 22:00	8/19/2012 22:00	48	0.006	0.78	0.008	0.295	0.518	0.13	0.339	0.169	0.135	8/17/2012 22:15	8/18/2012 7:15	9
33	8/27/2012 8:30	8/28/2012 23:30	39	0.008	0.91	0.009	0.548	0.880	0.44	0.348	0.134	0.153	8/27/2012 8:45	8/28/2012 7:30	22.75
34	9/2/2012 22:30	9/7/2012 18:45	116.25	0.064	3.47	0.019	1.19	1.49	0.36	0.471	0.171	0.138	9/2/2012 22:30	9/6/2012 11:00	84.5
35	9/8/2012 16:45	9/9/2012 12:45	20	0.004	0.33	0.014	0.177	0.599	0.15	0.417	0.225	0.127	9/8/2012 17:00	9/8/2012 22:30	5.5

MLM_1 Lower Moreland Township

Philmont Avenue and Byberry Road

Pipe Size: 10" dia. Tributary Drainage Area: 448 acres Tributary Service Population: 1,748

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	9/18/2012 2:45	9/20/2012 23:45	69	0.016	1.02	0.016	0.355	0.723	0.26	0.403	0.191	0.145	9/18/2012 2:45	9/18/2012 21:00	18.25
37	10/2/2012 10:30	10/2/2012 22:30	12	0.002	0.23	0.009	0.185	0.516	0.06	0.400	0.183	0.168	10/2/2012 10:30	10/2/2012 15:45	5.25
38	10/7/2012 10:15	10/7/2012 22:15	12	0.003	0.21	0.014	0.168	0.530	0.02	0.428	0.174	0.184	10/7/2012 10:30	10/7/2012 21:00	10.5
39	10/15/2012 12:00	10/15/2012 22:45	10.75	0.003	0.40	0.006	0.205	0.554	0.14	0.415	0.181	0.166	10/15/2012 12:00	10/15/2012 20:45	8.75
40	10/19/2012 9:00	10/19/2012 20:45	11.75	0.006	1.07	0.006	0.652	1.03	0.27	0.500	0.182	0.169	10/19/2012 9:30	10/19/2012 14:15	4.75
41	10/28/2012 15:45	11/1/2012 7:30	87.75	0.042	2.25	0.019	0.796	1.12	0.10	0.459	0.183	0.137	10/28/2012 15:45	10/30/2012 11:30	43.75
42	11/27/2012 6:00	11/29/2012 0:45	42.75	0.009	0.63	0.014	0.244	0.523	0.02	0.348	0.131	0.155	11/27/2012 6:00	11/27/2012 16:00	10
43	12/7/2012 9:45	12/8/2012 18:45	33	0.003	0.32	0.010	0.106	0.460	0.04	0.323	0.154	0.143	12/7/2012 9:45	12/8/2012 1:45	16
44	12/9/2012 8:45	12/11/2012 1:15	40.5	0.009	0.36	0.026	0.165	0.509	0.05	0.394	0.172	0.154	12/9/2012 8:45	12/9/2012 23:30	14.75
45	12/18/2012 0:45	12/18/2012 4:45	4	0.001	0.30	0.003	0.141	0.318	0.15	0.252	0.159	0.019	12/18/2012 1:00	12/18/2012 2:00	1
46	12/20/2012 20:30	12/23/2012 4:30	56	0.028	2.01	0.014	0.769	1.17	0.18	0.456	0.180	0.129	12/20/2012 21:15	12/21/2012 7:45	10.5
47	12/24/2012 17:30	12/25/2012 6:45	13.25	0.002	0.20	0.011	0.165	0.477	0.02	0.326	0.186	0.094	12/24/2012 17:45	12/24/2012 21:15	3.5
48	12/26/2012 13:30	12/29/2012 6:45	65.25	0.035	1.23	0.028	0.571	0.932	0.10	0.494	0.206	0.132	12/26/2012 13:45	12/27/2012 9:45	20
49	12/29/2012 10:45	12/30/2012 4:45	18	0.005	0.22	0.023	0.167	0.562	0.02	0.452	0.239	0.133	12/29/2012 11:15	12/29/2012 16:15	5
		Average:	29.8	0.008	0.65	0.011	0.291	0.627	0.13	0.376	0.173	0.136			12.4
		Maximum Value:	116.3	0.064	3.47	0.028	1.19	1.49	0.44	0.509	0.287	0.184			84.5
		Minimum Value:	4.0	0.001	0.16	0.003	0.100	0.318	0.02	0.252	0.093	0.019			0.50
		Standard Deviation:	22.9	0.012	0.64	0.006	0.234	0.231	0.11	0.063	0.040	0.029			14.4
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM_1 Lower Moreland Township

Philmont Avenue and Byberry Road

Pipe Size: 10" dia. Tributary Drainage Area: 448 acres Tributary Service Population: 1,748

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2013 13:30	1/14/2013 14:00	72.5	0.018	0.55	0.032	0.192	0.647	0.06	0.424	0.197	0.156	1/11/2013 13:30	1/11/2013 21:00	7.5
2	1/15/2013 22:00	1/18/2013 4:45	54.75	0.022	1.05	0.021	0.483	0.812	0.06	0.520	0.260	0.142	1/15/2013 22:15	1/16/2013 13:15	15
3	1/30/2013 22:00	2/2/2013 6:15	56.25	0.020	1.24	0.016	0.616	0.854	0.30	0.470	0.229	0.140	1/30/2013 22:15	2/1/2013 10:00	35.75
4	2/8/2013 8:15	2/10/2013 7:15	47	0.007	0.46	0.016	0.138	0.553	0.04	0.405	0.210	0.151	2/8/2013 8:15	2/9/2013 3:00	18.75
5	2/11/2013 4:00	2/15/2013 1:45	93.75	0.023	0.56	0.041	0.222	0.665	0.04	0.475	0.248	0.156	2/11/2013 4:15	2/14/2013 0:30	68.25
6	2/26/2013 19:15	3/1/2013 19:30	72.25	0.016	0.69	0.023	0.238	0.704	0.08	0.474	0.257	0.153	2/26/2013 19:15	2/28/2013 5:15	34
7	3/8/2013 7:30	3/9/2013 21:15	37.75	0.005	0.32	0.014	0.128	0.561	0.03	0.435	0.226	0.174	3/8/2013 7:30	3/8/2013 13:15	5.75
8	3/12/2013 3:15	3/17/2013 21:15	138	0.044	1.20	0.037	0.521	0.945	0.08	0.500	0.248	0.157	3/12/2013 3:30	3/16/2013 18:00	110.5
9	3/18/2013 18:00	3/23/2013 19:15	121.25	0.055	0.92	0.060	0.413	0.813	0.07	0.553	0.264	0.155	3/18/2013 18:00	3/19/2013 19:00	25
10	3/25/2013 6:30	3/28/2013 18:30	84	0.018	0.65	0.027	0.211	0.664	0.04	0.508	0.287	0.159	3/25/2013 6:30	3/28/2013 13:00	78.5
11	4/10/2013 20:00	4/11/2013 10:00	14	0.004	0.66	0.006	0.178	0.596	0.21	0.459	0.245	0.130	4/10/2013 20:15	4/11/2013 0:00	3.75
12	4/12/2013 7:00	4/15/2013 20:00	85	0.023	1.08	0.021	0.309	0.713	0.13	0.489	0.248	0.163	4/12/2013 7:15	4/12/2013 23:30	16.25
13	4/19/2013 21:15	4/21/2013 8:45	35.5	0.009	0.49	0.018	0.214	0.588	0.06	0.447	0.240	0.135	4/19/2013 21:30	4/20/2013 3:00	5.5
14	4/29/2013 3:30	4/30/2013 23:45	44.25	0.006	0.44	0.014	0.129	0.581	0.03	0.469	0.266	0.163	4/29/2013 3:30	4/30/2013 1:45	22.25
15	5/9/2013 4:00	5/10/2013 0:00	20	0.003	0.52	0.007	0.322	0.692	0.08	0.474	0.248	0.176	5/9/2013 4:15	5/9/2013 6:45	2.5
16	5/10/2013 22:30	5/12/2013 23:45	49.25	0.015	1.16	0.013	0.302	0.685	0.12	0.492	0.246	0.157	5/10/2013 22:45	5/12/2013 6:15	31.5
17	5/23/2013 15:45	5/25/2013 10:30	42.75	0.007	0.71	0.010	0.165	0.558	0.16	0.400	0.205	0.146	5/23/2013 15:45	5/25/2013 3:00	35.25
18	6/3/2013 0:30	6/5/2013 15:45	63.25	0.013	0.85	0.015	0.329	0.730	0.37	0.371	0.163	0.150	6/3/2013 0:45	6/3/2013 17:15	16.5
19	6/6/2013 19:30	6/22/2013 18:30	383	0.164	6.98	0.024	1.02	1.37	0.37	0.519	0.239	0.155	6/6/2013 19:30	6/18/2013 20:15	288.75
20	6/27/2013 18:30	6/29/2013 15:15	44.75	0.008	1.50	0.005	0.499	1.04	0.29	0.528	0.322	0.154	6/27/2013 18:30	6/28/2013 20:00	25.5
21	7/1/2013 7:00	7/2/2013 10:45	27.75	0.009	0.55	0.016	0.201	0.753	0.26	0.562	0.308	0.164	7/1/2013 7:15	7/1/2013 15:15	8
22	7/12/2013 15:45	7/15/2013 9:45	66	0.025	1.35	0.018	0.455	0.875	0.19	0.497	0.235	0.154	7/12/2013 15:45	7/13/2013 20:00	28.25
23	7/22/2013 16:00	7/24/2013 7:00	39	0.005	1.41	0.003	0.310	0.762	0.35	0.486	0.311	0.141	7/22/2013 16:15	7/23/2013 18:00	25.75
24	7/28/2013 15:30	7/29/2013 21:00	29.5	0.005	0.43	0.013	0.142	0.691	0.11	0.541	0.328	0.159	7/28/2013 15:30	7/29/2013 2:30	11
25	8/1/2013 6:45	8/3/2013 19:15	60.5	0.020	0.79	0.025	0.271	0.752	0.07	0.563	0.302	0.165	8/1/2013 6:45	8/3/2013 13:45	55
26	8/22/2013 6:30	8/24/2013 9:30	51	0.014	1.17	0.012	0.460	0.904	0.40	0.463	0.227	0.154	8/22/2013 6:30	8/22/2013 17:15	10.75
27	8/28/2013 10:45	8/29/2013 20:45	34	0.006	0.39	0.015	0.177	0.596	0.04	0.427	0.215	0.162	8/28/2013 11:00	8/28/2013 18:15	7.25
28	9/21/2013 20:00	9/27/2013 20:15	144.25	0.040	1.38	0.029	0.379	0.713	0.34	0.410	0.175	0.154	9/21/2013 20:15	9/22/2013 3:00	6.75
29	10/7/2013 13:30	10/9/2013 23:30	58	0.010	0.65	0.015	0.252	0.578	0.24	0.367	0.160	0.158	10/7/2013 13:30	10/7/2013 17:15	3.75
30	10/10/2013 4:45	10/10/2013 22:30	17.75	0.005	0.22	0.024	0.173	0.554	0.04	0.431	0.156	0.188	10/10/2013 5:00	10/10/2013 14:00	9
31	10/11/2013 3:00	10/15/2013 2:45	95.75	0.025	0.86	0.029	0.402	0.746	0.22	0.405	0.173	0.156	10/11/2013 3:15	10/11/2013 15:45	12.5
32	11/26/2013 16:00	12/4/2013 1:30	177.5	0.122	2.61	0.047	1.02	1.23	0.14	0.553	0.198	0.155	11/26/2013 16:15	11/27/2013 17:45	25.5
33	12/6/2013 4:45	12/14/2013 3:00	190.25	0.095	2.36	0.040	0.561	1.07	0.06	0.570	0.268	0.156	12/6/2013 5:00	12/10/2013 12:00	103
34	12/14/2013 16:00	12/20/2013 0:15	128.25	0.029	0.89	0.032	0.249	0.837	0.08	0.577	0.356	0.155	12/14/2013 16:15	12/17/2013 15:45	71.5
35	12/23/2013 4:15	12/28/2013 2:00	117.75	0.031	0.53	0.059	0.392	0.973	0.06	0.647	0.412	0.156	12/23/2013 4:15	12/26/2013 11:00	78.75

MLM_1 Lower Moreland Township

Philmont Avenue and Byberry Road

Pipe Size: 10" dia. Tributary Drainage Area: 448 acres Tributary Service Population: 1,748

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	12/29/2013 8:30	12/31/2013 0:00	39.5	0.021	1.23	0.017	0.721	1.34	0.11	0.758	0.424	0.175	12/29/2013 8:45	12/29/2013 16:15	7.5
37	1/5/2014 6:00	1/9/2014 1:30	91.5	0.022	0.80	0.028	0.490	1.10	0.13	0.592	0.361	0.160	1/5/2014 6:00	1/6/2014 20:30	38.5
38	1/10/2014 5:15	1/16/2014 6:00	144.75	0.029	1.20	0.024	0.442	0.994	0.10	0.582	0.370	0.154	1/10/2014 5:30	1/14/2014 18:00	108.5
39	2/3/2014 2:00	2/12/2014 16:15	230.25	0.091	2.77	0.033	0.719	1.05	0.10	0.472	0.203	0.154	2/3/2014 2:00	2/9/2014 21:15	163.25
40	2/13/2014 0:15	2/17/2014 19:30	115.25	0.037	1.83	0.020	0.311	0.702	0.09	0.485	0.237	0.154	2/13/2014 0:30	2/15/2014 16:45	64.25
41	3/19/2014 14:00	3/23/2014 8:15	90.25	0.036	0.88	0.041	0.428	1.03	0.14	0.679	0.415	0.148	3/19/2014 14:15	3/19/2014 22:15	8
42	4/7/2014 11:45	4/8/2014 21:15	33.5	0.008	0.49	0.016	0.224	0.639	0.04	0.509	0.278	0.162	4/7/2014 11:45	4/8/2014 6:45	19
43	4/15/2014 9:30	4/17/2014 6:00	44.5	0.014	1.01	0.014	0.244	0.740	0.16	0.599	0.360	0.147	4/15/2014 9:45	4/15/2014 23:30	13.75
44	4/25/2014 19:30	4/28/2014 9:45	62.25	0.008	0.43	0.020	0.216	0.800	0.15	0.596	0.405	0.152	4/25/2014 19:30	4/26/2014 1:30	6
45	5/10/2014 13:45	5/12/2014 17:45	52	0.012	0.61	0.019	0.232	0.799	0.18	0.649	0.426	0.158	5/10/2014 14:00	5/11/2014 0:15	10.25
46	5/16/2014 8:30	5/18/2014 23:45	63.25	0.022	1.10	0.020	0.310	0.947	0.10	0.740	0.473	0.165	5/16/2014 8:45	5/16/2014 21:15	12.5
47	5/27/2014 18:15	5/28/2014 22:15	28	0.004	0.35	0.011	0.204	0.760	0.08	0.573	0.372	0.160	5/27/2014 18:30	5/28/2014 15:15	20.75
48	6/9/2014 5:15	6/11/2014 22:45	65.5	0.025	1.02	0.025	0.458	1.11	0.13	0.755	0.480	0.164	6/9/2014 5:15	6/11/2014 9:15	52
49	6/13/2014 0:45	6/16/2014 22:30	93.75	0.023	1.08	0.021	0.488	1.04	0.49	0.763	0.536	0.156	6/13/2014 1:15	6/13/2014 18:00	16.75
		Average:	80.6	0.026	1.07	0.023	0.358	0.813	0.15	0.524	0.286	0.156			37.6
		Maximum Value:	383.0	0.164	6.98	0.060	1.02	1.37	0.49	0.763	0.536	0.188			288.8
		Minimum Value:	14.0	0.003	0.22	0.003	0.128	0.553	0.03	0.367	0.156	0.130			2.50
		Standard Deviation:	64.4	0.031	1.02	0.012	0.204	0.206	0.11	0.100	0.091	0.010			50.2
		Weighted Mean R-Value*:				0.024									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM_2 Lower Moreland Township

Welsh Road and Huntington Pike

Pipe Size: 12" dia. Tributary Drainage Area: 1,797 acres Tributary Service Population: 6,529

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2012 19:30	1/14/2012 6:00	58.5	0.017	1.66	0.011	1.73	2.56	0.13	1.12	0.572	0.193	1/11/2012 19:45	1/13/2012 8:30	36.75
2	1/16/2012 22:45	1/19/2012 3:15	52.5	0.005	0.32	0.015	0.316	1.18	0.03	0.912	0.604	0.201	1/16/2012 23:00	1/17/2012 14:45	15.75
3	1/23/2012 9:30	1/26/2012 15:15	77.75	0.013	0.34	0.038	0.586	1.44	0.05	1.02	0.610	0.215	1/23/2012 9:30	1/26/2012 15:15	77.75
4	1/27/2012 5:30	1/29/2012 5:00	47.5	0.008	0.57	0.013	0.693	1.71	0.20	1.06	0.679	0.196	1/27/2012 5:45	1/27/2012 11:30	5.75
5	2/11/2012 4:00	2/12/2012 11:00	31	0.003	0.20	0.016	0.329	1.07	0.03	0.855	0.565	0.170	2/11/2012 4:45	2/11/2012 20:15	15.5
6	2/29/2012 9:45	3/2/2012 5:45	44	0.005	0.96	0.005	0.843	1.61	0.08	0.836	0.501	0.204	2/29/2012 9:45	3/1/2012 0:45	15
7	3/2/2012 20:15	3/4/2012 6:45	34.5	0.003	0.34	0.008	0.231	1.13	0.04	0.776	0.518	0.164	3/2/2012 20:30	3/3/2012 9:45	13.25
8	4/22/2012 9:00	4/23/2012 23:45	38.75	0.009	2.09	0.004	1.04	1.67	0.12	0.911	0.396	0.235	4/22/2012 9:00	4/23/2012 18:15	33.25
9	5/14/2012 20:15	5/15/2012 17:00	20.75	0.004	0.94	0.004	0.434	1.19	0.11	0.830	0.423	0.203	5/14/2012 20:30	5/15/2012 13:00	16.5
10	5/16/2012 0:30	5/16/2012 21:00	20.5	0.007	1.00	0.007	1.29	1.77	0.16	1.05	0.416	0.206	5/16/2012 0:30	5/16/2012 4:45	4.25
11	7/15/2012 21:00	7/16/2012 8:00	11	0.003	0.97	0.003	1.06	1.62	0.34	0.783	0.343	0.112	7/15/2012 21:30	7/15/2012 23:45	2.25
12	8/27/2012 8:15	8/27/2012 22:00	13.75	0.002	0.69	0.003	0.728	1.44	0.31	0.796	0.340	0.281	8/27/2012 8:15	8/27/2012 17:30	9.25
13	9/3/2012 9:45	9/5/2012 23:00	61.25	0.022	3.72	0.006	1.68	2.05	0.61	1.01	0.370	0.226	9/3/2012 10:00	9/5/2012 12:00	50
14	10/19/2012 9:15	10/19/2012 18:45	9.5	0.002	0.94	0.002	2.07	2.69	0.24	0.836	0.316	0.258	10/19/2012 9:30	10/19/2012 14:15	4.75
15	10/29/2012 6:15	10/30/2012 20:45	38.5	0.014	2.21	0.006	1.68	2.22	0.11	0.989	0.334	0.232	10/29/2012 6:30	10/30/2012 11:30	29
16	11/7/2012 11:15	11/8/2012 1:00	13.75	0.002	0.50	0.004	0.693	1.33	0.02	0.797	0.372	0.239	11/7/2012 11:15	11/8/2012 0:45	13.5
17	12/20/2012 21:15	12/22/2012 22:45	49.5	0.017	2.01	0.009	2.01	2.65	0.19	1.02	0.415	0.196	12/20/2012 21:30	12/21/2012 7:30	10
18	12/24/2012 17:00	12/25/2012 9:30	16.5	0.002	0.21	0.009	0.322	0.890	0.02	0.779	0.515	0.137	12/24/2012 17:00	12/24/2012 21:15	4.25
19	12/26/2012 13:30	12/28/2012 7:15	41.75	0.012	1.21	0.010	1.06	1.83	0.10	1.02	0.501	0.190	12/26/2012 13:30	12/27/2012 9:45	20.25
20	12/29/2012 11:00	12/29/2012 22:15	11.25	0.001	0.23	0.002	0.129	1.00	0.02	0.887	0.561	0.270	12/29/2012 11:15	12/29/2012 16:15	5
		Average:	34.6	0.008	1.06	0.009	0.947	1.65	0.15	0.914	0.468	0.206			19.1
		Maximum Value:	77.8	0.022	3.72	0.038	2.07	2.69	0.61	1.12	0.679	0.281			77.8
		Minimum Value:	9.5	0.001	0.20	0.002	0.129	0.890	0.02	0.776	0.316	0.112			2.25
		Standard Deviation:	19.7	0.006	0.90	0.008	0.615	0.546	0.14	0.111	0.108	0.042			18.6
		Weighted Mean R-Value*:				0.007									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM_2 Lower Moreland Township

Welsh Road and Huntington Pike

Pipe Size: 12" dia. Tributary Drainage Area: 1,797 acres Tributary Service Population: 6,529

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/15/2013 21:45	1/18/2013 1:00	51.25	0.009	1.04	0.009	0.642	1.44	0.064	0.937	0.590	0.145	1/15/2013 21:45	1/16/2013 13:15	15.5
2	2/8/2013 7:45	2/10/2013 4:15	44.5	0.003	0.43	0.008	0.406	1.05	0.033	0.718	0.470	0.162	2/8/2013 8:00	2/9/2013 2:45	18.75
3	2/11/2013 4:15	2/12/2013 6:30	26.25	0.005	0.36	0.014	0.426	1.13	0.039	0.860	0.502	0.138	2/11/2013 4:15	2/11/2013 9:00	4.75
4	3/18/2013 18:00	3/21/2013 22:45	76.75	0.010	0.90	0.011	0.436	1.28	0.066	0.922	0.621	0.149	3/18/2013 18:00	3/19/2013 18:45	24.75
5	3/25/2013 6:45	3/26/2013 23:15	40.5	0.005	0.59	0.008	0.455	1.22	0.042	0.888	0.588	0.165	3/25/2013 6:45	3/26/2013 21:45	39
6	4/12/2013 7:00	4/15/2013 11:45	76.75	0.009	1.00	0.010	0.502	1.23	0.129	0.856	0.551	0.161	4/12/2013 7:15	4/12/2013 23:30	16.25
7	4/19/2013 21:00	4/20/2013 20:15	23.25	0.002	0.50	0.003	0.237	1.07	0.056	0.805	0.560	0.159	4/19/2013 21:15	4/20/2013 3:00	5.75
8	5/10/2013 22:45	5/13/2013 13:45	63	0.007	0.99	0.007	0.428	1.10	0.094	0.800	0.524	0.150	5/10/2013 23:00	5/12/2013 6:15	31.25
9	6/3/2013 1:00	6/4/2013 7:45	30.75	0.002	0.93	0.003	0.785	1.58	0.349	0.782	0.564	0.129	6/3/2013 1:15	6/3/2013 17:15	16
10	6/6/2013 19:30	6/21/2013 0:00	340.5	0.102	6.74	0.015	2.27	3.04	0.375	1.07	0.565	0.151	6/6/2013 19:30	6/18/2013 20:15	288.75
11	6/27/2013 18:15	6/29/2013 12:00	41.75	0.007	1.30	0.006	0.951	1.72	0.301	0.919	0.564	0.146	6/27/2013 18:30	6/28/2013 19:45	25.25
12	6/30/2013 12:45	7/2/2013 4:30	39.75	0.004	0.77	0.006	0.517	1.36	0.206	0.846	0.569	0.144	6/30/2013 12:45	7/1/2013 15:15	26.5
13	7/12/2013 15:45	7/15/2013 14:30	70.75	0.007	1.28	0.006	0.440	1.16	0.160	0.810	0.539	0.154	7/12/2013 15:45	7/13/2013 20:00	28.25
14	8/13/2013 5:00	8/15/2013 7:00	50	0.010	2.41	0.004	2.24	3.10	0.641	0.973	0.583	0.145	8/13/2013 5:00	8/13/2013 9:45	4.75
15	11/26/2013 14:00	11/29/2013 4:45	62.75	0.012	2.68	0.004	1.24	1.74	0.133	0.850	0.494	0.141	11/26/2013 14:15	11/27/2013 17:45	27.5
16	12/6/2013 2:30	12/8/2013 9:15	54.75	0.005	0.99	0.005	0.345	0.898	0.056	0.738	0.489	0.146	12/6/2013 2:45	12/7/2013 2:30	23.75
17	12/8/2013 11:30	12/11/2013 7:30	68	0.010	1.40	0.007	0.578	1.37	0.057	0.832	0.517	0.146	12/8/2013 11:45	12/10/2013 18:00	54.25
18	12/23/2013 4:00	12/24/2013 3:00	23	0.003	0.50	0.006	0.334	1.10	0.059	0.922	0.604	0.153	12/23/2013 4:15	12/23/2013 19:45	15.5
19	12/29/2013 8:30	12/31/2013 20:45	60.25	0.012	1.24	0.010	1.16	1.90	0.103	0.961	0.563	0.161	12/29/2013 8:45	12/31/2013 15:00	54.25
20	1/5/2014 5:15	1/9/2014 9:15	100	0.020	0.87	0.023	1.26	2.12	0.134	0.967	0.582	0.149	1/5/2014 5:15	1/6/2014 20:30	39.25
21	1/10/2014 7:15	1/13/2014 23:15	88	0.015	1.00	0.015	1.01	1.82	0.082	0.997	0.640	0.162	1/10/2014 7:30	1/12/2014 0:15	40.75
22	2/3/2014 2:00	2/4/2014 11:30	33.5	0.002	1.07	0.002	0.674	1.50	0.048	0.815	0.582	0.145	2/3/2014 2:00	2/3/2014 15:45	13.75
23	2/5/2014 0:30	2/10/2014 8:00	127.5	0.035	1.68	0.021	1.31	2.18	0.095	1.06	0.587	0.147	2/5/2014 0:30	2/9/2014 21:00	116.5
24	2/13/2014 0:15	2/18/2014 0:00	119.75	0.019	1.79	0.011	0.481	1.31	0.083	0.948	0.606	0.152	2/13/2014 0:30	2/15/2014 16:45	64.25
25	3/12/2014 15:30	3/13/2014 23:00	31.5	0.003	0.30	0.010	0.355	1.29	0.079	1.01	0.745	0.153	3/12/2014 15:30	3/12/2014 22:00	6.5
26	3/19/2014 14:15	3/23/2014 2:15	84	0.015	0.86	0.017	0.931	1.77	0.136	0.991	0.634	0.153	3/19/2014 14:15	3/19/2014 22:15	8
27	3/29/2014 10:00	4/6/2014 0:30	182.5	0.072	3.06	0.024	2.14	2.97	0.187	1.31	0.690	0.155	3/29/2014 10:15	4/4/2014 23:30	157.25
28	4/7/2014 11:30	4/9/2014 1:30	38	0.006	0.50	0.013	0.493	1.48	0.041	1.12	0.772	0.150	4/7/2014 11:45	4/8/2014 6:45	19
29	4/15/2014 10:00	4/18/2014 0:15	62.25	0.007	1.07	0.007	0.454	1.36	0.193	1.03	0.735	0.153	4/15/2014 10:15	4/15/2014 23:30	13.25
30	4/29/2014 12:45	5/9/2014 0:45	228	0.117	5.26	0.022	2.56	3.29	0.314	1.42	0.669	0.150	4/29/2014 12:45	5/8/2014 6:00	209.25
31	5/10/2014 13:30	5/12/2014 0:00	34.5	0.006	0.86	0.007	0.735	1.67	0.206	1.11	0.742	0.163	5/10/2014 13:45	5/11/2014 0:15	10.5
32	5/16/2014 8:30	5/19/2014 0:00	63.5	0.010	1.28	0.008	0.865	1.78	0.137	1.10	0.757	0.164	5/16/2014 8:45	5/16/2014 18:15	9.5
33	6/9/2014 2:30	6/10/2014 23:00	44.5	0.007	1.24	0.006	1.58	2.35	0.191	0.931	0.586	0.153	6/9/2014 2:45	6/10/2014 20:00	41.25
		Average:	75.2	0.017	1.42	0.010	0.887	1.68	0.148	0.948	0.600	0.151			44.5

MLM_2 Lower Moreland Township
Welsh Road and Huntington Pike
Pipe Size: 12" dia. Tributary Drainage Area: 1,797 acres Tributary Service Population: 6,529

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
		Maximum Value:	340.5	0.117	6.74	0.024	2.56	3.29	0.641	1.42	0.772	0.165			288.8
		Minimum Value:	23.0	0.002	0.30	0.002	0.237	0.898	0.033	0.718	0.470	0.129			4.75
		Standard Deviation:	65.0	0.027	1.35	0.006	0.631	0.637	0.128	0.151	0.081	0.008			62.2
		Weighted Mean R-Value*:				0.012									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-3 Lower Moreland Township

Ramage Run and City Limit Boundary

Pipe Size: 8" dia. Tributary Drainage Area: 96 acres Tributary Service Population: 344

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	8/19/2007 13:45	8/20/2007 11:15	21.5	0.005	1.29	0.004	0.066	0.103	0.09	0.048	0.014	0.021	8/19/2007 14:00	8/20/2007 5:00	15
2	8/20/2007 16:15	8/22/2007 11:15	43	0.010	1.72	0.006	0.061	0.097	0.25	0.048	0.014	0.020	8/20/2007 16:15	8/22/2007 0:15	32
3	9/11/2007 4:30	9/11/2007 16:45	12.25	0.002	0.68	0.003	0.054	0.094	0.22	0.043	0.013	0.020	9/11/2007 4:30	9/11/2007 16:15	11.75
4	10/9/2007 14:30	10/10/2007 12:30	22	0.004	1.45	0.003	0.075	0.119	0.25	0.047	0.016	0.020	10/9/2007 14:45	10/9/2007 23:00	8.25
5	10/11/2007 3:15	10/11/2007 18:00	14.75	0.003	0.53	0.007	0.045	0.072	0.21	0.051	0.017	0.019	10/11/2007 3:30	10/11/2007 13:45	10.25
6	10/12/2007 2:45	10/12/2007 10:15	7.5	0.001	0.38	0.003	0.028	0.061	0.14	0.043	0.017	0.018	10/12/2007 2:45	10/12/2007 6:15	3.5
7	10/24/2007 17:45	10/25/2007 19:45	26	0.003	0.57	0.005	0.042	0.083	0.05	0.041	0.015	0.020	10/24/2007 18:00	10/25/2007 8:00	14
8	10/26/2007 13:30	10/29/2007 0:00	58.5	0.012	2.57	0.005	0.052	0.105	0.23	0.053	0.019	0.022	10/26/2007 14:00	10/27/2007 13:15	23.25
9	11/6/2007 0:00	11/6/2007 13:00	13	0.001	0.23	0.004	0.023	0.066	0.03	0.027	0.006	0.017	11/6/2007 0:00	11/6/2007 9:15	9.25
10	11/15/2007 7:15	11/15/2007 23:45	16.5	0.002	0.38	0.004	0.032	0.062	0.11	0.033	0.002	0.024	11/15/2007 7:15	11/15/2007 15:30	8.25
		Average:	23.5	0.004	0.98	0.004	0.048	0.086	0.16	0.043	0.013	0.020			13.6
		Maximum Value:	58.5	0.012	2.57	0.007	0.075	0.119	0.25	0.053	0.019	0.024			32
		Minimum Value:	7.5	0.001	0.23	0.003	0.023	0.061	0.03	0.027	0.002	0.017			3.50
		Standard Deviation:	15.8	0.004	0.76	0.001	0.017	0.020	0.09	0.008	0.005	0.002			8.3
		Weighted Mean R-Value*:				0.004									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-3 Lower Moreland Township

Ramage Run and City Limit Boundary

Pipe Size: 8" dia. Tributary Drainage Area: 96 acres Tributary Service Population: 344

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/9/2010 20:00	2/13/2010 0:00	76	0.010	1.99	0.005	0.073	0.109	0.05	0.046	0.021	0.017	2/9/2010 20:00	2/10/2010 23:45	27.75
2	2/22/2010 21:00	2/27/2010 23:30	122.5	0.027	1.58	0.017	0.082	0.139	0.05	0.064	0.033	0.017	2/22/2010 21:00	2/27/2010 9:15	108.25
3	3/12/2010 10:00	3/20/2010 21:45	203.75	0.085	3.63	0.024	0.152	0.212	0.16	0.083	0.039	0.017	3/12/2010 10:15	3/15/2010 20:45	82.5
4	3/22/2010 9:15	3/25/2010 20:00	82.75	0.020	1.47	0.014	0.053	0.116	0.21	0.073	0.041	0.017	3/22/2010 9:30	3/23/2010 0:15	14.75
5	3/28/2010 20:45	4/4/2010 0:00	147.25	0.043	3.84	0.011	0.140	0.197	0.22	0.069	0.034	0.017	3/28/2010 20:45	3/31/2010 3:45	55
6	4/9/2010 0:00	4/10/2010 23:00	47	0.003	0.51	0.006	0.034	0.109	0.08	0.071	0.049	0.018	4/9/2010 0:00	4/9/2010 6:30	6.5
7	4/24/2010 23:45	4/27/2010 12:45	61	0.011	1.43	0.008	0.082	0.147	0.06	0.069	0.042	0.016	4/24/2010 23:45	4/26/2010 21:00	45.25
8	5/3/2010 4:00	5/4/2010 0:15	20.25	0.002	0.66	0.004	0.037	0.101	0.12	0.064	0.038	0.019	5/3/2010 4:15	5/3/2010 15:30	11.25
		Average:	95.1	0.025	1.89	0.011	0.082	0.141	0.12	0.067	0.037	0.017			43.9
		Maximum Value:	203.8	0.085	3.84	0.024	0.152	0.212	0.22	0.083	0.049	0.019			108
		Minimum Value:	20.3	0.002	0.51	0.004	0.034	0.101	0.05	0.046	0.021	0.016			6.50
		Standard Deviation:	59.6	0.028	1.24	0.007	0.044	0.042	0.07	0.011	0.008	0.001			36.5
		Weighted Mean R-Value*:				0.013									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-6 Lower Morland Township

Conshohocken Avenue

Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	9/11/2007 4:30	9/12/2007 1:00	20.5	0.005	0.93	0.006	0.050	0.055	0.34	0.008	0.003	0.003	9/11/2007 4:30	9/11/2007 16:15	11.75
2	9/15/2007 2:15	9/15/2007 6:00	3.75	0.001	0.16	0.003	0.012	0.020	0.03	0.009	0.004	0.004	9/15/2007 2:15	9/15/2007 4:45	2.5
3	10/9/2007 14:30	10/10/2007 3:45	13.25	0.012	1.07	0.012	0.107	0.114	0.27	0.015	0.003	0.002	10/9/2007 14:45	10/9/2007 23:00	8.25
4	10/11/2007 2:30	10/11/2007 19:30	17	0.006	0.58	0.010	0.088	0.093	0.13	0.008	0.002	0.003	10/11/2007 3:00	10/11/2007 13:30	10.5
5	10/12/2007 2:45	10/12/2007 11:15	8.5	0.002	0.37	0.005	0.017	0.021	0.08	0.007	0.001	0.003	10/12/2007 2:45	10/12/2007 6:15	3.5
6	10/19/2007 22:00	10/20/2007 2:30	4.5	0.001	0.50	0.002	0.014	0.022	0.18	0.009	0.004	0.002	10/19/2007 22:45	10/20/2007 0:00	1.25
7	10/24/2007 17:45	10/25/2007 11:15	17.5	0.009	0.57	0.016	0.018	0.026	0.05	0.013	0.004	0.003	10/24/2007 17:45	10/25/2007 8:00	14.25
8	10/26/2007 13:45	10/28/2007 18:15	52.5	0.012	2.72	0.004	0.058	0.064	0.19	0.010	0.004	0.003	10/26/2007 14:00	10/27/2007 13:15	23.25
9	11/5/2007 23:15	11/6/2007 10:15	11	0.012	0.26	0.047	0.146	0.153	0.03	0.019	0.004	0.003	11/5/2007 23:15	11/6/2007 9:15	10
10	11/15/2007 7:00	11/15/2007 19:30	12.5	0.002	0.39	0.005	0.029	0.035	0.12	0.008	0.004	0.003	11/15/2007 7:15	11/15/2007 15:30	8.25
		Average:	16.1	0.006	0.75	0.011	0.054	0.060	0.14	0.011	0.003	0.003			9.4
		Maximum Value:	52.5	0.012	2.72	0.047	0.146	0.153	0.34	0.019	0.004	0.004			23
		Minimum Value:	3.8	0.001	0.16	0.002	0.012	0.020	0.03	0.007	0.001	0.002			1.25
		Standard Deviation:	13.9	0.005	0.74	0.013	0.046	0.046	0.10	0.004	0.001	0.001			6.4
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-6 Lower Morland Township

Conshohocken Avenue

Pipe Size: 8" dia. | Tributary Drainage Area: 58 acres | Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/9/2010 19:30	2/14/2010 17:30	118	0.021	1.95	0.011	0.008	0.009	0.05	0.003	-0.001	0.003	2/9/2010 19:45	2/10/2010 23:45	28
2	2/22/2010 20:30	2/25/2010 6:15	57.75	0.007	1.26	0.005	0.013	0.017	0.04	0.005	0.001	0.002	2/22/2010 20:45	2/25/2010 6:15	57.5
3	3/12/2010 10:15	3/16/2010 8:30	94.25	0.023	3.69	0.006	0.022	0.025	0.16	0.006	0.001	0.003	3/12/2010 10:15	3/15/2010 20:45	82.5
4	3/22/2010 7:45	3/22/2010 13:15	5.5	0.001	0.27	0.005	0.010	0.014	0.06	0.007	0.001	0.004	3/22/2010 8:00	3/22/2010 13:00	5
5	3/22/2010 15:00	3/23/2010 23:15	32.25	0.007	1.24	0.006	0.014	0.018	0.27	0.006	0.001	0.003	3/22/2010 15:00	3/23/2010 0:00	9
6	3/28/2010 19:45	3/30/2010 0:00	28.25	0.006	2.09	0.003	0.008	0.013	0.26	0.006	0.001	0.003	3/28/2010 20:30	3/29/2010 16:45	20.25
7	3/30/2010 7:15	3/31/2010 15:00	31.75	0.007	1.66	0.004	0.008	0.013	0.06	0.006	0.001	0.003	3/30/2010 7:15	3/31/2010 3:30	20.25
8	4/8/2010 23:45	4/9/2010 23:45	24	0.002	0.51	0.003	0.006	0.012	0.08	0.005	0.002	0.003	4/8/2010 23:45	4/9/2010 6:15	6.5
9	4/24/2010 23:45	4/26/2010 4:00	28.25	0.003	0.97	0.003	0.008	0.014	0.07	0.005	0.001	0.003	4/24/2010 23:45	4/26/2010 1:30	25.75
10	4/26/2010 6:00	4/27/2010 4:45	22.75	0.003	0.51	0.006	0.011	0.014	0.04	0.005	0.001	0.003	4/26/2010 6:00	4/27/2010 3:15	21.25
11	5/3/2010 4:00	5/3/2010 22:45	18.75	0.003	0.71	0.005	0.010	0.013	0.11	0.006	0.001	0.003	5/3/2010 4:15	5/3/2010 10:15	6
		Average:	42.0	0.008	1.35	0.005	0.011	0.015	0.11	0.005	0.001	0.003			25.6
		Maximum Value:	118.0	0.023	3.69	0.011	0.022	0.025	0.27	0.007	0.002	0.004			83
		Minimum Value:	5.5	0.001	0.27	0.003	0.006	0.009	0.04	0.003	-0.001	0.002			5.00
		Standard Deviation:	34.5	0.007	0.98	0.002	0.004	0.004	0.09	0.001	0.001	0.000			24.1
		Weighted Mean R-Value*:				0.006									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-6 Lower Morland Township

Conshohocken Avenue

Pipe Size: 8" dia. Tributary Drainage Area: 58 acres Tributary Service Population: 420

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/19/2013 11:30	2/19/2013 19:15	7.75	0.007	0.20	0.033	0.031	0.046	0.02	0.024	-0.001	0.015	2/19/2013 11:45	2/19/2013 17:45	6
2	2/26/2013 19:15	2/27/2013 8:15	13	0.009	0.67	0.014	0.037	0.046	0.08	0.025	0.005	0.012	2/26/2013 19:15	2/27/2013 7:45	12.5
3	3/8/2013 7:30	3/8/2013 14:30	7	0.003	0.25	0.012	0.017	0.039	0.03	0.029	0.007	0.017	3/8/2013 7:30	3/8/2013 13:30	6
4	3/12/2013 3:15	3/13/2013 4:45	25.5	0.026	1.06	0.024	0.033	0.062	0.09	0.033	0.009	0.013	3/12/2013 3:30	3/12/2013 14:30	11
5	3/18/2013 17:45	3/20/2013 5:00	35.25	0.013	0.90	0.014	0.026	0.048	0.07	0.024	0.006	0.013	3/18/2013 18:00	3/19/2013 18:45	24.75
6	3/25/2013 6:45	3/26/2013 6:15	23.5	0.011	0.58	0.019	0.034	0.061	0.04	0.027	0.008	0.014	3/25/2013 6:45	3/25/2013 16:15	9.5
7	3/31/2013 15:30	3/31/2013 21:00	5.5	0.003	0.17	0.018	0.023	0.048	0.03	0.032	0.006	0.019	3/31/2013 15:30	3/31/2013 20:30	5
8	4/10/2013 20:15	4/11/2013 3:30	7.25	0.005	0.63	0.009	0.019	0.041	0.20	0.027	0.006	0.012	4/10/2013 20:15	4/11/2013 0:00	3.75
9	4/12/2013 7:45	4/12/2013 19:45	12	0.011	0.71	0.016	0.030	0.051	0.09	0.034	0.006	0.017	4/12/2013 8:00	4/12/2013 13:45	5.75
10	4/12/2013 21:30	4/13/2013 3:30	6	0.003	0.30	0.010	0.022	0.043	0.11	0.023	0.006	0.012	4/12/2013 21:45	4/12/2013 23:30	1.75
11	4/19/2013 21:15	4/20/2013 4:15	7	0.007	0.50	0.014	0.026	0.048	0.06	0.026	0.004	0.011	4/19/2013 21:30	4/20/2013 3:00	5.5
12	4/29/2013 3:30	4/29/2013 21:15	17.75	0.007	0.41	0.016	0.027	0.050	0.02	0.024	0.005	0.015	4/29/2013 3:30	4/29/2013 21:00	17.5
		Average:	14.0	0.009	0.53	0.017	0.027	0.049	0.07	0.027	0.006	0.014			9.1
		Maximum Value:	35.3	0.026	1.06	0.033	0.037	0.062	0.20	0.034	0.009	0.019			25
		Minimum Value:	5.5	0.003	0.17	0.009	0.017	0.039	0.02	0.023	-0.001	0.011			1.75
		Standard Deviation:	9.6	0.006	0.28	0.007	0.006	0.007	0.05	0.004	0.002	0.002			6.6
		Weighted Mean R-Value*:				0.016									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-7 Lower Moreland Township

Welsh Road

Pipe Size: 10" dia. Tributary Drainage Area: 23 acres Tributary Service Population: 87

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/9/2010 19:45	2/13/2010 12:45	89	0.021	1.94	0.011	0.026	0.046	0.05	0.024	0.005	0.015	2/9/2010 20:00	2/10/2010 23:45	27.75
2	2/22/2010 20:30	2/26/2010 6:30	82	0.043	1.59	0.027	0.047	0.068	0.04	0.030	0.008	0.014	2/22/2010 20:45	2/26/2010 4:30	79.75
3	3/12/2010 10:15	3/16/2010 10:15	96	0.053	3.69	0.015	0.075	0.115	0.16	0.037	0.014	0.016	3/12/2010 10:15	3/15/2010 20:45	82.5
4	3/22/2010 9:30	3/23/2010 13:30	28	0.014	1.49	0.009	0.057	0.094	0.27	0.039	0.016	0.015	3/22/2010 9:30	3/23/2010 0:00	14.5
5	3/28/2010 20:30	3/30/2010 4:15	31.75	0.019	2.10	0.009	0.074	0.088	0.26	0.036	0.014	0.014	3/28/2010 20:45	3/29/2010 16:45	20
6	3/30/2010 9:45	4/1/2010 3:15	41.5	0.034	1.64	0.021	0.066	0.103	0.06	0.044	0.017	0.015	3/30/2010 9:45	3/31/2010 3:30	17.75
7	4/8/2010 23:00	4/9/2010 10:00	11	0.004	0.51	0.008	0.038	0.076	0.08	0.031	0.012	0.013	4/8/2010 23:45	4/9/2010 6:15	6.5
8	4/25/2010 0:30	4/27/2010 4:15	51.75	0.028	1.48	0.019	0.032	0.054	0.06	0.021	-0.001	0.015	4/25/2010 0:30	4/27/2010 3:15	50.75
9	5/3/2010 6:00	5/3/2010 23:30	17.5	0.007	0.67	0.010	0.017	0.039	0.11	0.024	-0.001	0.019	5/3/2010 6:00	5/3/2010 10:15	4.25
		Average:	49.8	0.025	1.68	0.014	0.048	0.076	0.12	0.032	0.009	0.015			33.8
		Maximum Value:	96.0	0.053	3.69	0.027	0.075	0.115	0.27	0.044	0.017	0.019			83
		Minimum Value:	11.0	0.004	0.51	0.008	0.017	0.039	0.04	0.021	-0.001	0.013			4.25
		Standard Deviation:	31.9	0.016	0.92	0.007	0.021	0.026	0.09	0.008	0.007	0.002			30.1
		Weighted Mean R-Value*:				0.015									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MLM-7 Lower Moreland Township

Welsh Road

Pipe Size: 10" dia. Tributary Drainage Area: 23 acres Tributary Service Population: 87

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/26/2013 19:15	2/28/2013 3:45	32.5	0.015	0.69	0.022	0.039	0.081	0.08	0.036	0.014	0.015	2/26/2013 19:15	2/27/2013 11:45	16.5
2	3/8/2013 7:15	3/8/2013 18:15	11	0.005	0.25	0.021	0.043	0.072	0.03	0.040	0.014	0.019	3/8/2013 7:30	3/8/2013 13:30	6
3	3/12/2013 3:15	3/14/2013 13:45	58.5	0.031	1.07	0.029	0.051	0.082	0.09	0.039	0.016	0.015	3/12/2013 3:30	3/14/2013 6:45	51.25
4	3/18/2013 18:00	3/20/2013 6:45	36.75	0.021	0.90	0.023	0.041	0.078	0.07	0.039	0.016	0.014	3/18/2013 18:00	3/19/2013 18:45	24.75
5	3/25/2013 6:45	3/26/2013 2:00	19.25	0.010	0.59	0.017	0.029	0.070	0.04	0.046	0.020	0.018	3/25/2013 6:45	3/25/2013 16:15	9.5
6	4/10/2013 20:15	4/11/2013 3:00	6.75	0.003	0.63	0.005	0.027	0.064	0.20	0.036	0.017	0.012	4/10/2013 20:15	4/11/2013 0:00	3.75
7	4/12/2013 7:15	4/12/2013 19:45	12.5	0.009	0.70	0.013	0.035	0.069	0.09	0.047	0.017	0.019	4/12/2013 7:15	4/12/2013 13:45	6.5
8	4/12/2013 21:45	4/13/2013 6:30	8.75	0.004	0.31	0.013	0.039	0.072	0.11	0.030	0.017	0.007	4/12/2013 21:45	4/12/2013 23:30	1.75
9	4/19/2013 21:15	4/21/2013 8:45	35.5	0.008	0.50	0.016	0.032	0.074	0.06	0.037	0.019	0.014	4/19/2013 21:30	4/20/2013 3:00	5.5
10	4/29/2013 3:30	4/29/2013 20:45	17.25	0.009	0.41	0.021	0.037	0.081	0.02	0.041	0.016	0.017	4/29/2013 3:30	4/29/2013 20:30	17
11	5/7/2013 22:15	5/8/2013 14:00	15.75	0.006	0.29	0.022	0.038	0.057	0.07	0.030	0.010	0.013	5/7/2013 22:15	5/8/2013 13:15	15
12	5/9/2013 4:00	5/9/2013 21:30	17.5	0.008	0.53	0.015	0.048	0.078	0.08	0.035	0.011	0.018	5/9/2013 4:15	5/9/2013 6:45	2.5
13	5/10/2013 22:30	5/11/2013 22:30	24	0.009	0.91	0.010	0.038	0.070	0.11	0.034	0.011	0.017	5/10/2013 22:45	5/11/2013 21:30	22.75
		Average:	22.8	0.011	0.60	0.017	0.038	0.073	0.08	0.038	0.015	0.015			14.1
		Maximum Value:	58.5	0.031	1.07	0.029	0.051	0.082	0.20	0.047	0.020	0.019			51
		Minimum Value:	6.8	0.003	0.25	0.005	0.027	0.057	0.02	0.030	0.010	0.007			1.75
		Standard Deviation:	14.6	0.008	0.26	0.006	0.007	0.007	0.05	0.005	0.003	0.003			13.5
		Weighted Mean R-Value*:				0.018									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MSH-1 Lower Southampton Township

Trevose Road at Poquessing Creek

Pipe Size: 30" dia. Tributary Drainage Area: 5,132 acres Tributary Service Population: 21,642

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 8:30	14.25	0.002	0.19	0.009	1.29	4.92	0.03	3.51	1.99	1.15	4/1/2012 18:30	4/2/2012 2:30	8
2	4/22/2012 11:00	4/24/2012 22:00	59	0.024	2.13	0.011	4.45	9.42	0.10	5.83	2.96	1.59	4/22/2012 11:00	4/23/2012 17:45	30.75
3	5/1/2012 4:00	5/1/2012 14:45	10.75	0.002	0.41	0.005	2.09	6.45	0.15	4.89	2.80	1.43	5/1/2012 4:15	5/1/2012 10:15	6
4	5/9/2012 2:45	5/9/2012 22:15	19.5	0.003	0.30	0.010	1.64	5.92	0.07	4.81	2.84	1.51	5/9/2012 3:15	5/9/2012 7:15	4
5	5/10/2012 1:00	5/10/2012 22:30	21.5	0.003	0.14	0.023	1.62	5.94	0.02	4.73	2.84	1.43	5/10/2012 1:15	5/10/2012 4:45	3.5
6	5/15/2012 8:45	5/18/2012 2:45	66	0.014	2.00	0.007	4.72	9.80	0.38	5.15	2.99	1.50	5/15/2012 8:45	5/16/2012 5:00	20.25
7	5/21/2012 1:15	5/21/2012 23:00	21.75	0.003	0.25	0.013	1.62	5.94	0.06	4.69	2.77	1.44	5/21/2012 1:45	5/21/2012 20:00	18.25
8	5/22/2012 1:00	5/22/2012 14:30	13.5	0.003	0.19	0.014	2.27	6.22	0.02	4.60	2.80	1.18	5/22/2012 1:15	5/22/2012 9:45	8.5
9	5/24/2012 7:45	5/25/2012 0:45	17	0.004	0.34	0.010	5.12	9.94	0.21	5.35	2.85	1.83	5/24/2012 8:00	5/24/2012 16:45	8.75
10	5/27/2012 4:00	5/27/2012 15:45	11.75	0.005	0.40	0.014	6.15	11.0	0.11	5.92	2.93	1.50	5/27/2012 4:15	5/27/2012 6:45	2.5
11	6/1/2012 22:15	6/2/2012 11:15	13	0.002	0.39	0.006	1.67	6.18	0.17	4.44	3.01	0.873	6/1/2012 22:15	6/2/2012 2:15	4
12	6/12/2012 9:00	6/13/2012 10:15	25.25	0.004	0.64	0.006	1.60	6.04	0.07	4.72	2.73	1.46	6/12/2012 9:00	6/12/2012 23:30	14.5
13	7/4/2012 23:30	7/5/2012 23:45	24.25	0.004	0.38	0.009	4.62	8.63	0.24	4.08	2.17	1.44	7/5/2012 0:15	7/5/2012 3:45	3.5
14	8/1/2012 16:30	8/2/2012 0:45	8.25	0.002	0.26	0.006	1.83	6.33	0.11	5.25	2.80	1.81	8/1/2012 16:30	8/1/2012 17:45	1.25
15	8/5/2012 18:30	8/6/2012 22:00	27.5	0.006	0.73	0.008	5.30	10.1	0.17	4.84	2.69	1.51	8/5/2012 18:45	8/6/2012 2:15	7.5
16	8/17/2012 22:30	8/18/2012 18:00	19.5	0.009	0.85	0.011	6.43	11.1	0.16	4.90	2.00	1.39	8/17/2012 22:30	8/18/2012 7:15	8.75
17	8/27/2012 8:30	8/28/2012 19:00	34.5	0.023	1.03	0.022	6.39	10.2	0.21	5.44	1.79	1.55	8/27/2012 8:45	8/28/2012 7:30	22.75
18	9/3/2012 12:15	9/4/2012 1:45	13.5	0.005	1.01	0.005	3.46	8.06	0.26	5.11	1.98	2.00	9/3/2012 12:30	9/3/2012 16:00	3.5
19	9/4/2012 3:45	9/6/2012 12:00	56.25	0.057	2.07	0.028	7.14	11.4	0.34	6.82	2.19	1.41	9/4/2012 4:00	9/5/2012 12:15	32.25
20	9/18/2012 18:15	9/19/2012 17:00	22.75	0.004	0.48	0.009	3.37	7.40	0.17	4.15	2.15	1.41	9/18/2012 18:30	9/18/2012 21:00	2.5
21	11/27/2012 6:15	11/28/2012 16:30	34.25	0.007	0.63	0.011	2.05	5.89	0.02	4.36	2.17	1.52	11/27/2012 6:30	11/27/2012 16:00	9.5
22	12/7/2012 22:15	12/8/2012 19:15	21	0.002	0.29	0.007	0.792	5.64	0.06	4.06	2.31	1.44	12/7/2012 22:15	12/8/2012 1:45	3.5
23	12/9/2012 8:45	12/12/2012 3:45	67	0.006	0.46	0.013	1.20	5.61	0.04	4.19	2.35	1.55	12/9/2012 8:45	12/11/2012 6:45	46
24	12/18/2012 1:15	12/19/2012 3:45	26.5	0.002	0.41	0.005	0.875	5.29	0.14	4.06	2.48	1.32	12/18/2012 1:15	12/18/2012 15:45	14.5
25	12/26/2012 13:30	12/29/2012 7:30	66	0.024	1.29	0.019	4.28	10.0	0.10	6.74	4.21	1.35	12/26/2012 13:30	12/27/2012 10:00	20.5
26	12/29/2012 11:00	12/30/2012 7:00	20	0.001	0.22	0.007	0.807	7.55	0.02	6.33	4.56	1.54	12/29/2012 11:00	12/29/2012 17:15	6.25
27	1/11/2013 16:15	1/12/2013 20:00	27.75	0.004	0.52	0.008	1.44	6.89	0.05	5.29	3.24	1.55	1/11/2013 16:15	1/11/2013 21:00	4.75
28	1/14/2013 20:15	1/15/2013 19:15	23	0.002	0.45	0.004	1.03	6.13	0.06	4.94	3.30	1.40	1/14/2013 20:15	1/15/2013 2:45	6.5
29	1/15/2013 21:30	1/19/2013 14:45	89.25	0.025	1.09	0.023	3.09	8.20	0.07	6.06	3.79	1.39	1/15/2013 21:30	1/16/2013 12:15	14.75
30	1/30/2013 21:45	2/3/2013 6:15	80.5	0.032	1.17	0.027	3.95	8.66	0.31	6.19	3.56	1.37	1/30/2013 21:45	2/1/2013 10:00	36.25
31	2/8/2013 7:30	2/10/2013 7:15	47.75	0.008	0.45	0.017	1.52	7.82	0.02	5.61	3.65	1.44	2/8/2013 7:30	2/9/2013 3:00	19.5
32	2/26/2013 19:00	2/28/2013 18:30	47.5	0.009	0.69	0.013	1.98	8.36	0.07	6.79	4.74	1.43	2/26/2013 19:15	2/27/2013 11:45	16.5
33	3/7/2013 14:30	3/9/2013 19:45	53.25	0.006	0.59	0.011	1.34	8.12	0.03	6.38	4.52	1.49	3/7/2013 14:45	3/8/2013 13:45	23

MSH-1 Lower Southampton Township

Trevose Road at Poquessing Creek

Pipe Size: 30" dia. Tributary Drainage Area: 5,132 acres Tributary Service Population: 21,642

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
34	3/12/2013 3:30	3/17/2013 16:45	133.25	0.040	1.14	0.035	3.18	10.1	0.07	8.00	5.58	1.45	3/12/2013 3:30	3/16/2013 18:00	110.5
35	3/18/2013 18:15	3/23/2013 0:00	101.75	0.030	0.92	0.033	3.25	10.4	0.07	8.93	6.53	1.46	3/18/2013 18:30	3/19/2013 19:00	24.5
36	3/25/2013 6:30	3/26/2013 0:15	17.75	0.005	0.67	0.007	1.88	10.3	0.05	9.34	6.65	1.81	3/25/2013 6:30	3/25/2013 16:15	9.75
		Average:	37.7	0.011	0.67	0.013	2.93	7.99	0.12	5.50	3.23	1.48			15.8
		Maximum Value:	133.3	0.057	2.07	0.035	7.14	11.4	0.38	9.34	6.65	2.00			110.5
		Minimum Value:	8.3	0.001	0.14	0.004	0.792	5.29	0.02	4.06	1.79	0.873			1.25
		Standard Deviation:	29.2	0.013	0.47	0.008	1.85	1.94	0.10	1.32	1.22	0.190			19.8
		Weighted Mean R-Value*:				0.015									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MSH-1 Lower Southampton Township

Trevose Road at Poquessing Creek

Pipe Size: 30" dia. Tributary Drainage Area: 5,132 acres Tributary Service Population: 21,642

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 23:00	26.75	0.002	0.67	0.004	1.14	6.99	0.19	5.76	4.07	1.39	4/10/2013 20:15	4/11/2013 0:30	4.25
2	4/29/2013 2:00	4/30/2013 16:30	38.5	0.003	0.43	0.007	1.06	5.81	0.02	4.52	2.95	1.30	4/29/2013 2:00	4/30/2013 1:45	23.75
3	5/8/2013 3:15	5/10/2013 15:30	60.25	0.005	0.90	0.005	2.03	5.98	0.10	4.34	2.74	1.33	5/8/2013 3:30	5/9/2013 7:00	27.5
4	5/28/2013 11:00	5/29/2013 0:00	13	0.001	0.25	0.005	0.940	6.31	0.03	5.59	3.61	1.65	5/28/2013 11:00	5/28/2013 22:30	11.5
5	6/3/2013 0:45	6/4/2013 23:30	46.75	0.005	0.79	0.006	1.20	6.73	0.26	5.15	3.45	1.34	6/3/2013 0:45	6/3/2013 17:15	16.5
6	6/6/2013 19:30	6/26/2013 0:00	460.5	0.300	6.92	0.043	9.10	14.4	0.27	7.77	4.22	1.37	6/6/2013 19:30	6/25/2013 23:45	460.25
7	6/27/2013 18:15	6/30/2013 0:00	53.75	0.009	1.23	0.007	2.38	9.30	0.24	6.86	4.90	1.42	6/27/2013 18:30	6/28/2013 20:00	25.5
8	6/30/2013 12:30	7/4/2013 5:30	89	0.012	0.91	0.014	1.25	7.80	0.22	6.53	4.72	1.34	6/30/2013 12:30	7/3/2013 23:30	83
9	7/12/2013 15:30	7/17/2013 0:00	104.5	0.019	1.64	0.011	2.35	8.05	0.18	5.86	3.86	1.41	7/12/2013 15:45	7/13/2013 19:45	28
10	7/22/2013 16:00	7/26/2013 18:00	98	0.024	1.85	0.013	3.77	8.57	0.46	5.60	3.44	1.34	7/22/2013 16:15	7/23/2013 18:15	26
11	7/28/2013 15:45	7/31/2013 0:00	56.25	0.006	0.61	0.010	1.03	6.52	0.15	5.33	3.57	1.40	7/28/2013 15:45	7/29/2013 2:30	10.75
12	8/1/2013 6:45	8/3/2013 18:45	60	0.010	0.78	0.012	2.02	6.91	0.06	5.45	3.47	1.45	8/1/2013 6:45	8/3/2013 10:45	52
13	8/22/2013 6:30	8/22/2013 23:45	17.25	0.002	0.92	0.002	1.70	7.02	0.22	5.27	3.17	1.68	8/22/2013 6:30	8/22/2013 17:00	10.5
14	8/28/2013 10:30	8/30/2013 7:00	44.5	0.004	0.42	0.010	0.873	5.79	0.05	4.65	3.04	1.28	8/28/2013 10:30	8/28/2013 15:45	5.25
15	9/1/2013 4:30	9/2/2013 5:30	25	0.003	0.84	0.004	2.76	6.25	0.37	4.69	2.86	1.37	9/1/2013 5:00	9/1/2013 5:45	0.75
16	11/1/2013 6:00	11/1/2013 20:45	14.75	0.002	0.32	0.005	1.03	5.52	0.14	4.49	2.43	1.67	11/1/2013 6:00	11/1/2013 10:30	4.5
17	11/26/2013 14:15	12/4/2013 4:45	182.5	0.053	2.71	0.020	6.31	9.29	0.15	5.05	2.72	1.35	11/26/2013 14:15	11/27/2013 17:45	27.5
18	12/6/2013 2:30	12/13/2013 20:30	186	0.051	2.30	0.022	2.64	7.48	0.06	5.53	3.25	1.36	12/6/2013 2:45	12/10/2013 18:00	111.25
19	12/14/2013 14:15	12/19/2013 23:45	129.5	0.026	0.89	0.029	2.33	7.84	0.08	5.77	3.72	1.39	12/14/2013 14:30	12/17/2013 15:45	73.25
20	12/29/2013 8:30	1/4/2014 20:15	155.75	0.045	1.57	0.029	5.02	11.5	0.11	6.94	4.56	1.41	12/29/2013 8:45	1/3/2014 4:30	115.75
21	1/5/2014 5:45	1/10/2014 0:00	114.25	0.045	0.87	0.052	6.47	13.2	0.12	7.60	4.87	1.41	1/5/2014 5:45	1/6/2014 20:30	38.75
22	1/10/2014 7:45	1/17/2014 20:30	180.75	0.046	1.12	0.041	3.71	10.8	0.08	7.52	5.28	1.39	1/10/2014 8:00	1/14/2014 18:00	106
23	2/13/2014 0:15	2/17/2014 23:30	119.25	0.022	1.77	0.012	1.96	9.10	0.09	7.34	5.36	1.38	2/13/2014 0:30	2/15/2014 16:45	64.25
24	3/12/2014 15:30	3/14/2014 0:00	32.5	0.006	0.23	0.024	1.91	9.93	0.06	8.04	6.05	1.42	3/12/2014 15:30	3/12/2014 22:00	6.5
25	3/19/2014 14:30	3/26/2014 22:45	176.25	0.050	0.82	0.062	3.53	9.93	0.11	7.13	4.79	1.38	3/19/2014 15:15	3/25/2014 19:00	147.75
26	3/29/2014 9:15	4/14/2014 23:45	398.5	0.269	3.48	0.077	8.04	14.6	0.17	8.59	4.94	1.39	3/29/2014 9:30	4/11/2014 23:15	325.75
27	4/15/2014 9:45	4/24/2014 0:15	206.5	0.024	0.94	0.025	2.03	9.28	0.11	6.94	5.18	1.38	4/15/2014 10:00	4/22/2014 21:15	179.25
28	4/29/2014 12:30	5/15/2014 0:00	371.5	0.312	5.71	0.055	10.8	16.8	0.31	9.34	5.16	1.37	4/29/2014 12:30	5/11/2014 0:15	275.75
29	5/16/2014 9:45	5/21/2014 23:45	134	0.018	1.10	0.017	3.40	10.5	0.09	7.31	5.45	1.41	5/16/2014 9:45	5/21/2014 20:00	130.25
30	6/9/2014 2:45	6/12/2014 1:30	70.75	0.008	1.29	0.006	1.45	8.22	0.15	6.56	4.85	1.35	6/9/2014 2:45	6/11/2014 9:15	54.5
31	6/13/2014 1:15	6/18/2014 0:00	118.75	0.015	0.97	0.016	1.33	8.30	0.27	6.65	4.84	1.38	6/13/2014 1:15	6/17/2014 1:30	96.25
32	6/19/2014 2:45	6/20/2014 5:00	26.25	0.001	0.32	0.004	0.641	7.17	0.08	6.10	4.71	1.22	6/19/2014 3:00	6/19/2014 16:45	13.75
33	6/25/2014 16:15	6/27/2014 6:15	38	0.004	0.86	0.004	1.34	7.16	0.21	6.00	4.43	1.24	6/25/2014 16:45	6/26/2014 2:00	9.25
		Average:	116.7	0.042	1.41	0.020	2.96	8.75	0.16	6.25	4.14	1.39			77.8
		Maximum Value:	460.5	0.312	6.92	0.077	10.8	16.8	0.46	9.34	6.05	1.68			460.3
		Minimum Value:	13.0	0.001	0.23	0.002	0.641	5.52	0.02	4.34	2.43	1.22			0.75
		Standard Deviation:	110.7	0.083	1.46	0.019	2.52	2.76	0.10	1.26	0.961	0.101			103.1
		Weighted Mean R-Value*:				0.030									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MSH_2 Lower Southampton Township

Lukens Street

Pipe Size: 8" dia. Tributary Drainage Area: 60 acres Tributary Service Population: 282

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2/9/2010 19:45	2/13/2010 7:00	83.25	0.013	1.98	0.006	0.048	0.081	0.05	0.037	0.017	0.013	2/9/2010 20:00	2/11/2010 0:00	28
2	2/22/2010 20:30	2/27/2010 20:30	120	0.110	1.58	0.070	0.180	0.231	0.05	0.097	0.047	0.014	2/22/2010 20:45	2/27/2010 9:15	108.5
3	4/8/2010 23:45	4/10/2010 9:45	34	0.008	0.56	0.014	0.053	0.173	0.09	0.120	0.100	0.012	4/8/2010 23:45	4/9/2010 6:15	6.5
4	4/25/2010 1:00	4/27/2010 19:15	66.25	0.033	1.43	0.023	0.055	0.131	0.06	0.088	0.055	0.014	4/25/2010 1:15	4/26/2010 21:00	43.75
5	5/3/2010 4:00	5/4/2010 2:15	22.25	0.006	0.67	0.009	0.035	0.090	0.12	0.058	0.033	0.015	5/3/2010 4:15	5/3/2010 10:15	6
		Average:	65.2	0.034	1.24	0.024	0.074	0.141	0.07	0.080	0.050	0.014			38.6
		Maximum Value:	120.0	0.110	1.98	0.070	0.180	0.231	0.12	0.120	0.100	0.015			108.5
		Minimum Value:	22.3	0.006	0.56	0.006	0.035	0.081	0.05	0.037	0.017	0.012			6.00
		Standard Deviation:	39.2	0.044	0.61	0.026	0.060	0.062	0.03	0.033	0.031	0.001			42.2
		Weighted Mean R-Value*:				0.027									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MSH_2 Lower Southampton Township

Lukens Street

Pipe Size: 8" dia. Tributary Drainage Area: 60 acres Tributary Service Population: 282

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/19/2013 11:00	2/19/2013 20:45	9.75	0.001	0.22	0.004	0.015	0.060	0.02	0.039	0.019	0.017	2/19/2013 11:30	2/19/2013 18:00	6.5
2	2/26/2013 19:15	2/28/2013 5:15	34	0.008	0.69	0.011	0.029	0.081	0.07	0.047	0.025	0.013	2/26/2013 19:15	2/27/2013 11:45	16.5
3	3/7/2013 14:15	3/8/2013 17:30	27.25	0.006	0.57	0.010	0.048	0.094	0.03	0.042	0.020	0.014	3/7/2013 14:30	3/8/2013 13:45	23.25
4	3/12/2013 3:00	3/15/2013 6:45	75.75	0.013	1.00	0.013	0.039	0.080	0.07	0.043	0.022	0.014	3/12/2013 3:15	3/13/2013 17:15	38
5	3/18/2013 18:15	3/20/2013 10:15	40	0.005	0.92	0.005	0.028	0.080	0.07	0.046	0.028	0.014	3/18/2013 18:30	3/19/2013 19:00	24.5
6	3/25/2013 6:30	3/26/2013 13:30	31	0.004	0.67	0.006	0.027	0.076	0.05	0.053	0.032	0.015	3/25/2013 6:30	3/25/2013 16:15	9.75
7	3/31/2013 15:30	4/1/2013 4:00	12.5	0.002	0.21	0.009	0.022	0.073	0.04	0.049	0.031	0.012	3/31/2013 15:30	3/31/2013 22:45	7.25
8	4/12/2013 7:00	4/15/2013 20:00	85	0.028	1.17	0.024	0.065	0.103	0.11	0.054	0.026	0.015	4/12/2013 7:15	4/12/2013 23:30	16.25
9	4/19/2013 21:30	4/21/2013 6:45	33.25	0.006	0.48	0.012	0.026	0.077	0.07	0.043	0.023	0.013	4/19/2013 21:30	4/20/2013 3:00	5.5
10	5/10/2013 22:30	5/12/2013 12:45	38.25	0.010	1.04	0.010	0.083	0.111	0.13	0.036	0.012	0.014	5/10/2013 22:45	5/12/2013 6:30	31.75
		Average:	38.7	0.008	0.70	0.010	0.038	0.084	0.06	0.045	0.024	0.014			17.9
		Maximum Value:	85.0	0.028	1.17	0.024	0.083	0.111	0.13	0.054	0.032	0.017			38.0
		Minimum Value:	9.8	0.001	0.21	0.004	0.015	0.060	0.02	0.036	0.012	0.012			5.50
		Standard Deviation:	24.2	0.008	0.33	0.006	0.021	0.015	0.03	0.006	0.006	0.001			11.2
		Weighted Mean R-Value*:				0.012									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_1 Springfield Township

Nothwestern Avenue and Thomas Road

Pipe Size: 12" dia. Tributary Drainage Area: 77 acres Tributary Service Population: 404

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	8/19/2007 13:00	8/22/2007 7:00	66	0.095	2.92	0.033	0.407	0.460	0.23	0.228	-0.012	0.167	8/19/2007 13:15	8/22/2007 0:00	58.75
2	10/9/2007 15:00	10/10/2007 3:15	12.25	0.024	0.86	0.028	0.335	0.591	0.20	0.310	0.044	0.168	10/9/2007 15:00	10/10/2007 1:15	10.25
3	10/11/2007 2:00	10/13/2007 2:15	48.25	0.124	1.24	0.100	0.554	0.676	0.11	0.348	0.045	0.174	10/11/2007 2:00	10/12/2007 5:45	27.75
4	10/26/2007 13:15	10/28/2007 23:00	57.75	0.237	2.84	0.084	0.663	0.765	0.19	0.467	0.085	0.176	10/26/2007 13:15	10/27/2007 12:45	23.5
5	11/15/2007 7:00	11/15/2007 23:00	16	0.032	0.49	0.065	0.337	0.650	0.09	0.377	0.059	0.218	11/15/2007 7:15	11/15/2007 15:00	7.75
		Average:	40.1	0.102	1.67	0.062	0.459	0.628	0.16	0.346	0.044	0.181			25.6
		Maximum Value:	66.0	0.237	2.92	0.100	0.663	0.765	0.23	0.467	0.085	0.218			58.8
		Minimum Value:	12.3	0.024	0.49	0.028	0.335	0.460	0.09	0.228	-0.012	0.167			7.75
		Standard Deviation:	24.5	0.086	1.14	0.031	0.145	0.113	0.06	0.088	0.036	0.021			20.4
		Weighted Mean R-Value*:				0.061									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_1 Springfield Township

Nothwestern Avenue and Thomas Road

Pipe Size: 12" dia. Tributary Drainage Area: 77 acres Tributary Service Population: 404

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2/26/2013 19:15	2/27/2013 9:00	13.75	0.023	0.62	0.038	0.254	0.492	0.07	0.197	0.010	0.102	2/26/2013 19:15	2/27/2013 8:45	13.5
2	3/12/2013 2:45	3/13/2013 5:15	26.5	0.068	0.98	0.069	0.390	0.514	0.07	0.254	0.019	0.107	3/12/2013 3:00	3/12/2013 16:30	13.5
3	3/18/2013 17:45	3/20/2013 1:45	32	0.055	0.81	0.068	0.295	0.411	0.06	0.232	0.026	0.120	3/18/2013 17:45	3/19/2013 10:45	17
4	3/25/2013 5:45	3/25/2013 22:45	17	0.013	0.52	0.025	0.302	0.430	0.05	0.222	0.035	0.149	3/25/2013 5:45	3/25/2013 15:15	9.5
5	4/12/2013 7:00	4/14/2013 1:00	42	0.056	0.92	0.062	0.375	0.513	0.14	0.222	0.013	0.141	4/12/2013 7:15	4/12/2013 23:00	15.75
6	4/19/2013 20:30	4/20/2013 18:15	21.75	0.028	0.58	0.049	0.288	0.415	0.06	0.226	0.029	0.132	4/19/2013 20:45	4/20/2013 2:45	6
7	5/10/2013 22:15	5/11/2013 23:30	25.25	0.060	1.29	0.046	0.402	0.642	0.20	0.288	0.035	0.135	5/10/2013 22:15	5/11/2013 23:30	25.25
		Average:	25.5	0.043	0.82	0.051	0.329	0.488	0.09	0.234	0.024	0.127			14.4
		Maximum Value:	42.0	0.068	1.29	0.069	0.402	0.642	0.20	0.288	0.035	0.149			25.3
		Minimum Value:	13.8	0.013	0.52	0.025	0.254	0.411	0.05	0.197	0.010	0.102			6.00
		Standard Deviation:	9.5	0.021	0.27	0.017	0.058	0.081	0.05	0.029	0.010	0.018			6.1
		Weighted Mean R-Value*:				0.053									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_2 Springfield Township

Northwestern Avenue and Stenton Avenue at Wissahickon Creek

Pipe Size: 30" dia. Tributary Drainage Area: 2,648 acres Tributary Service Population: 12,155

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 13:00	18.75	0.002	0.16	0.013	0.923	2.73	0.03	2.06	1.09	0.784	4/1/2012 18:30	4/2/2012 2:00	7.5
2	4/21/2012 21:00	4/24/2012 23:30	74.5	0.036	2.34	0.016	3.40	5.02	0.12	2.44	0.731	0.864	4/21/2012 21:15	4/23/2012 6:30	33.25
3	5/3/2012 2:15	5/3/2012 15:30	13.25	0.003	0.16	0.020	1.10	2.79	0.04	1.87	0.692	0.775	5/3/2012 2:15	5/3/2012 4:45	2.5
4	5/4/2012 21:45	5/7/2012 10:15	60.5	0.015	0.37	0.039	1.32	2.90	0.20	1.86	0.642	0.808	5/4/2012 21:45	5/4/2012 23:30	1.75
5	5/8/2012 23:15	5/11/2012 18:15	67	0.015	0.55	0.027	1.52	3.03	0.07	1.91	0.675	0.847	5/8/2012 23:30	5/10/2012 4:00	28.5
6	5/15/2012 8:30	5/18/2012 23:15	86.75	0.036	1.63	0.022	3.53	4.61	0.26	2.44	0.805	0.921	5/15/2012 8:45	5/16/2012 4:15	19.5
7	5/21/2012 1:45	5/23/2012 0:00	46.25	0.008	0.38	0.020	1.51	3.34	0.07	2.11	0.946	0.876	5/21/2012 2:00	5/22/2012 9:45	31.75
8	5/23/2012 17:45	5/26/2012 19:00	73.25	0.017	1.09	0.015	2.44	4.45	0.46	2.26	0.982	0.879	5/23/2012 17:45	5/24/2012 22:30	28.75
9	5/27/2012 4:00	5/29/2012 10:15	54.25	0.028	1.30	0.021	4.47	5.72	0.50	2.74	1.04	0.825	5/27/2012 4:30	5/27/2012 6:45	2.25
10	5/29/2012 19:45	5/31/2012 11:30	39.75	0.009	0.30	0.029	1.50	3.18	0.16	2.35	1.15	0.819	5/29/2012 20:00	5/30/2012 2:30	6.5
11	6/1/2012 19:00	6/6/2012 23:45	124.75	0.030	1.30	0.023	2.13	3.85	0.26	2.44	1.15	0.875	6/1/2012 19:15	6/4/2012 20:45	73.5
12	6/12/2012 9:30	6/14/2012 9:30	48	0.012	0.46	0.026	1.30	3.45	0.05	2.46	1.16	0.866	6/12/2012 9:30	6/12/2012 23:15	13.75
13	6/22/2012 18:00	6/23/2012 14:00	20	0.003	0.33	0.009	0.729	2.63	0.06	2.01	0.944	0.820	6/22/2012 18:30	6/22/2012 22:30	4
14	7/14/2012 3:45	7/14/2012 21:30	17.75	0.003	0.25	0.010	0.719	2.78	0.05	2.12	0.926	0.943	7/14/2012 3:45	7/14/2012 9:00	5.25
15	7/15/2012 21:15	7/17/2012 3:00	29.75	0.009	0.85	0.011	2.16	4.08	0.60	2.34	0.959	0.836	7/15/2012 21:30	7/15/2012 23:45	2.25
16	7/19/2012 23:30	7/22/2012 0:15	48.75	0.016	1.00	0.016	3.60	4.58	0.34	2.32	0.892	0.874	7/19/2012 23:45	7/20/2012 9:15	9.5
17	7/26/2012 19:45	7/27/2012 20:15	24.5	0.007	0.24	0.031	1.31	2.83	0.09	2.19	0.789	0.884	7/26/2012 20:00	7/27/2012 0:15	4.25
18	8/5/2012 18:30	8/7/2012 0:00	29.5	0.008	0.46	0.017	1.14	2.92	0.12	2.20	0.851	0.898	8/5/2012 18:30	8/6/2012 2:00	7.5
19	8/10/2012 7:30	8/14/2012 3:30	92	0.027	2.15	0.013	2.12	4.02	0.36	2.17	0.765	0.899	8/10/2012 7:45	8/11/2012 20:30	36.75
20	8/14/2012 9:15	8/17/2012 20:00	82.75	0.014	1.12	0.013	1.74	3.83	0.40	2.00	0.795	0.906	8/14/2012 9:30	8/15/2012 18:00	32.5
21	8/17/2012 22:15	8/19/2012 21:30	47.25	0.009	0.52	0.018	1.61	3.00	0.08	1.94	0.747	0.861	8/17/2012 22:15	8/18/2012 7:15	9
22	8/27/2012 8:15	8/29/2012 21:30	61.25	0.015	0.57	0.026	1.13	3.04	0.13	2.08	0.724	0.931	8/27/2012 8:15	8/28/2012 7:15	23
23	9/2/2012 18:45	9/6/2012 23:00	100.25	0.031	1.44	0.021	1.86	4.00	0.25	2.17	0.769	0.872	9/2/2012 18:45	9/6/2012 10:45	88
24	9/8/2012 16:00	9/10/2012 1:00	33	0.007	0.32	0.021	0.788	2.87	0.05	2.09	0.832	0.904	9/8/2012 16:30	9/8/2012 22:30	6
25	9/18/2012 2:45	9/20/2012 0:15	45.5	0.012	1.19	0.010	1.59	3.76	0.31	2.28	0.930	0.888	9/18/2012 2:45	9/19/2012 1:30	22.75
26	10/2/2012 10:15	10/4/2012 0:45	38.5	0.009	0.42	0.021	1.18	2.97	0.14	2.09	0.744	0.960	10/2/2012 10:15	10/3/2012 7:45	21.5
27	10/15/2012 11:45	10/17/2012 1:15	37.5	0.009	0.59	0.016	1.80	3.53	0.20	2.12	0.742	0.940	10/15/2012 11:45	10/15/2012 20:30	8.75
28	10/19/2012 1:30	10/20/2012 20:30	43	0.013	0.69	0.019	1.30	3.28	0.14	2.03	0.644	0.869	10/19/2012 1:45	10/19/2012 23:15	21.5
29	11/7/2012 11:45	11/8/2012 13:45	26	0.003	0.32	0.010	0.647	2.74	0.02	1.94	0.852	0.892	11/7/2012 11:45	11/8/2012 0:15	12.5
30	11/27/2012 6:00	11/28/2012 14:00	32	0.009	0.62	0.015	1.03	2.90	0.02	2.16	0.744	0.907	11/27/2012 6:00	11/27/2012 15:45	9.75
31	12/7/2012 9:30	12/9/2012 7:00	45.5	0.009	0.34	0.027	0.933	2.95	0.05	1.87	0.660	0.868	12/7/2012 9:30	12/8/2012 1:45	16.25
32	12/9/2012 8:00	12/12/2012 11:30	75.5	0.018	0.38	0.048	1.30	2.99	0.04	1.97	0.660	0.886	12/9/2012 8:30	12/11/2012 6:45	46.25
33	12/20/2012 21:00	12/23/2012 7:45	58.75	0.040	2.37	0.017	4.23	6.12	0.14	2.79	0.800	0.803	12/20/2012 21:00	12/21/2012 7:15	10.25
34	12/26/2012 13:30	12/28/2012 7:00	41.5	0.019	1.02	0.019	2.88	4.90	0.09	2.61	0.991	0.819	12/26/2012 13:30	12/27/2012 9:15	19.75
35	1/11/2013 13:15	1/13/2013 7:00	41.75	0.006	0.46	0.012	0.619	2.70	0.08	1.90	0.839	0.830	1/11/2013 13:15	1/11/2013 20:45	7.5

MS_2 Springfield Township

Northwestern Avenue and Stenton Avenue at Wissahickon Creek

Pipe Size: 30" dia. Tributary Drainage Area: 2,648 acres Tributary Service Population: 12,155

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	1/14/2013 20:00	1/18/2013 18:30	94.5	0.020	1.32	0.015	1.93	3.99	0.06	2.03	0.800	0.864	1/14/2013 20:00	1/18/2013 6:00	82
37	1/28/2013 12:45	1/29/2013 7:30	18.75	0.003	0.20	0.013	0.625	2.54	0.03	1.93	0.922	0.763	1/28/2013 12:45	1/28/2013 19:30	6.75
38	1/30/2013 17:30	2/1/2013 19:30	50	0.028	1.39	0.020	3.59	5.11	0.27	2.77	0.920	0.878	1/30/2013 17:45	2/1/2013 10:00	40.25
39	2/8/2013 6:00	2/10/2013 14:15	56.25	0.012	0.31	0.038	0.859	2.83	0.02	1.98	0.720	0.890	2/8/2013 6:00	2/9/2013 2:30	20.5
40	2/11/2013 4:15	2/13/2013 9:30	53.25	0.013	0.36	0.037	1.02	3.22	0.04	2.17	0.910	0.830	2/11/2013 4:15	2/11/2013 8:45	4.5
41	2/13/2013 18:45	2/15/2013 16:45	46	0.005	0.25	0.019	0.508	2.73	0.03	2.03	0.989	0.865	2/13/2013 18:45	2/14/2013 0:15	5.5
42	2/19/2013 11:15	2/20/2013 9:45	22.5	0.003	0.21	0.016	0.449	2.52	0.02	1.93	0.828	0.835	2/19/2013 11:15	2/19/2013 17:30	6.25
43	2/26/2013 19:15	3/1/2013 20:45	73.5	0.021	0.66	0.032	1.49	3.20	0.07	2.14	0.773	0.877	2/26/2013 19:15	2/28/2013 19:45	48.5
44	3/12/2013 2:45	3/14/2013 19:45	65	0.026	0.98	0.027	2.52	4.49	0.07	2.36	0.808	0.864	3/12/2013 3:00	3/13/2013 17:00	38
45	3/18/2013 18:00	3/22/2013 7:30	85.5	0.029	0.79	0.037	1.80	3.25	0.07	2.20	0.783	0.831	3/18/2013 18:00	3/21/2013 3:45	57.75
46	3/25/2013 5:15	3/26/2013 21:00	39.75	0.011	0.54	0.021	1.27	3.14	0.04	2.29	0.874	0.922	3/25/2013 5:15	3/25/2013 20:30	15.25
		Average:	51.8	0.015	0.75	0.021	1.69	3.51	0.15	2.18	0.848	0.866			21.7
		Maximum Value:	124.8	0.040	2.37	0.048	4.47	6.12	0.60	2.79	1.16	0.960			88.0
		Minimum Value:	13.3	0.002	0.16	0.009	0.449	2.52	0.02	1.86	0.642	0.763			1.75
		Standard Deviation:	25.0	0.010	0.57	0.009	1.00	0.879	0.14	0.240	0.136	0.044			21.1
		Weighted Mean R-Value*:				0.019									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_2 Springfield Township

Northwestern Avenue and Stenton Avenue at Wissahickon Creek

Pipe Size: 30" dia. Tributary Drainage Area: 2,648 acres Tributary Service Population: 12,155

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:00	4/12/2013 7:00	35	0.010	0.64	0.016	1.18	2.99	0.17	2.18	0.910	0.770	4/10/2013 20:15	4/10/2013 23:45	3.5
2	4/12/2013 7:15	4/14/2013 6:30	47.25	0.020	0.78	0.026	1.50	3.49	0.13	2.51	0.910	0.866	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:00	4/21/2013 5:30	32.5	0.008	0.56	0.014	1.32	3.08	0.07	2.04	0.857	0.783	4/19/2013 21:00	4/20/2013 2:45	5.75
4	4/28/2013 22:30	4/30/2013 23:15	48.75	0.014	0.51	0.027	1.07	2.96	0.03	2.16	0.813	0.860	4/28/2013 22:30	4/30/2013 3:45	29.25
5	5/7/2013 22:00	5/13/2013 0:15	122.25	0.047	2.53	0.019	2.42	4.29	0.23	2.21	0.689	0.860	5/7/2013 22:15	5/12/2013 3:30	101.25
6	5/23/2013 15:30	5/25/2013 18:45	51.25	0.014	0.68	0.021	1.76	2.94	0.13	2.06	0.692	0.877	5/23/2013 15:30	5/24/2013 15:30	24
7	5/28/2013 8:45	5/29/2013 7:30	22.75	0.006	0.27	0.021	0.842	2.54	0.02	1.92	0.632	0.853	5/28/2013 9:00	5/28/2013 18:45	9.75
8	6/2/2013 22:45	6/5/2013 3:45	53	0.029	1.34	0.022	2.61	4.91	0.26	3.04	1.27	0.830	6/2/2013 23:45	6/3/2013 17:00	17.25
9	6/6/2013 17:45	6/9/2013 8:00	62.25	0.059	3.66	0.016	4.94	7.25	0.18	3.68	1.24	0.802	6/6/2013 17:45	6/8/2013 1:30	31.75
10	6/10/2013 7:00	6/12/2013 19:00	60	0.053	1.69	0.032	4.39	5.70	0.32	3.60	1.15	0.909	6/10/2013 7:15	6/11/2013 1:00	17.75
11	6/13/2013 9:15	6/14/2013 7:45	22.5	0.019	0.69	0.027	2.81	5.09	0.33	3.38	1.09	0.840	6/13/2013 9:30	6/14/2013 5:30	20
12	6/18/2013 12:30	6/20/2013 1:30	37	0.022	0.32	0.070	2.90	4.99	0.03	2.97	1.01	0.928	6/18/2013 12:45	6/18/2013 20:15	7.5
13	6/24/2013 19:00	6/29/2013 19:00	120	0.042	0.95	0.044	1.92	4.06	0.28	2.33	0.861	0.865	6/24/2013 19:15	6/28/2013 21:30	98.25
14	6/30/2013 12:15	7/3/2013 4:00	63.75	0.014	0.60	0.023	1.12	3.18	0.06	2.15	0.890	0.890	6/30/2013 12:30	7/2/2013 19:30	55
15	7/7/2013 19:00	7/8/2013 7:30	12.5	0.002	0.25	0.009	0.702	2.77	0.18	1.94	1.05	0.571	7/7/2013 20:00	7/7/2013 20:30	0.5
16	7/12/2013 15:30	7/13/2013 16:15	24.75	0.010	0.75	0.013	1.33	3.39	0.09	2.70	1.16	0.864	7/12/2013 15:45	7/13/2013 13:30	21.75
17	7/22/2013 17:45	7/24/2013 4:00	34.25	0.016	0.88	0.018	2.23	3.75	0.41	2.72	1.05	0.852	7/22/2013 17:45	7/23/2013 17:30	23.75
18	7/28/2013 15:15	7/29/2013 21:30	30.25	0.009	0.34	0.027	1.37	3.20	0.12	2.21	0.781	0.909	7/28/2013 15:30	7/29/2013 2:30	11
19	8/1/2013 6:30	8/2/2013 20:15	37.75	0.018	0.79	0.022	2.14	4.23	0.11	2.70	0.965	0.938	8/1/2013 6:30	8/1/2013 15:15	8.75
20	8/13/2013 4:30	8/14/2013 11:00	30.5	0.035	3.62	0.010	6.05	7.23	0.59	3.30	0.506	0.827	8/13/2013 4:45	8/13/2013 9:30	4.75
21	8/22/2013 6:15	8/23/2013 11:45	29.5	0.007	0.29	0.025	1.07	2.39	0.13	1.52	0.206	0.885	8/22/2013 6:30	8/22/2013 16:45	10.25
22	8/28/2013 9:45	8/29/2013 16:45	31	0.013	1.28	0.010	2.34	3.84	0.41	2.00	0.354	0.927	8/28/2013 9:45	8/28/2013 19:00	9.25
23	9/2/2013 11:30	9/4/2013 13:30	50	0.012	0.71	0.017	1.61	3.00	0.48	1.50	0.207	0.873	9/2/2013 11:45	9/2/2013 13:00	1.25
24	9/12/2013 18:30	9/13/2013 16:15	21.75	0.009	0.58	0.017	1.32	2.46	0.22	1.78	0.182	0.844	9/12/2013 18:30	9/13/2013 2:45	8.25
25	9/21/2013 19:15	9/23/2013 0:45	29.5	0.014	1.30	0.011	2.19	3.02	0.27	1.87	0.164	0.875	9/21/2013 19:30	9/22/2013 3:30	8
26	10/6/2013 16:45	10/8/2013 9:45	41	0.011	0.73	0.015	0.923	2.06	0.13	1.36	0.105	0.804	10/6/2013 17:00	10/7/2013 17:00	24
27	10/10/2013 4:00	10/12/2013 22:30	66.5	0.025	1.47	0.017	2.21	3.26	0.08	1.74	0.214	0.885	10/10/2013 4:15	10/11/2013 18:15	38
28	11/26/2013 11:15	11/29/2013 6:00	66.75	0.047	2.96	0.016	5.55	7.25	0.12	2.58	0.502	0.855	11/26/2013 11:15	11/27/2013 17:30	30.25
29	12/6/2013 2:15	12/7/2013 8:30	30.25	0.004	0.96	0.004	0.882	2.28	0.07	1.65	0.700	0.711	12/6/2013 2:15	12/7/2013 2:15	24
30	12/8/2013 11:45	12/12/2013 5:15	89.5	0.029	1.24	0.023	1.58	3.45	0.05	2.11	0.683	0.873	12/8/2013 11:45	12/10/2013 16:45	53
31	12/14/2013 15:00	12/17/2013 15:00	72	0.023	0.88	0.026	1.41	3.01	0.10	2.02	0.616	0.858	12/14/2013 15:15	12/17/2013 14:45	71.5
32	6/13/2014 0:45	6/15/2014 10:45	58	0.020	0.93	0.022	2.16	3.79	0.25	2.26	0.873	0.773	6/13/2014 0:45	6/13/2014 17:15	16.5
33	6/25/2014 16:30	6/26/2014 22:30	30	0.007	0.54	0.013	1.19	2.68	0.09	2.01	0.688	0.910	6/25/2014 16:30	6/26/2014 2:00	9.5
		Average:	47.4	0.020	1.08	0.021	2.09	3.77	0.19	2.31	0.728	0.847			24.6
		Maximum Value:	122.3	0.059	3.66	0.070	6.05	7.25	0.59	3.68	1.27	0.938			101.3
		Minimum Value:	12.5	0.002	0.25	0.004	0.702	2.06	0.02	1.36	0.105	0.571			0.50
		Standard Deviation:	25.8	0.015	0.89	0.012	1.34	1.40	0.14	0.598	0.337	0.070			25.2

MS_2 Springfield Township

Northwestern Avenue and Stenton Avenue at Wissahickon Creek

Pipe Size: 30" dia. Tributary Drainage Area: 2,648 acres Tributary Service Population: 12,155

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
		Weighted Mean R-Value*:				0.019									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_3 Springfield Township

Erdenheim Avenue and Stenton Avenue

Pipe Size: 20" dia. Tributary Drainage Area: 1,429 acres Tributary Service Population: 6,941

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	5/1/2012 3:45	5/1/2012 19:30	15.75	0.002	0.37	0.007	0.642	1.82	0.11	1.20	0.660	0.389	5/1/2012 4:00	5/1/2012 10:15	6.25
2	5/3/2012 2:00	5/3/2012 9:30	7.5	0.001	0.14	0.007	0.302	1.56	0.04	1.07	0.712	0.237	5/3/2012 2:15	5/3/2012 4:45	2.5
3	5/4/2012 21:30	5/5/2012 11:15	13.75	0.003	0.46	0.007	1.07	2.12	0.28	1.18	0.697	0.244	5/4/2012 21:45	5/4/2012 23:30	1.75
4	5/9/2012 3:00	5/9/2012 13:00	10	0.002	0.37	0.005	0.582	1.88	0.08	1.22	0.693	0.354	5/9/2012 3:00	5/9/2012 7:15	4.25
5	5/9/2012 21:15	5/10/2012 10:45	13.5	0.003	0.21	0.014	0.472	1.61	0.02	1.18	0.695	0.278	5/9/2012 21:30	5/10/2012 4:00	6.5
6	5/15/2012 8:15	5/15/2012 18:00	9.75	0.004	0.67	0.006	1.40	2.70	0.13	1.63	0.764	0.465	5/15/2012 8:15	5/15/2012 12:15	4
7	5/15/2012 23:30	5/16/2012 20:00	20.5	0.011	1.12	0.010	2.58	3.40	0.26	1.62	0.773	0.334	5/16/2012 0:00	5/16/2012 4:15	4.25
8	5/23/2012 17:30	5/24/2012 0:45	7.25	0.002	0.39	0.005	1.07	2.29	0.16	1.43	0.770	0.394	5/23/2012 17:45	5/23/2012 18:30	0.75
9	5/24/2012 14:00	5/24/2012 19:30	5.5	0.002	0.63	0.003	0.880	2.04	0.46	1.45	0.770	0.400	5/24/2012 14:15	5/24/2012 14:45	0.5
10	5/27/2012 5:00	5/28/2012 16:45	35.75	0.011	0.92	0.012	2.83	3.66	0.47	1.44	0.768	0.378	5/27/2012 5:00	5/27/2012 6:45	1.75
11	6/1/2012 19:00	6/3/2012 5:30	34.5	0.011	0.94	0.012	1.58	2.67	0.37	1.39	0.777	0.314	6/1/2012 19:15	6/2/2012 2:15	7
12	6/12/2012 9:15	6/13/2012 13:15	28	0.005	0.54	0.008	0.466	1.62	0.05	1.22	0.704	0.370	6/12/2012 9:30	6/12/2012 23:15	13.75
13	7/14/2012 3:45	7/14/2012 11:15	7.5	0.001	0.28	0.003	0.270	1.51	0.05	1.14	0.746	0.285	7/14/2012 3:45	7/14/2012 9:00	5.25
14	7/15/2012 21:00	7/16/2012 10:00	13	0.004	0.85	0.005	2.27	3.32	0.57	1.27	0.681	0.262	7/15/2012 21:15	7/16/2012 0:15	3
15	7/19/2012 23:45	7/20/2012 17:45	18	0.007	1.03	0.007	4.40	5.36	0.47	1.20	0.517	0.316	7/19/2012 23:45	7/20/2012 9:15	9.5
16	7/26/2012 19:30	7/27/2012 5:00	9.5	0.001	0.30	0.003	0.239	1.33	0.09	0.917	0.609	0.227	7/26/2012 19:45	7/27/2012 0:15	4.5
17	8/5/2012 18:30	8/6/2012 8:30	14	0.003	0.51	0.005	0.447	1.46	0.11	0.969	0.538	0.264	8/5/2012 18:30	8/6/2012 2:00	7.5
18	8/10/2012 7:30	8/10/2012 18:45	11.25	0.004	0.99	0.004	0.843	1.92	0.23	1.32	0.553	0.470	8/10/2012 7:45	8/10/2012 12:00	4.25
19	8/11/2012 17:45	8/12/2012 7:30	13.75	0.004	0.69	0.005	1.29	2.34	0.26	1.05	0.580	0.226	8/11/2012 17:45	8/11/2012 20:30	2.75
20	8/14/2012 9:15	8/14/2012 21:15	12	0.003	0.85	0.004	1.39	2.49	0.45	1.26	0.567	0.451	8/14/2012 9:30	8/14/2012 17:00	7.5
21	8/17/2012 22:00	8/18/2012 15:30	17.5	0.003	0.60	0.005	0.666	1.42	0.16	1.06	0.576	0.315	8/17/2012 22:15	8/18/2012 7:00	8.75
22	8/27/2012 8:15	8/27/2012 22:30	14.25	0.003	0.49	0.005	0.650	1.76	0.20	1.16	0.532	0.461	8/27/2012 8:15	8/27/2012 16:00	7.75
23	9/3/2012 9:30	9/4/2012 1:30	16	0.004	0.63	0.006	1.05	2.21	0.21	1.24	0.552	0.462	9/3/2012 9:30	9/3/2012 17:45	8.25
24	9/4/2012 2:30	9/5/2012 3:45	25.25	0.004	0.38	0.010	0.568	1.39	0.06	1.04	0.566	0.330	9/4/2012 2:45	9/5/2012 0:30	21.75
25	9/8/2012 16:30	9/8/2012 23:45	7.25	0.001	0.33	0.002	0.324	1.37	0.06	1.09	0.564	0.424	9/8/2012 16:30	9/8/2012 22:30	6
26	9/18/2012 2:45	9/18/2012 11:30	8.75	0.001	0.34	0.003	0.406	1.36	0.09	0.962	0.514	0.325	9/18/2012 2:45	9/18/2012 10:00	7.25
27	9/18/2012 17:00	9/19/2012 12:45	19.75	0.004	0.91	0.005	0.840	1.82	0.36	1.05	0.514	0.335	9/18/2012 17:00	9/19/2012 1:30	8.5
28	10/2/2012 10:15	10/2/2012 18:00	7.75	0.001	0.34	0.003	0.305	1.21	0.11	1.04	0.507	0.429	10/2/2012 10:15	10/2/2012 15:45	5.5
29	10/7/2012 10:15	10/7/2012 23:45	13.5	0.001	0.20	0.004	0.520	1.56	0.03	1.03	0.486	0.490	10/7/2012 10:30	10/7/2012 21:00	10.5
30	10/15/2012 12:00	10/15/2012 23:00	11	0.003	0.51	0.005	0.958	1.84	0.16	1.15	0.497	0.421	10/15/2012 12:00	10/15/2012 20:30	8.5
31	10/19/2012 9:30	10/19/2012 19:30	10	0.003	0.53	0.005	0.846	1.85	0.12	1.17	0.482	0.438	10/19/2012 9:30	10/19/2012 14:15	4.75
32	10/28/2012 15:45	10/28/2012 22:30	6.75	0.001	0.17	0.007	0.320	1.29	0.03	1.10	0.482	0.455	10/28/2012 16:00	10/28/2012 20:30	4.5
33	10/29/2012 4:45	10/31/2012 7:00	50.25	0.033	3.12	0.011	3.63	4.72	0.17	1.44	0.500	0.336	10/29/2012 5:00	10/30/2012 20:15	39.25
34	11/7/2012 11:45	11/7/2012 23:30	11.75	0.002	0.34	0.005	0.366	1.31	0.02	1.00	0.459	0.418	11/7/2012 11:45	11/7/2012 22:00	10.25
35	11/13/2012 2:30	11/13/2012 16:45	14.25	0.001	0.30	0.003	0.295	1.46	0.11	1.02	0.614	0.354	11/13/2012 2:45	11/13/2012 12:00	9.25
36	11/27/2012 5:45	11/28/2012 4:00	22.25	0.005	0.62	0.008	0.478	1.38	0.02	1.05	0.460	0.373	11/27/2012 5:45	11/27/2012 15:45	10

MS_3 Springfield Township

Erdenheim Avenue and Stenton Avenue

Pipe Size: 20" dia. Tributary Drainage Area: 1,429 acres Tributary Service Population: 6,941

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
37	12/7/2012 22:00	12/8/2012 19:45	21.75	0.003	0.24	0.011	0.282	1.37	0.06	0.963	0.506	0.342	12/7/2012 22:15	12/8/2012 1:30	3.25
38	12/9/2012 8:30	12/10/2012 14:15	29.75	0.005	0.31	0.017	0.418	1.40	0.04	1.08	0.512	0.405	12/9/2012 8:45	12/9/2012 23:15	14.5
39	12/20/2012 21:00	12/23/2012 21:45	72.75	0.045	2.38	0.019	4.14	5.01	0.17	1.49	0.564	0.351	12/20/2012 21:00	12/21/2012 7:15	10.25
40	12/26/2012 13:15	12/28/2012 18:30	53.25	0.023	1.04	0.022	1.66	2.74	0.10	1.39	0.646	0.350	12/26/2012 13:30	12/27/2012 9:15	19.75
41	1/11/2013 16:00	1/12/2013 19:15	27.25	0.002	0.40	0.004	0.377	1.47	0.06	1.02	0.610	0.358	1/11/2013 16:15	1/11/2013 20:45	4.5
42	1/14/2013 19:45	1/15/2013 11:15	15.5	0.002	0.37	0.006	0.333	1.43	0.03	1.06	0.618	0.305	1/14/2013 20:00	1/15/2013 2:30	6.5
43	1/15/2013 21:30	1/18/2013 19:30	70	0.023	1.02	0.023	1.61	2.24	0.06	1.26	0.615	0.342	1/15/2013 21:30	1/18/2013 6:15	56.75
44	1/30/2013 17:30	2/2/2013 15:00	69.5	0.029	1.39	0.021	2.61	3.24	0.28	1.36	0.630	0.343	1/30/2013 17:45	2/1/2013 10:00	40.25
45	2/8/2013 5:45	2/9/2013 10:15	28.5	0.002	0.34	0.007	0.321	1.46	0.02	1.08	0.653	0.341	2/8/2013 5:45	2/9/2013 2:30	20.75
46	2/11/2013 4:00	2/12/2013 23:15	43.25	0.008	0.38	0.022	0.574	1.87	0.04	1.24	0.687	0.373	2/11/2013 4:15	2/11/2013 8:45	4.5
47	2/26/2013 19:00	3/1/2013 0:15	53.25	0.010	0.67	0.015	0.561	1.82	0.07	1.31	0.783	0.352	2/26/2013 19:15	2/28/2013 7:30	36.25
		Average:	22.2	0.007	0.65	0.008	1.07	2.11	0.16	1.19	0.611	0.359			10.3
		Maximum Value:	72.8	0.045	3.12	0.023	4.40	5.36	0.57	1.63	0.783	0.490			56.8
		Minimum Value:	5.5	0.001	0.14	0.002	0.239	1.21	0.02	0.917	0.459	0.226			0.50
		Standard Deviation:	17.7	0.009	0.54	0.006	1.03	0.985	0.14	0.177	0.101	0.069			11.4
		Weighted Mean R-Value*:				0.010									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_3 Springfield Township

Erdenheim Avenue and Stenton Avenue

Pipe Size: 20" dia. Tributary Drainage Area: 1,429 acres Tributary Service Population: 6,941

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 20:15	4/11/2013 11:30	15.25	0.001	0.60	0.002	0.339	1.70	0.19	1.27	0.902	0.283	4/10/2013 20:15	4/10/2013 23:45	3.5
2	4/12/2013 7:15	4/13/2013 21:15	38	0.009	0.92	0.010	0.715	2.08	0.17	1.52	0.915	0.388	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 20:45	4/20/2013 18:15	21.5	0.004	0.57	0.007	0.470	1.88	0.05	1.45	0.942	0.347	4/19/2013 20:45	4/20/2013 2:45	6
4	4/28/2013 22:30	4/30/2013 21:45	47.25	0.008	0.53	0.015	0.724	1.95	0.03	1.30	0.818	0.325	4/28/2013 22:30	4/30/2013 3:45	29.25
5	5/7/2013 14:15	5/10/2013 2:30	60.25	0.010	1.22	0.008	0.895	2.08	0.21	1.28	0.813	0.317	5/7/2013 14:15	5/9/2013 13:00	46.75
6	5/10/2013 22:15	5/13/2013 23:30	73.25	0.022	1.28	0.017	1.20	2.16	0.14	1.48	0.849	0.346	5/10/2013 22:30	5/12/2013 3:30	29
7	5/18/2013 15:30	5/19/2013 22:00	30.5	0.002	0.35	0.007	0.275	1.55	0.04	1.14	0.696	0.379	5/18/2013 15:45	5/19/2013 15:45	24
8	5/23/2013 15:45	5/24/2013 18:30	26.75	0.002	0.76	0.003	0.349	1.40	0.13	1.08	0.680	0.329	5/23/2013 16:00	5/24/2013 15:30	23.5
9	5/28/2013 9:00	5/28/2013 22:15	13.25	0.001	0.28	0.005	0.230	1.25	0.03	1.15	0.637	0.409	5/28/2013 9:00	5/28/2013 17:30	8.5
10	6/2/2013 22:45	6/5/2013 2:30	51.75	0.009	0.92	0.010	1.04	2.18	0.20	1.09	0.615	0.307	6/2/2013 23:30	6/3/2013 17:00	17.5
11	6/6/2013 19:30	6/10/2013 4:00	80.5	0.071	3.60	0.020	4.32	5.33	0.19	1.85	0.695	0.330	6/6/2013 19:30	6/8/2013 1:30	30
12	6/10/2013 6:30	6/17/2013 0:00	161.5	0.083	2.53	0.033	2.81	3.97	0.41	1.69	0.871	0.344	6/10/2013 6:45	6/16/2013 18:00	155.25
13	6/18/2013 12:30	6/19/2013 2:30	14	0.002	0.37	0.004	0.323	1.71	0.05	1.41	1.01	0.298	6/18/2013 12:30	6/18/2013 20:30	8
14	6/26/2013 16:00	6/27/2013 14:45	22.75	0.001	0.46	0.003	0.524	1.78	0.30	1.22	0.840	0.323	6/26/2013 16:15	6/26/2013 23:45	7.5
15	6/30/2013 12:30	6/30/2013 21:30	9	0.001	0.25	0.002	0.192	1.52	0.03	1.32	0.784	0.482	6/30/2013 12:30	6/30/2013 15:45	3.25
16	7/1/2013 7:00	7/2/2013 3:15	20.25	0.002	0.32	0.005	0.399	1.77	0.10	1.21	0.789	0.350	7/1/2013 7:15	7/1/2013 18:45	11.5
17	7/12/2013 15:30	7/13/2013 9:45	18.25	0.005	0.80	0.006	0.688	1.72	0.09	1.15	0.644	0.266	7/12/2013 15:30	7/13/2013 0:00	8.5
18	11/1/2013 7:30	11/1/2013 14:30	7	0.001	0.19	0.004	0.325	1.58	0.13	1.29	0.699	0.476	11/1/2013 7:30	11/1/2013 9:45	2.25
19	11/26/2013 11:00	11/29/2013 19:15	80.25	0.050	3.09	0.016	3.03	3.68	0.13	1.55	0.643	0.330	11/26/2013 11:00	11/27/2013 17:30	30.5
20	12/6/2013 2:15	12/7/2013 19:30	41.25	0.010	0.97	0.010	1.09	2.24	0.07	1.35	0.764	0.359	12/6/2013 2:15	12/7/2013 2:15	24
21	12/8/2013 11:30	12/11/2013 7:15	67.75	0.024	1.30	0.018	1.13	2.51	0.05	1.46	0.804	0.326	12/8/2013 11:45	12/10/2013 16:45	53
22	12/14/2013 16:00	12/17/2013 7:30	63.5	0.020	0.85	0.023	0.978	1.83	0.09	1.21	0.593	0.325	12/14/2013 16:15	12/17/2013 5:15	61
23	12/23/2013 4:00	12/25/2013 5:00	49	0.015	0.58	0.026	0.863	2.16	0.08	1.44	0.837	0.318	12/23/2013 4:15	12/23/2013 19:30	15.25
24	12/29/2013 8:15	12/31/2013 20:15	60	0.022	1.21	0.018	1.89	3.12	0.09	1.48	0.773	0.370	12/29/2013 8:15	12/31/2013 14:45	54.5
25	1/5/2014 8:15	1/8/2014 10:00	73.75	0.041	0.92	0.045	2.02	3.46	0.12	1.69	0.824	0.350	1/5/2014 8:15	1/6/2014 12:00	27.75
26	1/10/2014 7:30	1/17/2014 7:30	168	0.052	1.23	0.042	1.55	2.87	0.08	1.55	0.925	0.335	1/10/2014 7:30	1/16/2014 8:15	144.75
27	2/3/2014 2:00	2/4/2014 9:00	31	0.006	1.07	0.005	0.697	1.72	0.05	1.33	0.843	0.313	2/3/2014 2:00	2/3/2014 15:30	13.5
28	2/5/2014 0:30	2/8/2014 11:15	82.75	0.053	1.72	0.031	1.93	3.34	0.12	1.75	0.842	0.317	2/5/2014 0:30	2/5/2014 12:15	11.75
29	2/13/2014 0:15	2/16/2014 14:00	85.75	0.029	1.77	0.017	1.35	2.26	0.09	1.24	0.591	0.334	2/13/2014 0:30	2/15/2014 16:30	64
30	2/19/2014 9:15	2/20/2014 1:45	16.5	0.005	0.30	0.017	0.601	2.04	0.06	1.73	1.10	0.352	2/19/2014 9:30	2/19/2014 12:00	2.5
31	3/12/2014 15:30	3/14/2014 18:30	51	0.011	0.38	0.030	0.970	2.75	0.19	1.84	1.31	0.326	3/12/2014 15:30	3/12/2014 21:45	6.25
32	3/19/2014 14:15	3/21/2014 18:00	51.75	0.014	0.75	0.019	1.03	2.59	0.08	1.71	1.13	0.326	3/19/2014 14:15	3/19/2014 22:00	7.75
33	3/29/2014 9:30	4/13/2014 0:45	351.25	0.157	3.51	0.045	2.87	4.38	0.16	1.83	1.08	0.339	3/29/2014 9:30	4/11/2014 23:00	325.5
34	4/15/2014 10:00	4/20/2014 23:00	133	0.030	1.23	0.025	1.25	2.76	0.14	1.73	1.17	0.343	4/15/2014 10:15	4/15/2014 23:15	13
35	4/25/2014 19:15	4/26/2014 22:15	27	0.003	0.53	0.006	0.646	2.04	0.12	1.64	1.17	0.361	4/25/2014 19:15	4/26/2014 1:00	5.75
36	4/29/2014 12:00	5/9/2014 18:45	246.75	0.168	4.95	0.034	6.65	7.99	0.19	2.04	1.08	0.332	4/29/2014 12:00	5/8/2014 4:45	208.75
37	5/16/2014 8:15	5/18/2014 8:15	48	0.028	1.95	0.015	2.39	3.78	0.14	1.95	1.07	0.328	5/16/2014 8:15	5/16/2014 18:00	9.75

MS_3 Springfield Township

Erdenheim Avenue and Stenton Avenue

Pipe Size: 20" dia. Tributary Drainage Area: 1,429 acres Tributary Service Population: 6,941

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
38	5/22/2014 5:45	5/24/2014 18:30	60.75	0.009	0.95	0.010	1.02	2.52	0.25	1.62	1.12	0.362	5/22/2014 5:45	5/24/2014 15:45	58
39	5/27/2014 17:45	5/30/2014 21:00	75.25	0.017	1.35	0.012	1.83	3.33	0.17	1.63	1.09	0.328	5/27/2014 17:45	5/28/2014 15:30	21.75
40	6/12/2014 14:15	6/13/2014 19:00	28.75	0.009	0.96	0.009	2.87	4.08	0.26	1.59	0.982	0.332	6/12/2014 14:15	6/13/2014 17:15	27
41	6/25/2014 22:30	6/26/2014 6:15	7.75	0.002	0.52	0.003	0.331	1.23	0.17	1.03	0.750	0.089	6/25/2014 23:00	6/26/2014 2:00	3
		Average:	63.7	0.025	1.17	0.015	1.34	2.59	0.13	1.47	0.870	0.336			39.5
		Maximum Value:	351.3	0.168	4.95	0.045	6.65	7.99	0.41	2.04	1.31	0.482			325.5
		Minimum Value:	7.0	0.001	0.19	0.002	0.192	1.23	0.03	1.03	0.591	0.089			2.25
		Standard Deviation:	66.7	0.037	1.03	0.012	1.27	1.27	0.08	0.259	0.183	0.057			63.0
		Weighted Mean R-Value*:				0.021									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_5 Springfield Township

Creisheim Valley Drive

Pipe Size: 8" dia. Tributary Drainage Area: 69 acres Tributary Service Population: 410

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	10/9/2007 15:15	10/10/2007 8:45	17.5	0.006	0.72	0.009	0.091	0.175	0.12	0.087	0.044	0.027	10/9/2007 15:30	10/10/2007 1:15	9.75
2	10/11/2007 2:15	10/11/2007 8:45	6.5	0.006	0.55	0.011	0.099	0.164	0.07	0.113	0.046	0.026	10/11/2007 2:15	10/11/2007 6:00	3.75
3	10/11/2007 12:00	10/11/2007 17:00	5	0.002	0.16	0.012	0.084	0.160	0.08	0.087	0.047	0.024	10/11/2007 12:00	10/11/2007 13:00	1
4	10/19/2007 14:30	10/20/2007 6:00	15.5	0.005	0.62	0.009	0.076	0.152	0.19	0.094	0.056	0.023	10/19/2007 14:45	10/20/2007 1:00	10.25
5	10/24/2007 17:30	10/25/2007 13:15	19.75	0.007	0.45	0.015	0.044	0.160	0.04	0.105	0.060	0.029	10/24/2007 17:45	10/25/2007 7:45	14
6	10/26/2007 13:15	10/29/2007 5:30	64.25	0.031	2.56	0.012	0.098	0.162	0.22	0.113	0.063	0.029	10/26/2007 13:15	10/27/2007 12:45	23.5
		Average:	21.4	0.010	0.84	0.011	0.082	0.162	0.12	0.100	0.053	0.026			10.4
		Maximum Value:	64.3	0.031	2.56	0.015	0.099	0.175	0.22	0.113	0.063	0.029			23.5
		Minimum Value:	5.0	0.002	0.16	0.009	0.044	0.152	0.04	0.087	0.044	0.023			1.00
		Standard Deviation:	21.8	0.011	0.86	0.002	0.021	0.007	0.07	0.012	0.008	0.003			8.0
		Weighted Mean R-Value*:				0.011									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_5 Springfield Township

Creisheim Valley Drive

Pipe Size: 8" dia. Tributary Drainage Area: 69 acres Tributary Service Population: 410

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/22/2010 20:15	2/26/2010 20:00	95.75	0.098	1.66	0.059	0.222	0.401	0.05	0.233	0.167	0.020	2/22/2010 20:15	2/26/2010 10:00	85.75
2	3/12/2010 9:00	3/20/2010 11:45	194.75	0.299	4.35	0.069	0.706	0.891	0.17	0.271	0.182	0.021	3/12/2010 9:00	3/15/2010 20:45	83.75
3	3/22/2010 7:30	3/23/2010 21:30	38	0.014	1.09	0.013	0.106	0.339	0.10	0.258	0.219	0.022	3/22/2010 7:45	3/23/2010 13:45	30
4	3/28/2010 20:30	4/4/2010 10:45	158.25	0.213	3.33	0.064	0.357	0.569	0.13	0.302	0.221	0.020	3/28/2010 20:45	3/31/2010 4:30	55.75
5	4/8/2010 22:15	4/10/2010 10:15	36	0.015	0.51	0.030	0.057	0.322	0.06	0.268	0.230	0.019	4/8/2010 22:15	4/9/2010 6:15	8
6	4/25/2010 0:15	4/27/2010 5:15	53	0.022	1.26	0.017	0.069	0.279	0.07	0.225	0.188	0.019	4/25/2010 0:30	4/27/2010 1:30	49
7	5/3/2010 3:45	5/4/2010 3:45	24	0.005	0.85	0.006	0.138	0.335	0.17	0.189	0.159	0.020	5/3/2010 3:45	5/3/2010 10:15	6.5
		Average:	85.7	0.095	1.86	0.037	0.236	0.448	0.11	0.249	0.195	0.020			45.5
		Maximum Value:	194.8	0.299	4.35	0.069	0.706	0.891	0.17	0.302	0.230	0.022			85.8
		Minimum Value:	24.0	0.005	0.51	0.006	0.057	0.279	0.05	0.189	0.159	0.019			6.50
		Standard Deviation:	66.9	0.117	1.43	0.026	0.232	0.217	0.05	0.037	0.028	0.001			32.6
		Weighted Mean R-Value*:				0.051									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_5 Springfield Township

Creisheim Valley Drive

Pipe Size: 8" dia. Tributary Drainage Area: 69 acres Tributary Service Population: 410

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/26/2013 19:15	2/27/2013 6:30	11.25	0.006	0.63	0.009	0.069	0.184	0.07	0.130	0.087	0.021	2/26/2013 19:15	2/27/2013 6:15	11
2	3/12/2013 3:00	3/13/2013 3:45	24.75	0.017	1.05	0.016	0.165	0.301	0.06	0.162	0.100	0.031	3/12/2013 3:00	3/12/2013 16:30	13.5
3	3/18/2013 17:45	3/19/2013 12:45	19	0.015	0.89	0.017	0.090	0.233	0.06	0.174	0.106	0.033	3/18/2013 17:45	3/19/2013 11:00	17.25
4	4/10/2013 19:45	4/11/2013 5:30	9.75	0.004	0.56	0.007	0.105	0.247	0.18	0.127	0.088	0.019	4/10/2013 20:15	4/10/2013 23:45	3.5
5	4/12/2013 7:15	4/12/2013 18:15	11	0.006	0.55	0.011	0.092	0.229	0.10	0.154	0.090	0.041	4/12/2013 7:15	4/12/2013 13:45	6.5
6	4/12/2013 21:30	4/13/2013 8:30	11	0.006	0.37	0.017	0.126	0.258	0.15	0.135	0.093	0.017	4/12/2013 21:30	4/12/2013 23:15	1.75
7	4/19/2013 21:30	4/20/2013 8:15	10.75	0.006	0.57	0.011	0.085	0.194	0.06	0.132	0.090	0.016	4/19/2013 21:30	4/20/2013 2:45	5.25
8	4/29/2013 1:15	4/29/2013 20:00	18.75	0.010	0.50	0.021	0.085	0.212	0.03	0.150	0.093	0.032	4/29/2013 1:15	4/29/2013 19:45	18.5
9	5/7/2013 22:00	5/8/2013 17:15	19.25	0.004	0.59	0.008	0.059	0.221	0.20	0.129	0.089	0.029	5/7/2013 22:15	5/8/2013 13:15	15
10	5/9/2013 3:00	5/9/2013 11:00	8	0.005	0.50	0.010	0.083	0.220	0.09	0.152	0.088	0.036	5/9/2013 3:00	5/9/2013 6:45	3.75
11	5/10/2013 22:30	5/11/2013 20:30	22	0.010	1.14	0.009	0.108	0.208	0.12	0.143	0.089	0.033	5/10/2013 22:30	5/11/2013 19:15	20.75
		Average:	15.0	0.008	0.67	0.012	0.097	0.228	0.10	0.144	0.092	0.028			10.6
		Maximum Value:	24.8	0.017	1.14	0.021	0.165	0.301	0.20	0.174	0.106	0.041			20.8
		Minimum Value:	8.0	0.004	0.37	0.007	0.059	0.184	0.03	0.127	0.087	0.016			1.75
		Standard Deviation:	5.8	0.004	0.25	0.005	0.029	0.032	0.06	0.015	0.006	0.008			6.8
		Weighted Mean R-Value*:				0.012									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_6 Springfield Township

Windbrook Avenue and Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 189 acres Tributary Service Population: 1,169

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/1/2012 18:15	4/2/2012 11:30	17.25	0.003	0.17	0.020	0.092	0.252	0.04	0.181	0.106	0.051	4/1/2012 18:30	4/2/2012 2:00	7.5
2	4/21/2012 21:30	4/22/2012 2:00	4.5	0.001	0.16	0.006	0.129	0.303	0.14	0.180	0.123	0.032	4/21/2012 21:30	4/21/2012 22:00	0.5
3	4/22/2012 8:45	4/24/2012 8:00	47.25	0.036	2.24	0.016	0.512	0.710	0.11	0.280	0.129	0.057	4/22/2012 8:45	4/23/2012 18:00	33.25
4	5/1/2012 4:00	5/1/2012 17:30	13.5	0.004	0.29	0.015	0.106	0.385	0.12	0.296	0.186	0.073	5/1/2012 4:15	5/1/2012 10:00	5.75
5	5/4/2012 21:45	5/5/2012 3:00	5.25	0.004	0.47	0.009	0.707	0.939	0.34	0.310	0.184	0.027	5/4/2012 21:45	5/4/2012 23:30	1.75
6	5/9/2012 2:45	5/9/2012 10:30	7.75	0.003	0.37	0.008	0.130	0.369	0.09	0.289	0.191	0.051	5/9/2012 3:00	5/9/2012 7:15	4.25
7	5/9/2012 22:15	5/10/2012 20:00	21.75	0.006	0.21	0.029	0.088	0.372	0.02	0.284	0.192	0.058	5/9/2012 22:30	5/10/2012 4:00	5.5
8	5/15/2012 8:15	5/15/2012 18:30	10.25	0.008	0.69	0.011	0.376	0.676	0.14	0.379	0.201	0.085	5/15/2012 8:15	5/15/2012 12:15	4
9	5/16/2012 0:30	5/16/2012 19:00	18.5	0.020	1.01	0.020	1.16	1.37	0.34	0.397	0.202	0.060	5/16/2012 0:30	5/16/2012 4:15	3.75
10	5/22/2012 2:00	5/22/2012 11:30	9.5	0.002	0.17	0.011	0.128	0.366	0.02	0.288	0.211	0.052	5/22/2012 2:00	5/22/2012 8:00	6
11	5/23/2012 17:30	5/23/2012 22:15	4.75	0.004	0.48	0.008	0.666	0.939	0.27	0.376	0.211	0.066	5/23/2012 17:45	5/23/2012 18:30	0.75
12	5/24/2012 14:15	5/24/2012 20:30	6.25	0.004	0.57	0.007	0.292	0.590	0.30	0.367	0.212	0.073	5/24/2012 14:15	5/24/2012 20:30	6.25
13	5/27/2012 4:45	5/27/2012 23:30	18.75	0.011	0.84	0.014	1.10	1.32	0.42	0.351	0.214	0.063	5/27/2012 5:00	5/27/2012 6:45	1.75
14	5/29/2012 20:00	5/30/2012 1:30	5.5	0.001	0.26	0.005	0.074	0.354	0.14	0.286	0.215	0.045	5/29/2012 20:00	5/29/2012 22:15	2.25
15	6/1/2012 19:30	6/2/2012 17:00	21.5	0.011	0.97	0.011	0.484	0.699	0.35	0.298	0.188	0.050	6/1/2012 19:30	6/2/2012 2:15	6.75
16	6/4/2012 12:00	6/5/2012 0:15	12.25	0.004	0.41	0.009	0.175	0.441	0.09	0.295	0.189	0.068	6/4/2012 12:15	6/4/2012 20:45	8.5
17	6/12/2012 9:15	6/13/2012 7:15	22	0.011	0.61	0.018	0.250	0.536	0.06	0.318	0.203	0.056	6/12/2012 9:30	6/12/2012 23:15	13.75
18	7/14/2012 3:30	7/14/2012 11:00	7.5	0.001	0.25	0.005	0.093	0.303	0.04	0.220	0.156	0.042	7/14/2012 3:45	7/14/2012 9:00	5.25
19	7/15/2012 21:30	7/16/2012 7:00	9.5	0.009	0.83	0.011	1.19	1.41	0.51	0.305	0.165	0.023	7/15/2012 21:30	7/16/2012 0:15	2.75
20	7/20/2012 1:15	7/20/2012 23:15	22	0.010	0.95	0.010	0.815	0.980	0.35	0.261	0.147	0.060	7/20/2012 1:15	7/20/2012 9:15	8
21	7/26/2012 19:45	7/27/2012 18:30	22.75	0.015	0.23	0.065	0.246	0.489	0.10	0.313	0.174	0.058	7/26/2012 20:00	7/27/2012 0:15	4.25
22	8/5/2012 18:45	8/6/2012 17:15	22.5	0.008	0.56	0.015	0.298	0.495	0.11	0.279	0.174	0.059	8/5/2012 18:45	8/6/2012 2:00	7.25
23	8/10/2012 8:15	8/10/2012 22:00	13.75	0.007	0.65	0.010	0.309	0.585	0.21	0.316	0.174	0.082	8/10/2012 9:45	8/10/2012 12:00	2.25
24	8/11/2012 18:00	8/11/2012 23:30	5.5	0.002	0.42	0.004	0.164	0.386	0.18	0.243	0.155	0.053	8/11/2012 18:00	8/11/2012 20:15	2.25
25	8/14/2012 9:45	8/15/2012 6:45	21	0.012	0.89	0.014	0.640	0.905	0.33	0.289	0.165	0.054	8/14/2012 10:00	8/15/2012 1:45	15.75
26	8/17/2012 22:00	8/18/2012 13:30	15.5	0.009	0.70	0.013	0.549	0.773	0.21	0.295	0.179	0.043	8/17/2012 22:15	8/18/2012 7:00	8.75
27	8/27/2012 8:00	8/27/2012 15:00	7	0.004	0.61	0.007	0.986	1.26	0.39	0.339	0.178	0.090	8/27/2012 8:00	8/27/2012 12:45	4.75
28	9/3/2012 9:30	9/3/2012 22:15	12.75	0.009	0.93	0.010	0.438	0.688	0.36	0.322	0.160	0.076	9/3/2012 9:30	9/3/2012 19:00	9.5
29	9/4/2012 3:30	9/4/2012 23:30	20	0.006	0.48	0.013	0.304	0.538	0.10	0.275	0.170	0.067	9/4/2012 3:30	9/4/2012 17:45	14.25
30	9/8/2012 16:30	9/9/2012 0:00	7.5	0.002	0.35	0.007	0.114	0.353	0.06	0.266	0.167	0.059	9/8/2012 16:30	9/8/2012 22:30	6
31	9/18/2012 4:15	9/18/2012 9:15	5	0.001	0.24	0.005	0.084	0.225	0.06	0.181	0.096	0.054	9/18/2012 4:15	9/18/2012 5:30	1.25
32	9/18/2012 17:00	9/19/2012 5:30	12.5	0.007	0.79	0.008	0.330	0.489	0.32	0.200	0.097	0.038	9/18/2012 17:00	9/18/2012 20:45	3.75
33	10/2/2012 10:30	10/2/2012 19:00	8.5	0.002	0.30	0.006	0.124	0.294	0.09	0.193	0.088	0.081	10/2/2012 10:30	10/2/2012 15:30	5
34	10/15/2012 12:15	10/15/2012 20:45	8.5	0.002	0.41	0.004	0.238	0.397	0.11	0.185	0.086	0.076	10/15/2012 12:30	10/15/2012 20:30	8
35	10/19/2012 9:30	10/20/2012 7:30	22	0.008	0.64	0.012	0.306	0.498	0.16	0.191	0.095	0.052	10/19/2012 9:30	10/19/2012 23:15	13.75

MS_6 Springfield Township

Windbrook Avenue and Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 189 acres Tributary Service Population: 1,169

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	10/29/2012 5:00	10/31/2012 8:30	51.5	0.067	3.07	0.022	0.948	1.11	0.17	0.318	0.100	0.059	10/29/2012 5:00	10/30/2012 20:15	39.25
37	11/7/2012 11:45	11/8/2012 1:15	13.5	0.003	0.38	0.008	0.076	0.292	0.02	0.233	0.142	0.065	11/7/2012 11:45	11/8/2012 0:45	13
38	11/13/2012 2:15	11/13/2012 15:00	12.75	0.003	0.27	0.011	0.132	0.276	0.05	0.219	0.129	0.063	11/13/2012 2:30	11/13/2012 12:00	9.5
39	11/27/2012 5:30	11/28/2012 14:00	32.5	0.009	0.63	0.014	0.108	0.302	0.02	0.202	0.105	0.065	11/27/2012 6:00	11/27/2012 15:45	9.75
40	12/7/2012 22:00	12/8/2012 13:00	15	0.003	0.24	0.011	0.156	0.263	0.05	0.166	0.101	0.042	12/7/2012 22:15	12/8/2012 1:30	3.25
41	12/9/2012 8:30	12/10/2012 7:30	23	0.006	0.33	0.018	0.115	0.302	0.04	0.196	0.109	0.056	12/9/2012 8:45	12/9/2012 23:30	14.75
42	12/20/2012 21:00	12/22/2012 20:15	47.25	0.060	2.22	0.027	1.13	1.29	0.14	0.325	0.115	0.055	12/20/2012 21:00	12/21/2012 7:15	10.25
43	12/24/2012 16:45	12/25/2012 10:00	17.25	0.003	0.20	0.013	0.102	0.271	0.02	0.192	0.134	0.040	12/24/2012 17:00	12/24/2012 21:15	4.25
44	12/26/2012 13:15	12/28/2012 18:45	53.5	0.032	1.11	0.029	0.461	0.658	0.10	0.270	0.135	0.060	12/26/2012 13:15	12/27/2012 9:15	20
45	12/29/2012 10:45	12/29/2012 19:30	8.75	0.001	0.20	0.006	0.042	0.279	0.02	0.234	0.143	0.075	12/29/2012 11:00	12/29/2012 16:15	5.25
46	1/11/2013 16:00	1/12/2013 4:15	12.25	0.004	0.39	0.010	0.193	0.352	0.06	0.214	0.131	0.043	1/11/2013 16:15	1/11/2013 21:00	4.75
47	1/14/2013 20:00	1/15/2013 8:45	12.75	0.005	0.39	0.012	0.118	0.304	0.05	0.218	0.137	0.038	1/14/2013 20:00	1/15/2013 2:30	6.5
48	1/15/2013 21:30	1/17/2013 16:00	42.5	0.028	1.05	0.027	0.340	0.484	0.06	0.281	0.143	0.057	1/15/2013 21:30	1/16/2013 11:15	13.75
49	1/28/2013 12:30	1/29/2013 0:00	11.5	0.002	0.19	0.013	0.066	0.276	0.02	0.229	0.135	0.068	1/28/2013 12:45	1/28/2013 19:30	6.75
50	1/30/2013 18:00	2/1/2013 9:30	39.5	0.032	1.34	0.024	0.834	0.990	0.27	0.307	0.154	0.053	1/30/2013 18:00	2/1/2013 9:15	39.25
51	2/8/2013 5:30	2/9/2013 7:00	25.5	0.004	0.36	0.011	0.099	0.286	0.02	0.212	0.137	0.055	2/8/2013 5:45	2/9/2013 2:45	21
52	2/11/2013 4:00	2/11/2013 15:00	11	0.004	0.39	0.010	0.112	0.344	0.04	0.256	0.139	0.072	2/11/2013 4:15	2/11/2013 8:45	4.5
53	2/13/2013 18:30	2/14/2013 7:45	13.25	0.001	0.24	0.006	0.040	0.277	0.03	0.206	0.156	0.037	2/13/2013 18:45	2/14/2013 0:15	5.5
54	2/19/2013 11:00	2/19/2013 23:15	12.25	0.004	0.23	0.019	0.095	0.317	0.02	0.260	0.143	0.073	2/19/2013 11:15	2/19/2013 17:45	6.5
55	2/26/2013 19:00	2/28/2013 9:15	38.25	0.015	0.69	0.022	0.181	0.362	0.07	0.245	0.145	0.053	2/26/2013 19:15	2/28/2013 8:45	37.5
56	3/12/2013 2:45	3/13/2013 12:00	33.25	0.025	1.04	0.024	0.426	0.669	0.06	0.312	0.160	0.059	3/12/2013 3:00	3/12/2013 16:30	13.5
57	3/16/2013 9:15	3/16/2013 21:00	11.75	0.002	0.19	0.008	0.058	0.306	0.02	0.260	0.167	0.077	3/16/2013 9:30	3/16/2013 18:00	8.5
58	3/18/2013 17:30	3/21/2013 5:15	59.75	0.026	0.90	0.029	0.173	0.383	0.06	0.276	0.168	0.054	3/18/2013 17:45	3/21/2013 3:45	58
59	3/25/2013 5:15	3/26/2013 22:00	40.75	0.011	0.65	0.017	0.103	0.399	0.04	0.293	0.194	0.066	3/25/2013 5:15	3/26/2013 21:30	40.25
		Average:	19.1	0.010	0.62	0.014	0.336	0.551	0.14	0.267	0.154	0.058			10.7
		Maximum Value:	59.8	0.067	3.07	0.065	1.19	1.41	0.51	0.397	0.215	0.090			58.0
		Minimum Value:	4.5	0.001	0.16	0.004	0.040	0.225	0.02	0.166	0.086	0.023			0.50
		Standard Deviation:	13.7	0.013	0.54	0.010	0.322	0.323	0.13	0.056	0.036	0.014			11.6
		Weighted Mean R-Value*:				0.016									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_6 Springfield Township

Windbrook Avenue and Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 189 acres Tributary Service Population: 1,169

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4/10/2013 19:30	4/11/2013 9:45	14.25	0.004	0.55	0.008	0.206	0.454	0.17	0.259	0.179	0.043	4/10/2013 19:45	4/10/2013 23:45	4
2	4/12/2013 7:15	4/14/2013 0:45	41.5	0.019	0.91	0.021	0.388	0.628	0.15	0.301	0.187	0.057	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:15	4/20/2013 17:45	20.5	0.004	0.58	0.008	0.156	0.394	0.06	0.268	0.194	0.047	4/19/2013 21:30	4/20/2013 2:45	5.25
4	4/28/2013 22:30	5/1/2013 4:45	54.25	0.017	0.55	0.031	0.179	0.424	0.03	0.252	0.162	0.052	4/28/2013 22:30	4/30/2013 4:45	30.25
5	5/7/2013 14:15	5/8/2013 22:00	31.75	0.006	0.55	0.011	0.237	0.465	0.07	0.242	0.158	0.060	5/7/2013 14:15	5/8/2013 13:15	23
6	5/9/2013 1:30	5/10/2013 2:30	25	0.010	0.50	0.020	0.177	0.373	0.07	0.261	0.158	0.055	5/9/2013 1:30	5/9/2013 6:45	5.25
7	5/10/2013 22:30	5/14/2013 0:15	73.75	0.028	1.25	0.022	0.343	0.524	0.14	0.267	0.170	0.051	5/10/2013 22:30	5/12/2013 5:30	31
8	5/23/2013 15:30	5/24/2013 17:30	26	0.009	0.79	0.011	0.309	0.511	0.16	0.270	0.172	0.057	5/23/2013 16:00	5/24/2013 15:30	23.5
9	5/28/2013 9:15	5/29/2013 0:30	15.25	0.001	0.29	0.005	0.076	0.318	0.03	0.235	0.156	0.068	5/28/2013 9:30	5/28/2013 17:30	8
10	6/2/2013 23:45	6/4/2013 14:30	38.75	0.010	0.94	0.011	0.482	0.700	0.24	0.227	0.138	0.057	6/2/2013 23:45	6/3/2013 17:00	17.25
11	6/6/2013 19:15	6/23/2013 2:15	391	0.383	6.38	0.060	1.20	1.42	0.35	0.348	0.173	0.054	6/6/2013 19:15	6/18/2013 20:30	289.25
12	6/26/2013 19:45	6/29/2013 23:00	75.25	0.020	1.24	0.016	0.794	1.06	0.33	0.281	0.193	0.054	6/26/2013 20:30	6/28/2013 21:30	49
13	6/30/2013 12:45	7/4/2013 4:00	87.25	0.019	0.81	0.024	0.366	0.577	0.10	0.261	0.179	0.055	6/30/2013 12:45	7/3/2013 23:00	82.25
14	7/12/2013 15:30	7/14/2013 0:00	32.5	0.008	0.88	0.009	0.183	0.405	0.13	0.236	0.155	0.051	7/12/2013 15:30	7/13/2013 18:30	27
15	7/22/2013 18:15	7/24/2013 13:15	43	0.010	0.92	0.011	0.509	0.647	0.45	0.209	0.125	0.056	7/22/2013 18:30	7/23/2013 17:45	23.25
16	7/28/2013 14:45	7/29/2013 11:15	20.5	0.006	0.23	0.024	0.242	0.421	0.09	0.196	0.112	0.051	7/28/2013 15:00	7/29/2013 2:30	11.5
17	8/1/2013 6:15	8/2/2013 19:15	37	0.010	0.63	0.016	0.207	0.422	0.07	0.222	0.123	0.066	8/1/2013 6:30	8/1/2013 15:15	8.75
18	8/13/2013 4:45	8/15/2013 15:15	58.5	0.033	2.52	0.013	1.38	1.59	0.43	0.254	0.123	0.062	8/13/2013 5:00	8/13/2013 9:30	4.5
19	8/22/2013 6:00	8/22/2013 18:15	12.25	0.002	0.55	0.004	0.267	0.494	0.34	0.246	0.144	0.082	8/22/2013 6:00	8/22/2013 17:00	11
20	8/28/2013 9:45	8/29/2013 6:15	20.5	0.012	1.49	0.008	1.17	1.40	0.57	0.262	0.139	0.052	8/28/2013 9:45	8/28/2013 15:45	6
21	9/2/2013 10:30	9/3/2013 7:45	21.25	0.009	0.69	0.013	0.680	0.890	0.32	0.220	0.115	0.053	9/2/2013 10:30	9/2/2013 13:15	2.75
22	9/12/2013 17:45	9/13/2013 7:45	14	0.004	0.53	0.007	0.213	0.341	0.14	0.195	0.122	0.039	9/12/2013 18:45	9/13/2013 2:45	8
23	9/21/2013 19:45	9/22/2013 15:45	20	0.010	1.16	0.009	0.366	0.520	0.24	0.208	0.100	0.046	9/21/2013 20:00	9/22/2013 3:30	7.5
24	10/6/2013 16:45	10/7/2013 7:45	15	0.002	0.51	0.004	0.075	0.228	0.28	0.149	0.092	0.039	10/6/2013 17:00	10/6/2013 17:45	0.75
25	10/7/2013 12:15	10/8/2013 4:00	15.75	0.004	0.60	0.006	0.185	0.361	0.13	0.170	0.093	0.049	10/7/2013 12:45	10/7/2013 17:00	4.25
26	10/10/2013 3:45	10/10/2013 22:15	18.5	0.004	0.47	0.009	0.157	0.336	0.07	0.195	0.097	0.071	10/10/2013 4:00	10/10/2013 15:30	11.5
27	10/11/2013 3:00	10/13/2013 9:00	54	0.028	1.38	0.020	0.386	0.568	0.18	0.217	0.102	0.050	10/11/2013 3:00	10/11/2013 18:45	15.75
28	11/26/2013 11:00	11/30/2013 10:00	95	0.064	3.12	0.021	0.890	1.01	0.14	0.256	0.117	0.056	11/26/2013 11:00	11/27/2013 17:30	30.5
29	12/6/2013 2:15	12/7/2013 19:00	40.75	0.015	1.00	0.015	0.168	0.348	0.06	0.231	0.129	0.056	12/6/2013 2:15	12/7/2013 2:15	24
30	12/8/2013 11:30	12/12/2013 13:00	97.5	0.040	1.38	0.029	0.204	0.430	0.05	0.252	0.145	0.057	12/8/2013 11:45	12/12/2013 6:15	90.5
31	12/14/2013 15:45	12/17/2013 1:00	57.25	0.023	0.86	0.027	0.194	0.432	0.09	0.262	0.161	0.053	12/14/2013 15:45	12/15/2013 1:00	9.25
32	12/23/2013 3:45	12/25/2013 14:30	58.75	0.019	0.53	0.036	0.270	0.524	0.06	0.258	0.158	0.061	12/23/2013 4:00	12/23/2013 20:00	16
33	12/29/2013 8:15	1/1/2014 5:30	69.25	0.043	1.21	0.036	0.461	0.697	0.09	0.278	0.145	0.056	12/29/2013 8:15	12/31/2013 15:00	54.75
34	1/5/2014 6:00	1/10/2014 4:45	118.75	0.080	0.89	0.089	0.767	1.02	0.11	0.302	0.162	0.056	1/5/2014 6:00	1/6/2014 12:00	30
35	1/10/2014 7:15	1/18/2014 5:30	190.25	0.108	1.26	0.086	0.383	0.614	0.10	0.301	0.176	0.055	1/10/2014 7:30	1/18/2014 2:15	186.75

MS_6 Springfield Township

Windbrook Avenue and Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 189 acres Tributary Service Population: 1,169

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	2/3/2014 2:00	2/12/2014 8:15	222.25	0.135	2.96	0.046	0.651	0.899	0.11	0.301	0.171	0.055	2/3/2014 2:00	2/9/2014 21:00	163
37	2/13/2014 0:15	2/16/2014 20:00	91.75	0.031	1.83	0.017	0.178	0.431	0.09	0.287	0.192	0.054	2/13/2014 0:30	2/15/2014 16:30	64
38	2/19/2014 9:30	2/20/2014 0:00	14.5	0.005	0.30	0.018	0.119	0.412	0.07	0.346	0.232	0.068	2/19/2014 9:30	2/19/2014 12:00	2.5
39	3/12/2014 15:15	3/13/2014 20:30	29.25	0.006	0.39	0.016	0.250	0.585	0.19	0.341	0.256	0.059	3/12/2014 15:30	3/12/2014 21:45	6.25
40	3/19/2014 14:00	3/23/2014 22:30	104.5	0.048	0.81	0.059	0.386	0.663	0.08	0.323	0.211	0.054	3/19/2014 14:15	3/19/2014 22:00	7.75
41	3/29/2014 9:15	4/5/2014 18:45	177.5	0.194	3.11	0.062	0.834	1.13	0.16	0.437	0.247	0.056	3/29/2014 9:30	4/4/2014 23:15	157.75
42	4/7/2014 11:45	4/10/2014 0:45	61	0.017	0.50	0.035	0.139	0.481	0.04	0.359	0.266	0.058	4/7/2014 11:45	4/8/2014 7:00	19.25
43	4/15/2014 9:45	4/17/2014 11:00	49.25	0.028	1.15	0.024	0.332	0.653	0.16	0.374	0.246	0.058	4/15/2014 10:00	4/15/2014 23:15	13.25
44	4/25/2014 18:00	4/26/2014 10:00	16	0.005	0.53	0.009	0.230	0.458	0.12	0.283	0.207	0.039	4/25/2014 18:30	4/26/2014 1:15	6.75
45	4/29/2014 12:15	5/6/2014 11:45	167.5	0.277	5.11	0.054	2.20	2.48	0.22	0.480	0.222	0.055	4/29/2014 12:30	5/4/2014 13:30	121
46	5/10/2014 12:45	5/11/2014 9:15	20.5	0.007	0.69	0.010	0.361	0.645	0.29	0.309	0.226	0.042	5/10/2014 13:30	5/11/2014 0:00	10.5
47	5/16/2014 7:45	5/19/2014 8:45	73	0.062	1.85	0.034	0.726	1.03	0.15	0.392	0.235	0.052	5/16/2014 8:00	5/16/2014 18:00	10
48	5/22/2014 4:30	5/22/2014 11:15	6.75	0.002	0.26	0.006	0.307	0.577	0.15	0.344	0.239	0.077	5/22/2014 5:45	5/22/2014 6:15	0.5
49	5/22/2014 16:15	5/24/2014 1:45	33.5	0.017	0.71	0.024	1.52	1.82	0.35	0.352	0.237	0.054	5/22/2014 17:15	5/23/2014 21:00	27.75
50	5/27/2014 17:30	5/30/2014 23:45	78.25	0.039	1.34	0.029	0.694	0.997	0.20	0.337	0.220	0.057	5/27/2014 17:45	5/28/2014 15:45	22
51	6/9/2014 1:45	6/10/2014 20:45	43	0.012	1.05	0.011	0.474	0.749	0.22	0.308	0.214	0.061	6/9/2014 2:00	6/10/2014 20:30	42.5
52	6/12/2014 23:30	6/14/2014 12:45	37.25	0.024	1.31	0.018	0.430	0.651	0.24	0.341	0.210	0.051	6/13/2014 0:30	6/13/2014 17:15	16.75
53	6/25/2014 22:30	6/26/2014 16:45	18.25	0.010	0.63	0.017	0.237	0.444	0.21	0.300	0.174	0.056	6/25/2014 23:15	6/26/2014 2:00	2.75
		Average:	61.3	0.037	1.18	0.023	0.459	0.692	0.17	0.279	0.171	0.055			35.1
		Maximum Value:	391.0	0.383	6.38	0.089	2.20	2.48	0.57	0.480	0.266	0.082			289.3
		Minimum Value:	6.8	0.001	0.23	0.004	0.075	0.228	0.03	0.149	0.092	0.039			0.50
		Standard Deviation:	66.5	0.069	1.14	0.019	0.409	0.422	0.12	0.064	0.047	0.008			54.9
		Weighted Mean R-Value*:				0.032									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_7 Springfield Township

Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 13 acres Tributary Service Population: 110

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	9/11/2007 8:15	9/11/2007 16:45	8.5	0.007	0.49	0.014	0.044	0.061	0.29	0.025	0.004	0.014	9/11/2007 8:15	9/11/2007 16:15	8
2	10/19/2007 22:15	10/20/2007 6:15	8	0.007	0.44	0.016	0.032	0.042	0.19	0.012	0.000	0.004	10/19/2007 22:30	10/20/2007 1:00	2.5
3	10/24/2007 17:30	10/25/2007 6:45	13.25	0.008	0.43	0.019	0.081	0.095	0.04	0.010	-0.003	0.008	10/24/2007 17:45	10/25/2007 6:30	12.75
4	10/26/2007 13:15	10/27/2007 18:00	28.75	0.036	2.56	0.014	0.076	0.089	0.22	0.021	-0.004	0.015	10/26/2007 13:15	10/27/2007 12:45	23.5
5	11/15/2007 6:45	11/15/2007 21:45	15	0.023	0.51	0.045	0.099	0.117	0.12	0.030	0.001	0.016	11/15/2007 7:15	11/15/2007 15:00	7.75
		Average:	14.7	0.016	0.88	0.021	0.066	0.081	0.17	0.020	0.000	0.011			10.9
		Maximum Value:	29	0.036	2.56	0.045	0.099	0.117	0.29	0.030	0.004	0.016			23.5
		Minimum Value:	8.0	0.007	0.43	0.014	0.032	0.042	0.04	0.010	-0.004	0.004			2.50
		Standard Deviation:	8.4	0.013	0.93	0.013	0.028	0.029	0.10	0.009	0.003	0.005			7.9
		Weighted Mean R-Value*:				0.018									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_7 Springfield Township

Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 13 acres Tributary Service Population: 110

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	3/12/2010 9:00	3/16/2010 19:45	106.75	0.059	4.35	0.014	0.052	0.056	0.17	0.009	0.002	0.003	3/12/2010 9:00	3/15/2010 20:45	83.75
2	3/22/2010 7:45	3/24/2010 1:45	42	0.014	1.07	0.013	0.017	0.025	0.10	0.008	0.002	0.002	3/22/2010 8:00	3/23/2010 13:45	29.75
3	3/28/2010 21:00	3/30/2010 6:30	33.5	0.008	1.76	0.005	0.013	0.017	0.13	0.006	0.002	0.002	3/28/2010 21:00	3/29/2010 19:45	22.75
4	3/30/2010 10:00	3/31/2010 18:45	32.75	0.006	1.54	0.004	0.014	0.019	0.07	0.006	0.002	0.002	3/30/2010 10:15	3/31/2010 4:30	18.25
5	4/8/2010 22:15	4/9/2010 18:30	20.25	0.007	0.51	0.015	0.011	0.015	0.06	0.007	0.002	0.002	4/8/2010 22:15	4/9/2010 6:15	8
6	5/3/2010 3:45	5/4/2010 1:00	21.25	0.003	0.85	0.003	0.008	0.015	0.17	0.006	0.002	0.003	5/3/2010 3:45	5/3/2010 10:15	6.5
		Average:	42.8	0.016	1.68	0.009	0.019	0.025	0.12	0.007	0.002	0.002			28.2
		Maximum Value:	107	0.059	4.35	0.015	0.052	0.056	0.17	0.009	0.002	0.003			83.8
		Minimum Value:	20.3	0.003	0.51	0.003	0.008	0.015	0.06	0.006	0.002	0.002			6.50
		Standard Deviation:	32.4	0.021	1.39	0.005	0.016	0.016	0.05	0.001	0.000	0.001			28.6
		Weighted Mean R-Value*:				0.010									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_7 Springfield Township

Stenton Avenue

Pipe Size: 12" dia. Tributary Drainage Area: 13 acres Tributary Service Population: 110

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	2/26/2013 19:15	2/28/2013 17:15	46	0.019	0.69	0.028	0.041	0.049	0.07	0.009	0.003	0.003	2/26/2013 19:15	2/28/2013 8:45	37.5
2	3/12/2013 3:00	3/13/2013 16:45	37.75	0.009	1.05	0.009	0.013	0.021	0.06	0.007	0.001	0.003	3/12/2013 3:00	3/13/2013 16:45	37.75
3	3/18/2013 17:45	3/19/2013 5:45	12	0.004	0.83	0.005	0.027	0.033	0.06	0.006	0.001	0.002	3/18/2013 17:45	3/19/2013 3:15	9.5
4	3/25/2013 5:15	3/26/2013 1:30	20.25	0.005	0.63	0.008	0.018	0.028	0.05	0.010	0.004	0.004	3/25/2013 5:15	3/25/2013 20:30	15.25
5	4/10/2013 19:45	4/11/2013 5:30	9.75	0.002	0.56	0.004	0.033	0.039	0.18	0.006	0.002	0.002	4/10/2013 20:15	4/10/2013 23:45	3.5
6	4/12/2013 7:00	4/13/2013 5:45	22.75	0.009	0.92	0.010	0.026	0.034	0.15	0.009	0.003	0.003	4/12/2013 7:15	4/12/2013 23:15	16
7	4/19/2013 21:30	4/20/2013 8:00	10.5	0.003	0.57	0.005	0.007	0.010	0.06	0.004	0.000	0.002	4/19/2013 21:30	4/20/2013 2:45	5.25
8	4/28/2013 22:30	4/30/2013 1:30	27	0.005	0.55	0.010	0.034	0.039	0.03	0.007	0.002	0.003	4/28/2013 22:30	4/30/2013 1:15	26.75
9	5/7/2013 22:00	5/8/2013 22:30	24.5	0.003	0.59	0.005	0.022	0.026	0.20	0.005	0.001	0.003	5/7/2013 22:15	5/8/2013 13:15	15
10	5/9/2013 3:00	5/9/2013 16:15	13.25	0.004	0.50	0.007	0.024	0.030	0.09	0.007	0.002	0.003	5/9/2013 3:00	5/9/2013 13:00	10
11	5/10/2013 22:00	5/11/2013 8:30	10.5	0.004	1.14	0.003	0.025	0.030	0.12	0.007	0.002	0.002	5/10/2013 22:30	5/11/2013 7:15	8.75
		Average:	21.3	0.006	0.73	0.008	0.025	0.031	0.10	0.007	0.002	0.003			16.8
		Maximum Value:	46.0	0.019	1.14	0.028	0.041	0.049	0.20	0.010	0.004	0.004			37.8
		Minimum Value:	9.8	0.002	0.50	0.003	0.007	0.010	0.03	0.004	0.000	0.002			3.50
		Standard Deviation:	12.0	0.005	0.22	0.007	0.010	0.010	0.06	0.002	0.001	0.001			12.0
		Weighted Mean R-Value*:				0.008									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_8 Springfield Township

Ridge Avenue

Pipe Size: 10" dia. Tributary Drainage Area: 5 acres Tributary Service Population: 11

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	2/22/2010 20:00	2/24/2010 7:00	35	0.102	1.35	0.076	0.030	0.101	0.06	0.066	0.044	0.013	2/22/2010 20:00	2/23/2010 22:00	26
2	3/12/2010 9:15	3/14/2010 22:45	61.5	0.083	3.75	0.022	0.036	0.091	0.18	0.057	0.036	0.017	3/12/2010 9:30	3/14/2010 22:45	61.25
3	3/28/2010 20:45	3/30/2010 0:45	28	0.030	1.71	0.018	0.043	0.098	0.13	0.048	0.030	0.014	3/28/2010 20:45	3/29/2010 19:45	23
4	3/30/2010 7:00	3/31/2010 20:45	37.75	0.134	1.49	0.090	0.046	0.098	0.07	0.061	0.030	0.019	3/30/2010 7:15	3/31/2010 3:15	20
5	4/24/2010 23:30	4/27/2010 11:30	60	0.109	1.28	0.085	0.042	0.092	0.06	0.055	0.034	0.015	4/24/2010 23:45	4/27/2010 1:30	49.75
		Average:	44.5	0.092	1.91	0.058	0.039	0.096	0.10	0.057	0.035	0.016			36.0
		Maximum Value:	61.5	0.134	3.75	0.090	0.046	0.101	0.18	0.066	0.044	0.019			61.3
		Minimum Value:	28.0	0.030	1.28	0.018	0.030	0.091	0.06	0.048	0.030	0.013			20.0
		Standard Deviation:	15.3	0.039	1.04	0.035	0.006	0.004	0.05	0.007	0.006	0.002			18.4
		Weighted Mean R-Value*:				0.048									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MS_8 Springfield Township

Ridge Avenue

Pipe Size: 10" dia. Tributary Drainage Area: 5 acres Tributary Service Population: 11

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	3/12/2013 3:00	3/13/2013 2:30	23.5	0.075	1.00	0.076	0.038	0.114	0.07	0.077	0.047	0.019	3/12/2013 3:00	3/12/2013 16:30	13.5
2	3/18/2013 17:30	3/19/2013 6:00	12.5	0.037	0.76	0.049	0.045	0.102	0.06	0.072	0.051	0.011	3/18/2013 17:45	3/19/2013 3:00	9.25
3	3/25/2013 5:45	3/25/2013 17:45	12	0.034	0.51	0.067	0.040	0.114	0.04	0.084	0.049	0.027	3/25/2013 5:45	3/25/2013 15:30	9.75
4	4/10/2013 19:45	4/11/2013 0:15	4.5	0.007	0.59	0.012	0.030	0.095	0.19	0.063	0.043	0.015	4/10/2013 20:15	4/10/2013 23:45	3.5
5	4/12/2013 7:00	4/13/2013 4:30	21.5	0.025	0.94	0.026	0.040	0.101	0.14	0.067	0.043	0.020	4/12/2013 7:15	4/12/2013 23:15	16
6	4/19/2013 20:45	4/20/2013 8:30	11.75	0.065	0.58	0.112	0.042	0.106	0.06	0.077	0.048	0.011	4/19/2013 20:45	4/20/2013 3:00	6.25
7	4/28/2013 22:15	4/29/2013 22:00	23.75	0.034	0.49	0.070	0.037	0.111	0.04	0.067	0.044	0.019	4/28/2013 22:30	4/29/2013 22:00	23.5
8	5/7/2013 14:15	5/9/2013 15:30	49.25	0.088	1.34	0.066	0.051	0.133	0.16	0.078	0.053	0.019	5/7/2013 14:15	5/9/2013 6:45	40.5
9	5/10/2013 22:15	5/11/2013 16:00	17.75	0.072	1.23	0.059	0.053	0.134	0.17	0.082	0.051	0.018	5/10/2013 22:15	5/11/2013 7:15	9
		Average:	19.6	0.049	0.83	0.060	0.042	0.112	0.10	0.074	0.048	0.018			14.6
		Maximum Value:	49.3	0.088	1.34	0.112	0.053	0.134	0.19	0.084	0.053	0.027			40.5
		Minimum Value:	4.5	0.007	0.49	0.012	0.030	0.095	0.04	0.063	0.043	0.011			3.50
		Standard Deviation:	12.8	0.027	0.32	0.029	0.007	0.014	0.06	0.007	0.004	0.005			11.3
		Weighted Mean R-Value*:				0.059									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2011 19:15	1/13/2011 22:45	51.5	0.003	0.51	0.007	1.34	10.5	0.05	8.30	4.69	3.27	1/11/2011 19:15	1/12/2011 2:00	6.75
2	1/17/2011 21:15	1/23/2011 23:30	146.25	0.035	1.04	0.034	5.49	13.6	0.05	9.59	5.09	3.30	1/17/2011 21:30	1/21/2011 13:45	88.25
3	1/26/2011 4:45	1/30/2011 23:45	115	0.015	1.57	0.009	3.55	12.9	0.06	9.53	5.51	3.38	1/26/2011 5:00	1/29/2011 15:30	82.5
4	2/1/2011 23:15	2/10/2011 22:15	215	0.059	1.15	0.051	4.33	14.3	0.06	10.6	6.00	3.24	2/1/2011 23:15	2/8/2011 5:15	150
5	2/24/2011 19:15	3/2/2011 23:15	148	0.036	1.28	0.028	6.20	14.1	0.15	10.6	6.08	3.31	2/24/2011 19:15	2/28/2011 21:15	98
6	3/6/2011 6:15	3/10/2011 0:00	89.75	0.039	1.79	0.022	8.27	17.3	0.17	11.9	6.28	3.40	3/6/2011 6:45	3/7/2011 1:45	19
7	3/10/2011 1:15	3/15/2011 10:00	128.75	0.040	1.78	0.023	7.24	15.2	0.07	12.0	7.19	3.21	3/10/2011 1:15	3/11/2011 2:30	25.25
8	3/16/2011 0:00	3/19/2011 11:30	83.5	0.008	0.59	0.014	2.15	13.6	0.09	11.2	7.74	3.00	3/16/2011 0:00	3/16/2011 6:15	6.25
9	3/21/2011 2:15	3/22/2011 23:45	45.5	0.005	0.38	0.012	2.58	13.5	0.06	11.1	7.39	3.22	3/21/2011 2:30	3/21/2011 10:45	8.25
10	3/23/2011 6:00	3/25/2011 0:15	42.25	0.005	0.30	0.018	1.96	13.2	0.05	11.5	7.35	3.48	3/23/2011 6:00	3/24/2011 6:30	24.5
11	3/31/2011 16:15	4/2/2011 20:15	52	0.006	0.37	0.017	2.20	13.4	0.02	10.8	6.79	3.37	3/31/2011 16:15	4/1/2011 17:30	25.25
12	4/5/2011 6:15	4/5/2011 23:15	17	0.003	0.24	0.011	2.56	12.4	0.09	11.3	6.53	3.95	4/5/2011 6:30	4/5/2011 14:00	7.5
13	4/8/2011 10:00	4/11/2011 0:30	62.5	0.008	0.74	0.011	2.98	13.6	0.03	10.6	6.32	3.59	4/8/2011 10:15	4/8/2011 21:30	11.25
14	4/12/2011 10:15	4/15/2011 0:15	62	0.012	0.91	0.013	5.04	13.6	0.09	11.1	6.86	3.35	4/12/2011 10:15	4/13/2011 17:45	31.5
15	4/16/2011 12:00	4/22/2011 6:00	138	0.038	2.57	0.015	8.24	19.2	0.29	11.9	7.20	3.29	4/16/2011 12:00	4/20/2011 0:30	84.5
16	4/23/2011 1:30	4/24/2011 10:30	33	0.003	0.49	0.007	2.36	12.6	0.05	10.7	7.34	2.89	4/23/2011 1:30	4/24/2011 1:00	23.5
17	4/28/2011 12:30	4/29/2011 0:00	11.5	0.001	0.24	0.006	1.96	12.7	0.11	11.9	7.38	3.90	4/28/2011 12:30	4/28/2011 17:45	5.25
18	5/4/2011 5:00	5/5/2011 12:45	31.75	0.004	0.47	0.009	2.53	12.9	0.04	10.7	6.82	3.24	5/4/2011 5:00	5/4/2011 14:00	9
19	5/14/2011 23:15	5/16/2011 8:30	33.25	0.006	1.19	0.005	4.47	13.7	0.24	10.7	6.81	2.98	5/14/2011 23:30	5/16/2011 2:00	26.5
20	5/17/2011 4:45	5/19/2011 9:15	52.5	0.008	0.63	0.012	3.99	13.6	0.08	10.7	6.83	3.11	5/17/2011 5:00	5/18/2011 19:30	38.5
21	5/19/2011 15:30	5/21/2011 12:45	45.25	0.007	1.06	0.007	3.04	13.9	0.38	10.7	6.85	3.08	5/19/2011 15:30	5/20/2011 20:45	29.25
22	6/9/2011 20:00	6/10/2011 19:45	23.75	0.003	0.29	0.009	3.26	13.7	0.16	9.33	5.60	3.17	6/9/2011 20:00	6/9/2011 20:45	0.75
23	6/11/2011 14:15	6/14/2011 0:00	57.75	0.009	0.54	0.017	5.63	12.7	0.13	9.87	5.53	3.56	6/11/2011 14:15	6/12/2011 2:15	12
24	6/14/2011 17:15	6/15/2011 13:00	19.75	0.003	0.18	0.017	3.50	13.4	0.06	9.32	5.42	3.13	6/14/2011 17:15	6/14/2011 19:45	2.5
25	6/16/2011 21:30	6/19/2011 12:30	63	0.012	1.51	0.008	7.30	13.6	0.29	9.45	5.37	3.14	6/16/2011 21:30	6/17/2011 14:30	17
26	6/22/2011 3:30	6/23/2011 0:00	20.5	0.002	0.19	0.008	2.13	12.5	0.07	9.31	5.48	3.44	6/22/2011 3:30	6/22/2011 8:15	4.75
27	6/28/2011 11:00	6/29/2011 0:15	13.25	0.001	0.24	0.006	2.44	11.8	0.09	9.64	5.15	3.92	6/28/2011 11:00	6/28/2011 13:30	2.5
28	7/8/2011 13:30	7/10/2011 10:45	45.25	0.015	1.46	0.010	16.2	24.6	0.35	9.87	5.10	3.14	7/8/2011 13:30	7/8/2011 20:30	7
29	7/25/2011 15:15	7/27/2011 9:30	42.25	0.007	0.88	0.008	8.29	17.5	0.29	8.37	4.49	3.06	7/25/2011 15:30	7/25/2011 20:45	5.25
30	8/3/2011 14:30	8/4/2011 20:30	30	0.008	0.90	0.009	7.60	15.3	0.21	8.64	4.10	3.27	8/3/2011 14:45	8/4/2011 7:30	16.75
31	8/9/2011 12:00	8/11/2011 20:30	56.5	0.019	2.21	0.009	18.8	26.4	0.59	9.13	4.15	3.25	8/9/2011 12:00	8/9/2011 19:15	7.25
32	8/14/2011 1:00	8/18/2011 0:00	95	0.076	4.38	0.017	22.3	32.1	0.21	12.2	4.97	3.26	8/14/2011 1:15	8/16/2011 12:30	59.25
33	8/18/2011 6:15	8/21/2011 11:15	77	0.041	2.55	0.016	17.8	27.8	0.44	11.5	5.64	3.24	8/18/2011 6:30	8/19/2011 20:45	38.25
34	8/21/2011 14:30	8/25/2011 0:15	81.75	0.027	1.36	0.020	11.1	21.4	0.35	10.8	5.80	3.35	8/21/2011 14:45	8/21/2011 21:45	7
35	8/25/2011 10:15	8/26/2011 21:00	34.75	0.008	0.65	0.013	4.40	14.2	0.21	10.7	6.07	3.38	8/25/2011 10:15	8/25/2011 20:30	10.25

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
36	8/27/2011 11:45	9/3/2011 12:00	168.25	0.172	6.01	0.029	28.2	36.0	0.35	15.2	6.84	3.27	8/27/2011 11:45	8/28/2011 12:15	24.5
37	9/5/2011 3:15	9/17/2011 11:30	296.25	0.305	8.36	0.037	30.2	38.2	0.55	16.6	8.23	3.21	9/5/2011 3:30	9/15/2011 16:45	253.25
38	9/23/2011 9:30	9/26/2011 23:45	86.25	0.038	1.85	0.021	12.7	26.6	0.26	14.9	9.18	3.48	9/23/2011 9:30	9/24/2011 0:30	15
39	9/27/2011 22:30	10/10/2011 11:30	301	0.062	1.38	0.045	5.60	17.9	0.09	12.8	8.50	3.25	9/27/2011 22:45	10/4/2011 7:45	153
40	10/12/2011 19:00	10/13/2011 9:15	14.25	0.002	0.16	0.014	2.40	14.3	0.06	11.1	7.55	2.73	10/12/2011 19:15	10/13/2011 2:45	7.5
41	10/13/2011 21:15	10/15/2011 12:30	39.25	0.005	0.39	0.013	3.64	13.9	0.18	11.0	7.47	2.95	10/13/2011 21:30	10/14/2011 17:15	19.75
42	10/19/2011 4:45	10/21/2011 20:15	63.5	0.020	0.76	0.027	8.87	20.7	0.14	11.9	7.11	3.25	10/19/2011 5:00	10/20/2011 4:45	23.75
43	10/27/2011 5:15	10/28/2011 9:45	28.5	0.003	0.24	0.013	2.88	14.0	0.02	10.4	6.74	3.15	10/27/2011 5:30	10/27/2011 19:30	14
44	10/29/2011 3:15	11/2/2011 23:15	116	0.051	1.22	0.042	9.52	22.0	0.08	12.4	6.85	3.33	10/29/2011 3:30	10/29/2011 22:00	18.5
45	11/16/2011 1:30	11/17/2011 22:30	45	0.009	0.64	0.015	3.77	14.3	0.07	11.1	6.95	3.16	11/16/2011 1:30	11/17/2011 0:00	22.5
46	11/22/2011 3:45	11/26/2011 20:30	112.75	0.074	2.13	0.035	15.0	22.4	0.14	13.6	6.97	3.33	11/22/2011 3:45	11/23/2011 15:00	35.25
47	11/29/2011 5:45	12/1/2011 22:30	64.75	0.004	0.67	0.006	2.72	15.1	0.06	11.3	7.70	3.34	11/29/2011 5:45	11/29/2011 20:30	14.75
48	12/6/2011 14:00	12/12/2011 9:00	139	0.051	2.59	0.020	7.20	17.9	0.18	13.0	7.94	3.24	12/6/2011 14:00	12/8/2011 1:30	35.5
49	12/22/2011 21:00	12/25/2011 17:45	68.75	0.032	1.29	0.025	14.7	23.7	0.14	13.4	7.82	3.33	12/22/2011 21:15	12/23/2011 5:30	8.25
50	12/27/2011 12:45	12/29/2011 20:15	55.5	0.015	0.71	0.021	10.6	22.9	0.16	12.6	8.04	3.24	12/27/2011 12:45	12/27/2011 19:15	6.5
		Average:	77.3	0.028	1.30	0.017	7.43	17.3	0.16	11.1	6.52	3.28			32.9
		Maximum Value:	301.0	0.305	8.36	0.051	30.2	38.2	0.59	16.6	9.18	3.95			253.3
		Minimum Value:	11.5	0.001	0.16	0.005	1.34	10.5	0.02	8.30	4.10	2.73			0.75
		Standard Deviation:	63.9	0.050	1.48	0.011	6.70	6.36	0.14	1.68	1.16	0.23			46.6
		Weighted Mean R-Value*:				0.022									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

										<--------EVENT AVERAGE-------->					
Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1/11/2012 19:15	1/14/2012 19:45	72.5	0.032	1.48	0.022	16.1	25.4	0.11	12.9	7.52	3.17	1/11/2012 19:15	1/13/2012 8:15	37
2	1/16/2012 22:30	1/18/2012 10:30	36	0.007	0.33	0.020	3.57	14.8	0.03	11.2	7.41	2.82	1/16/2012 22:30	1/17/2012 14:15	15.75
3	1/21/2012 1:45	1/21/2012 21:30	19.75	0.003	0.37	0.008	1.62	14.1	0.03	11.4	7.33	3.35	1/21/2012 2:00	1/21/2012 13:15	11.25
4	1/23/2012 7:15	1/25/2012 9:15	50	0.016	0.30	0.054	6.90	17.8	0.05	12.5	7.78	3.12	1/23/2012 7:30	1/23/2012 17:45	10.25
5	1/27/2012 5:45	1/28/2012 20:15	38.5	0.009	0.46	0.020	5.76	17.8	0.10	12.5	7.90	3.44	1/27/2012 5:45	1/27/2012 11:15	5.5
6	2/24/2012 2:45	2/25/2012 14:15	35.5	0.005	0.25	0.018	3.93	12.7	0.06	9.78	6.18	2.95	2/24/2012 2:45	2/25/2012 11:00	32.25
7	2/29/2012 10:00	3/2/2012 10:15	48.25	0.019	1.13	0.017	9.58	18.6	0.06	11.0	5.91	3.09	2/29/2012 10:15	3/1/2012 1:15	15
8	3/2/2012 19:00	3/6/2012 9:30	86.5	0.015	0.32	0.047	4.57	13.9	0.03	10.2	6.18	3.17	3/2/2012 19:15	3/3/2012 9:30	14.25
9	3/31/2012 0:30	3/31/2012 13:15	12.75	0.003	0.34	0.008	6.07	12.1	0.08	9.16	5.80	2.32	3/31/2012 0:45	3/31/2012 3:45	3
10	4/1/2012 18:15	4/2/2012 22:00	27.75	0.003	0.17	0.016	2.72	11.9	0.02	9.53	5.76	3.28	4/1/2012 18:45	4/2/2012 2:30	7.75
11	4/22/2012 8:15	4/26/2012 9:30	97.25	0.037	2.12	0.018	13.9	23.9	0.12	10.4	5.23	3.22	4/22/2012 8:15	4/26/2012 9:15	97
12	5/3/2012 2:15	5/4/2012 0:00	21.75	0.004	0.23	0.016	3.55	11.5	0.04	9.11	5.06	3.20	5/3/2012 2:15	5/3/2012 5:15	3
13	5/9/2012 4:30	5/11/2012 19:30	63	0.014	0.56	0.025	5.68	12.8	0.08	9.12	4.89	3.12	5/9/2012 4:30	5/10/2012 3:45	23.25
14	5/15/2012 8:15	5/19/2012 12:00	99.75	0.031	1.53	0.020	13.6	18.7	0.18	9.69	5.07	3.08	5/15/2012 8:15	5/16/2012 4:00	19.75
15	5/24/2012 13:45	5/25/2012 20:00	30.25	0.005	0.35	0.015	3.74	12.0	0.18	8.97	4.93	3.14	5/24/2012 14:00	5/24/2012 21:45	7.75
16	6/1/2012 19:15	6/2/2012 13:15	18	0.006	0.67	0.009	5.43	14.1	0.20	9.48	5.05	2.84	6/1/2012 19:15	6/2/2012 2:15	7
17	6/3/2012 19:30	6/4/2012 1:00	5.5	0.002	0.20	0.009	3.59	13.2	0.17	10.6	4.90	4.07	6/3/2012 19:45	6/3/2012 20:00	0.25
18	6/12/2012 8:45	6/14/2012 12:00	51.25	0.015	1.06	0.014	8.75	18.0	0.07	9.75	5.13	3.17	6/12/2012 8:45	6/12/2012 23:00	14.25
19	6/22/2012 17:00	6/23/2012 12:30	19.5	0.019	1.84	0.010	24.4	33.7	0.65	12.9	5.24	2.80	6/22/2012 17:00	6/22/2012 22:15	5.25
20	7/14/2012 3:45	7/14/2012 18:00	14.25	0.004	0.49	0.008	5.89	14.4	0.04	9.55	4.67	3.46	7/14/2012 3:45	7/14/2012 12:45	9
21	7/15/2012 21:30	7/17/2012 0:15	26.75	0.006	0.44	0.013	5.68	13.6	0.09	8.98	4.75	3.17	7/15/2012 21:30	7/16/2012 0:00	2.5
22	7/19/2012 23:30	7/21/2012 11:15	35.75	0.008	0.64	0.012	5.74	13.8	0.13	8.28	4.59	2.59	7/19/2012 23:45	7/20/2012 8:15	8.5
23	7/26/2012 19:45	7/27/2012 19:45	24	0.003	0.28	0.010	3.08	12.3	0.12	8.44	4.82	3.05	7/26/2012 20:00	7/27/2012 0:45	4.75
24	7/28/2012 16:45	7/29/2012 9:15	16.5	0.002	0.50	0.005	3.67	13.0	0.22	8.12	4.86	2.51	7/28/2012 17:00	7/28/2012 22:00	5
25	8/5/2012 18:15	8/6/2012 7:15	13	0.002	0.26	0.008	3.52	12.5	0.08	7.69	4.40	2.51	8/5/2012 18:30	8/6/2012 2:15	7.75
26	8/10/2012 9:30	8/11/2012 10:45	25.25	0.008	1.05	0.008	10.3	18.8	0.37	8.93	4.50	2.87	8/10/2012 9:30	8/10/2012 18:15	8.75
27	8/11/2012 17:15	8/12/2012 10:45	17.5	0.002	0.31	0.006	1.40	10.6	0.09	7.64	4.46	2.62	8/11/2012 17:15	8/12/2012 0:45	7.5
28	8/14/2012 9:15	8/15/2012 7:30	22.25	0.005	0.50	0.010	4.62	12.1	0.14	8.45	4.36	2.97	8/14/2012 9:45	8/15/2012 2:45	17
29	8/15/2012 15:15	8/16/2012 7:45	16.5	0.004	0.39	0.011	4.68	12.5	0.22	8.41	4.47	2.61	8/15/2012 15:30	8/15/2012 18:00	2.5
30	8/17/2012 21:30	8/18/2012 14:30	17	0.008	0.77	0.010	7.35	12.9	0.14	9.69	4.65	2.83	8/17/2012 21:30	8/18/2012 6:45	9.25
31	8/27/2012 7:00	8/28/2012 22:45	39.75	0.009	0.84	0.011	9.40	18.5	0.26	8.83	4.22	3.43	8/27/2012 7:15	8/28/2012 7:30	24.25
32	9/3/2012 7:45	9/7/2012 11:15	99.5	0.034	2.04	0.017	11.3	19.2	0.18	9.41	4.45	3.23	9/3/2012 8:00	9/6/2012 11:00	75
33	9/8/2012 16:30	9/9/2012 14:00	21.5	0.004	0.44	0.008	3.14	12.5	0.10	8.80	4.79	3.17	9/8/2012 16:45	9/8/2012 22:30	5.75
34	9/18/2012 2:00	9/20/2012 0:15	46.25	0.012	1.31	0.009	8.90	18.1	0.26	9.01	4.64	3.12	9/18/2012 2:00	9/19/2012 1:45	23.75
35	9/22/2012 19:00	9/23/2012 23:15	28.25	0.009	0.75	0.011	8.16	17.5	0.24	9.76	4.68	3.56	9/22/2012 19:15	9/22/2012 21:30	2.25

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	Observed Flow (mgd) (EVENT AVERAGE)	GWI Flow (mgd) (EVENT AVERAGE)	Base Wastewater Flow (mgd) (EVENT AVERAGE)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	9/27/2012 6:00	9/27/2012 11:00	5	0.002	0.15	0.012	4.51	12.0	0.04	10.2	4.64	3.75	9/27/2012 6:00	9/27/2012 7:30	1.5
37	10/2/2012 10:00	10/3/2012 0:00	14	0.002	0.19	0.010	2.58	10.5	0.06	8.96	4.39	3.89	10/2/2012 10:15	10/2/2012 14:15	4
38	10/7/2012 10:30	10/8/2012 9:00	22.5	0.002	0.23	0.010	2.54	11.6	0.03	8.33	4.23	3.59	10/7/2012 10:30	10/7/2012 21:00	10.5
39	10/9/2012 4:15	10/9/2012 9:15	5	0.001	0.11	0.010	2.35	10.1	0.02	7.63	4.35	2.17	10/9/2012 4:30	10/9/2012 8:45	4.25
40	10/15/2012 10:45	10/16/2012 10:00	23.25	0.003	0.32	0.010	4.18	12.0	0.07	8.08	4.36	3.03	10/15/2012 11:00	10/15/2012 20:45	9.75
41	10/19/2012 1:30	10/20/2012 12:45	35.25	0.005	0.77	0.006	3.64	11.6	0.16	7.62	4.16	2.76	10/19/2012 1:30	10/20/2012 0:00	22.5
42	11/7/2012 11:45	11/8/2012 9:30	21.75	0.006	0.37	0.017	3.83	13.1	0.02	9.24	4.86	2.93	11/7/2012 11:45	11/8/2012 1:30	13.75
43	11/13/2012 2:30	11/13/2012 23:00	20.5	0.003	0.23	0.013	2.20	11.6	0.08	8.70	4.78	3.20	11/13/2012 2:45	11/13/2012 11:45	9
44	11/27/2012 5:45	11/28/2012 9:00	27.25	0.006	0.58	0.010	4.12	12.1	0.02	8.89	4.76	3.05	11/27/2012 5:45	11/27/2012 15:45	10
45	12/7/2012 21:30	12/8/2012 13:45	16.25	0.003	0.18	0.018	4.60	11.3	0.06	7.98	4.23	2.72	12/7/2012 21:30	12/8/2012 1:30	4
46	12/9/2012 6:30	12/10/2012 23:00	40.5	0.007	0.30	0.022	2.93	13.1	0.03	8.70	4.26	3.61	12/9/2012 6:30	12/10/2012 2:00	19.5
47	12/18/2012 0:30	12/18/2012 22:30	22	0.004	0.26	0.014	5.34	11.2	0.07	8.31	4.47	3.03	12/18/2012 0:30	12/18/2012 15:00	14.5
48	12/20/2012 20:45	12/23/2012 14:00	65.25	0.042	2.14	0.020	25.0	30.6	0.15	11.3	4.95	3.11	12/20/2012 20:45	12/21/2012 23:30	26.75
49	12/26/2012 12:30	12/28/2012 20:45	56.25	0.030	1.25	0.024	15.3	25.1	0.10	11.2	5.41	3.15	12/26/2012 12:45	12/27/2012 9:15	20.5
50	1/11/2013 16:00	1/12/2013 19:30	27.5	0.003	0.37	0.009	3.60	13.4	0.06	9.20	5.25	3.37	1/11/2013 16:15	1/11/2013 20:45	4.5
51	1/14/2013 20:15	1/18/2013 20:30	96.25	0.036	1.33	0.027	13.6	19.2	0.06	10.3	5.37	3.08	1/14/2013 20:15	1/18/2013 5:45	81.5
52	1/30/2013 17:00	2/2/2013 20:00	75	0.028	1.43	0.020	16.6	22.2	0.28	10.9	5.78	3.19	1/30/2013 17:00	2/1/2013 10:15	41.25
53	2/8/2013 5:30	2/9/2013 20:15	38.75	0.006	0.37	0.017	2.04	13.3	0.02	10.1	5.92	3.43	2/8/2013 5:45	2/9/2013 1:15	19.5
54	2/11/2013 3:45	2/13/2013 1:00	45.25	0.011	0.40	0.027	4.64	15.3	0.05	10.3	5.92	3.22	2/11/2013 4:00	2/11/2013 8:45	4.75
55	2/13/2013 18:15	2/14/2013 21:00	26.75	0.004	0.21	0.018	2.08	11.8	0.02	9.94	6.03	3.20	2/13/2013 18:30	2/14/2013 0:00	5.5
56	2/19/2013 11:00	2/20/2013 0:30	13.5	0.003	0.22	0.012	2.34	11.5	0.02	10.3	5.59	3.81	2/19/2013 11:00	2/19/2013 17:30	6.5
57	2/26/2013 19:00	2/28/2013 13:30	42.5	0.011	0.62	0.017	5.90	14.7	0.06	10.0	5.70	3.04	2/26/2013 19:15	2/28/2013 8:30	37.25
58	3/12/2013 3:00	3/14/2013 9:30	54.5	0.018	0.97	0.019	9.76	18.9	0.07	10.5	5.89	2.94	3/12/2013 3:00	3/13/2013 16:45	37.75
59	3/18/2013 17:45	3/21/2013 0:45	55	0.017	0.80	0.021	6.15	15.7	0.05	11.0	6.24	3.20	3/18/2013 17:45	3/20/2013 21:15	51.5
60	3/25/2013 5:30	3/27/2013 0:00	42.5	0.012	0.50	0.024	4.25	14.4	0.05	11.3	6.55	3.36	3/25/2013 5:45	3/26/2013 20:30	38.75
		Average:	36.5	0.011	0.65	0.015	6.57	15.3	0.11	9.65	5.24	3.11			17.4
		Maximum Value:	99.8	0.042	2.14	0.054	25.0	33.7	0.65	12.9	7.90	4.07			97.0
		Minimum Value:	5.0	0.001	0.11	0.005	1.40	10.1	0.02	7.62	4.16	2.17			0.25
		Standard Deviation:	24.3	0.010	0.53	0.009	5.07	4.81	0.11	1.31	0.938	0.360			19.4
		Weighted Mean R-Value*:				0.016									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

										<--------EVENT AVERAGE-------->					
Event	**Event Start**	**Event End**	**Duration (hours)**	**I/I Volume (In.)**	**Rain Volume (In.)**	**Total R-value (ratio)**	**Peak I/I Flow (mgd)**	**Peak Total Flow (mgd)**	**Event Peak Rainfall (In./15 min)**	**Observed Flow (mgd)**	**GWI Flow (mgd)**	**Base Wastewater Flow (mgd)**	**Rainfall Start Date**	**Rainfall End Date**	**Rainfall Duration (hours)**
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
1	4/10/2013 20:30	4/11/2013 15:00	18.5	0.003	0.40	0.007	2.51	9.54	0.21	6.76	4.16	1.84	4/10/2013 20:45	4/10/2013 23:45	3
2	4/12/2013 7:00	4/13/2013 20:15	37.25	0.005	1.05	0.005	3.87	10.3	0.14	7.03	4.15	2.14	4/12/2013 7:15	4/12/2013 23:15	16
3	4/19/2013 21:15	4/20/2013 21:45	24.5	0.004	0.64	0.007	3.15	8.10	0.08	6.78	3.86	2.04	4/19/2013 21:30	4/20/2013 3:00	5.5
4	4/29/2013 2:45	4/30/2013 0:30	21.75	0.005	0.48	0.010	2.44	8.38	0.04	6.75	3.56	2.03	4/29/2013 2:45	4/29/2013 22:15	19.5
5	5/7/2013 21:45	5/10/2013 0:45	51	0.009	1.07	0.009	4.65	9.54	0.10	6.53	3.66	1.96	5/7/2013 21:45	5/9/2013 6:15	32.5
6	5/10/2013 22:15	5/13/2013 23:45	73.5	0.016	1.23	0.013	6.80	11.5	0.17	6.87	3.79	2.01	5/10/2013 22:15	5/12/2013 6:00	31.75
7	5/18/2013 20:15	5/20/2013 0:00	27.75	0.003	0.30	0.010	1.55	8.23	0.06	6.57	3.91	2.12	5/18/2013 20:15	5/19/2013 20:30	24.25
8	5/23/2013 14:45	5/24/2013 22:00	31.25	0.006	0.98	0.006	3.34	9.05	0.33	6.62	3.68	2.02	5/23/2013 14:45	5/24/2013 15:15	24.5
9	5/28/2013 9:15	5/29/2013 0:00	14.75	0.002	0.23	0.009	1.60	7.48	0.02	6.86	3.68	2.50	5/28/2013 9:30	5/28/2013 19:15	9.75
10	6/2/2013 23:45	6/4/2013 1:00	25.25	0.004	1.02	0.004	3.10	9.01	0.26	6.27	3.64	1.93	6/2/2013 23:45	6/3/2013 17:45	18
11	6/6/2013 19:00	6/15/2013 16:15	213.25	0.061	6.25	0.010	7.86	12.3	0.59	7.56	4.17	1.95	6/6/2013 19:15	6/14/2013 17:00	189.75
12	6/18/2013 12:15	6/19/2013 16:00	27.75	0.004	0.82	0.005	2.63	9.50	0.18	7.53	4.84	1.97	6/18/2013 12:30	6/18/2013 20:30	8
13	6/26/2013 17:00	6/27/2013 0:15	7.25	0.001	0.27	0.003	2.51	9.35	0.11	7.63	4.60	2.55	6/26/2013 17:00	6/26/2013 21:00	4
14	7/1/2013 6:45	7/2/2013 0:00	17.25	0.003	0.21	0.012	2.21	8.75	0.04	7.47	4.28	2.45	7/1/2013 6:45	7/1/2013 14:15	7.5
15	7/23/2013 0:30	7/24/2013 10:15	33.75	0.009	1.27	0.007	13.9	18.7	0.31	7.19	4.08	1.73	7/23/2013 0:30	7/23/2013 17:45	17.25
16	7/28/2013 13:45	7/29/2013 7:45	18	0.002	0.37	0.006	1.85	7.85	0.06	6.23	3.76	1.90	7/28/2013 14:00	7/29/2013 2:15	12.25
17	8/1/2013 6:00	8/2/2013 20:00	38	0.010	1.06	0.009	7.74	14.1	0.12	7.33	4.02	2.05	8/1/2013 6:00	8/1/2013 16:45	10.75
18	8/7/2013 20:45	8/8/2013 7:30	10.75	0.001	0.21	0.005	1.71	7.47	0.11	5.79	3.95	1.32	8/7/2013 20:45	8/8/2013 2:45	6
19	8/9/2013 14:45	8/10/2013 17:45	27	0.003	0.33	0.010	5.40	11.3	0.13	6.53	3.94	1.99	8/9/2013 14:45	8/9/2013 17:15	2.5
20	8/13/2013 4:30	8/15/2013 6:30	50	0.016	1.82	0.009	13.6	20.4	0.48	7.58	4.15	1.87	8/13/2013 4:45	8/13/2013 9:45	5
21	8/28/2013 9:45	8/30/2013 6:15	44.5	0.009	1.20	0.008	9.41	15.5	0.41	6.73	3.80	1.91	8/28/2013 9:45	8/30/2013 3:15	41.5
22	9/2/2013 10:30	9/6/2013 20:15	105.75	0.035	2.27	0.015	14.4	21.6	0.52	7.47	3.79	2.02	9/2/2013 10:30	9/3/2013 3:30	17
23	9/13/2013 0:45	9/13/2013 20:00	19.25	0.003	0.53	0.006	4.30	8.50	0.23	6.44	3.82	1.74	9/13/2013 1:15	9/13/2013 8:15	7
24	9/21/2013 19:30	9/24/2013 1:30	54	0.013	1.32	0.010	8.54	13.1	0.29	6.75	3.49	2.03	9/21/2013 19:30	9/22/2013 3:30	8
25	10/7/2013 7:45	10/8/2013 0:00	16.25	0.003	0.46	0.006	2.96	8.59	0.14	6.93	3.60	2.49	10/7/2013 8:00	10/7/2013 16:45	8.75
26	10/10/2013 3:45	10/14/2013 0:00	92.25	0.026	2.16	0.012	12.1	16.3	0.39	7.11	3.70	2.02	10/10/2013 3:45	10/11/2013 19:15	39.5
27	11/26/2013 11:15	11/29/2013 22:00	82.75	0.045	3.08	0.015	15.5	18.9	0.16	8.23	3.50	2.01	11/26/2013 11:15	11/27/2013 17:15	30
28	12/6/2013 2:00	12/7/2013 22:00	44	0.012	0.95	0.012	3.68	9.72	0.06	7.07	3.78	1.96	12/6/2013 2:00	12/7/2013 2:15	24.25
29	12/8/2013 10:30	12/12/2013 1:45	87.25	0.027	1.35	0.020	6.75	13.1	0.05	7.69	4.05	2.07	12/8/2013 10:45	12/10/2013 16:45	54
30	12/14/2013 15:45	12/17/2013 1:00	57.25	0.018	0.77	0.023	6.05	12.1	0.09	8.19	4.54	2.08	12/14/2013 15:45	12/15/2013 0:30	8.75
31	12/23/2013 3:30	12/24/2013 7:45	28.25	0.009	0.58	0.015	4.57	11.6	0.09	7.90	4.59	1.73	12/23/2013 3:45	12/23/2013 20:00	16.25
32	12/29/2013 7:45	12/31/2013 7:15	47.5	0.011	1.20	0.010	7.40	15.1	0.09	7.77	4.55	2.02	12/29/2013 8:00	12/29/2013 16:00	8
33	1/5/2014 21:00	1/7/2014 21:30	48.5	0.009	0.63	0.014	3.01	10.7	0.12	7.84	5.01	1.94	1/5/2014 21:00	1/6/2014 13:00	16
34	1/10/2014 18:45	1/12/2014 10:00	39.25	0.004	0.76	0.006	2.13	9.93	0.09	7.47	5.13	1.80	1/10/2014 18:45	1/11/2014 17:45	23
35	2/3/2014 2:45	2/9/2014 10:30	151.75	0.029	2.72	0.011	3.33	10.2	0.10	7.47	4.62	1.89	2/3/2014 2:45	2/5/2014 12:00	57.25

MUD_1 Upper Darby Township

South 60th Street and Cobbs Creek Parkway

Pipe Size: 60" dia. Tributary Drainage Area: 7,668 acres Tributary Service Population: 100,393

Event	Event Start	Event End	Duration (hours)	I/I Volume (In.)	Rain Volume (In.)	Total R-value (ratio)	Peak I/I Flow (mgd)	Peak Total Flow (mgd)	Event Peak Rainfall (In./15 min)	<--------EVENT AVERAGE--------> Observed Flow (mgd)	GWI Flow (mgd)	Base Wastewater Flow (mgd)	Rainfall Start Date	Rainfall End Date	Rainfall Duration (hours)
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
36	2/13/2014 0:00	2/16/2014 9:45	81.75	0.006	1.76	0.004	2.69	7.83	0.08	7.17	4.98	1.82	2/13/2014 0:00	2/15/2014 16:15	64.25
37	4/29/2014 12:00	5/7/2014 19:15	199.25	0.032	5.58	0.006	6.27	11.9	0.29	7.36	4.61	1.96	4/29/2014 12:00	5/4/2014 14:45	122.75
38	5/16/2014 7:15	5/18/2014 9:45	50.5	0.008	2.53	0.003	4.29	11.5	0.21	8.01	5.26	1.92	5/16/2014 7:15	5/16/2014 17:15	10
39	5/27/2014 17:45	5/29/2014 20:45	51	0.004	1.21	0.004	1.11	8.28	0.19	7.54	5.16	1.97	5/27/2014 17:45	5/28/2014 15:15	21.5
40	6/12/2014 0:00	6/14/2014 11:00	59	0.003	0.56	0.006	2.03	8.50	0.07	7.24	5.20	1.76	6/12/2014 0:00	6/13/2014 17:15	41.25
		Average:	53.2	0.012	1.29	0.009	5.32	11.3	0.18	7.16	4.18	1.99			26.7
		Maximum Value:	213.3	0.061	6.25	0.023	15.5	21.6	0.59	8.23	5.26	2.55			189.8
		Minimum Value:	7.3	0.001	0.21	0.003	1.11	7.47	0.02	5.79	3.49	1.32			2.50
		Standard Deviation:	46.1	0.013	1.29	0.005	3.92	3.67	0.14	0.565	0.532	0.223			34.6
		Weighted Mean R-Value*:				0.009									

* The weighted mean R-value ratio is calculated by dividing the sum of the I/I volume for all listed events by the sum of the rain volume for all listed events.