PHILADELPHIA WATER DEPARTMENT

Annual CSO Status Report

2006

Chapter 94: Wasteload Management Report

March 31st, 2007

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Section 1 - Introduction

This report is submitted pursuant to meeting the requirements of NPSDES Permits #'s 0026662, 0026671, and 0026689; Part C, Section D: Reporting Requirements, b. Annual CSO Status Report. This section requires that the permittee submit an Annual CSO Status Report as part of the Chapter 94 Municipal Wasteload Management Report. The purpose of this report is to document the status and changes made to programs implemented by the City of Philadelphia Water Department (PWD), during calendar year 2006, to manage and reduce the combined sewer overflows (CSOs) permitted to discharge to waters of the Commonwealth of Pennsylvania.

The report is organized as follows: Section 2 Citywide Programs discusses the operational status of the combined sewer system and includes summaries of the frequency and volume of overflows for the past calendar year. In addition, Section 2 provides a summary of any changes made to the programs required by the United States Environmental Protection Agencies (US EPA's) Nine Minimum Controls (NMCs) and as described in the Phase I section of the Long Term CSO Control Plan (LTCP) approved September 18, 1997 The section updates capital programs that are conducted on a City-Wide basis and as such have benefits to all receiving waters. In contract, Sections 3 through 9 are watershed-specific and describe the status of the watershed management planning and capital project implementation occurring within each respective watershed listed in the CSO LTCP. Monitoring of CSO discharges and other performance-related information for each CSO system is also summarized by watershed. Section 10 provides the status of activities completed to advance the concept of the Watershed Technology Center as described in the CSO LTCP.

Section 2 - Citywide Programs

1.0 Phase I – Continued Implementation of the Nine Minimum Controls

In the first phase of the PWD's CSO strategy, and in accordance with its NPDES permits, the PWD submitted to the Pennsylvania Department of Environmental Protection on September 27, 1995, *CSO Documentation: Implementation of Nine Minimum Controls*. The nine minimum controls are low-cost actions or measures that can reduce CSO discharges and their effect on receiving waters, do not require significant engineering studies or major construction, and can be implemented in a relatively short time frame. In general, PWD's NMC program includes comprehensive, aggressive measures to maximize water quality improvements through the following measures:

1. Review and improvement of on-going operation and maintenance programs
2. Measures to maximize the use of the collection system for storage
3. Review and modification of PWD's industrial pretreatment program
4. Measures to maximize flow to the wastewater treatment facilities
5. Measures to detect and eliminate dry weather overflows
6. Control of the discharge of solid and floatable materials
7. Implementation of programs to prevent generation and discharge of pollutants at the source
8. Public Notification of CSO impacts
9. Comprehensive inspection and monitoring programs to characterize and report overflows and other conditions in the combined sewer system.

Changes made to any of the specific projects or programs put into place as a result of the NMC document are discussed in below.

1.1 Operation & Maintenance

Reference Philadelphia NMC Report, 9/27/95 Section 1 pp. 61-62. The operation and maintenance program is well established and any changes or modifications to existing programs are indicated in the sections below.

1.1.1 CSO Regulator Inspection & Maintenance Program
Annual summaries of the comprehensive and preventative maintenance activities completed in the combined sewer system over the past year are detailed in Appendix A and any changes are discussed below.

In response to the CSO compliance inspection performed by DEP in November 2002, PWD has committed to demonstrating an improved follow-up response to sites experiencing a DWO. PWD has instituted a policy of next day follow-up inspection at sites that experience a DWO. PWD will conduct an evaluation of the effectiveness of twice-weekly inspections.

Customized Regulator Inspection Forms
Start: 8/1/95 End: 12/31/2000 Status: Complete

1.1.2 Pumping Station Maintenance

Annual summaries of the Wastewater Pumping summaries are included in Appendix B for:

- Flows

- Station Outages
- Station Condition
- Pump Performance
- Pump Availability
- Maintenance Breakdown

Central Schuylkill Pumping Station (CSPS) Quarterly Grit Pocket Cleanings -
Start: 8/1/95 End: Status: Ongoing
Grit removal operations are performed at the Central Schuylkill Pumping on a periodic basis to maintain the capacity of the siphon.

WW Pumping Predictive Maintenance Program
Start: 8/1/1995 End: Status: Ongoing

Pump Station Emergency Backup Power
Start: 9/27/1995 End: 12/1/1999 Status: Complete
See pump station maintenance annual summaries in Appendix B for documentation of any pump station outages.

1.1.2 Sewer Cleaning Contracts
Start: 12/1/1995 End: Status: Complete

1.1.3 Inflow Prevention Program
Start: 8/1/1995 End: 6/4/1999 Status: Complete

Tide Gate Inspection and Maintenance Program
Summaries of the tide gate inspection and maintenance completed during calendar 2006 are found in Appendix A, which documents the locations where preventative maintenance was performed on the tide gates. To summarize, 6 sites received Preventative Maintenance during 2006. These sites include S07, S15, S50, D11, D63, & D72.

Emergency Overflow Weir Modification
Start: 11/7/1994 End: 6/4/1999 Status: Complete

1.2 Maximize In-System Storage

Reference Philadelphia NMC Report, 9/27/95 Section 2 pp. 1-15

1.2.1 Evaluate Real Time Control in LTCP
Start: 2/1/1996 End: 1/27/1997 Status: Complete

See section 2 City Wide Programs

1.2.2 Install Diversion Dams
Start: 8/1/1995 End: 6/30/1997 Status: Complete

1.3 Modify Pretreatment Program

Reference Philadelphia NMC Report, 9/27/95 Section 3 pp. 1-13

1.3.1 Phase I Implementation
Start: 8/1/1995 End: 2/1/1997 Status: Complete

Inventory Significant Non-Domestic
Start: 8/1/1995 End: 8/21/1995 Status: Complete

Guidance Memorandum
Start: 8/1/1995 End: 1/26/1996 Status: Complete

Develop Data Form for Annual Inspections
Start: 3/1/1996 End: 9/1/1997 Status: Complete

Pretreatment Inspections - 1st 50%
Start: 3/1/1996 End: 7/1/1996 Status: Complete

Asses SIU Wet Weather Monitoring
Start: 7/1/1996 End: 8/1/1997 Status: Complete

1st 50% of SIUs Reduce Discharge
Start: 10/1/1996 End: 1/1/1997 Status: Complete

Pretreatment Inspections - 2nd 50%
Start: 7/1/1996 End: 12/31/1996 Status: Complete

2nd 50% SIUs Reduce Discharge
Start: 1/1/1997 End: 12/31/1998 Status: Complete

1.3.2 Phase II Implementation
Start: 3/1/1997 End: Status: Ongoing

Report - Performance of Phase I Activities
Start: 3/1/1997 End: 3/31/1997 Status: Complete

Annual Pretreatment Inspections – Criteria
Start: 3/18/1997 End: Status: Ongoing

Inspections are ongoing using guidance criteria to evaluate wet weather pollution prevention efforts for those industries that may have batch operations within a continuous discharge. IWU will continue to investigate combined sewer trunks to find the sources of the high strength wastes and then evaluate in detail the nature and timing of these particular discharges.

Philadelphia Inter-governmental Scrap Yard Task Force
Start: 5/1/2003 End: Status: Ongoing

To address numerous complaints about the operation of scrap metal and auto salvage businesses, which may cause polluted runoff to enter the City's sewers, as well as create blight in City neighborhoods, and contribute to short dumping and other environmental harms to area waterways, the City will: (1) continue to participate with the USEPA and PADEP in a multi-governmental task force to conduct random inspections of these facilities; (2) provide compliance assistance to scrap yard operators on the various laws and regulations; (3) provide educational assistance on measures that can be undertaken by the industry to control runoff from storage or transport areas; and (4) where necessary, support comprehensive enforcement actions in cases where facilities are unwilling to cooperate.

1.4 Maximize WPCP Flow

Reference Philadelphia NMC Report, 9/27/95 Section 4 pp. 28-42

The basic strategy of flow maximization, or Modified Regulator Plan (MRP) was to deliver more flow to the WPCPs more frequently, to enable greater pollutant removals. The results of the hydraulic modeling of the interceptor sewers under the flow maximization scenarios indicate that significantly higher rates of flow can be delivered to the WPCPs more frequently than under current conditions. To date, 100% of the projected flow increase associated with the Modified Regulator Plan has been implemented. Some additional modifications might be made in the future to prioritize certain overflows, or to reflect an improved understanding of the collection system dynamics as identified throughout the ongoing modeling work, but no additional capture is expected to result on a system wide basis.

1.4.1 POTW Stress Testing
Start: 9/1/1997 End: Status: Moved to Section 2.3 per CSO LTCP

1.4.2 Prelim Costs - NMC #4 Implementation
Start: 8/1/1995 End: 12/20/1995 Status: Complete

1.4.3 NE DD Modified Regulator Plan (MRP)
Start: 1/1/1996 End: 7/1/1998 Status: Complete

1.4.4 SW DD Modified Regulator Plan (MRP)
Start: 1/1/1996 End: 7/1/1998 Status: Complete

1.4.5 SE DD Modified Regulator Plan (MRP)
Start: 10/30/1995 End: 7/1/1998 Status: Complete

1.4.6 NMC 4 Implementation Costs (LTCP)
Start: 5/1/1996 End: 9/1/1996 Status: Complete

1.5 Eliminate Dry Weather Overflow (DWO)

Reference Philadelphia NMC Report, 9/27/95 Section 5 pp. 1-5

Dry weather discharges at CSO outfalls can occur in any combined sewer system on either a chronic (i.e., regular or even frequent) basis or on a random basis (i.e., as a result of unusual conditions, or equipment malfunction). Random dry weather discharges can occur at virtually any CSO outfall following sudden clogging by unusual debris in the sewer, structural failure of the regulator, or hydraulic overloading by an unusual discharge of flow by a combined sewer system user. Chronic dry weather discharges can and should be prevented from occurring at all CSO outfalls. Random discharges cannot be prevented, but they can and must be promptly eliminated by cleaning repair, and/or identification and elimination of any excessive flow and/or debris sources.

As documented in Section 1 of the NMC report, regular inspections and maintenance of the CSO regulators are performed throughout the City. These programs ensure that sediment accumulations and/or blockages are identified and corrected immediately to avoid dry weather overflows. The results of these efforts are reflected in the Department's Monthly CSO Status Report submitted to PADEP and EPA Region III and summarized on annual basis in this report. The detailed inspection report summaries are included in Appendix A. The implementation of a comprehensive monitoring network is an ongoing project to enhance PWD's ability to ensure high levels of protection against dry weather overflow. Based upon peer review of other CSO communities the present combination of the physical inspection and maintenance with comprehensive monitoring, the present program far exceeds the level of effort employed in other communities.

1.5.1 CSO Monitoring Network

Start: 8/1/1995 End: 12/31/2006 Status: Ongoing

The Philadelphia Water Department's continues to implement the expansion to the CSO Monitoring network and temporary monitoring programs to support planning for further CSO control projects and to minimizing dry weather overflows and tidal inflows. The CSO monitoring network contract has been closed out and difficulties encountered with the contractor have been resolved through legal process with the bonding company of the contractor. PWD will continue to review, replace, and update network equipment in order to continue to support the above functions. See **Table 1** for status of the remote sites.

Table 1 - Site Status Report for CSO Monitoring Network Implementation

MONITORING NETWORK - MONTHLY OPERATIONAL STATUS REPORT		
Month of:		**Jan-2006**
381 TOTAL of ALL NETWORK MONITORING SITES		
20 SITES NOT INSTALLED		
361 SITES INSTALLED		
Status of the 361 Installed Sites		
26 of 26 METERING CHAMBERS INSTALLED	98.0%	Operational
24 of 24 RAIN GAUGE SITES INSTALLED	95.7%	Operational
141 of 200 CSO SITES INSTALLED	78.2%	Operational
* Operational - The site data from all sensors is available on the server and is reasonably accurate		

1.5.2 WTP Residuals Management

Start: 12/15/1994 End: 12/31/1997 Status: Complete

The Department will continue to monitor the effectiveness of the operational changes to residuals management strategies, monitor for any adverse impacts on downstream CSOs, and report any DWOs in the monthly status reports.

1.5.4 Somerset Grit Chamber Cleaning

Start: 8/1/1995 End: Status: Ongoing

p. 30 SIAC - PWD regularly monitors the sediment accumulation in the grit trap at the origin of the Somerset Intercepting Sewer and in locations downstream to determine appropriate cleaning intervals for the girt trap and downstream interceptor. Driven by the monitoring program, the grit basin is cleaned periodically and debris quantities tracked to further refine the frequency of cleaning so as to maintain adequate capacity in the Somerset Intercepting sewer.

Somerset Grit Chamber cleaning details, specifically tonnage removed and dates of cleaning during 2006 are available in Appendix A. To summarize, 5 cleanings were performed at the chamber with a total of 252.53 tons of grit removed.

1.6 Solids and Floatables

Reference Philadelphia NMC Report, 9/27/95 Section 6 pp.1-12

The control of floatables and solids in CSO discharges addresses aesthetic quality concerns of the receiving waters. The ultimate goal of NMC No. 6 is, where feasible, to reduce, if not eliminate, by relatively simple means, the discharge of floatables and coarse solids from combined sewer overflows to the receiving waters. The initial phase of the NMC process has and will continue to focus on the implementation of, at a minimum, technology-based, non-capital intensive control measures.

The effectiveness of this minimum control, and the evaluation of the potential need for other methods to more effectively control the discharge of solids and floatables from CSOs, has been incorporated into the floatables monitoring and pilot evaluation project (T-4 Netting Facility below). That is, the need to control the discharge of solids and floatables, the degrees of control that will be necessary, and the determination of the controls that may be required, are intended to be an ongoing process throughout the development stage and the early implementation phases of the Long Term Control Plan.

1.6.1 Pilot Netting Facility

Start: 3/1/1996 End: 4/1/1997 Status: Complete

A pilot, in-line, floatables netting chamber was constructed as part of a sewer reconstruction project at CSO T-4 Rising Sun Ave. E. of Tacony Creek. The construction of the chamber was completed in March of 1997 and the netting system continues to operate. The quantity of material collected is weighed with each net change.

In 2006, nine (9) inspections were made and 1786 pounds of debris were collected and disposed of. Since the installation of the netting device, there have been 65 inspections and net replacements (approx. 130 nets), with an approximate total of 12,774 pounds of debris captured (Appendix A). The City has compared the floatables removed from the net with other floatables control technologies employed. More specifically, on an area weighted basis the inlet cleaning program data suggests that street surface litter dominates the volume of material that can enter the sewer system. The pilot in-line netting system installed at T_4 has also been shown to capture debris on the same order as the WPCP influent screens indicating that effective floatables control needs to target street surface litter in order to effectively reduce the quantity of debris likely to cause aesthetic concerns in receiving streams.

<u>1.6.2 Repair, Rehabilitation, and Expansion of Outfall Debris Grills</u>

Start: 9/27/95 End: Status: Ongoing

Debris grills are maintained regularly at sites where the tide introduces large floating debris into the outfall conduit. This debris can then become lodged in a tide gate thus causing inflow to occur. Additionally, these debris grills provide entry restriction, and some degree of floatables control. The list of the debris grills receiving preventative maintenance is available in Appendix A. To summarize, 28 maintenance visits were performed during 2006 at F05, T08, and Sandy Run.

1.7 Pollution Prevention

Most of the city ordinances related to this minimum control are housekeeping practices that help to prohibit litter and debris from actually being deposited on the streets and within the watershed area. These include litter ordinances, hazardous waste collection, illegal dumping policies and enforcement, bulk refuse disposal practices, and recycling programs. If these pollutant parameters eventually accumulate within the watershed, practices such as street sweeping and regular maintenance of catch basins can help to reduce the amount of pollutants entering the combined system and ultimately, the receiving water. Examples of these programs are ongoing and were presented in the NMC document. The City will continue to provide public information about the litter and stormwater inlets as part of its implementing this minimum control as well as continue to develop the following new programs.

From the moment the City of Philadelphia began providing water to its citizens there has been a need to create partnerships to protect the water supply. In our earliest days it was through the creation of Fairmount Park. Today we comply with state and federal regulations that require citizen participation. More importantly however, the Philadelphia Water Department through its Public Education Unit, has for more than 21 years voluntarily reached the public through an aggressive education and community outreach program that serves as a model for utilities across the country. Through these programs, the Water Department raises public awareness and understanding of stormwater problems and issues. Educational materials and programs are distributed and hosted at these events and at the Water Department's premier watershed education center – The Fairmount Water Works Interpretive Center. In addition, monthly billstuffers are included with customers' water and sewer bills, reaching over 460,000 households. And, the City continues to facilitate watershed stakeholder meetings to unify public participation in the surrounding counties and to address the issues pertaining to stormwater management on a watershed scale.

1.7.1 Billstuffers

Billstuffers are regularly produced by the Water Department as an educational tool for disseminating information pertaining to customer service and environmental issues. Specific billstuffers are designed on an annual basis for the CSO, Stormwater and Watershed Management programs to address the associated educational issues. These billstuffers reach over 470,000 water and wastewater customers. The environmental bill stuffers distributed in 2006 include:

- Waterwheel (Jan.)
- Streets Recycling (March)
- Waterwheel (April)
- Streets Department Curbside Recycling Program (May)
- Streets Recycling (August)
- Ins and Outs of Sewer Inlets/Proper Disposal of Grease (Oct.)
- In's & Out's of Sewer Inlets (Nov.)
- Trash & Recycling Schedule (Dec.)

1.7.2 Waterwheel Watershed Newsletters

The Water Department's watershed newsletters are usually published on bi-annual basis and target specific information to the residents living within a particular watershed. In this manner, citizens can be kept informed of departmental water pollution control initiatives specific to the watershed they live in. Issues are sometimes published in the form of billstuffers and sometimes as a brochure (when combined with the annual drinking water quality report). Newsletters issued in FY 2006 include:

Winter 2006 Edition – This issue, in the form of a billstuffer, featured Watershed Improvements and Accomplishments including an update on the Pennypack Watershed Partnership, Goals for Philadelphia's River Conservation Plans, and the Stormwater BMP Recognition Program.

Spring 2006 Edition – This issue, contained within the PWD's Annual Drinking Water Consumer Confidence Report, featured the department's Waterways Restoration Team, the crew dedicated to removing trash and other debris from our city's waterways, and the department's new Homeowner's Manual for Stormwater Management.

1.7.3 Comprehensive Education Materials

The following projects were initiated, completed or ongoing in 2006:

- Watershed educational partnerships (continued from 1999) with Bodine High School, Edison-Faira High School, Fairmount Park, Phila. Recreation Dept., Academy of Natural Sciences, Lincoln High School, Turner Middle School, Senior Environmental Corps, and the Schuylkill Center for Environmental Education.
- Implementation of the Tookany-Tacony/Frankford (TTF) Watershed Management Plan
- Implementation of the Tacony-Frankford River Conservation Plan.
- Establishment of a 501c(3) TTF Partnership Entity to implement the final plan
- Completion of the draft report for the Pennypack Creek River Conservation Plan
- Completion of Year One studies and public outreach for Poquessing Creek River Conservation Plan
- The creation of the Wissahickon Watershed Partnership and the initiative of a number of outreach programs
- The development of a new PWD website (www.phillyriverinfo.org) for the new Stormwater Regulations, BMP manuals (developer's and homeowner's versions) and all Office of Watershed programs.

PWD Public Education Outreach – Fairmount Water Works Interpretive Center

Educational Programs For Teachers

Ready to explore the Water Works?
Teachers and students are invited on an adventure to explore Water in Our World at the Fairmount Water Works Interpretive Center. Here, students travel through time as they learn about the role of water in Philadelphia's past, present and future.

Each program is approximately 2 hours long. Students will spend some time outside observing the river, completing activities outside or among exhibits, and viewing a film about the history of the Water Works. The FWWIC's programs are designed for grades four and up.

Innovative exhibits and interactive educational programs meld the history, technology and science of providing water to a regional urban watershed. Below are short descriptions of the FWWIC programs.

Water in Our World
This general orientation to the Interpretive Center provides the perfect overview for the teacher focusing on a variety of water issues, past, present and future. Your students will be introduced to a variety of concepts and vocabulary using activity booklets in exhibits on the natural water cycle, watersheds, the water use cycle, land use and pollution. They will also learn about their individual relationship to local, regional and global water quality issues on Planet Earth.

Land and Water: A Delicate Balance
Every day, people make choices about how they will use the land around them - often without considering how their use of land may affect the water they drink. Let your students come to understand the delicate relationship of land use to water quality through a matching card activity using the exhibits in the Interpretive Center. Students will also study a variety of maps to understand the development of land over time, and then plan fictional communities of their own in a way that would protect water quality.

From Street to Stream: Slow the Flow
Students will focus on stormwater runoff (one of the greatest sources of water pollution today), watersheds, and the different kinds of land pollution that affect our water quality - past and present. Students will explore, on foot, the Water Works site and surroundings as a way to better understand the concepts of point- and non-point-source pollution. The lesson will also give students a look into the Philadelphia Water Department's demonstrations of best management practices for existing and future land development.

Building as Machine: Water for the City
The Water Works is an engineering landmark. Students will learn about the design and function of this nineteenth century pumping station and why it was the most visited public place in America at that time. Learn how innovative technology for the public good and a concern for the natural environment, beauty and civic pride all came together at this unique site. Students will become apprentice engineers as they examine the pumps and gears that put the "works" in Water Works.

Full Day Program: The Schuylkill River Watershed: A Tale of Two Settings (grades 5 - 12; Sep - Nov and Apr - Jun)
The Schuylkill River is a critical natural resource for the entire Philadelphia region. But can your students tell you why the river is so important? In collaboration with the Schuylkill Center for Environmental Education (SCEE), located upstream, just inside the City's northwestern boundary, the Fairmount Water Works Interpretive Center (FWWIC) offers a full-day program that travels to both sites to teach students about the critical connection between watershed protection and water quality. Students will explore the ecology of

SCEE's unimpaired first-order stream, which is a tributary of the Schuylkill River, and will use the interactive exhibits at FWWIC to learn how communities within the Schuylkill River Watershed impact the river and have a stake in protecting them.

Activity Books
One of the Water Department's most successful community publications is the student activity book (grades 3 – 8) "Let's Learn About Water." This publication develops the concepts of definition of a watershed, impact of non-point source pollution, and personal responsibility for protecting our water supply. It is in great demand by schools, communities and government officials. This book was developed with the Partnership for the Delaware Estuary and was funded in part through DEP Coastal Zone Management funds. Future editions will include descriptions and activities for various city watersheds. The curriculum has already been used in a number of middle schools to meet state required science-based credits. In 2005, the Activity Booklet was updated and made full color. The Fairmount Water Works Interpretive Center was also highlighted in some of the activities to encourage students to visit with their families.

PWD's Public Education Unit
PWD's Public Education Unit makes presentations at area schools, organizations and community events, providing information on all topics regarding the urban and natural water cycles and watersheds. Teacher workshops and school-based programs and exhibits are also held daily at the Fairmount Water Works Interpretive Center (FWWIC).

General Educational projects in 2005/2006
A great variety of public information materials concerning the stormwater/watershed management in relation to the watershed framework were developed as a result of the watershed partnerships and river conservation plans, including: fact sheets, press releases, tabletop exhibits, brochures, watershed surveys, websites, watershed walks, and presentation materials. Materials developed for a specific watershed are discussed in the Watershed Planning sections as appropriate.

Some of these publications/projects include:

- WaterWheel - Issue included with 2006 Water Quality Report (April/May 2006)
- WaterWheel – Issue included in December 2006 billstuffer.
- 2005 Annual Water Quality Report featuring special supplement on Source Water Assessment and Protection (April 2006)
- Fairmount Water Works Interpretive Center: Water in Our World (printed several runs 5,000 each time distributed at the Center and other visitor centers and public areas
- Nature's Solution to Urban Runoff: Saylor Grove Stormwater Wetland is Featured in PWD's Flower Show Exhibit – March 2006
- 5th Annual 2006 Southeastern Pennsylvania Coast Day & BYOB Fishing Event (contributed funds for brochure)
- PWD Annual Report Fiscal Years 2006 (annual report features watershed/stormwater projects)
- Clean Water Begins and Ends with You! Calendar Contest: distribution of calendars and SEPTA car cards featuring winning entries
- Guide for Hydrant Use & Street Water Discharges (best management practices for construction contractors) - in development by Industrial Waste.
- Learn About Your Water from the Comfort of Your Own Home (PWD and Partnership for the Delaware Estuary videos running on Philadelphia's Government Access Channel)
- Another Philadelphia First: Online Forecast System Predicts Schuylkill River Water Quality: RiverCast Unveiled - June 2005

- Southeast Water Pollution Control Plant Employees Receive Platinum Award, Recognizing Environmental Excellence in Wastewater Treatment, National Association of Clean Water Agencies Award - May 2006
- Pennsylvania Has a Coast? Travelers learn about the Delaware Estuary and the region's premiere ecotourism center (signs on display at the Philadelphia International Airport)
- You 'Otter' Know: Schuylkill River is Healthier than Ever
- Clean Water Begins and Ends With You! Drawing Calendar Contest - Awards Ceremony at the Fairmount Water Works Interpretive Center; Students' drawings were on display at the Center.
- Fairmount Water Works Interpretive Center – educational brochure for teachers
- First Urban Shad Watch at the Fairmount Water Works Interpretive Center – April 2005. Second annual event held April 2006. Next scheduled April 2007.
    - Season of the Shad Celebration Featuring: Native American Foodways Demonstrations, Fishnet Weaving and Shad Catching, Cooking and Drying Methods
    - Catch of the Day – Fish paintings for children
    - Fish don't talk, but what do they tell us? Aquatic biologist' presentation on how many species of fish have returned to the Schuylkill River
    - What's in the River Today? New Exhibit featuring otter caught on tape
    - Name the Shad; Name the Otter Activity
    - Fish Facts – educational activity booklet, filled to the gills with activities about fish
- Saturday Morning Family Programs at the Fairmount Water Works Interpretive Center (Spring 2006)
    - "The Thirsty Land! Everyone has a Watershed. Where's yours?" – April
    - "The Dirty Truth: The Scoop on Poop and Pollution" – April
    - An Expedition in Time: Explore water pollution now and then during "Ready? Set. Navigate!" – May
    - A Delicate Balance: Exploring the Relationship of Land and Water during "Choose it. Use it! …Abuse it? Lose it." – June
- Travel Through Time Tours: Experience our past, examine our present, explore our future – May (for Drinking Water Week)
- Drinking Water Week at the Fairmount Water Works Interpretive Center (PWD water treatment engineers and plant managers introduced students to water treatment processes)
- New PWD pontoon boat commissioned and used to assist with removal of flood debris in the non-tidal Schuylkill – June 2006
- 5th Annual 2006 Southeastern Pennsylvania Coast Day Event – September 16, 2006
- PWD Flower Show Exhibit: March 2006

  The Philadelphia Water Department and the Partnership for the Delaware Estuary Inc. presented "Saylor Grove Stormwater Wetland: Nature's Solution to Urban Runoff" at the 2006 Philadelphia Flower Show. The exhibit featured a genuine stormwater wetland project that the Water Department constructed at Saylor Grove, located at Lincoln Drive and Wissahickon Avenue in the Northwest section of Philadelphia. By using nature to create a "natural treatment plant," the Saylor Grove Wetland filters pollution from stormwater runoff in Saylor Grove. Not only is the wetland improving Philadelphia's source-water quality in the Monoshone Creek, it is also an attractive user-friendly neighborhood park.

  Stormwater runoff from about 150 acres of developed land, in Northwest Philadelphia, drains through Saylor Grove, located in the Monoshone Creek Watershed. Today, the Monoshone Creek is considered impaired – polluted and unable to support the plants and animals once found there. There are a number of ways to improve the creek, such as creating the Saylor Grove Wetland. The exhibit encouraged visitors to learn more about the Saylor Grove Wetland and how they can help reduce stormwater runoff pollution to their local waterways.

1.7.4 Citizen Advisory Committee (CAC) and other Partnership Projects

Water Quality Citizens Advisory Council

In 2001, the Water Quality CAC was formed from a merger of the Stormwater and the Drinking Water Quality CACs. Over the past few years, source water protection had become more of a concern for drinking water quality. The Drinking Water CACs focus has been drawn naturally toward non-point source pollution, a focus traditionally undertaken by the Stormwater CAC. Finally, this merging of the two CACs complemented the PWD's, DEP's and EPA's new approach to looking at and addressing water quality issues on a holistic basis. The Partnership for the Delaware Estuary facilitates CAC meetings. The committee consists of representatives from the following groups: Tookany Creek Watershed, Academy of Natural Sciences, Action AIDS, Bridesburg Civic Association, Bucks County Water & Sewer Authority, Center in the Park Senior Environmental Corps, Clean Water Action, Cobbs Creek Community Environmental Education Center, Delaware River Basin Commission, Delaware Valley Regional Planning Commission, Drexel University, Eastwick PAC, Fairmount Park Commission, Frankford Group Ministry, Friends of Fox Chase Farm, Friends of High School Park, Friends of Manayunk Canal, Friends of Pennypack Park, Friends of Poquessing Creek Park, Friends of Tacony Creek Park, MANNA, Mayor's Commission on Literacy, PA DEP Water Supply Division, Partnership for the Delaware Estuary, PA Environmental Council, PennPIRG, PA Horticultural Society, Pennypack Environmental Center, Pennypack Watershed Association, Phila. Health Department, Phila. Corp. for Aging, School District of Philadelphia, Schuylkill Center for Environmental Education, Schuylkill Navy, Schuylkill River Development Corp, Schuylkill River Heritage Corridor, Southhampton Watershed Association, Stroud Water Research Center, US EPA Region III, Wissahickon Charter School.

1.7.5 City-Wide Initiatives

Annual Earth Day Service Project

Community and watershed volunteers participated in the Water Department- and Stormwater CAC-sponsored annual Earth Day service project by installing storm drain curb markers throughout the City. Volunteers used the new curb markers developed by PWD and PA Coastal Zone Management Project to stencil the message "Yo!!! No Dumping! Drains to River!" beside a fish. By developing a more durable and easily applied curb marker, volunteers are able to cover more area. In spring and summer 2006, over 15 organizations participated in the storm drain marking activity. Throughout these months, approximately 3,000 storm drains were decaled by the summer in the City of Philadelphia.

"Stormy Weather" Video

The video focuses on individual responsibility as a critical success factor in improving storm water quality. The deleterious effects of storm water pollution on the physical and biological community in aquatic systems are addressed through various anti-litter messages, such as: litter control, responsible household and pet waste management, and the proper use of inlets. The video is distributed to schools, watershed organizations and interested civics. The video has been distributed to over 300 environmental groups on an annual basis, various citizen groups, and schools, and has become a part of the environmental education curriculum for Delaware schools. The City's cable channel is showing the video twice a day.

"Clean Water Begins and Ends with You"

The Partnership for the Delaware Estuary and the PWD, sponsored its eighth drawing contest for Philadelphia students grades K-12 in January 2006. Students were required to draw an illustration that shows how Philadelphians can help prevent stormwater runoff pollution. First prize drawings were used to promote stormwater pollution prevention messages on SEPTA buses and in the creation of a "Clean Water Begins and Ends with You" calendar. In 2006, there were almost 1,500 drawings entered into the contest, with 44 schools participating. This year's award ceremony was held in March 2006 at the Fairmount Water Works Interpretive Center.

Clean Water Theatre
Working in partnership with the Academy of Natural Sciences, the Partnership for the Delaware Estuary, the PWD CAC offered the Clean Water Theatre's "All Washed Up" program which uses local artists and musicians to engage public, private and parochial schools throughout the City of Philadelphia in becoming active and informed stewards of our environment. The setting of the 20 minute play is in an urban park that has a river running through it. The story is built around three characters (an old man who is the caretaker of the park and who had been a vaudeville song and dance man in his youth, and two teenagers – a boy and a girl) that explore the importance of environmental stewardship and clean water. While there were not any live performances of Clean Water Theatre in 2005, many video and DVD copies of the performance was distributed to teachers and local educators.

Senior Citizen Corps (SEC)
The Water Department continues to work with the Senior Citizen Corps to address stormwater pollution problems and water quality monitoring programs for the Monoshone Creek, a tributary to the Wissahickon Creek and to the Tookany Creek. The SEC performs biomonitoring, collects water samples, and conducts physical assessments of the stream. The Water Department assists SEC efforts through the provision of municipal services, education about stormwater runoff and the department's Defective Lateral Program, and mapping services such as GIS. Meetings are held monthly. The Corps has also partnered with PWD on its Saylor Grove Wetland Demonstration Project, assisting with public education and outreach, and providing tours to local students beginning fall 2006. The SEC, in partnership with Chestnut Hill College, also began water quality monitoring at the Saylor Grove Wetland in summer 2006.

Safe Boating Program
PWD has also initiated an outreach, education, and notification program for marinas and personal watercraft that may be situated near CSO outfalls on the Delaware River. PWD has held meetings with representatives from DEP's Coastal Non-Point Pollution program, the Partnership for the Delaware Estuary and administrators of similar programs in New Jersey to develop a host of educational and environmental management measures. Our proposed approach entails conducting a survey of existing marinas and boat launches and their use profiles (personal, charter, open, closed craft, etc.). We would then initiate meetings with the individual marinas to implement site-specific notification mechanisms (brochure, flags, sign, etc.) that list precautions that should be exercised by those engaging in contact recreation within the marina and/or on the open water. In addition, these meetings would discus how the marina can adopt environmentally responsible operation and maintenance practices for personal and multi-purpose watercraft that are jointly supportive of safe contact recreation and the DEP Coastal Non-Point Pollution goals. Specifically, these would address the measures identified in the Marinas and Recreational Boating section of the DEP document titled Deliverables for Results-Based Funding Coastal Non-point Pollution (CNP) Specialist.

Waterways Restoration Team – A Partnership between PWD and the Fairmount Park Commission
In July 2003, the Philadelphia Water Department and the Fairmount Park Commission (FPC) initiated an exciting partnership that will improve the environmental quality of our precious City parks and streams.

The FPC has assumed responsibility for over 200 acres of land dedicated to the City for stormwater management purposes land that was, up until now, a mowing and landscaping maintenance burden for the Water Department. The FPC will use this land to further its vision of developing "watershed parks," creating natural connections between neighborhoods and existing park areas.

In exchange, the Water Department is fielding a Waterways Restoration Team (WRT) – a crew dedicated to removing large trash – cars, shopping carts, and other short dumped debris - from the 100 miles of stream systems that define our City neighborhoods. This crew will also restore eroded stream banks and streambeds around outfall pipes and remove sanitary debris at these outfalls. The Waterways Restoration Team will work in partnership with the FPC staff and the various Friends of the Parks groups to maximize resources and the positive impacts to our communities. This partnership focuses on the core strengths of our two agencies. The FPC will continue to improve landscape management of the City's parks and dedicated lands, while the Water Department will focus its efforts on water quality improvements, a mandate it has under its state and federal water quality related permits.

Waterways Restoration Team – FY '06 Performance Measurements

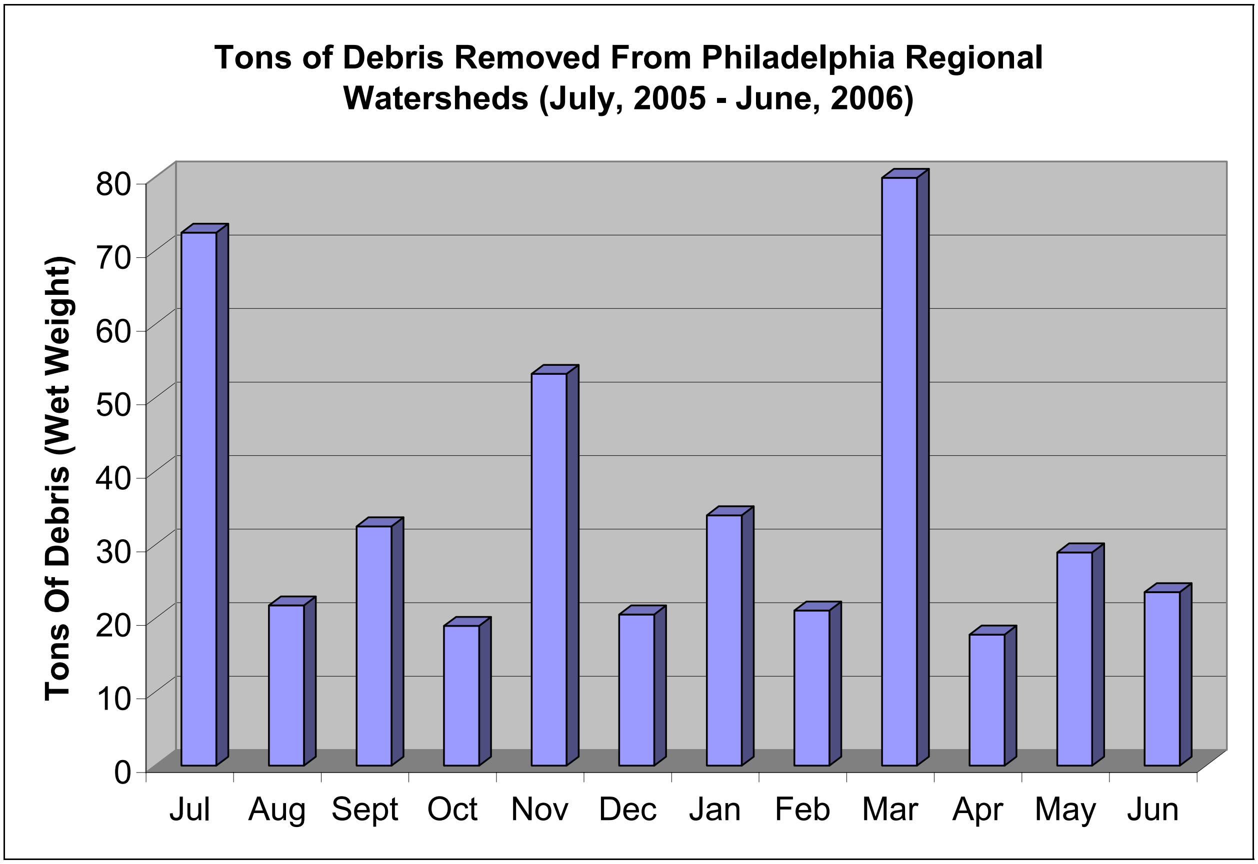

Table 2 - Statistics for Waterways Restoration Team for FY 2006

	Totals	
Fiscal Year 2006 Waterways Restoration Team	Debris Removed (ton)	425
	Cars Removed	21
	Tires Removed	396
	Shopping Carts Removed	161
	Number of Clean-up Sites	124

In addition to the unbelievable amounts of trash that have been eliminated from our park and stream systems, the Waterways Restoration Team completed its second plunge pool restoration project at the Tustin Street outfall in the Pennypack Creek and completed the final stabilization of the lower segment of the Wises Mill Road Tributary to the Wissahickon Creek.

1.8 Public Notification

As discussed in Section 7 of the above report, the Water Department had developed and will continue to develop a series of informational brochures and other materials about its CSO discharges and the potential affect on the receiving waters. The brochures provide phone contacts for additional information. Also, the opportunity to recruit citizen volunteers to check or adopt CSO outfalls in their watersheds (i.e., notifying the PWD of dry weather overflows, etc.) will be explored through the watershed partnership framework. Brochures and other educational materials discuss the detrimental affects of these overflows and request that the public report these incidences to the department. In addition, the Water Department has enlisted watershed organizations to assist it with this endeavor. PWD will continue with this focus in 2007 to continue to raise the level of awareness in its citizens about the function of combined and stormwater outfalls through a variety of educational mediums. The watershed partnerships will also continue to be used for this type of education.

In response to the compliance inspection performed by DEP in November 2002, PWD reviewed and revised our public notification program in areas that have a reasonable likelihood for primary contact recreation. As part of our watershed management program development, PWD examined recreational uses in the area waterways. As a result, the development and use of new notification practices are already underway for areas known to support contact recreation, namely the Upper Schuylkill River and in areas of Tacony Creek Park. Flyers were developed and directly distributed to people observed to be swimming in Tacony Creek. A recreational advisory has been completed for the Schuylkill River in conjunction with the Department's Water Quality Committee. This system's educational message will be similar to the marina programs as the advisories are based upon rainfall, CSOs and upstream influences on water quality.

The department is working with Fairmount Park to install CSO signage (see below) at 20 of the most highly visible CSO outfalls (text will also be included in English and Spanish). Lastly, the department's Clean Streams Team will investigate the feasibility of installing signage that can withstand nature and vandals at the department's outfalls.

1.9 Monitoring and Reporting

Reference Philadelphia NMC Report, 9/27/95 Section 9 pp. 1-3 and System Hydraulic Characterization Report, 6/27/95 Section 5, pp. 5-3.

Monitoring and characterization of CSO impacts from a combined wastewater collection and treatment system are necessary to document existing conditions and to identify water quality benefits achievable by CSO mitigation measures. The tables included in the following section represent the average annual CSO overflow statistics for calendar year 2006 as required in the NPDES Permit. The table has been reorganized to present overflows by the specific receiving water into which the CSOs from a given interceptor system discharge. In order to be consistent, the column headings are presented in the same format found in the System Hydraulic Characterization (SHC) and NMC Documentation. These statistics are also summarized in the Watershed Planning Section along with water body - specific monitoring programs that occurred in 2006.

1.9.1 Annual CSO Statistics (2006)

The estimated average annual frequency and volume statistics for calendar year 2006 are presented in the **Table 3**.

Table 3 - Annual CSO Statistics

COBBS CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Cobbs Creek High Level	26	32	0 - 72	25	1449 - 1509	46% - 47%	0 - 327
Cobbs Creek Low Level	9	12	0 - 62	25	120 - 124	72% - 72%	0 - 202

DELAWARE RIVER 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Upper Delaware Low Level	12	12	7 - 61	33	1087 - 1128	56% - 56%	8 - 251
Somerset	8	9	27 - 70	50	4107 - 4299	60% - 61%	51 - 316
Lower Delaware Low Level	27	27	5 - 68	42	3160 - 3284	55% - 55%	6 - 333
Oregon	5	6	4 - 61	44	1398 - 1458	36% - 36%	4 - 230
Lower Frankford Low Level	5	6	27 - 66	45	1286 - 1336	42% - 42%	43 - 263

PENNYPACK CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency: Range per subsystem	Frequency: Avg per subsystem	CSO Volume (MG): Range per subsystem	CSO Capture (%): Range per subsystem	CSO Duration (hrs): Range per subsystem
Pennypack	5	5	17 - 59	33	97 - 100	65% - 65%	27 - 222

SCHUYLKILL RIVER 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency: Range per subsystem	Frequency: Avg per subsystem	CSO Volume (MG): Range per subsystem	CSO Capture (%): Range per subsystem	CSO Duration (hrs): Range per subsystem
Central Schuylkill East Side	20	26	0 - 82	34	1414 - 1466	54% - 54%	0 - 419
Central Schuylkill West Side	10	10	0 - 71	44	743 - 773	45% - 46%	0 - 350
Lower Schuylkill East Side	7	9	7 - 65	46	861 - 895	49% - 50%	10 - 324
Lower Schuylkill West Side	4	4	10 - 67	50	1306 - 1359	19% - 19%	15 - 274
Southwest Main Gravity	2	2	5 - 64	35	2213 - 2306	59% - 59%	6 - 283

TACONY CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency: Range per subsystem	Frequency: Avg per subsystem	CSO Volume (MG): Range per subsystem	CSO Capture (%): Range per subsystem	CSO Duration (hrs): Range per subsystem
Tacony	16	16	5 - 71	44	4651 - 4851	36% - 36%	5 - 342
Upper Frankford Low Level	12	12	13 - 64	43	450 - 467	56% - 56%	21 - 285

2.0 Phase II – Capital Improvement Projects

The second phase of the PWD's CSO strategy is focused on technology-based capital improvements to the City's sewerage system that will further increase its ability to store and treat combined sewer flow, reduce inflow to the system, eliminate flooding due to system surcharging, decrease CSO volumes and improve receiving water quality. The recommended capital improvement program is the result of a detailed analysis of a broad range of technology-based control alternatives. The capital improvement plan encompasses the three major areas of the City that are affected by CSOs: the Northeast, Southeast and Southwest drainage districts. **Table 4** provides a summary of the 17 capital projects described fully in *CSO Documentation – Long Term CSO Control Plan, January 1999*. A column has been added to this table that details the receiving water body that will benefit from the project. Lastly, the completion dates of the respective projects have been modified to be consistent with the Draft NPDES permits.

Table 4 - Summary of Phase II Capital Projects

Watershed	Project Description	Capital Cost
City Wide Program	Establish Real Time Control (RTC) Center	$350,000
City Wide Program	Targeted Infiltration/Inflow Reduction Programs	$2,000,000
Schuylkill and Delaware	Solids & Floatables Control Program	$380,000
Pennypack	Integrate Water Quality Objectives into Flood Relief Programs	N/A
Pennypack	85% CSO Capture Pennypack Watershed (P-1 through P-5)	$230,000
Tacony - Frankford	RTC - Tacony Creek Park Storage (T-14)	$450,000
Tacony - Frankford	RTC - Rock Run Relief Sewer Storage (R-15)	$490,000
Delaware	Somerset Interceptor Sewer Conveyance Improvements	$300,000
Tacony - Frankford	Frankford Siphon Upgrade	$10,000
City Wide Program	RTC & Flow Optimization - Southwest Main Gravity Interceptor, Cobbs Creek Cut-off, and Lower Schuylkill West Side	$1,750,000
Schuylkill	RTC - Main Relief Sewer Storage (R-7 through R-12)	$650,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase I	$6,200,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase II	$7,000,000
Schuylkill	Eliminate Outfalls: Dobson's Run Phase III	$11,700,000
Schuylkill	Eliminate Main & Shurs Outfall (R-20)	$12,000,000
Schuylkill	Eliminate 32nd & Thompson Outfall (R-19)	$1,500,000
Darby - Cobbs	Cobbs Creek Low Level (CCLL) Conveyance Improvements	$440,000
Darby - Cobbs	Cobbs Creek Low Level (CCLL) Control Project	$2,500,000
City Wide Program	WPCP Wet Weather Treatment Maximization Program	$150,000
	Total Phase II Project Cost:	**$48,100,000**

This section presents the status of the capital improvement projects being implemented on a citywide basis.

2.1 Infiltration and Inflow (I/I) Reduction Projects

Start: 9/1/1998 End: Status: Ongoing

Reference Long Term CSO Control Plan p. 2-5.

Description: Opportunities exist to reduce CSO impacts by means of reducing the entry of stormwater runoff, rainfall-derived I/I, and groundwater infiltration into the sewer system. Appropriate measures will be identified, evaluated, and implemented, where appropriate and cost-effective. There are four basic approaches to CSO control through I/I reduction:

1. Reduce the entry of stormwater runoff (including perennial stream baseflow) into the combined sewer system by diverting streamflow directly to a receiving stream.

2. Reduce the entry of groundwater infiltration to the combined sewers, interceptor sewers, and/or upstream separate sanitary sewers.

3. Reduce the entry of rainfall-derived I/I from upstream sanitary sewer systems.

4. Monitor and study the tidal inflows from river levels exceeding emergency overflow weir elevations at tide gates.

Each of the above methods enables CSO reduction by effectively increasing the capacity in the intercepting sewers and WPCPs available for the capture and treatment of combined wastewater. Several opportunities have already been identified and are currently being evaluated. The estimated costs for the I/I reduction program as documented in the CSO LTCP is $2,000,000.

Environmental Benefits: Since I/I is relatively clean water that occupies conveyance and treatment capacity, eliminating it from the system frees up capacity for the relatively more concentrated combined wastewater. This reduces CSO discharges and enables greater pollutant capture throughout the combined sewer system. An additional benefit of reduced infiltration (and diversion of any perennial streamflow) is the reduction in the operating costs associated with continuously pumping and treating these flows.

Status: This program consists of a combination of investigative and corrective efforts geared at reducing extraneous flows into the combined sewer system.

2.1.1 Temporary Flow Monitoring Program

The PWD temporary flow-monitoring program initiated in July 1999, with deployment of portable flow meters throughout targeted Philadelphia sewershed areas to quantify wastewater flow through sanitary sewers and characterize the tributary sewersheds. The identification and quantification of rainfall dependent inflow/infiltration (RDII) into sanitary sewers contributing to the City of Philadelphia's service area is a key component in assessing potential reductions in combined sewer overflow (CSO) impacts.

The data collected allows for the quantification of wet and dry weather flows in separate sanitary sewers for a specified list of sites over a given period. The flow monitoring data is subjected to rigorous QA/QC procedures resulting in consistently good data quality over the monitoring period. Further analysis of the flow monitoring data is performed using hydrograph separation techniques in order identify the primary flow components. The results of these studies include the quantification of base wastewater flow rates (BWWF), ground water infiltration / direct surface stream inflow rates (GWI/SWI), and rainfall dependant infiltration and inflow (RDII) expressed as a percentage of rainfall volume over the sewershed area (R-value). This analysis was performed in 2002 for approximately 18 sites.

In 2003, the PWD flow monitoring program continued with the redeployment of 7 sanitary sewer flow monitoring sites providing data suitable for RDII analysis and 3 combined sewer sites providing data for model calibration. RDII analysis and dry weather flow characterization was performed for these 7 sanitary sewer flow monitoring sites (4 in the NE sewer district, 2 in the SW sewer district, and 1 in the SE sewer district) with data collected over the period September 2002 through November 2003.

In 2004, 13 flow meters were redeployed in sanitary sewer to provide data suitable for RDII analysis and 4 combined sewer sites providing data for model calibration. RDII analysis and dry weather flow characterization was performed for these 13 sanitary sewer flow monitoring sites (8 in the NE sewer district and 5 in the SW sewer district) with data collected over the period January 2004 through November 2004. In addition to the PWD temporary sewer flow-monitors, 17 sanitary sewer flow monitors were deployed, through a contract with CSL Services, Inc., at un-metered connections from outlying community service areas. RDII analyses and dry weather flow characterizations were performed on these additional 17 sanitary sewer flow monitoring sites with data collected over the period November 2004 through December 2004.

In 2005, 16 PWD Temporary flow monitors were deployed (9 re-deployments of 2004 sites and 7 new deployments) to provide suitable data for the PWD's Temporary Flow Monitoring Program. Eight (8) metering locations were selected in separate sanitary sewer areas to provide suitable data for RDII analysis and the remaining sites were selected in combined sewer locations to provide data for model calibration. Monitoring data collected from January of 2005 through December of 2005 was used in hydraulic modeling of the system at these locations, including RDII analysis and dry weather flow characterizations. In addition to the PWD temporary flow monitoring, 19 sanitary sewer flow monitors were deployed through a contract with CSL Services Inc., at un-metered connections to the system from outlying community service areas. RDII analyses and dry weather flow characterizations were also performed on these additional sanitary sewer sites with data collected from July of 2005 through September of 2005.

In 2006, 8 PWD temporary flow monitors were redeployed in 2005 sanitary sewer monitoring locations to collect data for RDII analysis. An additional 4 PWD flow monitors were redeployed in combined trunk sewer locations in order to characterize wet and dry weather flows in targeted storm flood relief project areas. Twenty (20) additional portable flow monitors were deployed through CSL Services, Inc. in spring of 2006 for similar characterization. CSL Services were also utilized during Fall 2006 with the deployment of 6 portable flow monitors in combined trunk sewer locations in various combined watersheds. These deployments were used to measure system storage capacities as well as providing continued support for storm flood relief projects.

In 2007, the PWD will continue to deploy temporary flow monitors in various sewersheds and will continue the sanitary sewer monitor redeployments through the CSL Services contract. PWD is also planning a request for proposals for portable flow metering and dye dilution testing services for the 2007-2008 fiscal year.

2.1.2 Tide Inflow Study – Corrective Actions

The System Inventory and Characterization Report (SIAC) identified 88 CSOs influenced by the tides. Many of these sites have openings above the tide gate. During extreme high tides inflow into the trunk sewer can occur. During these events, significant quantities of additional flow can be conveyed to the treatment plant and thus reduce capacity for storm flow, as well as increasing treatment costs. Page 2-12 of the NMC report describes a program to install tide gates, or other backflow prevention structures, at regulators having an emergency overflow weir above the tide gate. This program was completed in June of 1999 and protected all openings up to 1.5' City Datum and resulted in significant inflow reductions. These reductions were estimated in the 1999 annual status report.

After further review, additional sites were targeted for inflow protection measures. Although situated at elevations significantly higher than extreme high tides, these additional sites were modified in 2001. **Table 5** summarized the number of sites corrected.

Table 5 - Status tide inflow protection project

Drainage District	Total # Sites	# Completed
Northeast	21	21
Southwest	7	7
Southeast	6	6
Total	**34**	**34**

2.1.3 Sewer Assessment Program

The permittee has implemented a comprehensive sewer assessment program (SAP) to provide for continued inspection and maintenance of the collection system using closed circuit television. The SAP is one of the tools used to guide the capital improvement program to ensure that the existing sewer systems are adequately maintained, rehabilitated and reconstructed.

2.1.4 City Wide GIS Mapping

The PWD has begun to utilize the comprehensive Geographic Information System (GIS) of the City sewer system to target locations for inspection and potential maintenance where I/I may be a problem. Two such examples, are intake walls; locations where springs and creeks directly enter the sewer system, and creek crossings; locations where sewers travel directly under a waterbody.

2.1.5 Whitaker Avenue Stream Restoration

I/I studies in the Tacony-Frankford Watershed identified a location in need of stream restoration to protect PWD infrastructure. A manhole severely exposed due to stream migration from high quantities of runoff had its riser knocked off during a storm event. Large quantities of stream water were flowing into the open sanitary sewer. The immediate problem was corrected, but the long term solution needed to be addressed.

D.S. Winokur and Associates was contracted and completed a detailed survey and drafting of the base maps necessary to support KCI Technologies in the preparation of contract drawings for this Growing Greener Grant partially funded restoration.

In 2005, KCI Technologies completed the conceptual design of a natural stream channel design for approximately 2000 feet of this portion of Tacony Creek. The design considers stable channel dimension, pattern and profile; impacts of urban development and hydrologic and hydraulic modifications; protection or removal of existing PWD infrastructure; in-stream structures for grade control, stream bank stability, and habitat; incorporation of flood attenuation and recharge areas; bioengineered bank stabilization; riparian restoration with site access and a trail network; and long term ecological stability. The total estimated budget for the design portion of this project is $83,664.00 and will be covered in entirety by the PWD to satisfy grant obligations as grant matching funds.

In 2006, the project team continued to move the design forward to a set of specifications and drawings for bidding. The proposed restoration approach is described in the following paragraph.

The two existing, abandoned railroad abutments and adjacent segments of stone retaining wall will be removed to eliminate associated hydraulic impacts and reestablish a more stable channel dimension. Eroded meander bends will be realigned with a more stable radius of curvature and reestablished using stone toe protection in conjunction with bioengineered bank stabilization treatments. Rock vane structures will be installed in the channel at meander bends within the project reach to redirect flows away from outside stream banks and adjacent sanitary infrastructure and to improve aquatic habitat. A portion of the existing stream, currently impacted by a cut-off channel, will be restored to a single channel to improve sediment transport. Boulder clusters will be placed in the channel to improve flow diversity and in-stream habitat. Recommendations have been developed for the removal of existing trash and debris from the channel in order to improve aesthetic site conditions. Enhancements to the existing riparian corridor have been proposed by incorporating native seeding and supplemental riparian plantings following construction. Riparian plantings will consist of native tree and shrub species common to the area.

It is anticipated that in February 2007, the appropriate Federal and State permit applications will be completed and submitted to the respective resource agencies in order to request approval to construct the proposed stream restoration project. There is a standard review period of 120 days required by the agencies before they can issue permit approval. In April 2007, the City of Philadelphia Water Department and its consultant will complete a detailed property line survey in order to identify portions of property on which stream restoration work is proposed. Once the Department has obtained permit approval, the project will be advanced to the Final Design stage and construction documents will begin to be developed. In addition, the Department will begin coordinating agreements with property owners prior to the construction of the proposed stream improvements. Once the Final Design construction documents have been completed and all agreements are finalized with respective property owners, the construction of the project will be advertised for bid. Construction will begin shortly after the project is awarded and is anticipated to be completed during one construction season.

Anticipated Project Timeline

- Permit Submission - Winter 2007
- Property Line Survey - Winter/Spring 2007
- Permit Approval - Spring/Summer 2007
- Final Design - Summer 2007
- Property Owner Agreements - Summer 2007
- Advertisement – Summer/Fall 2007
- Construction – Fall/Winter 2007

2.1.6 Main Interceptor I/I Study and Corrective Actions

A combination of I/I study methods, including, flow monitor deployment, facility inspections of the Roxborough Reservoir and Filters, dye testing of Eva and Evergreen, summit manhole/dead end sewer plug replacement, CCTV inspections of the sewer, and grit profiling studies, has allowed the PWD to identify sources of I/I and reduce or remove sources through corrective actions.

2.1.7 Sewerage Facility Planning Modules

The PWD reviews sewage facility planning modules and downstream sewage conveyance and treatment facilities to ensure that adequate capacity exists within these systems to accommodate flow increases as well as identify sources of extraneous flows during wet weather conditions. I/I studies will continue at the points of connection from outlying communities to quantify excess flow.

2.1.8 Infrastructure Assessments

PWD actively conducts efforts to inventory and prioritize sewerage infrastructure by collecting spatial location data for all points that either hydraulically alter the flow of the creek, or, infrastructure points affected by the stream migration for both infiltration or exfiltration. These studies have identified over 300 points in the Cobbs Watershed (completed in 2002), 1000 points in the Tookany/Tacony-Frankford Watershed (2004), and over 2000 points of infrastructure in the Wissahickon Watershed (2005-2006).

The data collected includes the spatial locations of all bridges, channelized portions, confluences, culverted portions, dams, manholes, outfalls, and pipes within the Watershed. In addition to spatial locations, and depending on the type of infrastructure point, the following information is also collected: Size, Material, Length and Height of Exposed Portion, Condition, Presence and Quality of Dry Weather Flow, Bank Location, Level of Submergence, Dimensions – Height, Width, Length (Channels and Culverts only), Digital Photos and Descriptions, and Additional Field Notes.

Corrective actions are taken when points of concern are identified.

2.2 Real-Time Control Program

2.2.1 Establish Real Time Control Center

Start: 4/1/1998 End: 12/1/2003 Status: Complete

Reference Long Term CSO Control Plan p. 2-4.

Description: A Real Time Control center (RTC) will be established at the Fox Street facility over the next 3 years. The ultimate goal for this center is to house a centralized RTC system that will allow telemetered commands to be sent to site-specific, automated controls located throughout the collection and treatment facilities. These signals may be transmitted based upon an optimized response to rainfall patterns and are intended to further enhance capture of CSO volume. Establishing a RTC center will enable PWD to provide 24-hr monitoring and eventually, control of key collection system facilities including automated CSO regulators, pump stations, and inter-district diversions.

An RTC facility also will provide the basis for improved management of many aspects of collector system operations, by centralizing collection and processing of data provided by the various automated functions (e.g., CSO monitoring, automated regulators, etc.). By use of RTC, flows are diverted or stored where capacity exists in the system. This function prevents wet-weather overflows prior to maximum use of available conveyance and/or storage capacities, thus allowing for prioritization of overflow locations based on hydraulic or pollutant load characteristics.

Status: The construction of the Real Time Control Center RTC building was completed in the summer of 2003. The Collector System Real Time Control Center became operational in September 2006. The center located at the Collector System Headquarters at Fox St. and Abbottsford Rd. is currently attended to during the day shift and for major storm events. The 24 ft. by 46 ft. room incorporates a two high by three wide matrix of video projection cubes for a total video screen wall of 89.4 sq. ft. (6.7 ft H x 13.35 ft W). The ergonomically designed room and furniture layout enables large groups of people to simultaneously view the display screens.

The display screens make use of the Decision Support System (DSS) that has been under development since 2002. This web-based application consolidates many of the Departments information sources into one application making real-time and static information easier for the decision maker to use. Some of the information sources currently in use are; pump station and CSO control site SCADA and alarm systems; Collector System monitoring network data; the Department's wide variety of GIS data; sewer system and equipment scanned drawings; CCTV inspections video; Collector Systems work order mgt. systems; weather and tide predictions to name a few.

2.2.1 RTC – SWMG, CC, LSWS

Start: 7/1/1998 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-13.

Description: A number of interrelated projects in the Southwest Drainage District (SWDD) were determined to enhance the operation of the high-level and low-level collection systems and consequently maximize capture and treatment of wet-weather flows at the SWWPCP. Each of the high-level interceptor systems that discharge to the SWWPCP can influence the hydraulic capacity and treatment rate of the other high-level interceptor systems, as they compete for capacity in the Southwest Main Gravity (SWMG) into the plant. Therefore, several integrated projects were proposed together to establish a protocol for prioritizing flow from each interceptor system. These projects will be defined and implemented in conjunction with a centralized real-time control (RTC) system (see 10.5.1 - Real Time Control Center). In addition, the RTC system will control the Triple Barrel reach of the SWMG, and will control the diversion from the SWMG to the Lower Schuylkill West Side Interceptor (LSWS), thereby enabling use of the full capacities of these interconnected conduits during wet-weather.

The individual projects that constitute the SWMG optimization program are: adding a RTC system with monitoring at approximately six locations and automated gate structures at seven locations, modifying the SWMG Triple Barrel sewer at 70th & Dicks St.; replacing the dry weather outlet (DWO) pipe and raising the dam at regulator C_17, modifying the regulators along the LSWS interceptor, and modifying the hydraulic control point regulators along the SWMG to pass more flow to the LSWS. The total estimated cost for these projects is $1,750,000.

Status: During the first year of the project, Reid Crowther Consulting, Inc. set up an RTC model using SewerCAT software developed by Reid Crowther. Existing Stormwater Management Model (SWMM) data for the SWDD was imported into this model. Hydraulic conditions of the SWDD were assessed, current systems and practices were reviewed, and an RTC objective function was identified. Several technical approaches and operational modes were assessed, and an automatic system with the availability of supervisory control constitutes the present operating strategy. A technical memorandum was completed describing the facilities required for the implementation of RTC in the SWDD; an implementation plan has been developed and preliminary budget estimates were produced.

During the calendar year 2001, the SWDD RTC strategy was further refined and analyzed and a draft conceptual design memorandum was completed describing the RTC facilities, system strategies and objectives, cost estimates for RTC implementation, analysis of alternative scenarios, and work plan for the development of an RTC decision support system. The proposed RTC scenarios were modeled using the EXtended TRANsport (EXTRAN) component of SWMM and were quantified in terms of CSO volume estimates, impact on wet weather hydraulic grade lines (HGLs) and flows at selected locations, and costs/benefits.

The SWDD RTC conceptual design memorandum outlines recommendations for the modifications to the SWDD collection system in three phases. Phase I includes enlarging of the DWO pipe and raising the diversion dam at the C_17 regulator, modifying the operation of CSPS based on the level in the CCLL interceptor, and regulating inflows from S_27 to the SWMG using a DWO sluice gate under RTC. In addition, installation of a side-overflow weir at the West Barrel at the 70th & Dicks Triple Barrel and opening the East and Center Barrels open for dry weather flow is encompassed in Phase I of the RTC project. Phase II concentrates on decreasing overflows in the LSWS by enlarging the S_45 DWO pipe and regulating inflows using a computer-controlled DWO sluice gate. The strategy for Phase II also incorporates closing of DWO shutter gates at S_43 and S_47. The 3rd phase of the RTC conceptual design is enlargement of the S38 DWO pipe and regulating flows using a computer-controlled DWO gate.

<u>Phase I</u>

C17

The contract award for this project was $1.7 million. On 8/19/05, the gate on the 66in reinforced concrete DWO pipe was installed and functioning to specification. On 1/9/06, the old dam and 20in DWO pipe upstream of the new gate & dam were sealed and removed from service. The project was closed out on September 3, 2006.

Central Schuylkill Pump Station (CSPS)

No operation changes to the pump station will be made until construction is complete on the 70th and Dicks Triple Barrel.

S27

This regulator is currently operating under local control. Future modifications will be evaluated after completion of the work done on S45.

70th and Dicks Triple Barrel

The design for the rehabilitation of the DWO sluice gate chamber was completed with the aid of the consulting engineering firm of Gannett Fleming, and was bid through Projects Control in April of 2006. The bid was awarded to JPC Group in the amount of $1,729,530.

The scope of work includes the following: The three sluice gates will be replaced with new sluice gates. The current gates are not motorized. Under this contract, each gate will get a new electric actuator and become motorized again. The gates will be controlled from the RTC at Flow Control, but there will also be a small electrical box installed so that the gates can be controlled locally from street level at 70th and Dicks. The box will be installed on the side lawn of 2700 South 70th St. There are also some other small items being done under this contract (i.e. new sump pumps to pump water out of the control chamber where the actuators are located, new seals and hatches to prevent sewer water from penetrating control chamber).

A construction Notice-to-Proceed was issued in October 2006. Construction should be complete by mid-2007.

<u>Phase II</u>

S45

The regulator modifications at 67th Street, is currently under design with the aid of the consultant engineering firm of Hatch Mott MacDonald. Design should be complete by mid 2007.

S43

Modifications to this hydraulic control point will be placed on hold until completion of the work done on S45.

S47

Modifications to this hydraulic control point will be placed on hold until completion of the work done on S45.

Phase III
S38
After extensive hydrologic and hydraulic modeling, it was determined that modifications to S38 were unnecessary. The goal of maximizing flow to the SW Plant through the Lower Schuylkill West Side Interceptor can be achieved solely through modifications to the S45 regulating chamber.

2.3 WPCP Flow Optimization (Stress Testing)

Start: 1/1/1998 End: 5/1/2001 Status: Complete

Reference Long Term CSO Control Plan p. 2-17 – 2-21.

The plant stress-testing project established:

- Maximum and average flows that should be treated in various unit processes for current and future operations;
- Ranges of hydraulic, solids and BOD_5 loads that could be applied to the various unit processes and yet obtain maximum removal efficiencies in each unit process;
- Changes in plant processes and operations (such as increased loads, MLSS levels, changes in sludge wasting, return activated sludge (RAS) ratios, detention times, etc.) that would increase removal efficiencies; and
- Magnitudes of excess capacity, if any, in each unit operation of the plant (increased flow through plant process units) that could be achieved and still meet the discharge permit requirements for each plant.

The results of stress testing allow for a determination of existing and future optimum flows, loads, and operations of the various unit processes. The identification of choke points, deficiencies and unit process capacities are provided in the stress testing summary report that has been developed for each WPCP. Specific WPCP Capital Improvement Projects (CIP) have been identified as potential projects resulting from the findings of the stress testing which were provided as part of the summary reports. The actual need for additional CIPs, and the resulting prioritization of the CIPs and the budgeting, appropriation of monies, scheduling and actual implementation of the CIPs was accomplished within the context of the overall watershed approach to CSO abatement defined in the LTCP.

CH2MHill submitted the Final Reports for each of the three WPCPs on May 1, 2001. The reports provided the following information: project objectives and methodology, current performance, maximum instantaneous flow, current sustainable treatment capacity and potential upgrades. The report also included hydraulic and treatment throughput capacities for each plant process, capacity limiting factors, and the potential operating modifications or capital projects whose purpose would be to increase plant throughput. Recommended modifications or upgrades were prioritized and categorized into those potential projects that could be considered for either immediate implementation, resulting in enhanced treatment, or capital improvement projects that could also increase treatment capability but would require PWD expenditures. The various CIPs were also categorized by four treatment objectives including: process improvements, peak primary treatment capacity, peak secondary treatment capacity, and wet weather treatment capacity. This second categorization provided anticipated combined CIP costs for each of the treatment objectives as well as the peak treatment capacities.

Table 6 - Potential upgrade options at the NE Plant as identified in the Stress Test

Potential Upgrade Options at Northeast WPCP

Option No.	Description	Priority Classification	Estimated Conceptual Cost
1	Improve mixing in mixed liquor channel to secondary clarifiers 9 through 16	A	$ 472,000
2	Polymer addition on Set 1 secondary clarifiers to maintain effluent quality	B	$ 22,000
3	Separate flow measurement of secondary effluent from sets 1 and 2	C	currently undetermined
4	Automation of step feed operation for aeration tanks	A/B	$ 161,000
5	Modify Set 2 secondary effluent channels to reduce hydraulic restrictions under high flow conditions	B/D	$ 223,000
6	Modify the existing RAS system in the secondary clarifiers	C	$ 2,183,000
7	Provide a second conduit to the Set 2 primary clarifiers to convey additional flow to Set 2 Primary tanks	D	$ 3,312,000
8	Reduce losses and increase capacity between the grit tanks and Set 1 clarifiers by installing another conduit and venturi meter	D	$ 707,000
9	Provide a bypass from the primary effluent channels to the chlorine contact chamber	D	$ 8,291,000
10	Provide separate primary sludge thickening	D	$ 12,254,000
11	Reuse abandoned ABCD tanks in wet weather treatment facility	C	$5.0 - 10.0 million
12	Increase raw sewage pumping and screening by:	D	-
12a	50 mgd	D	$10.0 - 20.0 million
12b	150 mgd	-	$20.0 - 24.0 million
12c	300 mgd	-	$36.0 - 40.0 million

Options numbered 1, 2 & 4 have been completed.

Table 7 - Potential upgrade options at the SW Plant as identified in the Stress Test

Potential Upgrade Options at Southwest WPCP

Option No.	Description	Priority Classification	Estimated Conceptual Cost
1	Replace caulking on secondary clarifier launders to improve flow distribution	A	$ 1,640,000
2	Provide preliminary treatment for the BRC centrate that is recycled in the plant	B/C	$ 8,585,000
3	Modify existing RAS system in the secondary clarifiers	C	$ 4,256,000
4	Provide primary effluent bypass to secondary clarifiers	D	$ 902,000
5	Provide separate facilities for primary sludge thickening	D	$ 9,892,000
6	Resolve hydraulic limitations between primary clarifiers and aeration basin	D	$ 5,429,000
7	Provide and additional effluent pump at the effluent pumping station	D	$ 806,000

Option number 1 has been completed.

2.4 Specialized Sewer Cleaning Projects

Mobile Dredging and Pumping Company was awarded the sewer cleaning contract and started performing the work under Purchase Order # POXX07103124 at a cost of $869,252.50. Mobile Dredging was responsible for cleaning the following sewer site:

Upper Delaware Low Level Interceptor Sewer

The cleaning project of this interceptor sewer starts at a manhole located at the intersection of State Road and Grant Avenue and ends at a manhole located at Wissinoming Street approximately 200 feet north of Cottman Avenue. The length of this section is approximately 17,340 feet. The following is a breakdown of all the sewer sizes in that section of the Interceptor:

Table 8 - Section sizes and lengths of Interceptor cleaned

Upper Delaware Low Level Interceptor Sewer line

Section Size	Section Length (Linear Feet)
6'-0" x 5'-0"	10,175
7'-0" x 5'-6"	3,115
36 in	350
9'-0" x 9'-0"	2,330
9'-6" x 9'-0"	1,370
TOTAL	17,340

The work started on September 5, 2006 and is still ongoing. As of December 31, 2006, the total amount of debris removed from this sewer was 18 tons.

2.5 Solids / Floatables Control

2.5.1 Solids / Floatables Control Pilot Program

Start: 3/1/1996 End: 7/1/2005 Status: Complete

Reference Long Term CSO Control Plan p. 2-6.

Description: This project involves the reduction in solids and floatable material to receiving waters, most notably the Delaware and Schuylkill Rivers, to improve water quality and aesthetics of surrounding parks and recreational areas. Although the NMCs and the projects contained herein increase system-wide capture of solids and floatables, implementation of additional measures will be examined in pilot projects. For example, the outfall at regulator T-4 was recently equipped with a floatables net trap which will capture floatables at this location. This installation will reduce the quantity of discharge at this location as well as provide data to support the floatables monitoring effort.

Additionally, PWD will pilot the use of a floatables skimming vessel to remove debris from targeted reaches of the Delaware and Schuylkill Rivers. It is proposed that a relatively small (20 to 30 foot) vessel be used for this pilot study at an estimated cost of up to $380,000.

Environmental Benefits: Reduction in floatables improves both water quality and aesthetics of receiving streams. The use of a skimmer vessel also allows for a mobile control program capable of managing debris at various locations, increasing the effectiveness of this control measure. In addition, the boat will be a visible control, and will increase the public awareness and education of floatables' impacts.

Status: A pilot netting facility at the T-4 outfall has been collecting debris from CSOs since April of 1997. In 2006, nine (9) inspections were made and 1786 pounds of debris were collected and disposed of. Since the installation of the netting device, there have been 65 inspections and net replacements (approx. 130 nets), with an approximate total of 12,774 pounds of debris captured (Appendix A). The City has compared the floatables removed from the net with other floatables control technologies employed. More specifically, on an area weighted basis the inlet cleaning program data suggests that street surface litter dominates the volume of material that can enter the sewer system. The pilot in-line netting system installed at T_4 has also been shown to capture debris on the same order as the WPCP influent screens indicating that effective floatables control needs to target street surface litter in order to effectively reduce the quantity of debris likely to cause aesthetic concerns in receiving streams.

During calendar year 2003, HydroQual, Inc., provided assistance in the evaluation of both skimmer vessel technologies and the individual vessels. The investigation identified the vendors able to provide equipment suitable for use on the Schuylkill and Delaware Rivers. The analysis looked at the following factors: material handling, vessel speed, mobile offloading, seaworthiness, operations and maintenance costs, quiet operation, service area flexibility, capital costs, and life-cycle costs. Through the investigation, the PWD has determined that the front-end loader type vessel would be the most suitable for recovering floatable material within the service area. The research identified only one front-end loader vessel that meets the City's programs needs, the Rover 12 produced by Hewitt Environmental. The PWD had requested that the Procurement Department purchase a Rover 12 from Hewitt Environmental. The vessel can be described as follows:

A 39-ft, front-end loader, single hull, shallow draft, debris skimming vessel with a hydraulically controlled grated bucket and a 5.6 cubic yard on-board hold equipped with a main diesel engine, Caterpillar Model 3056 205-hp. Four-blade, magnesium bronzed propeller housed in a stainless steel tube, 122 gallon fuel tank, and a fully enclosed, removable, aluminum cabin with heating and air conditioning. The water canon system is run with a 16 HP Mitsubishi Diesel Engine (150 gpm at 100 psi). Hydraulic pumps control the ballast control. The trailer is a Model YH-915XD (rated on-road 12 tons, off-road 15 tons) with electric/hydraulic brakes. Four marine grade stainless steel mooring bollards, four lifting hooks, 35 inch long galvanized anchor, and guard rails. Accessories include a hailer, radar, portable VHF, depth sounder, crew seat, AM/FM radio, and GPS plotter, warehouse supports, working lamps, a manually operated searchlight, a spare parts kit including 4 spare debris containment bins, 5 life jackets, a deluxe telescopic boat hook, and six inflatable heavy duty fenders. Includes operator and technical manuals, a 3-year or 3000-hr warranty on the Cummins engine, and operator training for 2 personnel for 5 days.

On June 18, 2004, the initial payment for the construction of the vessel was authorized by the PWD and the fabrication of the skimming vessel officially began. On December 17, 2004 the PWD sent a team to Rhode Island for a vessel inspection at Hewitt Environmental's contractors manufacturing facility - Blount Boats, Inc - 461 Water Street, Warren, RI 02885. The inspection took place in the Blount shipyard. The inspection lasted about 2.5 hours and included weld inspections, review of the water testing performed on the hull, and a thorough visual inspection. Hewitt design engineers also performed a contract drawing review for the PWD representatives. Fabrication continued throughout the first half of 2005 and the boat was delivered in early July. The vessel completed sea trials and after a few minor modifications, was accepted by the PWD. The total cost of the vessel was $526,690.

The vessel (**Figure 1**), now known as the R. E. Roy, was operated in-house, by Philadelphia Water Department personnel from delivery until April 2006. These personnel were trained by the vessel construction company on proper operations of the vessel. The vessel was in operation on the Schuylkill and Delaware Rivers performing general debris collection and removal. The vessel was also used to clean up for and service as a public relations highlight at events such as the Schuylkill Regatta.

The PWD went through the process of securing a contractor for the permanent operation of the skimming vessel from October 2005 through March 2006. The vendor selected through this process has become the full-time operator of the skimming vessel for a contract period of at least one year, with the option for contract renewal. The vessel is now operated five days per week, 8 months of the year.

The contract was awarded to River Associates, Inc of Philadelphia, PA in the spring of 2006. River Associates began operation in April 2006. Since that time, they have been operating the vessel and performing general debris cleanup on both the Delaware and Schuylkill Rivers. They have also participated in numerous public events including the PECO Energy Earth Day Cleanup, the Jam on the River at Penn's Landing, the Schuylkill River Sojourn, and the Godspeed Sail & Landing Party at Penn's Landing.

Figure 1 - Completed skimming vessel in operation

2.5.2 Pontoon Vessel

Start: 10/01/2004 End: 06/01/2006 Status: Complete

Description: The Philadelphia Water Department has purchased a pontoon vessel to be used as a workboat on the Upper Schuylkill, Lower Schuylkill, and Delaware Rivers within Philadelphia. The vessel will be used to retrieve floating trash and debris from the waterways within the service area. The debris will be hand netted from the water surface by employees standing on the vessel deck. The hand nets will be emptied into 30-gallon debris containers on the deck, and the containers would be offloaded by hand. The pontoon vessel can be utilized in tight spaces found in marinas, among piers, and in near shore areas. This small pontoon vessel is to be used as a companion vessel to the larger floatables skimming vessel already being operated in Philadelphia.

Status: The pontoon vessel was acquired by PWD in June 2006. PWD then made additional upgrades and retrofits to the vessel. The vessel has since been field tested and has been used on several instances as both a work boat and for public outreach purposes until it went into storage for the winter months. Presently, PWD plans to continue field testing of the vessel in Spring 2007 to discover the best operational schedule given its advantages, as well as its limitations.
The operational area of the Pontoon Vessel will include:

- The Lower Schuylkill above Fairmount Dam up to Flatrock Dam (7.2 miles)
- The Lower Tidal Schuylkill down to the confluence with the Delaware River (8.1 miles)
- The Delaware River from the confluence up to the Philadelphia City Boundary (18.8 miles)

3.0 Phase III – Watershed-Based Planning and Management

3.1 Introduction

The third component of the City's CSO strategy involves a substantial commitment by the City to watershed planning to identify long term improvements throughout the watershed, including additional future CSO controls that will result in further improvements in water quality and, ultimately, the attainment of water quality standards. The need for this watershed initiative is rooted in the fact that insufficient physical, chemical and biological information currently exists on the nature and causes of water quality impairments, sources of pollution, and appropriate remedial measures. Because of this deficiency, it is currently impossible to determine what needs to be done for additional CSO control or control of other wet weather sources throughout the watershed. This deficiency, especially with respect to the effects of wet weather discharges and receiving water dynamics, is increasingly recognized nationwide and has led to a broader recognition of the need for watershed-based planning and management to properly define water quality standards and goals. The PWD believes that the National CSO Policy, state and federal permitting and water quality management authorities, cities, environmental groups, and industry, now recognize that effective long-term water quality management can be accomplished only through watershed-based planning.

Further, watershed planning is not only mandated by the CSO Policy and guidance documents, but also is consistent with the current Clean Water Act (CWA) and its regulations, as well as the priorities announced by EPA's Office of Water (See EPA's Watershed Approach Framework, Office of Water, June 1996). Therefore, as discussed in Section II and throughout this report, watershed-based planning and management must not only be fully embraced, but initiatives for development of watershed plans must be actively pursued by the City in cooperation with other stakeholders. This must be done not only to comply with the directions of the CWA, the CSO Policy, and other guidance, but more importantly, to define, prioritize and address the most important causes of non-attainment in the watersheds and to move toward attainment of water quality standards and achievement of beneficial uses.

At the same time, however, the City realizes that effective watershed planning is, even in its simplest form, quite difficult. Understanding the complex, interrelated chemical, biological, hydrologic and hydraulic processes that govern water quality is a very expensive, lengthy process that requires extensive, site-specific data and technical analyses. Establishing stakeholder groups, building consensus, articulating goals and objectives, assessing water quality and water quality impacts of point sources and a vast array of non-point sources, reviewing and possibly revising water quality standards to reflect wet weather processes in water bodies, establishing and implementing water quality based controls, evaluating their effectiveness and financing the cost of studies, design and implementation watershed-wide, requires extensive commitment and resources of a broad range of stakeholders. The process of watershed planning does not happen overnight. The City, nonetheless, is determined to reduce CSO discharges in the near term and undertake, in cooperation with other agencies and stakeholders, comprehensive watershed planning over the next several years.

In light of this commitment and consistent with the CSO LTCP, sections 3-9 describe the status of the various components of the initiative that PWD is undertake to initiate and support watershed-based planning in each of the watersheds within the PWD service area.

3.2 CSO Receiving Water Bodies and Their Watersheds

Water bodies receiving CSO discharges in the PWD service area include the Cobbs/Darby Creeks, the Pennypack Creek, the Tacony/Frankford Creeks, the Schuylkill River and the Delaware River. Although they do not have CSO discharges, the Wissahickon and Poquessing Creeks are important waterways within the PWD service area. There are 164 point sources of CSO discharge from the PWD sewer system to these waterways. **Table 9** below indicates the number of CSO point sources and the number of major separate stormwater outfalls on each waterway, as identified in the City's NPDES permits.

Table 9 - CSO and Stormwater Point Source Discharges to Tributaries

	Number of CSO	**Number of Major**
Waterway	**Point Sources**	**Stormwater Outfalls**
Delaware/Schuylkill Rivers (tidal)	94	30
Cobbs/Darby Creeks	34	3
Tacony/Frankford Creeks	31	35
Pennypack Creek	5	130
Schuylkill River (non-tidal)	0	32
Poquessing Creek	0	141
Wissahickon	0	63

3.3 Overview of Watershed Management Planning Work Scope

To meet the regulatory requirements and long-term goals of its CSO, stormwater, and drinking water source protection programs, PWD has embraced a comprehensive watershed characterization, planning, and management program. Watershed management fosters the coordinated implementation of programs to control sources of pollution, reduce polluted runoff, and promote managed growth in the city and surrounding areas, while protecting the region's drinking water supplies, fishing and other recreational activities, and preserving sensitive natural resources such as parks and streams.

Coordination of these different programs has been greatly facilitated by PWD's creation of the Office of Watersheds (OOW). This organization is composed of staff from the PWD's planning and research, CSO, collector systems, laboratory services, and other key functional groups, allowing the organization to combine resources to realize the common goal of watershed protection. OOW is responsible for characterization and analysis of existing conditions in local watersheds to provide a basis for long-term watershed planning and management.

This section outlines the elements of the Phase III Watershed Planning Initiative as described in the PWD CSO LTCP. Watershed planning includes various tasks ranging from monitoring and resources assessment to technology evaluation and public participation. The following is a list of typical tasks and subtasks that generally describe the work elements in the watershed planning programs being developed.

General Activities

- Management and facilitation
- Public Participation and Information
- Funding Support

Step 1 - Preliminary Reconnaissance Survey

- Data collection and assessment
- Preliminary water quality assessment
- Land use and resource mapping
- Inventory of point and non-point sources
- Definition of regulatory issues and requirements
- Preliminary biological habitat assessment
- Reconnaissance stream survey
- Preliminary problem assessment

Step 2 - Watershed Work Plan and Assessment

- Monitoring, sampling and bioassessment
- QA/QC and data evaluation
- Watershed modeling
- Waterbody modeling
- Problem definition and water quality goal setting
- Technology evaluation
- Economic assessment and funding requirements
- Public Involvement / Watershed Partnership
- Development of Watershed Management Plan

Step 3 - Watershed Plan Implementation

- Institutional arrangements
- Implementation programs
- Monitoring and measures of success

An overview of the elements being completed in each watershed and their year of completion are shown in **Table 10**.

Table 10 - Planning being completed in each watershed

Watershed	Preliminary Reconnaissance	Watershed Monitoring Program	Watershed Management Plan	River Conservation Plan
Delaware River (tidal, non-tidal)	Monitoring Only		-	Starting in 2007
Cobbs-Darby Creeks	2003	2003	Completed 2004	Darby RCP completed in 2005 by Darby Creek Valley Association
Tacony-Frankford Creeks	2000/2001	2004	Completed 2005	Completed in 2004
Pennypack Creek	2002	2002	Started 2007, Anticipated Completion in 2008	Completed in 2005
Schuylkill River (tidal, non-tidal)	Monitoring Only		-	Completed in 2001 by the Academy of Natural Sciences, Natural Lands Trust, and the Conservation Fund
Poquessing Creek	2001	2001	Starting 2008, Anticipated Completion in 2009	Completed in 2007
Wissahickon Creek	2001	2005-2006	Started in 2005, Anticipated Completion in 2007	Completed in 2000 by FPC

Past activities have focused on integrating efforts in five major regulatory programs that contain significant elements related to watershed management plans to be developed under Step 2 for the Darby-Cobbs and Tacony-Frankford Watersheds and continuation of monitoring and reconnaissance studies for the remaining basins included in the CSO LTCP. These include: (1) the TMDL process to improve water quality on impaired streams and water bodies; (2) the Phase I and Phase II Stormwater Regulations to control pollution due to stormwater discharges from municipal stormwater systems; (3) PA Act 537 Sewage Facilities Planning to protect and prevent contamination of groundwater and surface water by developing proper sewage disposal plans; (4) the Storm Water Management PA Act 167 to address management of stormwater runoff quantity particularly in developing areas; and (5) EPA's Combined Sewer Overflow (CSO) Control Policy to minimize mixed sewage and stormwater overflowing directly into streams. Some of the data collection and analyses are common to more than one program; therefore, an integrated watershed management approach seeks to develop a cohesive single plan that effectively meets the requirements of each program.

Watershed planning includes various tasks, ranging from monitoring and resource assessment to technology evaluation and public participation. The scope and importance of each task varies for each watershed, depending on the site-specific factors such as the environmental features of the watershed, regulatory factors such as the need to revise permits or complete TMDLs, available funding, extent of previous work, land use, and the size and degree of urbanization of watershed. It is clear that significant savings can be achieved through coordination of the programs and the development of one comprehensive plan for a watershed that meets all five program needs. Sections 3-10 describe the status of the various components of the initiative that PWD has undertaken to advance watershed-specific capital program implementation and watershed-based planning in each of the watersheds within the PWD service area.

Section 3 - Darby-Cobbs Watershed

1.0 CSO Capital Improvement Projects

1.1 Cobbs Creek Low Level (CCLL) Control Project

Start: 6/1/1998 End: 5/1/2000 Status: Complete

Reference Long Term CSO Control Plan p. 2-16.

Description: Control pipes, located in the CCLL interceptor near Glenmore Avenue, are two 18-inch orifice openings in an interceptor manhole bulkhead. The control pipes were installed to prevent chronic flooding occurring at the 75th and Grays Avenue chamber downstream. The 75th and Grays chamber is a former regulator (C-28), whose outfall to Cobbs Creek was sealed but still contained a 12-inch by 18-inch orifice opening to the interceptor. Grit accumulation has reduced the capacity of this orifice. The orifice opening at the 75th and Gray's chamber was the limiting hydraulic element in the interceptor. The opening restricted flow to the 30-inch interceptor that conveys flow from the 75th and Gray's Avenue chamber to the SWWPCP low level pumping station. The maximum flow through this opening was 11.8 mgd, assuming the 30-inch interceptor downstream of the 75th and Gray's Avenue has been cleaned (*Cobbs Creek Low Level Interceptor Conveyance Improvements*.) Flow was recently rerouted past the orifice in the 75th and Gray's chamber with a new 30-inch pipe, increasing the capacity to 15 mgd. The hydraulic limit of the 30-inch CCLL interceptor can now be realized. This project was completed at a cost of $200,000.

Additionally, the upstream interceptor will be cleaned and lined and a smooth transition between the brick sewer and the new 30-inch RCP bypass will be constructed. The two 18-inch orifices will be reconfigured in order to facilitate cleaning. While these orifices will control flooding problems at the 75th and Grays Avenue, they will not reduce the flow delivered to the interceptor below the interceptor capacity of 15 mgd. The projected cost for this project is $2,500,000.

Environmental Benefits: These projects reduce the frequency and volume of overflows to Cobbs Creek, one of the smaller receiving streams. Interceptor capacity increases from 11.8 to 15 mgd due to the new 30-inch bypass line in conjunction with grit removal in the downstream interceptor (*Cobbs Creek Low Level Interceptor Conveyance Improvements)*. The reduction in overflow volume is 10 MG on an average annual basis.

Status: Construction began on November 17, 1998 after the contract was awarded to Empire Sewer Cleaning Company at a cost of $3,447,540. The project schedule proposed by the contractor was for a period of 300 days. Therefore, due to the $947,540 increase in scope, and the subsequent affect on the implementation schedule, the estimated project completion date is January 10, 2000. The scope of work entails Gunite restoration of approximately 10,850 feet (various sizes) of the Cobbs Creek Low Level Intercepting Sewer from 60th Street to 75th and Grays Avenue. During 1999, the remaining 7,000 feet of sewer rehabilitation was completed. The sewer reach was cleaned in preparation for the application of 3 inches of gunite. Bank rehabilitation was completed at three exposed sewer locations along Cobbs Creek and manhole restoration work was completed. The completion date for the minor manhole repair work was May of 2000.

1.2 Cobbs Creek Low Level (CCLL) Improvements

Start: 4/2/1998 End: 12/1/2000 Status: Complete

Reference Long Term CSO Control Plan p. 2-16.

Description: Inspections have revealed that grit has accumulated in the 30-inch Cobbs Creek Low-Level (CCLL) interceptor to a depth of approximately 12 inches. Grit buildup reduces the hydraulic capacity of the interceptor both by constricting its cross sectional area, and by increasing its frictional resistance. This project entails the removal of grit and debris along the entire 30-inch interceptor. The estimated cost for the project is $440,000.

Environmental Benefits: This project will reduce the frequency and volume of overflows to Cobbs Creek by restoring the conveyance capacity of the 30-inch Cobbs Creek interceptor between the 75th and Gray's Avenue chamber and the SWWPCP low level pumping station. When grit is removed from this interceptor segment, the model indicates that the capacity nearly doubles from 5.9 mgd to 15 mgd. This project results in a 50 MG volume reduction on an average annual basis.

Status: The grit buildup in the Island Avenue sewer from 75th and Wheeler Streets to the Southwest WPCP was identified to impede the hydraulic capacity of the Cobbs Creek Low Level Interceptor and will continue to be cleaned as a part of this project. The disposal of debris from these sewers was handled under the BRC grit screening disposal contract with Waste Management, Inc., at a budget of $155,000. The cleaning work on the Cobbs Creek Low Level (CCLL) Interceptor started on 5/3/00. In this project, a 2000-ft section of the Island Avenue sewer is located under Septa's Trolley tracks between Dicks Street and Lindbergh Avenue. The project encountered considerable delays during the work coordination process with SEPTA. SEPTA then agreed to shuttle a bus on Island Avenue between the hours of 9:00 PM and 4:00 AM for a period of two weeks starting 6/19/2000 in order to allow Mobile Dredging to perform the work. The project was completed in calendar 2000.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Darby-Cobbs Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org.

2.1 Preliminary Reconnaissance Survey

In addition to the formation of an initial stakeholder body, significant progress was made towards developing the technical tools that comprise the preliminary reconnaissance survey as described in the CSO LTCP. The following technical documents comprise the preliminary reconnaissance survey:

- Historical Water Quality for The Darby and Cobbs Creeks Watershed
- Analysis of 1999 Monitoring Data for The Darby and Cobbs Creeks Watershed
- A screening Level Contaminant Loading Assessment for the Darby and Cobbs Creek Watershed
- Documentation of the Biological Assessment of the Cobbs Creek Watershed.

2.2 Watershed Work Planning & Assessment

The Philadelphia Water Department (PWD) has embarked on an ambitious program of watershed management for several creeks within the City limits. The first plan to be completed is for Cobbs Creek. The Cobbs Creek Integrated Watershed Management Plan was completed in June 2004. The watershed plans are designed as integrated watershed planning efforts to address the objectives of several programs, including CSO Long Term Planning, Pennsylvania Stormwater Management programs, potential or existing TMDLs, River Conservation Plans, and Phase II Stormwater permits. PWD's Office of Watersheds (OOW) has carried out an extensive sampling and monitoring program to characterize conditions in the Cobbs Creek watershed.

The program is designed to document the condition of aquatic resources and to provide information for the planning process needed to meet regulatory requirements. The program includes hydrologic and water quality analysis, biological and habitat assessments, and fluvial geomorphological assessments of the entire length of Cobbs Creek and its major tributaries. A SWMM model was developed for the watershed that simulated the watershed response to storms for both the storm sewers as well as combined sewers. The model was used to assess current pollutant loading from CSOs and from stormwater water. The model has also been adapted to simulate a wide array of CSO controls and stormwater BMPs, including swales, green roofs, infiltration basins, porous pavement, and similar techniques. By simulating BMPs at various levels of implementation, graphs of urban BMP effectiveness in controlling CSOs and stormwater were developed and used to make watershed-specific recommendations on the needed degree of implementation and the selection of the most cost-effective approaches to meeting water quality and quantity objectives. The plan has resulted in a careful assessment of the potential for restoration of an urban stream. Proposed for implementation is an array of CSO controls, storm water BMPs, stream restoration measures, non-structural measures, and public education/participation programs. Implementation of the plan recommendations will be carried out in phases to allow for an adaptive management approach.

2.2.1 Watershed Partnership

The Darby-Cobbs Watershed Partnership was facilitated by the Philadelphia Water Department to create a framework for all stakeholders in the 75 square mile Darby-Cobbs watershed basin to work together to provide environmentally sound solutions to improve the water quality of Darby and Cobbs Creeks. Permit holders, participating agencies, and community-based organizations are constructing this framework upon regulatory and voluntary activities. The Partnership itself is a public participation mechanism, and acts as a forum for participating members to work together to develop a watershed strategy that meets state and federal regulatory requirements and embraces the environmental/public sensitive approach to improve stream water quality and quality of life in communities.

As one of the first steps in defining its framework, the Partnership developed a mission statement: "To improve the environmental health and safe enjoyment of the Darby-Cobbs Watershed by sharing resources through cooperation of the residents and other stakeholders in the Watershed."

The Partnership formed a Public Participation Committee to ensure that the Partnership identifies and recruits representatives of the diverse array of stakeholders in this basin, including municipalities. Members of the Public Participation Committee include representatives of the following agencies/organizations: the Philadelphia Water Department, the Fairmount Park CAC, Fairmount Park Commission, Dove Communications, US Fish and Wildlife Service, Heinz National Wildlife Refuge Center, Pennsylvania Environmental Council (PEC), Cobbs Creek Community Environmental Education Center (CCCEEC), Delaware Creek Valley Association, DCNR, PA Department of Environmental Protection, Trail Boss

Program, Delaware County Planning Department, EPA Region III, Delaware Riverkeeper Network, Academy of Natural Sciences, and the Men of Cobbs Creek.

Under the direction of the Partnership Steering Committee, the Partnership will evolve from one that was based upon a planning mandate to one that will focus on the implementation of the watershed management plan. During the summer of 2005, the Partnership Steering Committee teamed with the Eastern Delaware County Council of Government (COG) and the SE PA Resource and Conservation District to apply for a William Penn Foundation grant to facilitate the implementation of the plan in Delaware County. Currently, we are waiting to hear back from the foundation.

More recently, the Partnership reconvened in the spring of 2006 to begin sharing and tracking implementation projects in the Cobbs Creek portion of the watershed. A new steering committee met in October 2006 to discuss the development of a project inventory tracking system and the prioritization of early action projects.

2.2.2 Define Preliminary Goals and Objectives

Early in the planning process, a series of project goals and objectives was developed in conjunction with the stakeholders. In general, **goals** represent consensus on a series of "wishes" for the watershed. A series of 10 project goals were established that represent the full spectrum of goals from all the programs relevant to the watershed (e.g. River Conservation Plan, TMDL programs, Act 167 Stormwater Plans etc.) A significant effort was made to consolidate the various goals into a single, coherent set that avoided overlap and was organized into clear categories.

Once the preliminary set of goals was developed, a series of associated **objectives** was developed. Objectives translate the "wishes" into measurable quantities; **indicators** are the means of measuring progress toward those objectives. This relationship is the critical link between the more general project goals and the indicators developed to assess the watershed and to track future improvement. This process was incorporated in to the watershed management plan.

2.2.3 Data Analysis and Indicator Development

An important aspect of the WMP is to provide a basic description of existing conditions within the watershed and stream. To accomplish this, a series of indicators were developed that effectively represent the results of the data collection efforts and the extensive data analysis and modeling that took place as part of the planning effort. An indicator is a measurable quantity that characterizes the current state of one aspect of watershed health. Every indicator is directly linked to one or more project objectives. Thus, they monitor progress and achievement of objectives as management alternatives are implemented over time. This approach is modeled after the EFP2 program.
The indicators selected for their potential use both in assessing current conditions as well as assessing future progress in improving conditions are shown below:

The Land Use and Stream Health Relationship
Indicator 1: Land Use and Impervious Cover
Indicator 2: Streamflow
Indicator 3: Stream Channels and Aquatic Habitat
Indicator 5: Fish
Indicator 6: Benthos

Water Quality
Indicator 7: Effects on Public Health (Bacteria)
Indicator 8: Effects on Public Health (Metals and Fish Consumption)
Indicator 9: Effects on Aquatic Life (Dissolved Oxygen)

Pollutants and Their Sources
Indicator 10: Point Sources
Indicator 11: Non-point Sources

The Stream Corridor
Indicator 12: Riparian Corridor
Indicator 13: Wetlands and Woodlands
Indicator 14: Wildlife
Indicator 15: Flooding

Quality of Life
Indicator 16: Public Understanding and Community Stewardship
Indicator 17: School-Based Education
Indicator 18: Recreational Use and Aesthetics
Indicator 19: Local Government Stewardship
Indicator 20: Business and Institutional Stewardship
Indicator 21: Cultural and Historic Resources

2.2.4 Development and Screening of Management Options

Clear, measurable objectives also provided the guidance needed in developing **options** designed to meet the project goals. A management option is a technique, measure, or structural control that addresses one or more objectives (e.g., a detention basin that gets built, an ordinance that gets passed, and an educational program that gets designed). The following example clarifies the difference between a goal, an objective, and a management option [think of a better one]:

Goal: Improve water quality

Objective: maintain dissolved oxygen levels above 5 mg/L

Management Option: decrease phosphorus loads from stormwater by infiltrating stormwater at specific locations

Lists of management options were developed to meet each of the goals and objectives established for the Cobbs Creek watershed. Some of the options could be eliminated as impractical for reasons of cost, space required, or other considerations. Only those options deemed feasible and practical were considered in the final list of management options. The list became the basis for assembling the complete Watershed Management Alternatives plan.

2.2.5 Monitoring and Field Data Collection

As part of the 5-yr rotating Watershed Monitoring Program, the Darby-Cobbs Watershed was completed in 2003 to support the development of the watershed management plan and to update the current biological, chemical and physical indicator status. The 2003 monitoring programs focused on developing a biologic and aquatic habitat baseline prior to the implementation of a stream habitat restoration and bank protection project in the Cobbs Creek.

Chemical Sampling

Philadelphia Water Department staff collected surface water grab samples at nine locations within Darby-Cobbs Watershed for chemical and microbial analysis (Figure 2). Sampling events were planned to occur at each site at weekly intervals for one month during three separate seasons. Actual sampling dates were as follows: "winter" samples collected 2/13/03, 2/20/03, 2/27/03, and 3/20/03; "spring" samples collected 3/27/03, 5/22/03, 5/29/03, 6/05/03, and 6/12/03; "summer" samples collected 8/14/03, 8/21/03, 8/28/03, and 09/04/03. A total of 117 discrete, or "grab" samples were taken. To add statistical power, additional discrete water quality samples from PWD's wet weather chemical sampling program were included in analyses when appropriate.

Sites DCC770, DCC455, DCC208, DCD1570, DCD1170, DCD765, DCI010 and DCN010 were included in PWD's baseline chemical assessment of Darby-Cobbs Watershed in 1999. Sites in the Tinicum sub-basin (DCM300 and DCS170) were sampled in 1999 but not in 2003. A single new site (DCD1660), located on Darby Creek upstream of its confluence with Ithan Creek, was added for 2003.

Discrete sampling was conducted on a weekly basis and was not specifically designed to target wet or dry weather flow conditions. Depending on which definition of "dry weather" was used (i.e., 48 hr interval or 72 hr interval), between 6-7 sampling events occurred during dry weather- this data is most pertinent to Target A of the Watershed Management Plan (Dry Weather water quality and aesthetics). Specifically addressed are indicators 7 and 8 - chemical and microbial constituents that are influential in shaping communities of aquatic systems or that are indicative of anthropogenic degradation of water quality in the watershed.

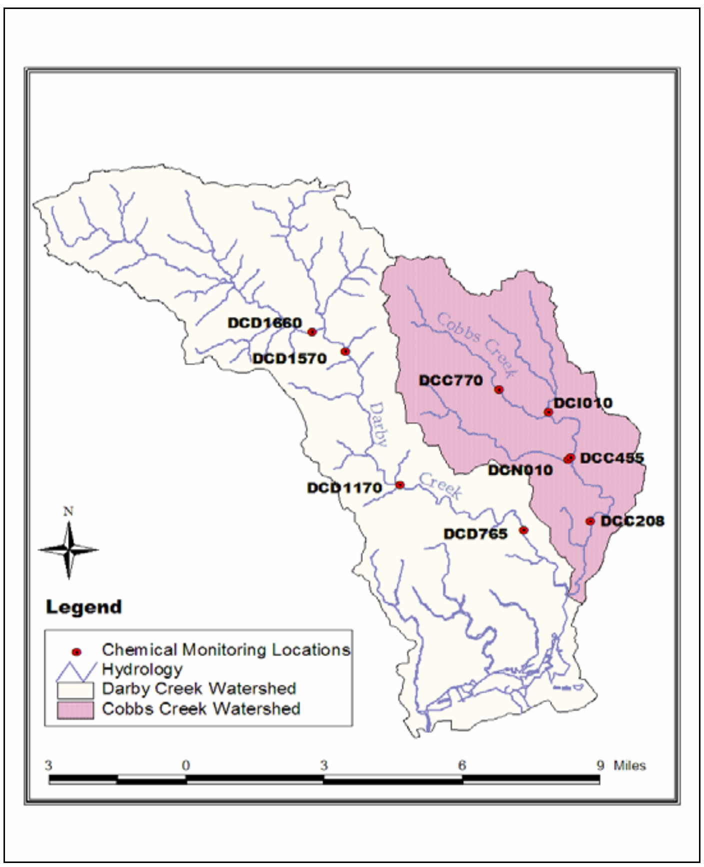

Figure 2 - Discrete water quality stations in the Darby-Cobbs Watersheds (2003)

Wet Weather Targeted Sampling

Target C of the Watershed Management Plan addresses water quality in wet weather. Yet characterization of water quality at several widely spatially distributed sites simultaneously over the course of a storm event presents a unique challenge. Automated samplers (Isco, Inc.) stationed at five monitoring locations were used to collect samples during two runoff producing rain events in July and September 2003 **(Figure 3)**.

The automated sampler system obviated the need for BLS team members to manually collect samples, thereby greatly increasing sampling efficiency. Automated samplers were equipped with vented in-stream pressure transducers that allowed sampling to commence beginning with a small (0.1ft.) increase in stage. Once sampling was initiated, a computer-controlled peristaltic pump and distribution system collected grab samples at 1 hr. intervals.

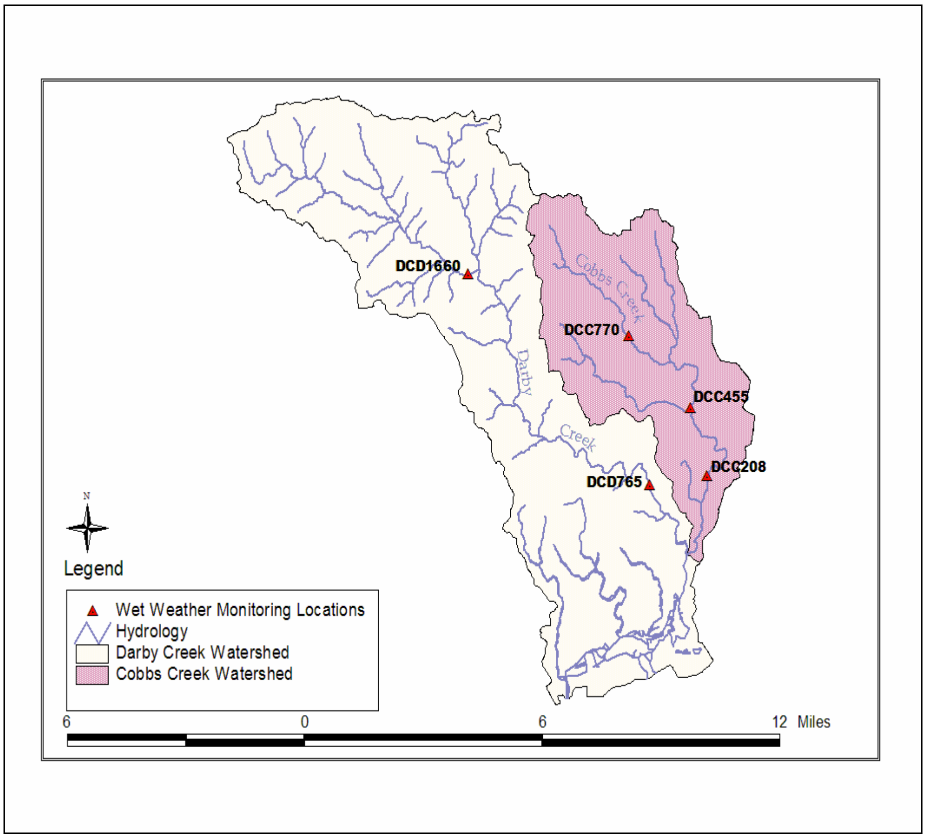

Figure 3 - Wet-weather monitoring locations in Darby-Cobbs Watershed

Use of automated samplers allows for a greater range of flexibility in sampling programs, including flow-weighted composite sampling based on a user defined rating curve, but stage discharge rating curves at these sites were poorly defined for larger flows. Though some difficulties were encountered due to a combination of mechanical failure, individual site characteristics, and/or vandalism, the one hour fixed interval was found to be generally satisfactory in collecting representative samples over a storm event. PWD continues to refine methods of sampling stormwater and experiment with alternative automated sampling programs.

RADAR Rainfall Data and Analysis
Because storm events are inherently variable and do not evenly distribute rainfall spatially or temporally, PWD contracted with Vieux and Associates, to obtain discretized measurements of rainfall intensity during storm events targeted by wet weather sampling. For each 15 minute interval, RADAR tower-mounted equipment measured high frequency radio wave reflection in the atmosphere above Darby Cobbs Watersheds **(Figure 4).**

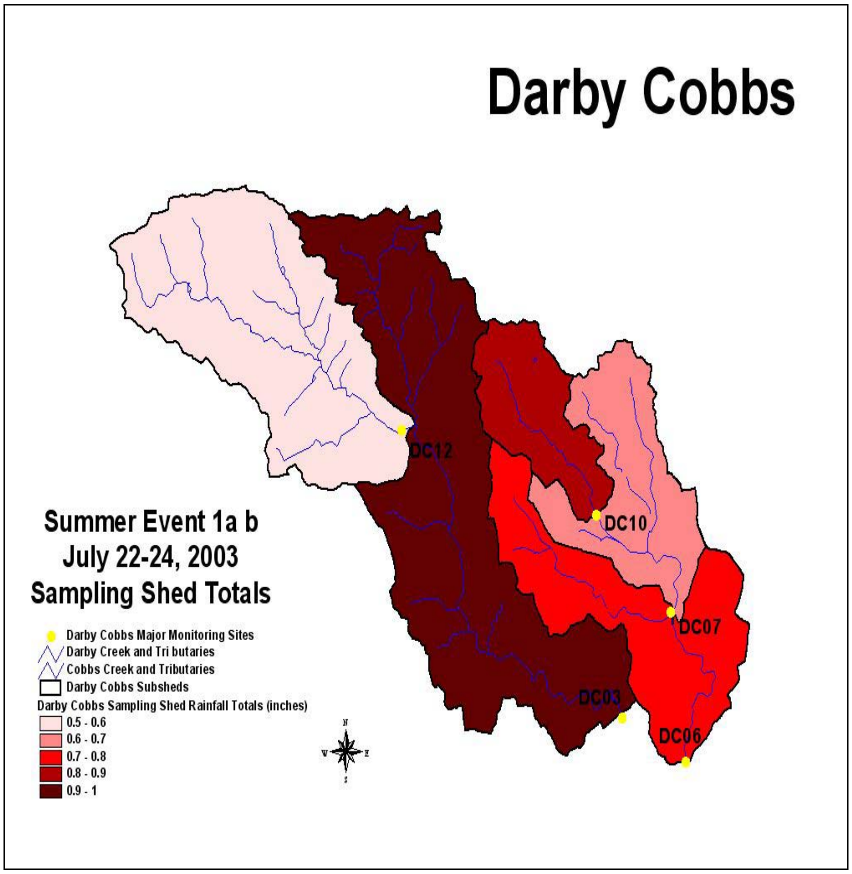

Figure 4 – Radar rainfall data collected in the Darby-Cobbs Watershed (July 22-July 24)

This information was provided to PWD as a series of relative reflectivity measurements for individual blocks 1km2. The resulting grid allowed for the summing of relative rainfall intensity within the sub-shed served by each sampling site over the course of the storm. Individual intensity measurements were also graphed and arranged sequentially to produce animated time series rainfall accumulation graphics. This analysis, combined with data from the PWD rain gauge network and stream stage measurements logged by the automated sampler, allows for more thorough analysis of water quality data, particularly in determining whether some areas or sub-sheds may have contributed more runoff than others.

Biological Assessments and Analyses
Between 3/1/03-3/27/03, PWD staff conducted benthic and habitat assessments at sixteen (n=16) locations within the Darby-Cobbs Watershed **(Figure 5**). Using standard operating procedures developed by the EPA, samples were collected during late winter and analyzed in the laboratory. Similarly, between 6/1/03-7/1/03, PWD biologists conducted fish assessments at ten (n=10) locations. Tidal fish and habitat assessments were also performed at five (n=5) locations in the lower Darby Creek during 8/1/03-9/1/03.

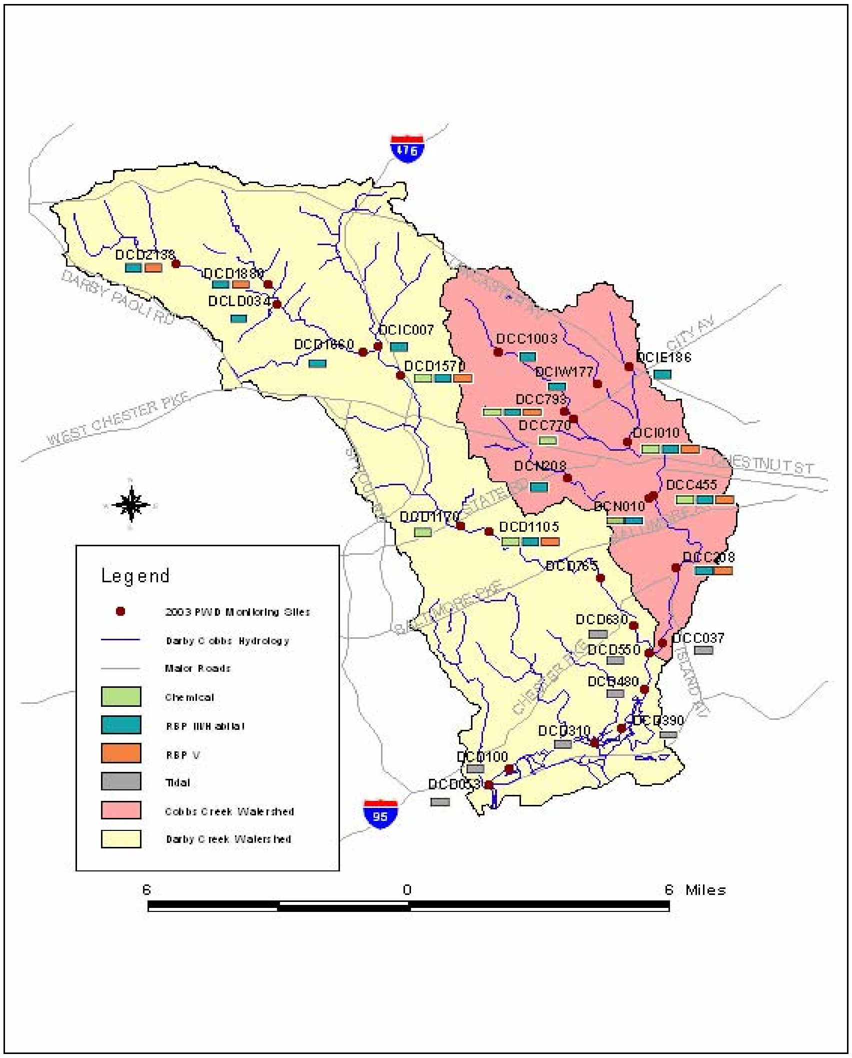

Figure 5 - Biological and habitat monitoring locations in Darby-Cobbs Watershed

2.2.6 Modeling

In most streams in the eastern US, stormwater flows can range from 30% of total annual streamflow in less-developed watersheds to over 70% in highly urbanized settings. Modeling of stormwater flows is, therefore, a critical component of a WMP. The model should, at a minimum, be built to provide storm-by-storm flows to the streams as well as estimates of pollutant loads carried by the stormwater reaching the streams. Working in partnership with PADEPs Act 167 Stormwater management Planning program, a Stormwater Management Model (SWMM) was built for the entire Cobbs Creek watershed. SWMM is a comprehensive set of mathematical models originally developed for the simulation of urban runoff quantity and quality in storm and combined sewer systems. The model splits the Cobbs creek watershed into 107 subwatersheds, and calculates flow and pollutant loading from each land use type within each of the subwatersheds. It simulates the hydraulics of combined sewers, the open channel of the creek itself, and the floodplain. Thus, the model is useful for simulation of stormwater runoff quantity and quality, combined sewer overflow, and streamflow. It is one tool for simulation and evaluation of watershed management alternatives. The model was calibrated by comparing stormwater runoff to estimated runoff, calculated through hydrograph separation at USGS gauge 01475550, on Cobbs Creek upstream of the confluence with Darby Creek. Model simulations included:

- A simulation of existing conditions in which annual average flows were provided for various key points along the stream.
- Storm specific flows for storms of various return periods (1-year, 2-year, 5-year, 10-year, 25-year) at various key points along the stream
- Annual average pollutant loads for key pollutants found in stormwater. The list of pollutants includes nutrients such as nitrate and phosphorus, total suspended solids, heavy metals, BOD, and DO.

The model results were also critical for identifying areas where stormwater runoff or pollutant loads are particularly high and in need of control. Model flow results, in combination with the results of the fluvial geomorphic assessment, provide excellent tools for identifying areas of the watershed that are undergoing stormwater related stress.

2.2.7 Development and Evaluation of Management Alternatives

BMPs, stream restoration measures, stormwater and CSO management technologies, and public education measures must be combined into coherent, integrated management plan alternatives that address multiple objectives. In highly urbanized watersheds, however, it is very difficult to develop appropriate water quality, quantity, and habitat objectives. For Cobbs Creek, PWD's approach is to define three separate sets of objectives or targets, and recommend BMPs and programs to achieve each of the targets. Targets are defined here as groups of objectives that each focus on a different problem related to the urban stream system. They can be thought of as different parts of the overall goal of fishable and swimmable waters through improved water quality, more natural flow patterns, and restored aquatic and riparian habitat.

The three targets of watershed restoration for Cobbs Creek are:

- TARGET A: Dry Weather Water Quality and Aesthetics
- TARGET B: Healthy Living Resources
- TARGET C: Wet Weather Water Quality and Quantity

By defining clear and achievable targets, and designing the alternatives and implementation plan to address the targets simultaneously, the plan will have a much higher likelihood of success. It will also result in realizing some of the objectives within a relatively short time frame, providing positive incentive to the communities and agencies involved in the program to continue and expand their efforts. This approach will also result in more immediate benefits to the people living in the watershed than would an approach that attempts to meet all objectives completely in one implementation plan.

2.3 Public Involvement and Education

The Partnership formed a Public Participation Committee to ensure that the Partnership identifies and recruits representatives of the diverse array of stakeholders in this basin, including municipalities. Members of the Public Participation Committee include representatives of the following agencies/organizations: the Philadelphia Water Department, the Fairmount Park CAC, Fairmount Park Commission, Dove Communications, US Fish and Wildlife Service, Heinz National Wildlife Refuge Center, Pennsylvania Environmental Council (PEC), Cobbs Creek Community Environmental Education Center (CCCEEC), Delaware Creek Valley Association, DCNR, PA Department of Environmental Protection, Trail Boss Program, Delaware County Planning Department, EPA Region III, Delaware Riverkeeper Network, Academy of Natural Sciences, and the Men of Cobbs Creek.

The Water Department is supporting a number of public education initiatives in development by the Public Participation committee of the Darby-Cobbs Watershed Partnership, including: 1) the production and publicizing of the Watershed Status Report, 2) the development of a teachers training workshop funded by a Growing Greener grant, in which twenty middle- and high-school teachers participated in five Saturday workshops on lessons involving: watershed management, stormwater management, water quality, and ecological restoration. The final workshop was dedicated to the design of service-learning projects, 3) the development of a resident survey on watershed awareness and pollution-causing practices, and 4) the development in partnership with Green Works, of a video tour of the Darby-Cobbs Watershed, which became available in the Fall of 2002 and 5) A watershed-wide bus tour, geared to municipal officials, which was hosted in the Cobbs Creek Watershed in May 2003.

In 2003, the Partnership sponsored a number of workshops designed to develop a watershed management plan for the Cobbs sub-basin, including a presentation of the history of Cobbs Creek, developed by researcher Adam Levine, which was held at the CCCEEC in November 2003. All of these events and presentations are designed to engage the residents of the watershed in the development of the watershed management plan. This plan will serve as a template for all urban watersheds in our region. Workshops to date have focused on developing the goals and objectives of the watershed, a problem analysis session to support the goals, a review of the proposed methodology for the plan, and the introduction of the management concepts that will be developed to meet the plan's goals and objectives. In February 2004, the draft Executive Summary and draft management plan was presented to the Partnership's Steering Committee. PWD revised these documents to incorporate Steering Committee suggestions.

The Public Participation and Education Committee's goal is to increase public understanding and encourage grassroots stewardship in the watershed. During 2003, the Public Participation Committee disseminated a 17 minute video titled, 'The Stream That Binds us," that has received rave reviews. The Partnership has been distributing these videos to schools, libraries, EACs (Lower Merion had the video featured on its local cable network). Additional outreach regarding the watershed management plan occurred in May 2003 with a guided bus tour of the Cobbs Creek watershed aimed at municipal officials. During the fall and winter of 2003, members of the Public Participation Committee developed a simple PowerPoint presentation to use at civic and community meetings, to inform residents about the watershed management plan. The presentation has been viewed by a variety of senior citizen, homeowners associations, community groups and municipal boards.

In 2003, the Partnership also focused on tackling the weighting of the goals that will help define the format of the Cobbs Creek Watershed Management Plan. This plan will be a model for an overall basin plan. The goals that Partnership stakeholders have selected include:

- Streamflow and Living Resources
- Stream Habitat and Aquatic Life
- Stream Channels and Banks
- Flooding
- Water Quality
- Pollutant Loads
- Stream Corridors
- Quality of Life
- Stewardship
- Coordination

The Partnership revised the draft Executive Summary and Watershed Management Plan that it shared with the Partnership Steering Committee in February 2004.

In June of 2004, the Cobbs Creek Integrated Watershed Management Plan (CCIWMP) was completed and handed over to the Darby-Cobbs Watershed Partnership with guidelines for watershed-wide implementation of those water management options that were identified as best meeting the planning goals and objectives under the site specific conditions of Cobbs Creek.

Updates on planning progress are posted regularly on the Partnership's website – www.phillyriverinfo.org.

Watershed Tours:
The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

3.0 Annual CSO Statistics

Table 11 - COBBS CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Cobbs Creek High Level	26	32	0 - 72	25	1449 - 1509	46% - 47%	0 - 327
Cobbs Creek Low Level	9	12	0 - 62	25	120 - 124	72% - 72%	0 - 202

Section 4 - Tacony-Frankford Watershed

1.0 CSO Capital Improvement Projects

1.1 Frankford Siphon Upgrade

Start: 10/1/1997 End: 7/30/1997 Status: Complete

Reference Long Term CSO Control Plan p. 2-10.

Description: A four-barrel siphon conveys flow under Frankford Creek in the Upper Delaware Low Level Interceptor. One of the control valves is not functioning properly, reducing the wet-weather conveyance capacity of the siphon. PWD will repair the control valve in the siphon chamber to restore full capacity and function of the siphon. (Additional repairs to the other valves may be required also.)

Environmental Benefits: Restoring the capacity of the siphon will increase the volume of combined wastewater captured from the combined areas along the upper Delaware River and Pennypack Creek. Additionally, this will allow the increase of flows resulting from the *85% Capture: Pennypack Watershed* project to be conveyed.

On 8/1/1997 the upstream 48" siphon gate valve was opened and the dropped disc was removed from the body. The valve bonnet was replaced and the siphon placed back in service. Dye tests confirmed that the 48" was conveying full flow as the collector rose with the peak daily flow. The three remaining siphons were similarly tested and are flowing full.

1.2 RTC - Rock Run Relief Sewer (R_15)

Start: 10/16/1998 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-9 – 2-10.

Description: The Rock Run Relief Sewer provides flood relief to combined sewer areas upstream of regulator T_08 in the Northeast Drainage District (NEDD). Currently, CSOs discharge into the Tacony Creek at the Rock Run Relief Sewer outfall – an 11' by 14' sewer - during periods of moderate or greater rainfall. Installation of an inflatable dam in the Rock Run Relief Sewer allows for utilization of approximately 2.3 million gallons (MG) of in-system storage to retain combined flows during a majority of these wet weather events. The inflatable dam stores combined flows in the relief sewer until storm inflows have subsided and capacity exists in the Tacony Interceptor for conveyance of combined flows to the Northeast Water Pollution Control Plant (NEWPCP). This control technology provides an additional margin of protection against dry weather overflows while still maintaining flood protection for upstream areas. The estimated budget for this job is $490,000.

Environmental Benefits: This project will reduce the discharge of combined sewage into Tacony Creek, one of the more-sensitive water bodies exposed to CSO discharges in the City of Philadelphia. An average annual reduction in CSO volume of 190 MG/year, from 1040 to 850 MG/year, is achieved at the Rock Run Relief Sewer outfall through use of the available in-system storage volume. This represents a reduction of roughly 20% in the average annual volume of CSO and a significant reduction in the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into Tacony Creek at this location, near Nedro Avenue and Hammond Street in Tacony Creek Park, an area where golfing and other recreational activities may occur. Since this project modifies an existing structure (the Rock Run Relief Sewer) rather than constructing a new one, it provides control very cost-effectively (unit cost for this storage is $0.14/gal versus roughly $6/gal for siting, design, and construction of a new storage structure).

Status: A design memorandum was completed that documents the expected environmental benefits of the Rock Run Relief Project, quantifies the flooding risks associated with the project, and documents the recommended control logic for the inflatable dam's operation and drain-down control. In support of this memorandum, several alternative control logics for the inflatable dam operation and drain-down gate were investigated to develop a logic that minimized the risks of flooding, increased Rock Run Relief storage utilization and eliminated adverse affects of the project at other CSO regulators on the Tacony Creek. The inflatable dam will result in a reduction of roughly 20% in the average annual volume of CSO and a significant reduction in the associated discharged into Tacony Creek at this location, near Nedro Avenue and Hammond Street in Tacony Creek Park, an area where golfing and other recreational activities frequently occur, through the implementation of this capital project.

On June 13, 2006, the project was awarded to AP Construction in the amount of $3,665,000. Authorization to start work was held until to 12/13/2006. By the end of 2006, the contractor performed site clearing and some excavation work. Construction should be complete sometime in 2007.

1.3 RTC – Tacony Creek Park (T_14)

Start: 10/16/1998 End: Status: In-Progress

Reference - Long Term CSO Control Plan p. 2-8 – 2-9.

Description: The T_14 trunk sewer system conveys combined sewage from the largest combined sewershed in the PWD collection system. Currently, CSOs discharge into the Tacony Creek at the T_14 outfall – a 21' by 24' sewer - during periods of moderate or greater rainfall. Installation of an inflatable dam in the T_14 trunk sewer allows for utilization of approximately 10 million gallons (MG) of in-system storage to retain combined flows during a majority of these wet weather events. The inflatable dam stores combined flows in the trunk sewer until storm inflows have subsided and capacity exists in the Tacony Interceptor for conveyance of combined flows to the Northeast Water Pollution Control Plant (NEWPCP). This control technology provides an additional margin of protection against dry weather overflows and Tacony Creek inflows to the combined system while still maintaining flood protection for upstream areas. The estimated budget for this job is $450,000.

Environmental Benefits: This project will reduce the discharge of combined sewage into Tacony Creek, one of the more-sensitive water bodies exposed to CSO discharges in the City of Philadelphia. The gate installation at T14 will result in a reduction of roughly 30% in the average annual volume of CSO and a significant reduction in the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into Tacony Creek at this location, near Juniata Park and Tacony Creek Park, in an area where golfing and other recreational activities frequently occur. Since this project modifies an existing structure (the T14 Trunk Sewer) rather than constructing a new one, it provides control very cost-effectively (unit cost for this storage is $0.03/gal versus roughly $6/gal for a new storage structure).

Status: The engineering firm of O'Brien & Gere should complete the bid documents by April of 2007. PWD expects to obtain bids by the end of April with a notice of award by May. The design firm has finished the design drawings and is currently in the process of obtaining various permits and approvals. The Engineers estimate for this project is about $4,000,000.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Tacony-Frankford Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org.

2.1 Preliminary Reconnaissance Survey

During 2000-2001, the Philadelphia Water Department conducted preliminary biological assessments (Rapid Bioassessment Protocols III and V) and habitat assessments at seven locations (n=7) along the Tookany/Tacony-Frankford Watershed to investigate the various point and nonpoint source stressors. Biological and physical assessments were then compared to a representative site located in the French Creek Watershed, Chester County, Pennsylvania. Chemical data trends of the Tookany/Tacony-Frankford (2000-2001) generated by the Bureau of Laboratory Services were also analyzed. The aggregation of biological, physical and chemical information was utilized as a comprehensive tool to measure the degree of impairment and the major contributing stressors within each assessment site and at the watershed scale. Moreover, the preliminary reconnaissance (i.e., Phase I) report completed on 6/18/02 has served as a template for future monitoring in the Tookany/Tacony-Frankford Watershed.

2.2 Watershed Work Planning & Assessment

The Philadelphia Water Department (PWD) has embarked on an ambitious program of watershed management for several creeks within the City limits. The second plan completed was for Tookany/Tacony-Frankford Creek. The Tookany/Tacony-Frankford Integrated Watershed Management Plan was completed in June 2005. The watershed plans are designed as integrated watershed planning efforts to address the objectives of several programs, including CSO Long Term Planning, Pennsylvania Stormwater Management programs, potential or existing TMDLs, River Conservation Plans, and Phase II Stormwater permits. PWD's Office of Watersheds (OOW) has carried out an extensive sampling and monitoring program to characterize conditions in the Tookany/Tacony-Frankford Creek Watershed.

The program is designed to document the condition of aquatic resources and to provide information for the planning process needed to meet regulatory requirements. The program includes hydrologic and water quality analysis, biological and habitat assessments, and fluvial geomorphological assessments of the entire length of Tookany/Tacony-Frankford Creek and its major tributaries. A SWMM model was developed for the watershed that simulated the watershed response to storms for both the storm sewers as well as combined sewers. The model was used to assess current pollutant loading from CSOs and from stormwater water. The model has also been adapted to simulate a wide array of CSO controls and stormwater BMPs, including swales, green roofs, infiltration basins, porous pavement, and similar techniques. By simulating BMPs at various levels of implementation, graphs of urban BMP effectiveness in controlling CSOs and stormwater were developed and used to make watershed-specific recommendations on the needed degree of implementation and the selection of the most cost-effective approaches to meeting water quality and quantity objectives. The plan has resulted in a careful assessment of the potential for restoration of an urban stream. Proposed for implementation is an array of CSO controls, storm water BMPs, stream restoration measures, non-structural measures, and public education/participation programs. Implementation of the plan recommendations will be carried out in phases to allow for an adaptive management approach.

Completion of Comprehensive Characterization Report
The Comprehensive Characterization Report contains a series of technical documents that form the scientific basis for the Tookany/Tacony-Frankford Integrated Watershed Management Plan (TTFIWMP). The report characterizes the land use, geology, soils, topography, demographics, meteorology, hydrology, water quality, ecology, fluvial geomorphology, and pollutant loads found in the watershed. It presents and discusses data collected through the end of 2004. The report is intended as a single compilation of background and technical documents that can be periodically updated as additional field work or data analysis are completed. This report was completed in August 2005.

2.2.1 Watershed Partnership

The PWD sponsored Tookany/Tacony-Frankford Watershed kicked off with its first Partnership meeting on October 4, 2001. The Tookany/Tacony-Frankford Watershed drains 29 square miles, or 20,900 acres in Philadelphia and Montgomery counties. It is, for the most part, a highly urbanized watershed with a large diverse population that includes portions of the inner city as well as wealthy suburban communities. This partnership, geographically less diverse than the Darby-Cobbs Watershed, was able to benefit from a number of organizations and groups that are already involved in neighborhood revitalization. Its members are anxious to tackle projects that will see immediate benefits. Members include:

Tacony-Frankford Partnership

- Philadelphia Water Department
- Fairmount Park Commission and the Natural Lands Restoration Project
- Pennsylvania Environmental Council
- Frankford Group Ministry
- Melrose Park Neighbors Association
- Friends of Tacony Park
- Edison High School
- Rohm and Haas Co.
- Senior Environmental Corps.
- Awbury Arboretum
- Frankford United Neighbors
- Frankford Style Community Arts
- PA Department of Environmental Protection
- US Environmental Protection Agency
- US Army Corps of Engineers
- Philadelphia Green
- Phila. Urban Resources Partnership
- Cheltenham Township

This Partnership has been modeled after the Darby-Cobbs Partnership in working structure and the technical documents generated. However, PWD envisions that more “hands-on” type projects will be encouraged and requested on a regular basis. To supplement the work of the Partnership and to further the development of a watershed management plan, the Water Department, Fairmount Park and the Frankford Group Ministry received a DCNR grant in October 2001 to develop a River Conservation Plan for the Philadelphia county portion of the Tacony-Frankford watershed. The Partnership has worked closely to coordinate this grant with the River Conservation Plan in its final draft on the Tookany Watershed in Montgomery County. Cheltenham Township, a Partnership member, is developing this RCP.

The creation and completion of a River Conservation Plan (RCP) for the Tacony-Frankford Watershed has provided the Partnership with an environmental and cultural planning inventory for a highly urbanized watershed with the ultimate goal to develop a holistic management plan that will facilitate restoration, enhancement and sustainable improvements in the watershed. The watershed management was completed in June 2005.

This Partnership has elected a Board and has received its tax-exempt status as the first multi-municipal Watershed Partnership in the region. The mission of the Partnership is the implementation of the watershed management plan. A search for an Executive Director who will report directly to the Board will begin in fall 2006 and was recently completed. In the interim, the Partnership received a National Park Service grant in October 2006 to develop a communications/business plan to provide an implementation strategy over the next five years. The Partnership also submitted a Targeted Watershed Management grant application to the EPA in November 2006 to begin implementation of identified partner projects that manage stormwater through natural and low-impact development practices.

2.2.2 Define Preliminary Goals and Objectives

Refer to section 2.2.2 of Section 3 - Darby-Cobbs Watershed

2.2.3 Data Analysis and Indicator Development

Refer to section 2.2.3 of Section 3 - Darby-Cobbs Watershed

2.2.4 Development and Screening of Management Options

Refer to section 2.2.4 of Section 3 - Darby-Cobbs Watershed

2.2.5 Monitoring and Field Data Collection

Chemical Sampling

During 2004, Philadelphia Water Department (PWD) staff collected surface water grab samples at eight locations within Tacony-Frankford Watershed for chemical and microbial analysis **(Figure 6).** Sampling events were planned to occur at each site at weekly intervals for one month during three separate seasons. Actual sampling dates were as follows: "winter" samples collected 1/15/04, 1/22/04, 1/29/04, and 2/5/04; “spring” samples collected 4/21/04, 4/29/04, 5/6/04, and 5/13/04; “summer” samples collected 8/5/04, 8/12/04, 8/19/04 and 8/26/04. A total of 96 discrete samples, comprising 3552 chemical and microbial analytes, were collected and recorded during the 2004 assessment of the Tacony-Frankford Watershed.

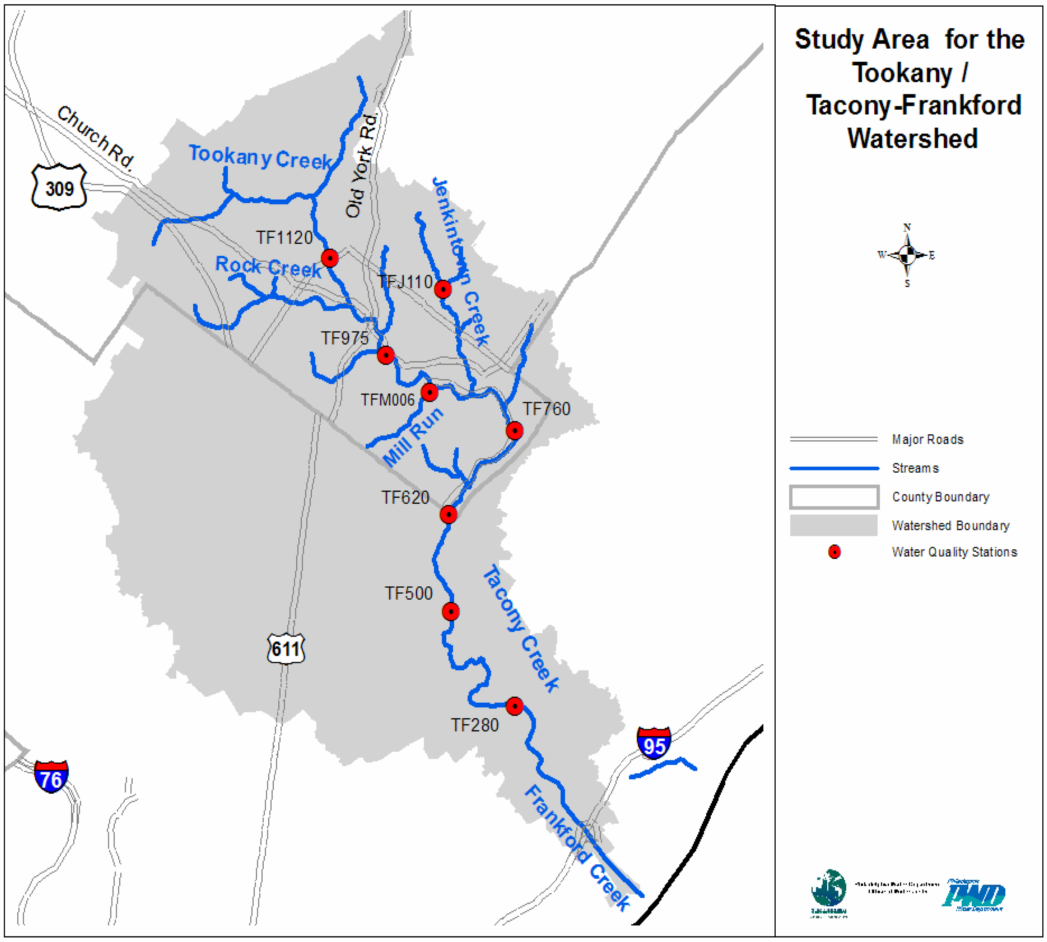

Figure 6 - Discrete water quality stations in the Tacony-Frankford Watershed (2004)

Sites TF 280, TF 500, TF 620, TF 760, TF 975, TF 1120 and TFJ 110 were included in PWD's baseline chemical assessment of Tacony-Frankford Watershed in 2000. A single new site (TFM006), located on Mill Run and the Tacony Creek confluence was added for 2004. Discrete sampling was conducted on a weekly basis and was not specifically designed to target wet or dry weather flow conditions. Depending on which definition of "dry weather" was used (i.e., 48 hr interval or 72 hr interval), between 6-7 sampling events occurred during dry weather- this data is most pertinent to Target A of the Watershed Management Plan (Dry Weather Water Quality and Aesthetics). Specifically addressed are indicators 7 and 8 - chemical and microbial constituents that are influential in shaping communities of aquatic systems or that are indicative of anthropogenic degradation of water quality in the watershed.

Wet Weather Targeted Sampling

Target C of the Watershed Management Plan addresses water quality in wet weather. Yet characterization of water quality at several widely spatially distributed sites simultaneously over the course of a storm event presents a unique challenge. Automated samplers (Isco, Inc.) stationed at six monitoring locations were used to collect samples during two runoff producing rain events on 7/7/04 and 8/30/04 **(Figure 7).**

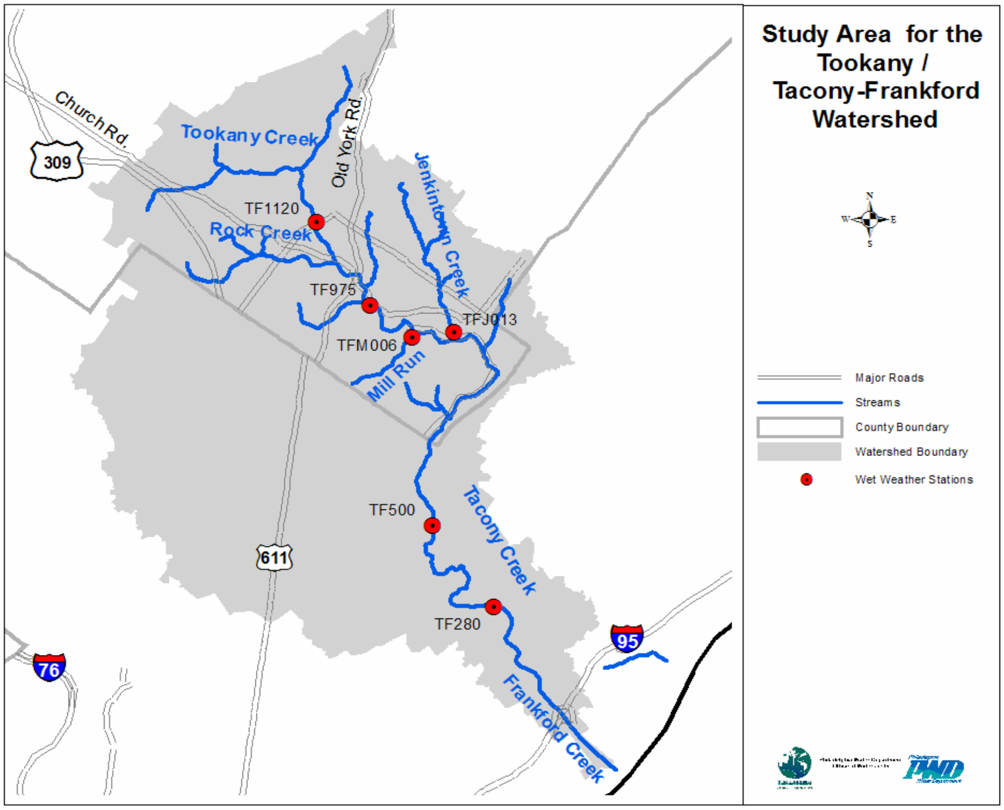

Figure 7 - Wet-weather monitoring locations in Tacony-Frankford Watershed

The automated sampler system obviated the need for BLS team members to manually collect samples, thereby greatly increasing sampling efficiency. Automated samplers were equipped with vented in-stream pressure transducers that allowed sampling to commence beginning with a small (0.1ft.) increase in stage. Once sampling was initiated, a computer-controlled peristaltic pump and distribution system collected grab samples at 1 hr. intervals. Use of automated samplers allows for a greater range of flexibility in sampling programs, including flow-weighted composite sampling based on a user defined rating curve, but stage discharge rating curves at these sites were poorly defined for larger flows. Though some difficulties were encountered due to a combination of mechanical failure, individual site characteristics, and/or vandalism, the one hour fixed interval was found to be generally satisfactory in collecting representative samples over a storm event **(Figure 8).**

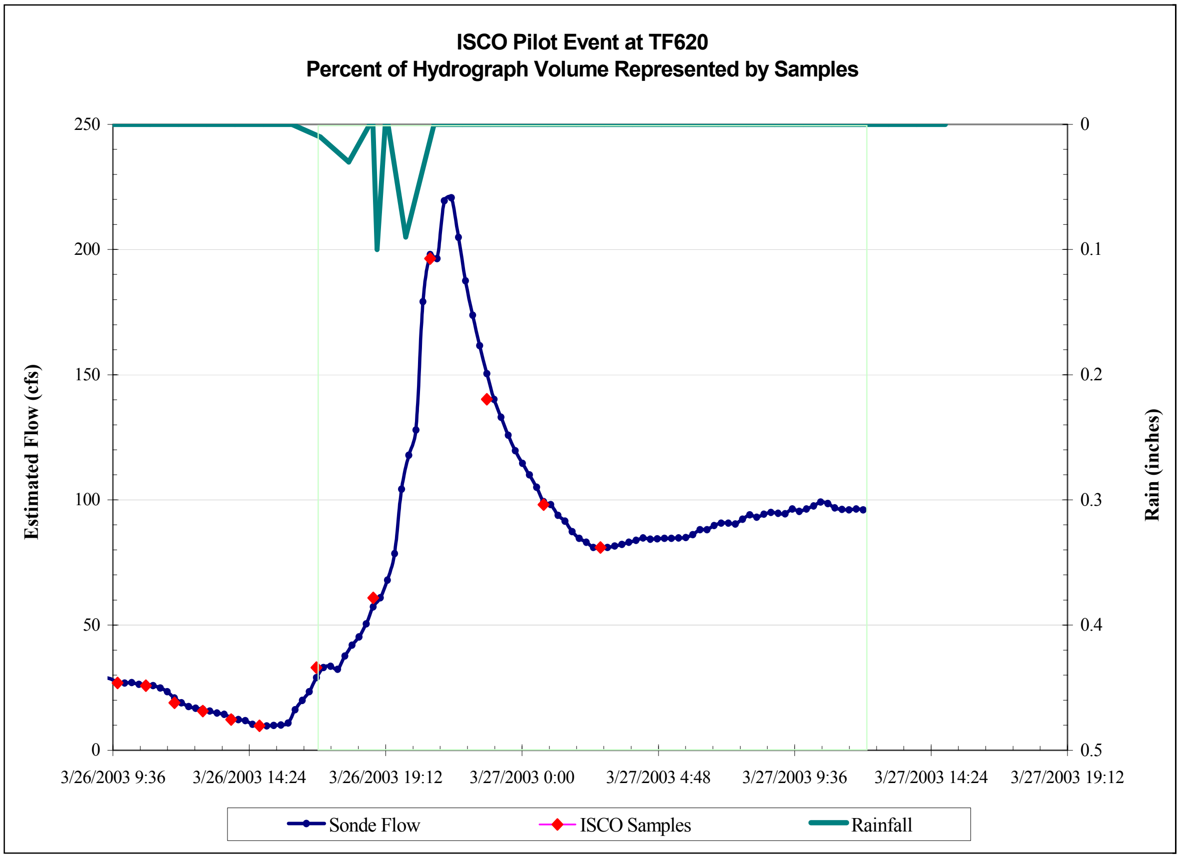

Figure 8 - Example of sample collection times with respect to a wet weather event in the Tacony-Frankford Watershed (2003)

To date, PWD has successfully characterized nine storm events (n=9) in the Tacony-Frankford Watershed. PWD continues to refine methods of sampling stormwater and experiment with alternative automated sampling programs.

Biological Assessments and Analyses

Between 3/24/04 – 4/1/04, PWD staff conducted benthic and habitat assessments at twelve (n=12) locations within the Tacony-Frankford Watershed **(Figure 9)**. Using standard operating procedures developed by the EPA, samples were collected during late winter and analyzed in the laboratory.

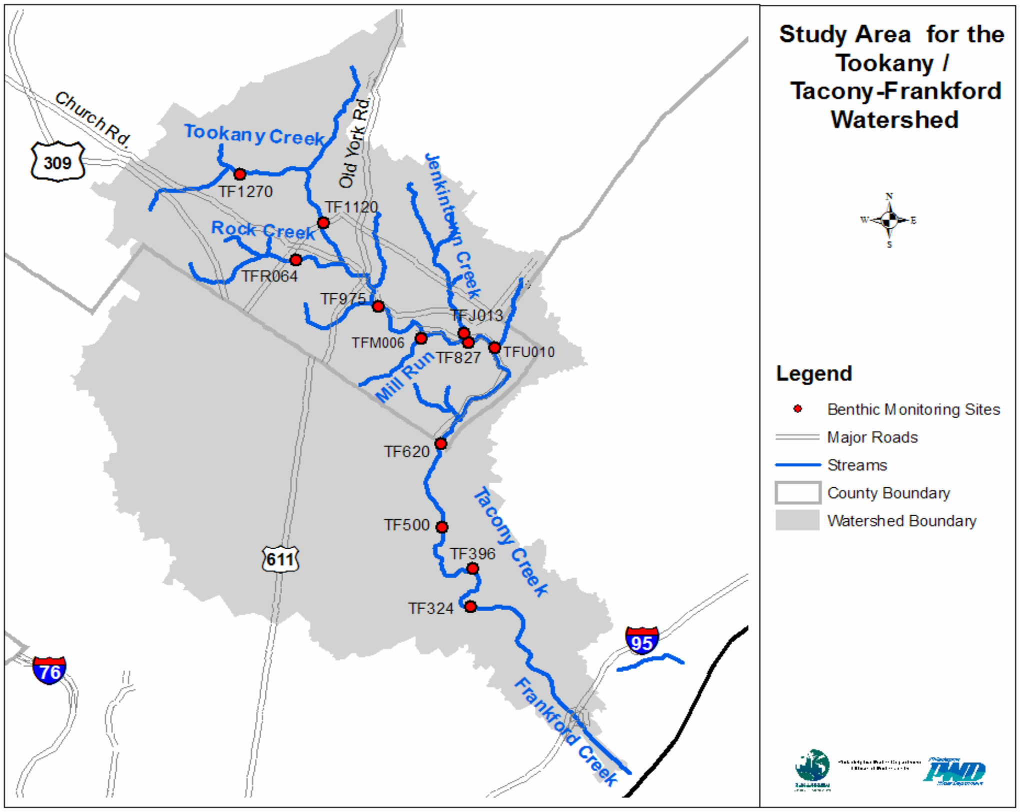

Figure 9 - Benthic and habitat monitoring locations in the Tacony-Frankford Watershed

Fish Assessments

Similarly, between 6/2/04-6/16/04, PWD biologists conducted fish assessments at seven (n=7) locations within Tacony-Frankford Watershed **(Figure 10).** Standard operating procedures, developed by the EPA and refined by the USGS, were used to assess fish community health at the watershed-scale. In addition, tidal fish assessments were also performed at two (n=2) locations in the lower Frankford Creek between 8/1/04 – 8/8/04 **(Figure 11).**

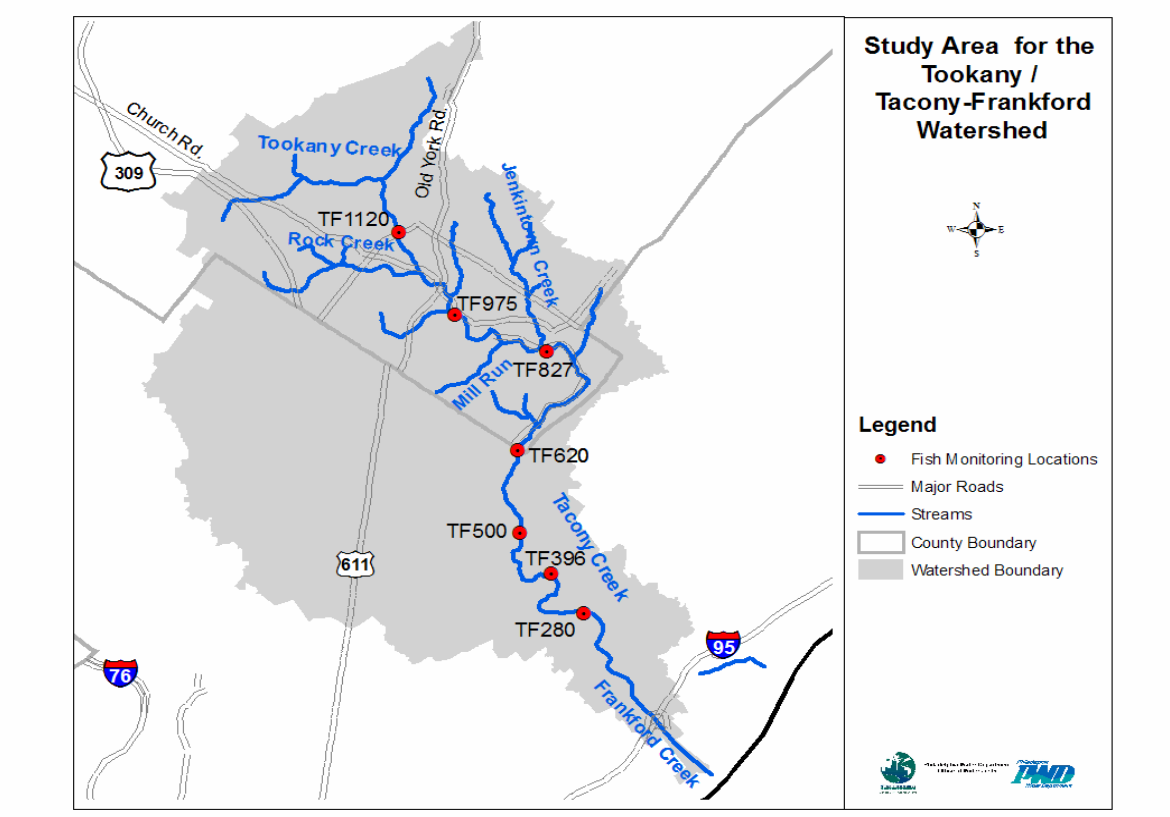

Figure 10 – Fish monitoring locations in Tacony-Frankford Watershed (2004)

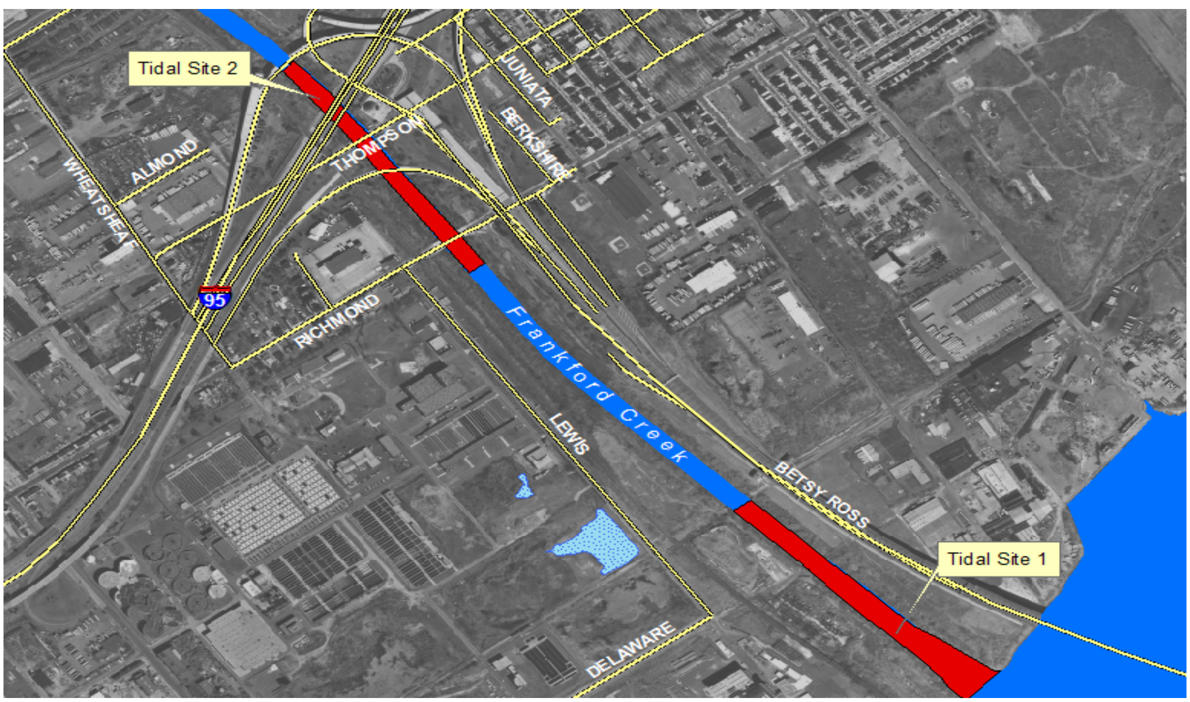

Figure 11 - Tidal monitoring locations in lower Frankford Creek (2004)

Algae Assessments
Replicate algae samples were collected from TF280and TF620 on the Tacony-Frankford Creek (TFC) on 6 occasions in August and September 2004 to determine the biomass of benthic algae in terms of chlorophyll a (chl a), spatial variation in biomass within and between sites, the scouring effects of high flows, and algal accrual rates following a high flow event **(Figure 12).** The goals of the project were to explain patterns in dissolved oxygen (DO) concentrations at base flow, and during and following high flow events. The study indicated spatial differences in mean chl a concentrations between sites but consistent temporal patterns. Main results include:

Dissolved oxygen profiles of the 2 sites during the study period showed that mean daily DO concentration at TF280 was typically in the order of 6mg/l with daily minimum and maximum concentrations generally ±1.5 mg/m^2. At TF620, mean daily DO concentrations were approximately 8 mg/l with daily minimum and maximum concentrations in the order of ±1mg/l.

Chlorophyll a concentrations were consistently significantly greater at TF620 than at TF280 with mean concentrations ranging from 29.8 (±3.79) to 88.5 (±11.0) mg/m^2 at TF280, and from 108.5 (±14.8) to 127.9 (±12.8) mg/m^2 at 620. Mean chl a concentration at TF500 sampled 19 August 2004 was 34.9 (± 6.9) mg/m^2.

Mean chl a at the TF620 site on 8 September 2004 was significantly lower (49.8 ± 6.5 mg/m^2) than on other sampling dates. This is possibly due to seasonal changeover in benthic algal community structure (summer die-off).

Algal accrual rates during the first 5 days following an artificial scouring experiment were similar to accrual rates on non-scoured rocks for each site. The average daily accrual rate for TF280 and TF620 was 8.36 ±1.30 mg/m^2 and 16.7 ± 4.34 mg/m^2, respectively. The accrual rate at TF620 of non-scoured rocks was 11.7 mg/m^2. During days 5-9 of the experiment, both sites lost biomass with an average daily loss rate of 1.73 (± 0.99) mg/m^2 at TF280 and 4.56 (± 1.31) mg/m^2 at TF620. The mean daily accrual rate of non-scoured rocks at TF280 during this time period was 8.96 mg/m^2 and 2.48 mg/m^2 at TF620.

Among the factors affecting algal biomass discussed above, grazing, nutrients, current velocity, and scouring disturbances are likely the most important in driving algal communities in the TFC. Differences in algal community structure between the two sites are likely the result of differential nutrient conditions, grazing pressures, and disturbance regimes. Light may also play a factor in explaining site differences (especially when data from TF500 is considered).

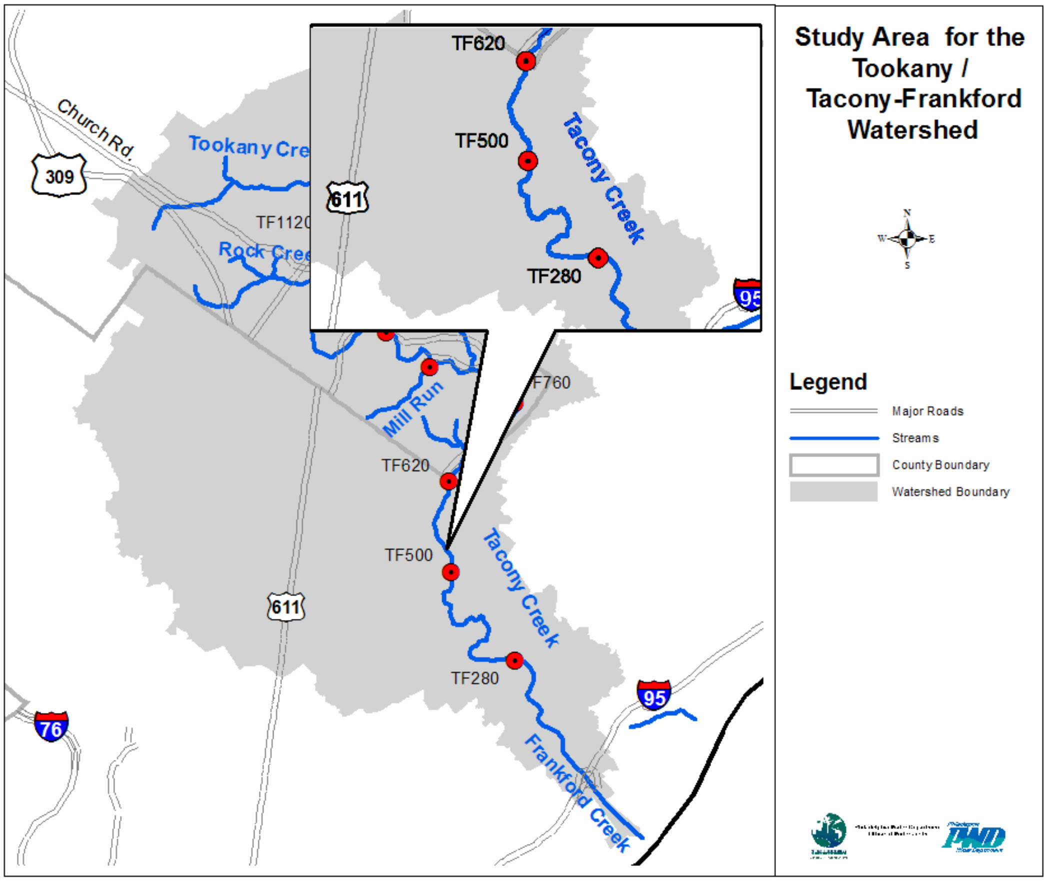

Figure 12 - Algae monitoring stations on Tacony-Frankford Creek

RADAR Rainfall Data and Analysis
PWD extended its contract with Vieux and Associates, to further quantify rainfall intensity during storm events targeted by wet weather sampling in the Tacony Frankford Watershed. A total of six (n=6) rain events were captured using RADAR rainfall techniques during the spring and summer of 2003, and two rain events (n=2) were captured during 2004. Wet-weather data accompanied by rainfall intensity was used to model pollution loadings in various sub-watersheds along the Tacony-Frankford Creek **(Figure 13).**

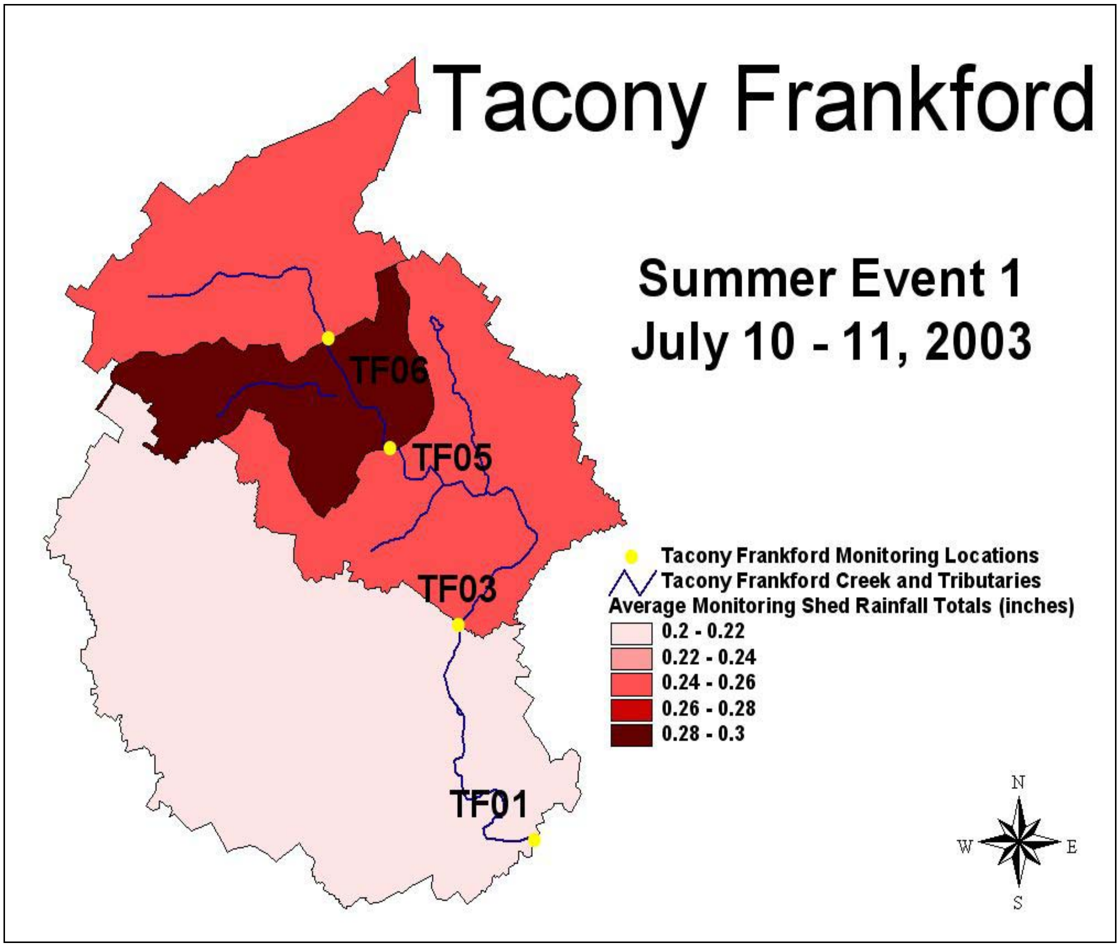

Figure 13 - RADAR rainfall data collected in the Tacony-Frankford Watershed (July 10-July 11)

2.2.6 Modeling

A SWMM model is being updated and calibrated for the watershed that can simulate the watershed response to storms for both the storm sewers as well as combined sewers. The model will be used to assess current pollutant loading from CSOs and from stormwater water. The model will also be used to test a wide array of CSO controls and stormwater BMPs, including swales, green roofs, infiltration basins, porous pavement, and similar techniques. By simulating BMPs at various levels of implementation, graphs of urban BMP effectiveness in controlling CSOs and stormwater will be developed and used to make watershed-specific recommendations on the needed degree of implementation and the selection of the most cost-effective approaches to meeting water quality and quantity objectives.

2.2.7 Development and Evaluation of Management Alternatives

Refer to section 2.2.7 of Section 3 – Darby Cobbs Watershed

2.3 Public Involvement and Education

River Conservation Plan
The Tacony-Frankford River Conservation Plan (RCP) is a holistic plan to improve the Tacony-Frankford watershed. It is developed through a collaborative process of local organizations and residents, and addresses various types of projects that will make the watershed a better place to live. It addresses history, water quality, culture, art, parks, trails, youth education, municipal education, etc.

The goal is to create a grassroots driven watershed conservation plan. The plan will reflect the character of the watershed and the issues and concerns of the residents of the watershed. The planning process also creates or enhances partnership possibilities among plan participants.

The RCP was completed in July of 2004.

Watershed Tours
The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

Refer to section 1.7 – Pollution Prevention of Section 2 for additional public outreach in this watershed.

3.0 Annual CSO Statistics

Table 12 - TACONY CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Tacony	16	16	5	-	71	44	4651	-	4851	36%	-	36%	5	-	342
Upper Frankford Low Level	12	12	13	-	64	43	450	-	467	56%	-	56%	21	-	285

Section 5 - Pennypack Watershed

1.0 CSO Capital Improvement Projects

1.1 85% CSO Capture – Pennypack Watershed

Start: 2/1/1996 End: 9/7/2004 Status: Complete

Reference Long Term CSO Control Plan p. 2-8.

Description: Addressing CSO discharges to Pennypack Creek is a high priority for the CSO Program and is mainly a result of the proximity of the CSO to a smaller receiving stream which enters the Delaware just below the Baxter WTP intake structure. This project will enable capture of 85% of the combined sewer flow in all five Pennypack (PP) CSO basin areas while maintaining existing overall system-wide CSO capture on an average annual basis by modifying the PP, UDLL and LFLL regulators. It was determined that an increase in capacity of approximately 20 cfs was required for the PP interceptor to achieve 85% capture (consistent with the "presumptive" CSO control target defined in national CSO policy). The construction project entails construction of new dry weather outlet (DWO) conduit at 3 of the Pennypack CSO regulators. In addition, the diversion dam height at four PP regulator locations will be raised. Lastly, modifications at twelve Brown & Brown type and automated regulators along the UDLL and LFLL interceptors will be completed in order to provide the required capacity in the UDLL interceptor. These actions will result in 85% CSO capture in the Pennypack watershed. The projected budget for this project is $230,000.

Environmental Benefits: This project will significantly reduce the CSO discharge into Pennypack Creek. The average annual volume of CSO is reduced by 91 MG, from 130 to 58 MG. This represents a reduction of roughly 55% in the average annual volume of CSO and the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into Pennypack Creek between Frankford Avenue and the Delaware River. Additionally, this project protects a small stream surrounded by public parkland where recreational activities occur.

1.1.1 Regulator Modifications (P1-P4)

Start: 11/18/1998 End: 7/1/2005 Status: Complete

The hydrologic and hydraulic computer models developed by the PWD for the CSO Program were applied to determine new dry weather outlet (DWO) pipe diameters and diversion dam heights necessary to achieve 85% capture of combined flows in the Pennypack basins. A preliminary site plan for the CSO regulator modifications necessary to achieve 85% capture of Pennypack combined flows was completed. Additional monitoring was performed to verify model representations of wet weather inflows in the Pennypack interceptor.

Status: A preliminary site plan was developed for the construction of new CSO regulator chambers at P_1, P_2 and P_4. Model analyses in 1999 refined initial estimates of regulator modifications including new DWO pies and diversion dam heights at these three chambers. In 2000, PWD staff finalized the project's design memorandum and site plans documenting chamber modification specifics that allow for 85% capture of combined flows in the Pennypack basins while maintaining existing levels of CSO capture in the Northeast Low Level System.

The final designs for the new CSO regulator chambers and DWO pipes were completed in 2004. The design plans and specifications were forwarded to Projects Control the first week of January. The project was bid in April and won by METRO for a total of $1,709,334.00. The new DWO (dry weather overflow) pipes have been installed in Frankford Avenue and the installation of the gates is complete. The project was completed in July of 2005.

1.1.2 Integrate Water Quality Programs with Storm Flood Relief (WQ & SRF) - Sheffield Ave.
Start: 2/1/1996 End: 6/31/2000 Status: Complete

Reference Long Term Control Plan on page 2-6.

Description: There are several flood relief projects defined and currently in various stages of implementation. However, these projects have been developed to better manage the relatively high flows associated with larger, less frequent events. CSO control is primarily concerned with lower, more frequent flows. There is a potential opportunity to realize multiple benefits from the flood relief projects by expanding the scope of these projects to address both storm flood relief and CSO control objectives. Generally this will require adjusting the design of the individual projects to manage both low and high flows, resulting in the dual benefit of CSO control and flood relief. For example, it may be possible to use a new flood relief sewer to provide storage of low flows for CSO control and conveyance of high flows for flood control. The costs for implementing CSO controls in flood relief projects will be defined on a case-by-case basis.

Environmental Benefits: The specific benefits that accrue will be defined on a case-by-case basis.

Status: The Sheffield Ave. Relief sewer project was undertaken as a demonstration project to examine the process by which the Department could utilize the existing flood relief sewer planning process to gain increased CSO benefit. Design level modeling of the Sheffield and Cottman Avenue sewershed was undertaken from the period from 2/1/1996 to 12/13/1996. The storage and treatment requirements to achieve the 85% capture objective were determined in conjunction with the DWO conduit re-sizing to be completed as part of project 10.3.2 Regulator Modifications (P_1 – P_4) from 12/16/1996 to 3/7/1997. The treatment rates and storage volumes required to achieve 85% capture were used to evaluate diversion structure and regulator alternatives from 3/10/1997 to 7/11/1997. Design specifications were developed from 7/14/1997 to 6/1/1998. The contract was awarded to Lisbon Contractor Inc., at a cost of $5,630,462. This project is now complete.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Pennypack Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org.

2.1 Preliminary Reconnaissance Survey

The preliminary reconnaissance survey for the Pennypack Creek had been completed. Specifically the physical, chemical, and biologic assessment was completed in calendar year 2002 with a comprehensive report completed in 2003.

2.2 Watershed Work Planning & Assessment

The Philadelphia Water Department (PWD) has embarked on an ambitious program of watershed management for several creeks within the City limits. The watershed plans are designed as integrated watershed planning efforts to address objectives of several programs, including CSO Long Term Planning, Pennsylvania Stormwater Management programs, potential or existing TMDLs, River Conservation Plans, and Phase II Stormwater permits. PWD's Office of Watersheds (OOW) has carried out an extensive sampling and monitoring program to characterize conditions in the Pennypack Creek Watershed. The program is designed to document the condition of aquatic resources and to provide information for the planning process needed to meet regulatory requirements. The program included hydrologic and water quality analysis, biological and habitat assessments, and fluvial geomorphological assessments of the entire length of Pennypack Creek and its major tributaries.

A Watershed Management Plan is set to be developed for this watershed in 2008.

2.2.1 Watershed Partnership

The PWD and its partners – the Fairmount Park Commission, the Friends of Pennypack Park, the Friends of Fox Chase Farms, the Pennypack Ecological Trust and the Montgomery County Planning Commission – received notice in Summer 2002 that it was awarded a grant from DCNR to develop a river conservation plan for the Pennypack Creek Watershed – Philadelphia, Montgomery and Bucks Counties. In the Fall 2002, team members toured various sections of the watershed to gain a better understanding of its current physical topography and condition. Also, the team developed a Request for Proposals for a consultant to lead the data collection and public outreach components of the plan, under the guidance of the RCP team. The consultant, F.X. Browne, Inc. was selected to oversee both the data collection and public outreach components of the RCP and began this work in the Fall 2003. In January 2004, the first RCP Steering Committee took place and a public outreach schedule and suggested public workshops were discussed and planned for the spring. In 2005, a number of public outreach and education events took place, including:

- April 2005 Stream Restoration Workshop
- April 2005 Watershed Friendly Homeowners Workshop
- September 2005 Fish Shocking Demo on Pennypack and presentation of draft plan
- September 2005 Presentation of draft plan at Pennypack Trust Ecological Restoration Plant Sale
- October 2005 – Presentation of draft plan at Montco Trout Unlimited
- October 2005 – Presentation of draft plant at annual Applefest Celebration at Fox Chase Farms

The RCP Plan was completed in December 2005. Work to implement some of its recommendations will continue into the future and will act as a platform for the development of a watershed management plan in fall 2007.

Currently, the stakeholders who participated in the RCP process are now working with the Montgomery County Planning Commission, Montgomery County Lands Trust, the Greenspace Alliance and other partners in the development of a Pennypack Greenway, one of the major recommendations of the Pennypack RCP. The goal of the greenway is to create a natural connection from the suburban headwaters of the Pennypack to the urban mouth of the creek on the Delaware River.

2.2.2 Define Preliminary Goals and Objectives

Refer to section 2.2.2 of Section 3 – Darby-Cobbs Watershed

2.2.3 Data Analysis and Indicator Development

Refer to section 2.2.3 of Section 3 – Darby-Cobbs Watershed

2.2.4 Development and Screening of Management Options

Refer to section 2.2.4 of Section 3 – Darby-Cobbs Watershed

2.2.5 Monitoring and Field Data Collection

During 2002-2003, the Philadelphia Water Department's Office of Watersheds and Bureau of Laboratory Services conducted biological assessments (Rapid Bioassessment Protocols III and V) and physical habitat assessments at twenty locations in Pennypack Creek Watershed to investigate point and non-point source stressors **(Figure 14)**. Biological and physical assessments were then compared to two reference sites located in French Creek Watershed, Chester County, Pennsylvania. Spatial differences in water quality were evaluated with a series of discrete chemical samples taken from 13 monitoring stations in Pennypack Creek (n = 7) and its tributaries (n = 6). The aggregation of biological, physical and chemical information was utilized as a comprehensive tool to measure the degree of impairment and the major contributing stressors within each assessment site and at a watershed scale.

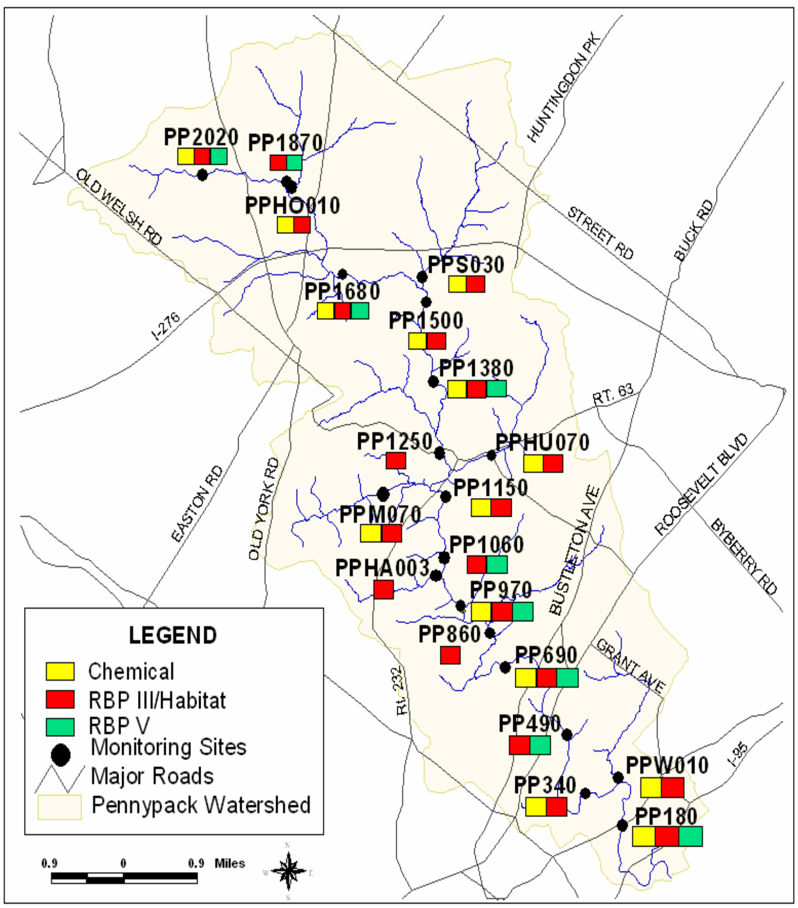

Figure 14 - Biological, chemical and physical monitoring locations within the Pennypack Watershed (2002-2003)

Chemical Sampling
Sampling was conducted on weekly intervals without regard for weather or other environmental factors **(Figure 15)**. As a result, samples were taken under a variety of conditions (e.g., wet weather) that may have influenced results of many chemical and water quality analyses. For example, in-stream measurements of dissolved oxygen and grab samples taken for fecal coliform analyses may exhibit great variability in response to environmental conditions. The former may be heavily dependent on time of day and sunlight intensity, while the latter may vary with rainfall.

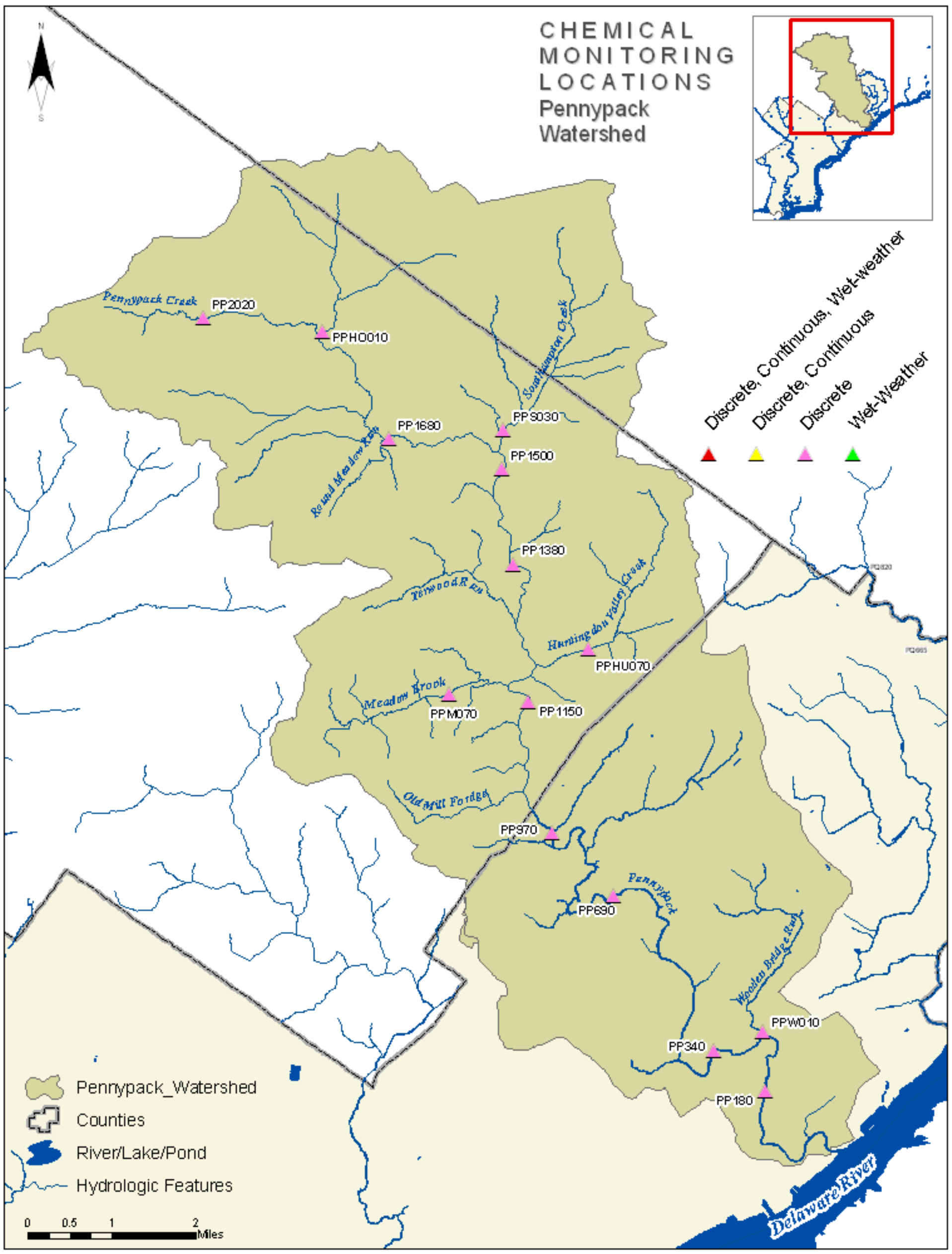

Figure 15 - Chemical monitoring locations in Pennypack Watershed

Benthic Assessments

A total of 3,452 individuals from 30 taxa were identified during the 2002 benthic macroinvertebrate survey of Pennypack Creek Watershed **(Figure 16).** Average taxa richness was 9.8. Throughout the watershed, moderately pollution tolerant taxa were dominant (93.62%). Few pollution sensitive taxa were found, and pollution sensitive EPT taxa (families Ephemeroptera, Plecoptera and Trichoptera) were not present. Mean Hilsenhoff Biotic Index (HBI) of all assessment sites was 5.743. Family Chironomidae (midges) and the net-spinning caddisfly genera Hydropsyche and Cheumatopsyche dominated the benthic assemblage (proportional abundance 55.13% and 24.83%, respectively). Riffle beetles (Stenelmis) contributed 6.66%, and all other taxa, including amphipods, tipulids, and oligochaetes, contributed 2% or less. Trophic levels were dominated by generalist feeders (89.63%). A combination of poor taxa richness, elevated HBI scores, and virtual lack of EPT taxa and specialized feeders characterizes the overall watershed as "severely impaired."

Ichthyofaunal Assessments

A total of 16,869 individuals of 39 species representing 10 families were collected throughout Pennypack Creek Watershed in the 2002 bioassessment. Most abundant species were swallowtail shiner (Notropis procne) and white sucker (Catostomus commersoni), which comprised about 33% of all fish collected. Other common species were satinfin shiner (Cyprinella analostana), banded killifish (Fundulus diaphanus), redbreast sunfish (Lepomis auritus), spottail shiner (Notropis hudsonius), and blacknose dace (Rhinichthys atratulus). Out of 39 species collected, seven species comprised over 80% of the entire fish assemblage. Similarly, three species made up 80% of total biomass, with white sucker contributing greater than 50%. Despite the high abundance and species richness, the unbalanced community structure is typical of impaired streams experiencing eutrophic conditions.

Habitat Assessments

Habitat impairments in Pennypack Creek Watershed mirror those of other urban stream systems assessed by PWD. Firstly, preponderance of impervious surfaces within the watershed and its sub-basins causes small streams to exhibit increasingly "flashy" hydrographs in response to rain events. Periods of high flow result in erosion of banks and deposition of sediment in pools and on point bars. Erosion and sedimentation may decrease reproductive success of invertebrates and fish by washing away eggs, or alternately, covering eggs with sediment. Furthermore, stream organisms may be washed downstream and displaced from their optimum habitat.

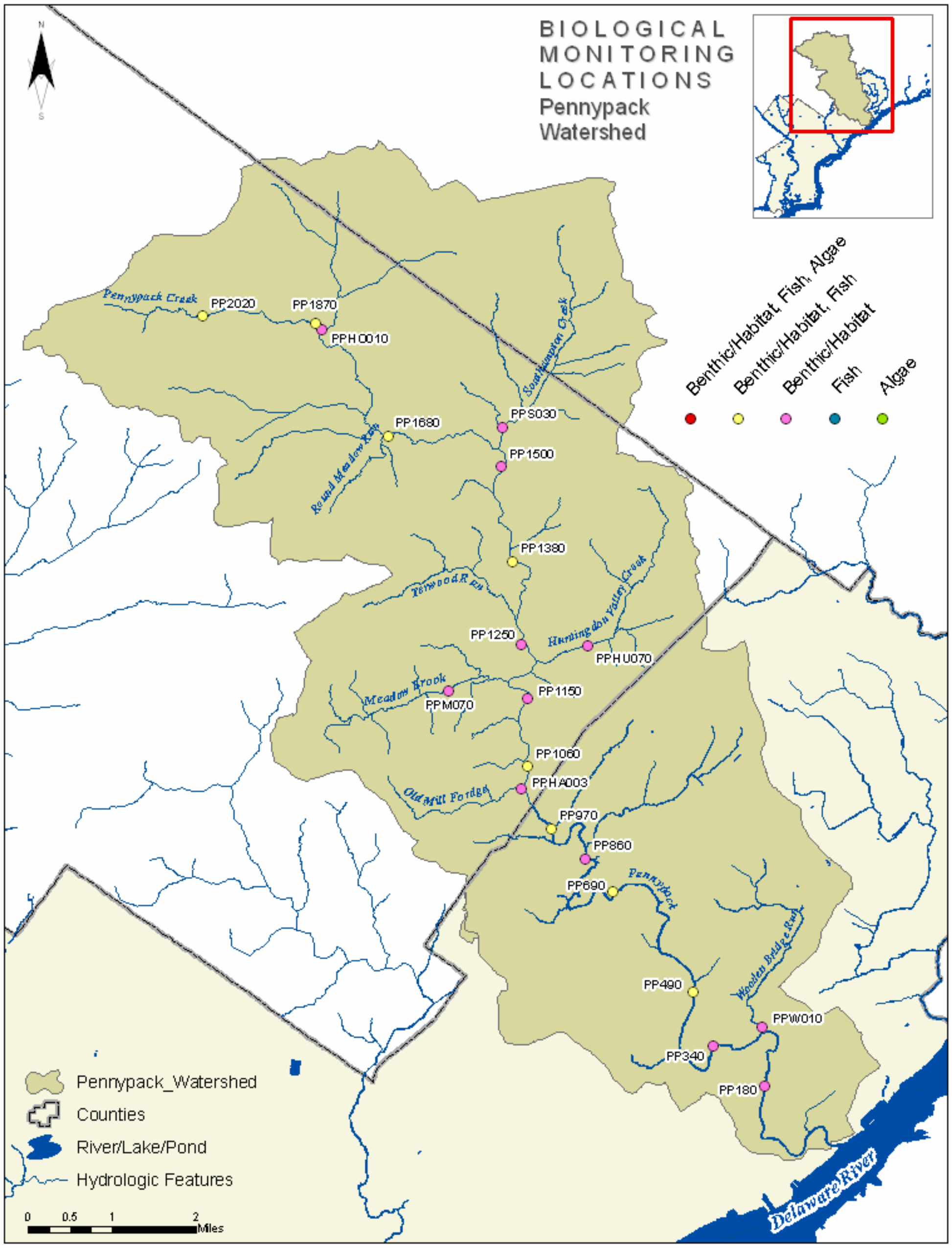

Figure 16 - Biological and physical assessment sites in Pennypack Watershed

2.2.6 Modeling

The PWD envisions the development of a SWMM model for the watershed that can simulate the watershed response to storms for both the storm sewers as well as combined sewers. The model will be used to assess current pollutant loading from CSOs and from stormwater water. The model will also be used to test a wide array of CSO controls and stormwater BMPs, including swales, green roofs, infiltration basins, porous pavement, and similar techniques. By simulating BMPs at various levels of implementation, graphs of urban BMP effectiveness in controlling CSOs and stormwater will be developed and used to make watershed-specific recommendations on the needed degree of implementation and the selection of the most cost-effective approaches to meeting water quality and quantity objectives.

2.2.7 Development and Evaluation of Management Alternatives

Refer to section 2.2.7 of Section 3 – Darby-Cobbs Watershed

2.3 Public Involvement and Education

River Conservation Plan

The Partnership developed a Request for Proposals for a consultant to lead the data collection and public outreach components of the plan, under the guidance of the RCP team. The consultant, F.X. Browne, Inc. was selected to oversee both the data collection and public outreach components of the RCP and began this work in the Fall 2003. In January 2004, the first RCP Steering Committee took place and a public outreach schedule and suggested public workshops were discussed and planned for the spring. In 2005, a number of public outreach and education events took place, including:

- April 2005 Stream Restoration Workshop
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The RCP Plan was completed in December 2005. Work to implement some of its recommendations will continue into the future and will act as a platform for the development of a watershed management plan in 2008.

Watershed Tours

The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

3.0 Annual CSO Statistics

Table 13 - PENNYPACK CREEK 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency		CSO Volume (MG)	CSO Capture (%)	CSO Duration (hrs)
			Range per subsystem	Avg per subsystem	Range per subsystem	Range per subsystem	Range per subsystem
Pennypack	5	5	17 - 59	33	97 - 100	65% - 65%	27 - 222

Section 6 – Wissahickon Creek Watershed

1.0 CSO Capital Improvement Projects

NOT APPLICABLE

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Wissahickon Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org.

2.1 Preliminary Reconnaissance Survey

The preliminary reconnaissance survey for the Wissahickon Creek has been completed. Specifically the physical, chemical, and biologic assessment was completed in calendar year 2001 with a comprehensive report completed in 2001.

2.2 Watershed Work Planning & Assessment

In November 2005, the Philadelphia Water Department (PWD) sponsored the Wissahickon Creek Watershed Partnership to begin the development of an integrated watershed management plan – a long-range road map designed to serve the twin goals of protecting natural resources and advancing vital communities. It reaches out to include municipal and conservation planning efforts that strive to ensure that growth within the watershed occurs only with special care to the environment.

The integrated Watershed Management Plan aims to:

- Serve as a holistic, comprehensive management tool that facilitates restoration and revitalization efforts throughout the watershed.
- Accommodate all regulatory and planning requirements affecting municipalities, which must address “point” (specific discharges) and “non-point” (generalized runoff) sources of pollution and flooding.
- Improve the water quality and natural environment of these heavily stressed streams, including highly urbanized areas.
- Boost the ability of the streams to support a diversity of wildlife, such as fish, insects, and birds.
- Enhance parkland and “riparian” (riverside) buffers, creating an enjoyable natural environment for the communities within the watershed.
- Develop a flexible “adaptive management” approach that will ensure sustainable improvements to the watershed.

This planning effort also benefits from the resources of other earlier and ongoing planning processes. In addition, the integrated plan is designed to serve the needs of municipal and government entities by addressing and satisfying the many related regulatory programs. Some of the reports, plans, and programs that will be taken into consideration by the Wissahickon Creek Integrated Watershed Management Plan include the following:

- Phase I and Phase II of the Clean Water Act's stormwater regulations to control pollution due to discharges from municipal stormwater systems.
- PA Sewage Facilities Act 537 to protect and prevent contamination of groundwater and surface water by developing proper sewage disposal plans.
- PA Stormwater Management Act 167 to address management of stormwater runoff quantity, particularly in developing areas.
- The Wissahickon TMDL (Total Maximum Daily Load) process to improve water quality of impaired streams and water bodies by calculating and limiting pollutant loads.
- Schuylkill Action Network (SAN) ongoing partnership projects.
- Fairmount Park Commission Master Plan for the Wissahickon Creek.
- Wissahickon Creek River Conservation Plan (2000).
- Sandy Run River Conservation Plan (2003)
- "Wissahickon Creek Watershed: Physical Characteristics and Water Quality," National Institute for Environmental Renewal (1999).

2.2.1 Watershed Partnership

In November 2005, the Philadelphia Water Department (PWD) sponsored the Wissahickon Creek Watershed Partnership to begin the development of an integrated watershed management plan – a long-range road map designed to serve the twin goals of protecting natural resources and advancing vital communities. It reaches out to include municipal and conservation planning efforts that strive to ensure that growth within the watershed occurs only with special care to the environment.
The integrated Watershed Management Plan aims to:

- Serve as a holistic, comprehensive management tool that facilitates restoration and revitalization efforts throughout the watershed.
- Accommodate all regulatory and planning requirements affecting municipalities, which must address "point" (specific discharges) and "non-point" (generalized runoff) sources of pollution and flooding.
- Improve the water quality and natural environment of these heavily stressed streams, including highly urbanized areas.
- Boost the ability of the streams to support a diversity of wildlife, such as fish, insects, and birds.
- Enhance parkland and "riparian" (riverside) buffers, creating an enjoyable natural environment for the communities within the watershed.
- Develop a flexible "adaptive management" approach that will ensure sustainable improvements to the watershed.

This planning effort also benefits from the resources of other earlier and ongoing planning processes. In addition, the integrated plan is designed to serve the needs of municipal and government entities by addressing and satisfying the many related regulatory programs. Some of the reports, plans, and programs that will be taken into consideration by the Wissahickon Creek Integrated Watershed Management Plan include the following:

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The foundation of this planning effort is the comprehensive collection of data that will prioritize pollution and impairment sources and confirm the best strategies for alleviating these impairments and restoring the watershed to one that is fishable, swimmable and enjoyable. PWD has committed to the watershed-wide collection of biological, chemical and physical data (including fluvial geomorphologic analysis and modeling), in addition to providing professional facilitation services to support the Wissahickon Creek Watershed Partnership.

Current Wissahickon Watershed Partners include:

- Wissahickon Valley Watershed Association
- Whitpain Township
- PA DEP
- Whitemarsh Township
- Merck & Co., Inc.
- Abington Township
- McNeil CSP
- Center for Sustainable Communities
- Philadelphia Water Department
- Pennsylvania Environmental Council
- Lower Gwynedd Township
- Upper Gwynedd Township
- Ambler Wastewater Treatment Plant
- Upper Dublin Township
- US EPA
- Lansdale Borough
- Morris Arboretum
- Friends of the Wissahickon
- FX Browne, Inc.

- Cheltenham Township
- Montgomery County Planning Commission
- Fairmount Park Commission
- Montgomery County Conservation District
- North Wales Water Authority
- EEMA, Inc.
- Philadelphia University
- Schuylkill Riverkeeper
- Clean Water Action
- Wissahickon Restoration Volunteers
- Senior Environmental Corps, Center in the Park
- Schuylkill Center for Environmental Education

While the plan is in development, the Partnership has held or is developing a number of outreach materials including:

- Best Practices Municipal Workshops (for MS4 munis) – February 2006
- Homeowners' Stormwater Workshop (for MS4 munis) – February 2006
- Rain Barrel Workshops for Homeowners – October 2006
- Watershed-wide Wissahickon Brochure – in planning
- Public education re unusual events in the Wissahickon – in planning

2.2.2 Define Preliminary Goals and Objectives

Refer to section 2.2.2 of Section 3 – Darby-Cobbs Watershed

2.2.3 Data Analysis and Indicator Development

Refer to section 2.2.3 of Section 3 – Darby-Cobbs Watershed

2.2.4 Development and Screening of Management Options

Refer to section 2.2.4 of Section 3 – Darby-Cobbs Watershed

2.2.5 Monitoring and Field Data Collection

As part of the 5-yr rotating Watershed Monitoring Program, the Wissahickon Watershed was completed in 2005-2006 to support the development of the watershed management plan and to update the current biological, chemical and physical indicator status.

Chemical Sampling

Spatial and temporal analyses of the discrete chemical samples taken in the Wissahickon Creek Watershed in 2005 **(Figure 17)** were completed in 2006. A completed summary of the water quality report is described in the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*. The report can be found at http://www.phillyriverinfo.org/Watersheds/Wissahickon.aspx

Wet Weather Targeted Sampling
During 2006, wet weather targeted sampling was completed on the twelve tributaries (n=12) of the Wissahickon Creek within Philadelphia County. Data is currently being analyzed and will be completed during the 2007 calendar year.

Continuous Water Quality Sampling
Sonde deployments along the Wissahickon Creek continued throughout the winter and spring months of 2006. Data analyses and reports can be found in the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006).*

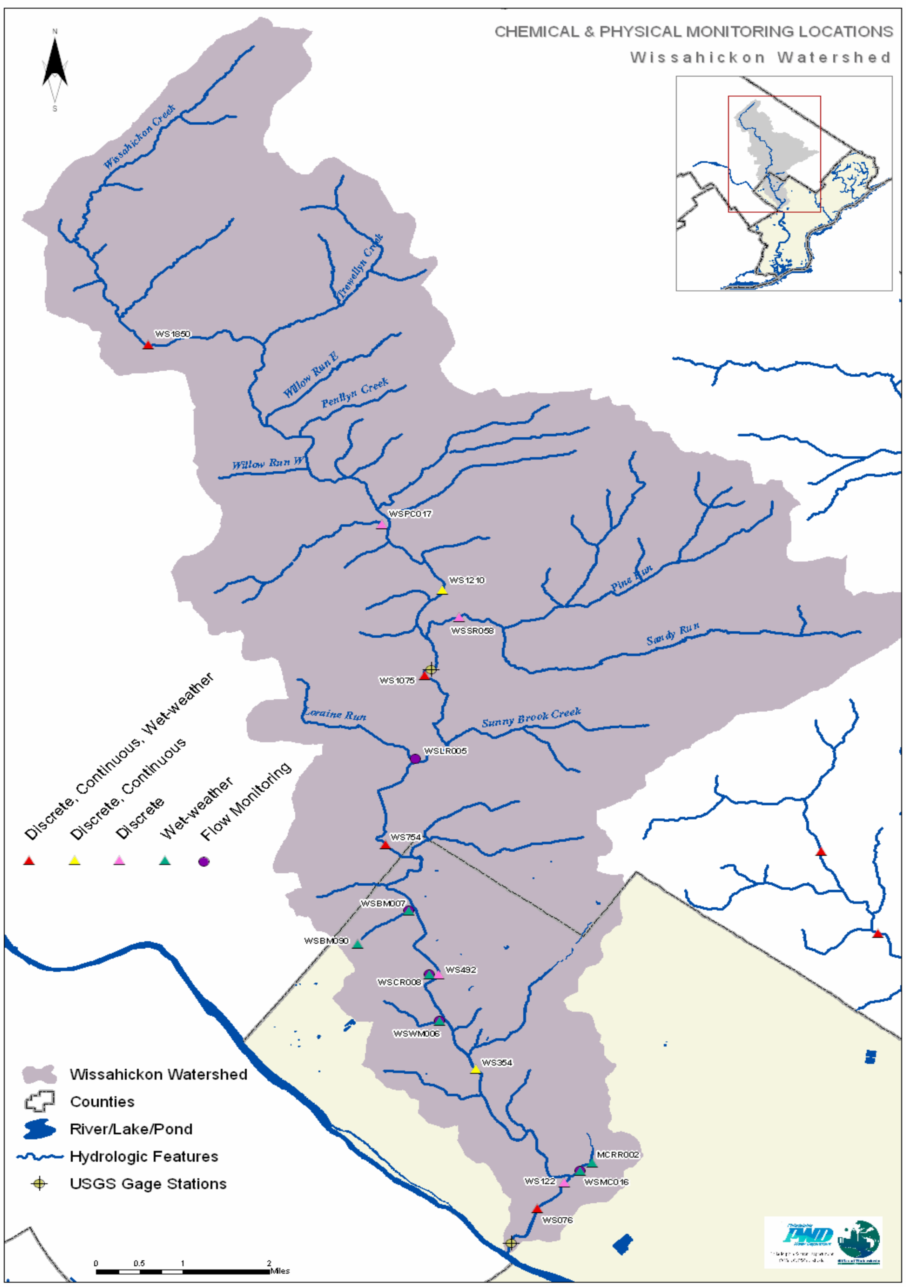


Figure 17 - Chemical monitoring locations in the Wissahickon watershed

Biological Assessment and Analyses
Benthic assessments conducted in 2005 **(Figure 18)** were analyzed in 2006 and a completed report can be found in *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*.

Fish Sampling
Assessments conducted at the ten (n=10) sites during 2005 were analyzed and completed in 2006. For a completed document refer to the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*.

Algae Sampling
Periphyton samples collected from four (n=4) sites on 4/22/05 were analyzed during 2006 with a completed document incorporated into the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*.

Habitat Assessment
The thirty-two (n=32) sites along the Wissahickon Creek were analyzed in 2006. For a complete review of the habitat quality report, refer to the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*.

Habitat Suitability Index Modeling
Habitat Suitability Index (HSI) models were completed in 2006. Additional information can be found in the *Wissahickon Creek Watershed Comprehensive Characterization Report (2006)*.

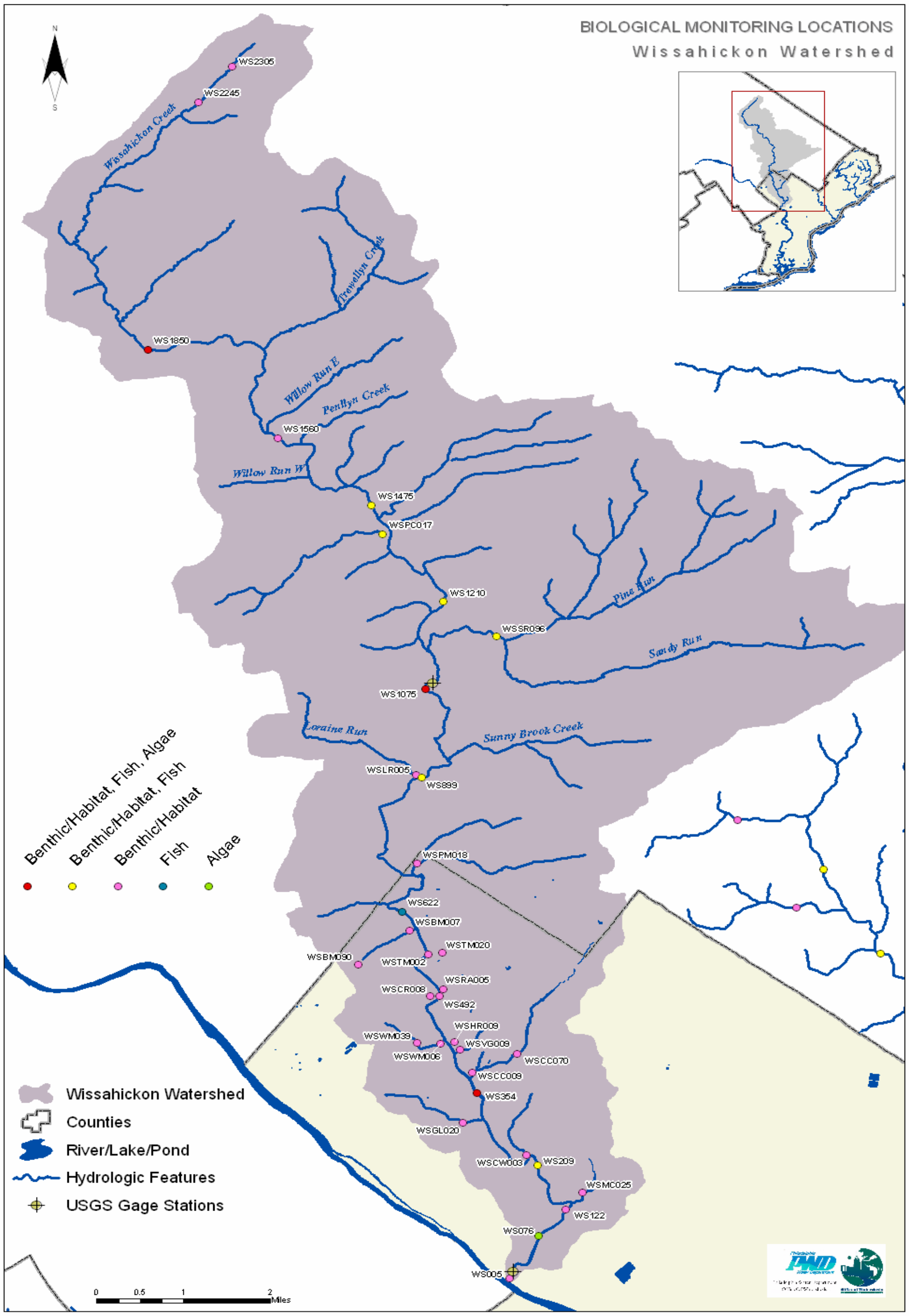


Figure 18 - Biological monitoring stations in the Wissahickon watershed

2.2.6 Modeling

Modeling Sediment Loads

Streambank Erosion Load Field Methods
During 2006, PWD has initiated a monitoring plan that addresses the adverse impacts to in-stream habitats as a result of transport of sediment and/or streambank erosion. Baseline data from 12 perennial tributaries that originate in the City will be monitored to define their contribution of sediment loading.

There are two elements to the monitoring program. The first estimates the sediment load originating from streambanks. The second estimates the total sediment load being carried by the stream. Data collection is ongoing for both parts.

Sediment Load Originating from Streambank Erosion
In order to estimate the sediment load originating from streambank erosion a bank erosion hazard index (BEHI) and near bank stress (NBS) assessment were completed. Once the assessment was concluded bank pins were installed to collect empirical data on streambank erosion rates.

BEHI/NBS Assessments
PWD employed the BEHI and NBS as defined by Rosgen (1996) to predict erosion rates and classify erosion potential. Three hundred and sixty eight reaches in 12 tributaries were assessed using BEHI and NBS criteria (Table 1). Reaches were assessed based on visual inspection of obvious signs of erosion. BEHI and NBS scores were grouped as very low, low, moderate, high or very high.

Table 14 - Portion of Each Tributary Assessed Using BEHI/NBS Method

Site	BEHI/NBS Assessed (ft)	Channelized (ft)	Visually Assessed (ft)
Monoshone	147	3,074	9,537
Kitchens Ln	1,250	0.00	12,946
Cresheim	1,835	1,062	29,143
Valley Green Run	270	277	3,859
Hartwell	340	0.00	6,358
Rex Ave	270	0.00	2,982
Thomas Mill	625	0.00	6,895
Hill Crest	75.0	2,128	6,929
Paper Mill	2,640	8,576	48,298
Gorgas Ln	350	325	3,261
Wises Mill	1,042	1,057	11,301
Cathedral	1,135	0.00	4,227
Bells Mill	1,759	0.00	7,781

Bank Profile Measurements
Bank pins were installed in Bells Mill, Cathedral Run, Wises Mill and Monoshone tributaries in October and November 2005. Nine bank pin sites were chosen in each of the tributaries listed with the exception of Monoshone. Only four bank pin sites were chosen in Monoshone because much of the tributary is channelized. Bank pins were installed in reaches with varying BEHI and NBS scores in order to validate and calibrate the prediction model. Three of the 9 sites were in reaches visually assessed to have low erosion potential. Additional bank pin sites in these tributaries and others are planned for the future (**Figure 19).**

Bank pins were installed where the bend in the bank was greatest. If possible, at least one bank pin was put in below bankfull height and they were spaced no closer than 1 ft. The number of bank pins at a site was dependent on bank height and ranged from one to three. After installation, bank pins were spray painted orange to facilitate visibility.

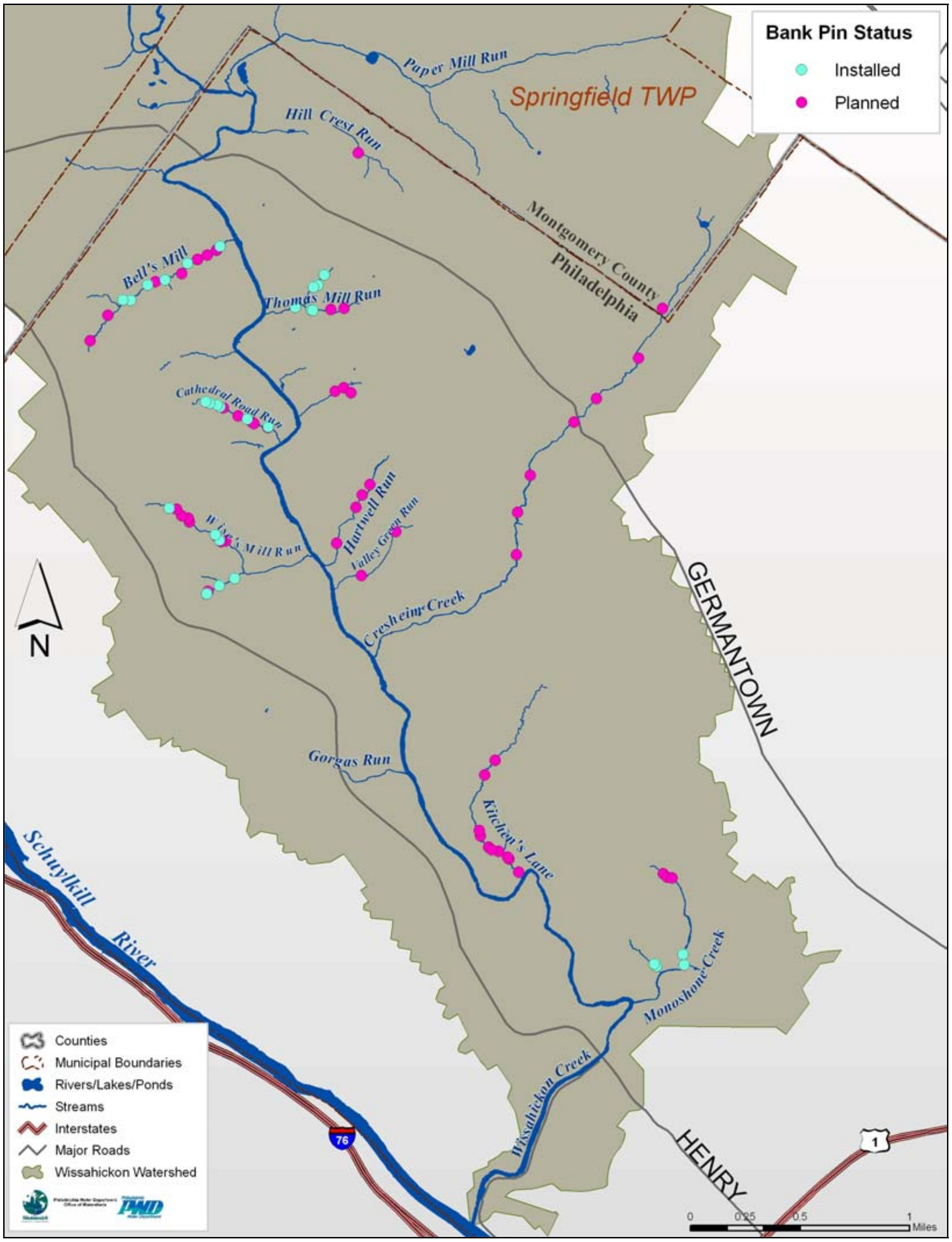


Figure 19 - Current and Planned Bank Pin Site Locations

Toe pins are bank offset pins driven vertically into the bed surface. The toe pin offers a permanent location to measure the bank profile from. The profile was measured with a survey rod, a Keson pocket rod and two levels. The survey rod was placed on the edge of the toe pin and kept straight using a level. The pocket rod was placed against the bank, on top the bank pin, and kept straight using a level. The distance from the bank to the edge of the survey rod closest to the bank was recorded on a field data sheet.

Channel Stability
Bar samples, sub-pavement samples and pebble counts were collected at 9 sites in 5 tributaries to Wissahickon Creek in order to gather information on channel stability. Bar and sub-pavement samples as well as pebble counts were collected following methods described on EPA's Watershed Assessment of River Stability and Sediment Supply (WARSSS) website. Additionally, Riffle Stability Index (RSI) Assessments and pebble counts were completed at 14 sites in the same 5 tributaries. RSI methods are described in Kappesser (1994). RSI assessments were done in place of bar samples in cases where sediment bars were not prominent due to high slope. In some cases RSI assessments were done in close proximity to bar or sub-pavement samples in order to compare results from the two methods. All samples were collected in April and May 2006.

Total Suspended Sediment Load
To estimate the total suspended sediment load in the steam both a stage discharge and a sediment discharge rating curve were generated. Stage was continuously recorded and used in conjunction with the rating curves to calculate an estimated sediment load per year.

Stage Data
Stage data from Bells Mill, Cathedral Run, Wises Mill and Monoshone were recorded near the Wissahickon confluence downstream of all stormwater outfalls. Stage was measured every six minutes by either an ultrasonic down-looking water level sensor or a pressure transducer and recorded on a Sigma620. PWD staff periodically downloaded stage data and performed quality assurance. Any data determined to be incorrect was removed and saved in another location.

Dates of ultrasonic down-looking sensor installation in Bells Mill, Cathedral Run and Wises Mill were May 2005, September 2005 and August 2005 respectively. Pressure transducers were installed in Monoshone in July 2005 and Bells Mill in November 2005. Stage data will continue to be recorded at these sites and additional collection sites are planned.

Stage Discharge Rating Curve
Staff gages were installed in Monoshone, Wises Mill and Bells Mill concurrent with ultrasonic downlooker or pressure transducer installation. Staff gages are located next to the stage recording device in culverts with concrete floors to ensure that the cross section will not change over time.

Discharge rating curves were established in Monoshone, Wises Mill and Bells Mill following a modified version of the USGS protocol (Buchanan and Somers 1969). Discharge was measured in a cross section close to the staff gage using a SonTek Flowtraker Handheld ADV and plotted against the stage it was recorded at. Due to lack of a suitable monitoring location, the discharge rating curve in Cathedral Run will be mathematically modeled instead of measured in the field.

Sediment Discharge Rating Curve
In order to create a sediment concentration discharge rating curve, suspended sediment concentration was measured at various flows. Automated water collection devices (ISCO model no. 6712) were used to collect water samples during wet weather events in 4 Wissahickon Creek tributaries **(Figure 20)**. In an attempt to characterize the entire storm, automated samplers were triggered by a 0.2 ft elevation change in stream height and samples were collected every 20 minutes for the first hour. Following this step, samples were collected every 2-4 hours until discharge returned to baseflow conditions. The stage at which water samples were

collected was related to the stage discharge rating curve in order to generate a sediment concentration discharge rating curve.

Total suspended sediment samples were collected from Monoshone Creek (5/20/2005 and 7/8/2005), Wises Mill (11/16/2005), Cathedral Run (11/10/2005 and 11/16/2005) and Bells Mill (9/15/2005, 9/26/2005 and 10/8/2005). Sample collection followed methods described in Section 4 for wet weather monitoring. Additional sample collections are planned for these 4 tributaries as well as other tributaries.

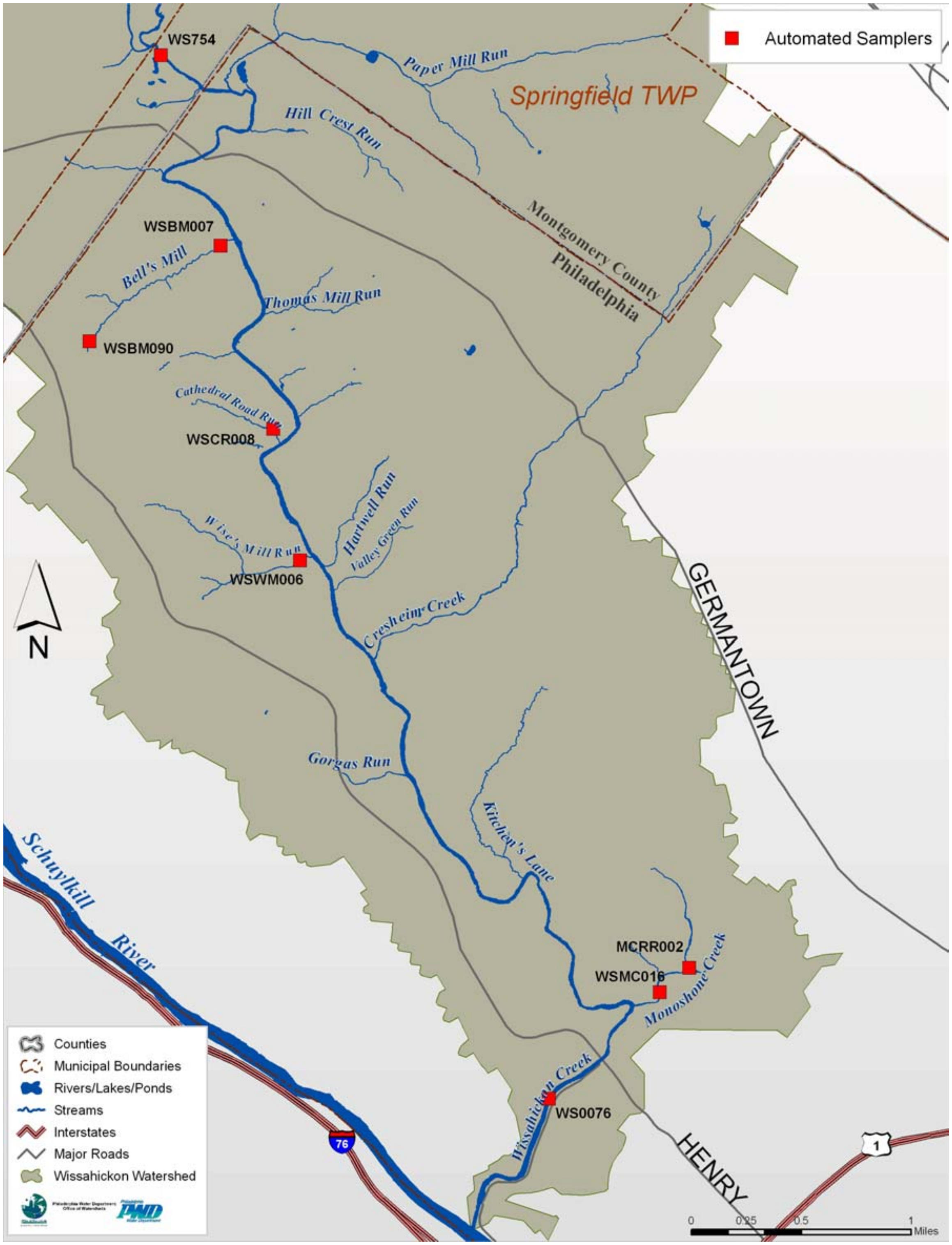


Figure 20 - Automated Sampler Locations

2.2.7 Development and Evaluation of Management Alternatives
Refer to section 2.2.7 of Section 3 – Darby-Cobbs Watershed

2.3 Public Involvement and Education

River Conservation Plan
NOT APPLICABLE

Watershed Tours
The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

3.0 Annual CSO Statistics
NOT APPLICABLE

Section 7 – Poquessing Creek Watershed

1.0 CSO Capital Improvement Projects

NOT APPLICABLE

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Poquessing Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at [www.phillyriverinfo.org.](http://www.phillyriverinfo.org)

2.1 Preliminary Reconnaissance Survey

Most elements of the preliminary reconnaissance survey for the Poquessing Creek have been completed. Specifically the physical, chemical, and biologic assessment was completed in calendar year 2001 with a comprehensive report completed in 2001.

2.2 Watershed Work Planning & Assessment

The Philadelphia Water Department (PWD) has embarked on an ambitious program of watershed management for several creeks within the City limits. PWD anticipates developing a Poquessing Integrated Watershed Management Plan in the future. The watershed plans are designed as integrated watershed planning efforts to address the objectives of several programs, including CSO Long Term Planning, Pennsylvania Stormwater Management programs, potential or existing TMDLs, River Conservation Plans, and Phase II Stormwater permits. PWD's Office of Watersheds (OOW) has carried out an extensive sampling and monitoring program to characterize conditions in the Poquessing Creek Watershed.

2.2.1 Watershed Partnership

In 2004, the PWD, along with its partners, the Fairmount Park Commission and the Friends of Poquessing Creek, were awarded a state river conservation plan grant for the Poquessing Creek Watershed. In 2005, our RCP consultant, Borton-Lawson, began the data collection and public outreach components of the plan, including civic presentations, surveys, key person interviews, and have conducted a number of steering committee meetings. The first public meeting was held in April 2005 and the first public event – a major clean up of a stream segment, was co-hosted with PA Cleanways in April 2005. Currently, the Steering Committee is finalizing management options for the RCP and is planning a watershed-wide celebration to present the final plan in spring 2007.

2.2.2 Define Preliminary Goals and Objectives

Refer to section 2.2.2 of Section 3 - Darby-Cobbs Watersheds

2.2.3 Data Analysis and Indicator Development
Refer to section 2.2.3 of Section 3 - Darby-Cobbs Watersheds

2.2.4 Development and Screening of Management Options
Refer to section 2.2.4 of Section 3 - Darby-Cobbs Watersheds

2.2.5 Monitoring and Field Data Collection

Chemical and Nutrient Sampling
Samples collected by the Philadelphia Water Department (2001) revealed low to moderate nutrient levels within the watershed, suggesting that nutrient enrichment may not be as serious a concern as in other watersheds in Southeastern Pennsylvania (**Figure 21**). Studies of other stream systems in Philadelphia by the Water Department and of nearby Chester county streams by the United States Geological Survey (USGS) showed greater concentrations of Phosphorus and Nitrogen species (i.e., Nitrate, Nitrite, Ammonia) than those encountered in the Poquessing-Byberry watershed (Reif 2000). The relative paucity of agriculture and point sources of nutrients (e.g., wastewater treatment plants) in the Poquessing-Byberry watershed probably explains its low nutrient concentrations. Potential point and non-point sources include fertilized yards, golf courses and commercial landscaping; animal waste; rain and atmospheric deposition; and sewage from faulty infrastructure.

A search for water quality data discovered scant recent historical (i.e., within the past 20 years) water quality data for the Poquessing-Byberry watershed, underscoring the need for continued monitoring efforts by PWD and other regulatory agencies. Since the USGS discontinued Water quality sampling at its 5 gauging stations in the watershed from 1970 to 1973, there has been no regular sampling of water quality in the Poquessing-Byberry watershed.

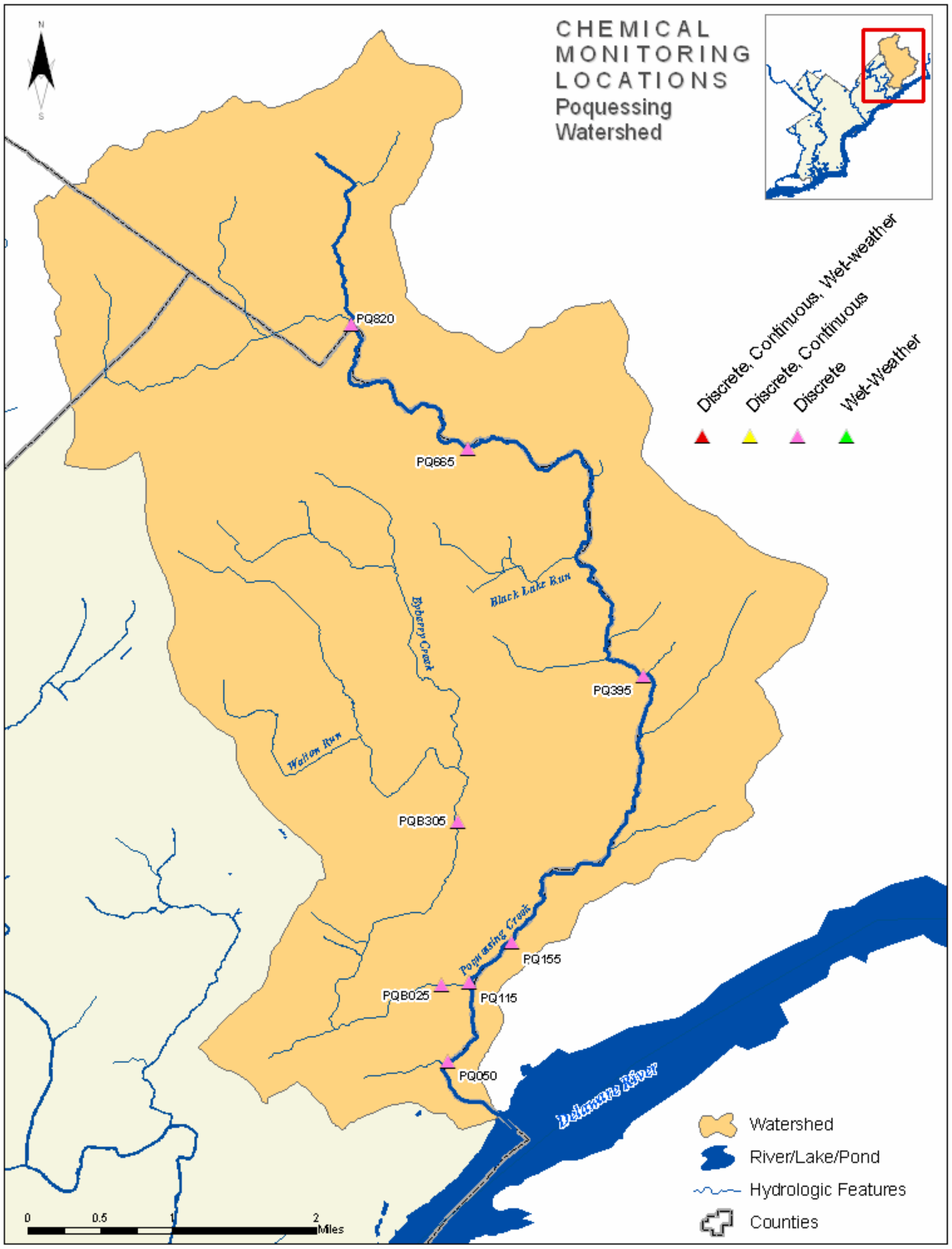


Figure 21 - Chemical monitoring locations in Poquessing-Byberry Watershed

Benthic Assessments

Benthological assessments conducted by the Philadelphia Water Department during December 11th through 18th, 2001, have identified biological impairments in the macroinvertebrate community at all assessment locations in the Poquessing-Byberry watershed, including Byberry Creek and the unnamed tributary to Poquessing Creek **(Figure 22)**. While community composition may vary slightly at each site, the pollution tolerance values and trophic designations indicate that the benthic assemblage in the Poquessing-Byberry watershed is skewed towards a more moderately tolerant generalist feeding community. Moreover, all sites showed elevated Hilsenhoff Biotic Index (HBI) scores along with poor representation of pollution sensitive mayfly, stonefly and caddisfly (EPT) taxa.

Moderately tolerant taxa (i.e., hydropsychid caddisflies and chironomid midges) were present throughout the watershed but the spatial distribution of their respective dominance clearly showed a shift from the dominance of chironomids in upstream reaches and tributaries of Poquessing Creek to dominance by hydropsychid caddisflies (i.e., genera Hydropsyche and Cheumatopsyche) in the lower portions of the watershed. Percent contributions of Chironomidae and Hydropsychidae ranged from 33.67% to 71.32% and from 31.37% to 66.67%, respectively.

This trophic shift from gatherer- collectors (i.e., chironomids) to filterer-collectors (i.e., hydropsychid caddisflies) appears to proceed in a downstream direction, perhaps in response to a change in food availability. Upstream sites may have greater amounts of algal periphyton when compared to downstream sites, which might be richer in fine particulate organic matter (FPOM)

Physical properties associated with available habitat appear to be limiting resources for benthic establishment or recolonization. Results show that a majority of assessment locations scored in the sub-optimal to poor ranges for both embeddedness and sediment deposition. Accumulation of sediment in the interstitial spaces of riffles has been shown to limit available habitat and possibly smother benthic invertebrate life stages (Cormier, 2000).

Ichthyofaunal Assessments
Ichthyofaunal assessments conducted by the Philadelphia Water Department during October 2001 revealed a total of 24 species of seven families. Spatial variation in fish communities was evident both longitudinally (i.e., upstream vs. downstream) and among streams (i.e., Poquessing Creek and Byberry Creek). Most notably was the upstream decrease in potential predators in both streams. As previously stated, American eel (*A. rostrata*) constituted a majority of the predator numbers and biomass at all locations. Potential predatory sunfish (e.g., *L. auritus* > 75 mm) and bass (e.g., *M. dolomieui and M. salmodies* > 100m *)* either decreased in an upstream manner or were poorly represented throughout the drainage. The absence of native predators, such as rock bass (*A. rupestris*) and paucity of catfish species (e.g., *A. natalis* and *A. nebulosus*) could potentially be an indicator to the abundance of minnow species in the drainage (i.e., top-down effect). Although longitudinal decrease in piscivores in the Poquessing-Byberry watershed is apparent, there are several possible reasons for differences in upstream (i.e., headwater) communities relative to downstream sites. One possible reason is the decrease in habitat heterogeneity along the stream gradient. Environmental variability in upstream sites, such as the abundance of well-defined pool systems and variation in stream depth and temperature, could possibly account for the differences in predator biomass (Paller, 1994). Moreover, physical obstructions, such as check dams or low flow across riffle systems during summer months, may also impede upstream migration of larger predatory species.

Habitat Assessments
Physical habitat assessments conducted by PWD scientists suggest that physical parameters are likely the chief source of impairment within benthic macroinvertebrate and ichthyfaunal communities in the Poquessing-Byberry watershed. The majority of assessed sites were categorized as "partially supporting" or "non supporting" when compared to the reference stream. Moreover, the Pennsylvania Department of Environmental Protection has listed 22.5 assessed river miles within the watershed as "Impaired", due to the effects of urban runoff and storm sewers (PADEP 2002).

Many benthic invertebrate taxa rely heavily on riffle systems to carry out a majority of the aquatic portion of their life cycle. Sediment deposition and scouring were evident in many sites within the Poquessing-Byberry watershed; it is likely that these disturbances were sufficiently severe to have hindered reproduction and food acquisition for many species of macroinvertebrates. Certainly, those species not adapted to extreme hydrologic fluctuations have been extirpated from this area.

The fish assemblage present in the Poquessing-Byberry watershed appears to have suffered a similar fate. Species that are well adapted to hydrologic extremes and pollution currently dominate the assessed areas.

Like the benthic invertebrate community, fish communities rely heavily on specific habitats within a stream reach. Many species frequent shallow riffles systems for food acquisition while other species rely on large pools for foraging and reproduction. Stream runs with vegetated areas are also important habitat components for many species of fish.

Extremes in the hydrologic profile of The Poquessing-Byberry watershed may contribute to the low species diversity observed in the fish community. Many species rely on vegetation or rocks to deposit their eggs, while other species build nests that are closely guarded by the parent or parents. Extreme flow conditions contribute to deposition of sediment in pool systems and scouring of regions where offspring have been deposited, thus decreasing recruitment of fish populations and minimizing habitat utilization in certain species.

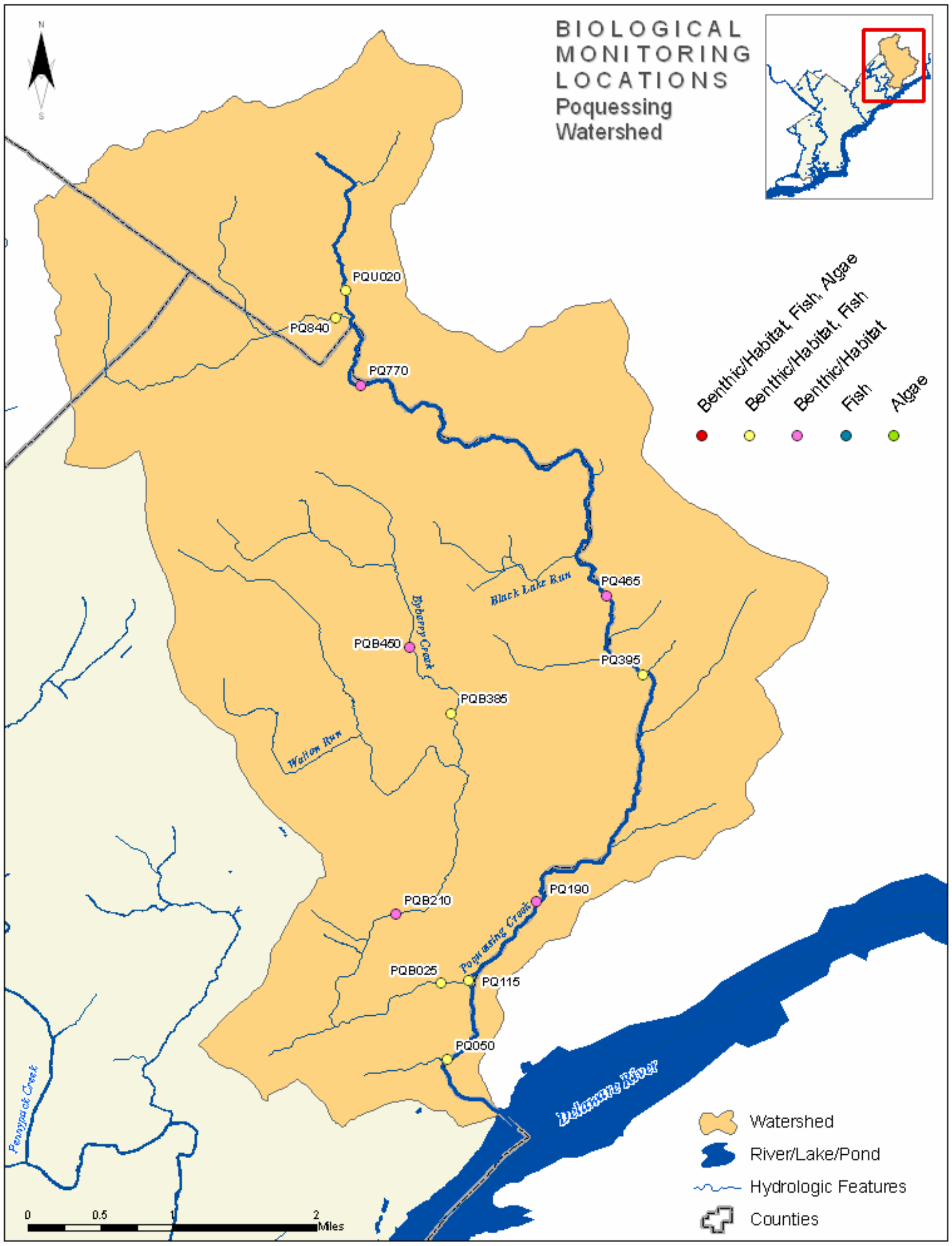


Figure 22 - Biological and physical assessment sites in Poquessing-Byberry Watershed

2.2.6 Modeling

The PWD envisions the development of a SWMM model for the watershed that can simulate the watershed response to storms for the storm sewers. The model will be used to assess current pollutant loading from stormwater water. The model will also be used to test a wide array of stormwater BMPs, including swales, green roofs, infiltration basins, porous pavement, and similar techniques. By simulating BMPs at various levels of implementation, graphs of urban BMP effectiveness in controlling stormwater will be developed and used to make watershed-specific recommendations on the needed degree of implementation and the selection of the most cost-effective approaches to meeting water quality and quantity objectives.

2.2.7 Development and Evaluation of Management Alternatives

Refer to section 2.2.7 of Section 3 – Darby-Cobbs Watershed

2.3 Public Involvement and Education

Watershed Tours

The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

Refer to section 1.7 – Pollution Prevention of Section 2 for additional public outreach in this watershed.

3.0 Annual CSO Statistics

NOT APPLICABLE

Section 8 – Delaware River Watershed

1.0 CSO Capital Improvement Projects

1.1 Somerset Interceptor Cleaning

Start: 11/1/1997 End: 1/21/1998 Status: Complete

Reference Long Term CSO Control Plan p. 2-10.

Description: The Somerset Interceptor conveys wastewater and combined flows from Somerset Street East of Richmond Street north to the Northeast Water Pollution Control Plant (NEWPCP) for treatment. Historically, this interceptor has been susceptible to solids accumulation over time. Removal of grit, sediment and debris from the Somerset Interceptor enables the hydraulic capacity of the interceptor to be utilized fully. Maximum utilization of the interceptor allows for increased CSO capture for Somerset Interceptor regulators.

Environmental Benefits: It is estimated that an average annual reduction in CSO volume of 210 MG/year, from 2290 to 2080 MG/year, will be achieved as a result of the completion of this project. In addition, this represents an estimated 10% reduction in the average annual volume of CSO from this interceptor system.

Status: This project was completed on 1/21/1998 by Mobile Dredging and Pumping Co. Inc., of Chester, PA at a cost of $273,867. The cleaning of this 8,800 lineal foot sewer extending from Richmond and Somerset Streets to the NEWPCP at Castor and Balfour Streets, was completed in ninety-four calendar days. The Somerset Interceptor comprises of sewer sections with sizes varying from 48 to 66 inches in diameter. An estimated 460 tons of grit, sediment and debris were removed from the Somerset Interceptor and transported by the contractor to the Southwest Water Pollution Control Plant (SWWPCP) for combination with existing grit disposal methods. Prior to disposal, contractor trucks were weighed at the Biosolids Recycling Center (BRC). The disposal was handled under the BRC Grit / Screenings disposal contract with Waste Management, Inc. The disposal costs were approximately $16,000 ($35.00 per ton).

1.2 Inflow Reduction

Start: End: Status: Complete

An analysis of tidal inflows at CSO regulators was performed to quantify the frequency of river inflows across regulator emergency overflow weirs due to tidal-influenced river levels. Emergency overflow weirs are designed at CSO regulators to prevent flooding of upstream trunk sewer systems during tide gate malfunction. However, during extreme high tides, flow reversals may occur across these weirs resulting in an inflow of river water to the CSO regulator chamber and combined sewer system. To free up capacity taken up by this flow during high tide periods, the PWD has installed tide gates at CSO regulators with low-lying emergency overflow weirs. A list of regulators for installation of overflow weir tide gates was developed through review of PWD's CSO regulator level monitoring data and review of PWD's CSO regulator databases.

Model analyses and review of PWD CSO level monitoring regulator data were performed to estimate the reduction in inflow frequency due to installation of overflow weir gates. Model analyses were performed to quantify the expected decrease in inflow volumes and frequencies in the SEDD for a one-year period, 1998. Table 1 lists the expected decreases in tidal inflow frequencies and volumes in the SEDD, due to the installation of overflow weir tide gates.

Table 15 - Tidal Inflow Reductions in the SEDD Due to Installation of Overflow Weir Gates

CSO regulator	Reduced inflow frequency	Reduced inflow volume (MG)
D_39	2	0.03
D_44	5	0.38
D_45	103	23.34
D_47	11	1.77
D_51	1	0.36
D_62	1	0.16
D_63	6	1.36
D_64	1	0.13
D_66	6	1.22
D_73	39	24.12

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Delaware Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org.

PWD continues to support the analysis and management of CSO discharges to the Delaware Estuary by participating in committee meetings, sampling, and contributing to the development of source track down and various monitoring programs. Specifically during 2003, PWD has actively supported the PCB TMDL for the Delaware.

Past reports from the DRBC regarding general water quality monitoring and specific monitoring for wet weather impacts suggest that fecal coliform standards are being met in the main stem estuary in the Philadelphia region most of the time. [1] DRBC indicated that further work on Bacteria Total Maximum Daily loads that might be required would occur in 2005. Past studies have shown dissolved oxygen concentrations in the Estuary are largely unaffected by CSO contributions. [2] As a result, monitoring and planning priorities continue to focus on the tributaries.

2.1 Preliminary Reconnaissance Survey

2.2 Watershed Work Planning & Assessment

2.2.1 Watershed Partnership

The PWD has embraced a comprehensive watershed management program that minimizes water pollution from all sources in a manner that is based on good science and achieves a sensible balance between ratepayer costs and environmental benefit. Watershed management integrates the department's "wet weather" programs – combined sewer overflow and stormwater management – with a new drinking water source protection program. This concept also takes full advantage of a variety of pollution reduction efforts, political initiatives and environmental goals to foster City and regional partnerships, and to support initiatives which

[1] Santoro, E., Draft Delaware Estuary Monitoring Report, November 1999.
[2] Hydroqual, Inc., Task 3.0 Evaluation of Wet Weather Impacts, 1999

enhance the health of the region's waterways and the public's perception of its environment. To this end, the PWD invited the public, state and local agencies, watershed groups and community organizations, to join in a watershed partnership.

The PWD will sponsor the Delaware Direct Watershed Partnership, which will be geared to reconnect the city with its waterways, to make the streams and parks in our communities valuable assets to our citizens that will induce them to join us in our protection efforts. This will be achieved by recognizing community values and the importance of environmental aesthetics. New solutions, which involve more localized "green" developments, can be more aesthetically pleasing, environmentally friendly and less costly.

2.2.2 Define Preliminary Goals and Objectives
NOT APPLICABLE

2.2.3 Data Analysis and Indicator Development
NOT APPLICABLE

2.2.4 Development and Screening of Management Options
NOT APPLICABLE

2.2.5 Monitoring and Field Data Collection
NOT APPLICABLE

2.2.6 Modeling
NOT APPLICABLE

2.2.7 Development and Evaluation of Management Alternatives
NOT APPLICABLE

2.3 Public Involvement and Education
The development of an RCP will be a project of the Partnership, and Partnership members will serve as the Steering Committee. The RCP will incorporate and coordinate a number of municipal/regulatory/community plans that are ongoing in the watershed to ensure the resources and projects support the ultimate goal of an RCP: the protection of natural resources and their sustainability in an urbanized watershed. The completion of a River Conservation Plan (RCP) for the Delaware Direct Watershed will enable the City to create an environmental and cultural planning inventory for a highly urbanized watershed with the ultimate goal to develop a holistic management plan that will facilitate restoration, enhancement and sustainable improvements in the designated watershed.

3.0 Annual CSO Statistics

Table 16 - DELAWARE RIVER 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Upper Delaware Low Level	12	12	7	-	61	33	1087	-	1128	56%	-	56%	8	-	251
Somerset	8	9	27	-	70	50	4107	-	4299	60%	-	61%	51	-	316
Lower Delaware Low Level	27	27	5	-	68	42	3160	-	3284	55%	-	55%	6	-	333
Oregon	5	6	4	-	61	44	1398	-	1458	36%	-	36%	4	-	230
Lower Frankford Low Level	5	6	27	-	66	45	1286	-	1336	42%	-	42%	43	-	263

Section 9 – Schuylkill River

1.0 CSO Capital Improvement Projects

1.1 RTC – Main Relief Sewer

Start: 8/1/1999 End: 6/15/2005 Status: Complete

Reference Long Term CSO Control Plan p. 2-13 – 2-14.

Description: The Main Relief Sewer provides flood relief to combined sewer areas in all three of PWD's drainage districts (Northeast, Southeast and Southwest). The Main Relief Sewer discharges to the Schuylkill River at Fairmount Park, a highly visible recreational area. Currently CSO is released into the river at the Main Relief Sewer outfalls during periods of moderate or greater rainfall. There exists within the single large (13.5' by 13.5' box) sewer above these outfalls a potential storage volume of approximately 4.0 million gallons (MG), and during all but the largest rainfalls most or all of this volume is available to store the overflow that otherwise discharges to the river. However, in order to use this 4.0 MG of storage, an inflatable dam is required in the box sewer just above the Main Relief Sewer outfalls to the Schuylkill River. This dam will reduce CSO discharges to the Schuylkill River by utilizing the relief sewer's in-system storage. This control technology provides an additional margin of protection against dry weather overflows while still maintaining flood protection for upstream communities. The inflatable dam maintains the stored flow in the relief sewer and a new connecting sewer drains the stored flow to an existing, nearby interceptor. The projected cost for this project is $650,000.

Environmental Benefits: This project will reduce the discharge of combined sewer overflow (CSO) into the Schuylkill River. An average annual reduction in CSO volume of 50 MG/year is expected at the Main Relief Sewer outfalls through use of the available in-system storage volume. This represents a reduction of approximately 70% in the average annual volume of CSO and a significant reduction in the associated pollutants (bacteria and organic matter from untreated wastes, litter and other solid materials in both wastewater and stormwater runoff, etc.) discharged into the Schuylkill River at this location, within Fairmount Park, at the historic Fairmount Water Works. Since this project modifies an existing structure (the Main Relief Sewer) rather than constructing a new one, it provides control very cost-effectively (unit cost for this storage is $0.10/gal versus roughly $6/gal for siting, designing, and constructing a new storage structure).

Status: In November of 2003, the project was advertised and bid. The bid was awarded in mid-December to Ross Arrco for an amount of $1,029,919. All submittals were approved and construction began in June, 2004 and was completed in mid-summer of 2005. The dam did not become fully automated until the Dauphin Street job, which used a portion of the Main Relief Sewer as a bypass during construction, was completed in the fall of 2006.

1.2 Elimination / Consolidation of Outfalls - Main & Shurs

Start: 9/4/1998 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-15.

Description: The relief overflow at R_20 (Main Street and Shurs Lane) was constructed due to chronic flooding during wet weather. High flow in the Upper Schuylkill East Side (USES) Interceptor, caused by infiltration and inflow from separate sanitary areas, reduces the available capacity at R_20. Currently, overflows occur during periods of relative high rainfall. Preliminary estimates indicate that a 2.0 MG of storage would be required under current conditions to eliminate R_20. However, given the sensitivity of the project design to inflow and infiltration (I/I), further evaluation of I/I (see *Targeted Infiltration and Inflow Studies*) and available sewer capacity is required in order to refine the indicated facility size. The estimated cost (prior to design and land acquisition) for this project is $12,000,000.

Environmental Benefits: An average annual reduction in CSO volume of 10 MG is achieved by eliminating the R_20 overflow.

Status: In 2006 the Engineering firm of Hazen & Sawyer (H&S) continued design work. As of December 2006, H&S submitted several draft copies of the Phase II Geotechnical & Environmental Study prepared by NTH Consultants. This report addresses the geotechnical considerations necessary for the design and construction of the CSO basin. NTH recommends that the CSO basin be supported on a concrete mat foundation bearing primarily on the mica schist bedrock in the area. In regards to excavation support during construction, NTH recommends that sheet piling be used considering the size of the basin, the site constraints (basin bounded by the railroad spur & canal to the north and the Schuylkill River to the south) and the high groundwater table and associated dewatering issues. NTH will do a preliminary design for the sheet pile system and will leave the responsibility for finalizing the design to the contractor.

H&S noted that there is a separate geotechnical report for the Performing Arts Center. They are expecting to receive preliminary drawings for the Performing Arts Center from their sub-consultant BKP in mid-February 2007.

H&S met with their sub-consultants (NTH, BKP, Hunt, and Andropogon) to discuss the site retaining walls along the river front. These site walls will be typically less than 4 feet high, but will increase to as much as 12 feet or more approaching the Performing Arts Center. They are proposing to use gabion baskets for the shorter walls, and a mechanically stabilized earth (MSE) wall with gabion-style facing units for the higher walls. The MSE walls use some sort of horizontal tie-back. The gabion-style wall is desired for its stability and natural appearance along the river bank. Hunt is preparing cross-sections along the river bank and will forward these to NTH for preparation of the retaining wall designs. Preliminary retaining wall designs are expected to be complete by the end March 2007.

H&S submitted a draft copy of the ACOE/PADEP Joint Permit Application for the project prepared by Hill Environmental. They also submitted a copy of a report analyzing the hydraulic impacts of the project on the Schuylkill River. This report will be included as part of the Permit Application. The HEC-RAS modeling that was done indicated that the proposed project would result in no significant impact to the flooding potential in the Schuylkill River under 100-year flood conditions. H&S would like to submit the permit application to PADEP and the ACOE by the end of March 2007.

H&S has contacted Realen Properties in regards to the public's use of the Cotton St. Bridge as an access to the Venice Island site (see attached letter). H&S will follow up their letter with a phone call to further discuss this issue and come to some sort of an agreement. H&S will eventually need to document any verbal agreements with a letter. At some point, H&S will also need to present the project to the Streets Department to discuss construction vehicle routes and maintenance of traffic during construction.

H&S has a milestone in the schedule for a plan submittal on 4/30/07. At that time the PWD can expect to get a complete set of drawings for the project organized by contract discipline (General/Mechanical, Electrical, Plumbing and HVAC). In mid-February, H&S expects to get a set of preliminary drawing for the Performing Arts Center. At the end of February, they expect preliminary retaining wall designs to be completed and to submit the permit application. In March, H&S plans to submit a set of drawings for the CSO Facility (Head House, Tank, etc.). This submittal would include structural, architectural, mechanical, site and utility drawings.

The estimated date for bidding is Fall 2007 and the new Engineers estimate is $24,000,000.

1.3 Elimination / Consolidation of Outfalls - 32nd & Thompson

Start: 4/1/1998 End: 9/15/2003 Status: Complete

Reference Long Term CSO Control Plan p. 2-15.

Description: Structure R_19 (32nd and Thompson) is a storm relief chamber located on a trunk sewer chamber that flows to structure R_12 (Pennsylvania Ave. & Fairmount Ave). Due to flat conduit slopes and resulting low flow velocities, the trunk has experienced sediment and grit accumulation across 75% to 90% of its cross-section between R_19 and R_12. Flow Control Unit has operated a temporary monitor in the overflow conduit at R_19 for approximately one year. In this time, there have been six recorded wet-weather overflows. Inspections indicated this sewer is difficult to clean and the historical records indicated there might be structural deficiencies. Therefore this sewer will be reconstructed at a steeper grade.

Once the sewer is reconstructed, it will be monitored. Model runs currently indicate that a reconstructed sewer will have sufficient capacity to eliminate all overflows from this site. Grit accumulation will be monitored at this location and cleaning will be scheduled as needed. Subsequently R_19 will be bulkhead and removed from service. The estimated cost for this project is $1,500,000.

Environmental benefits: This project will eliminate one of the City's CSO overflows, resulting in 0.5 MG reduction of overflow volume on an average annual basis.

Status: Construction at this site commenced in the summer of 2003 and was completed in October of 2003.

1.4 Elimination / Consolidation of Outfalls - Stokely & Roberts (R_ 22)

1.4.1 Stokely & Roberts (R_22) - Dobson's Run Phase I

Start: 5/1/1996 End: 10/4/1998 Status: Complete

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Description: Temporary dams were installed in the Dobson's run storm sewer. Flow was diverted to the Wissahickon High Level interceptor at Stokely St. & Roberts Ave. through hydraulic control point R_22, and to the Upper Schuylkill East Side interceptor at South Ferry Road and Kelly Drive through CSO S_01T. The LTCP includes a $6,500,000 program of sewer construction in the upper reaches that will allow R_22 to be removed from service. Two additional phases of the project will eliminate branch-sewer contributions of sanitary sewage from S_01T at an estimated cost of $18,700,000.

Environmental Benefits: This project will eliminate two of the City's intercepting chambers and will completely eliminate CSO overflows, resulting in a 173-MG reduction of overflow volume on an average annual basis.

Status: This project entails the reconstruction of the storm and sanitary sewer from Wissahickon Ave. to Roberts Ave. and elimination of the overflow chamber located at Stokely & Roberts (R_22). The contract was awarded to A.P. Construction and construction commenced on 7/18/1996. The construction, including the elimination of the R_22 chamber, was completed on 10/4/1998 at a total cost of $7,040,000. (The estimated construction cost was $ 5.8 million).

1.4.2 Kelly Drive (S_01T) - Dobson's Run Phase II
Start: 6/1/1997 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Phase II of the Dobson's Run Reconstruction consists of the sewer reach from Henry Ave. to Kelly Drive and eliminates branch sewer contributions of sanitary sewage from reaching temporary CSO S_01T. In order to take advantage of economies of scale, design work for Phase II and III of Dobson's Run has been combined into one project because both phases involve tunneling.

The project was bid on December 5th, 2006 with the low bidder being the joint venture of JPC/JAY DEE at the amount of $36.4 million. The contract should be awarded sometime in February 2007 with a contingency that brings the limit of contract to $38.5 million.

1.4.3 Kelly Drive (S_01T) - Dobson's Run Phase III
Start: 7/1/2001 End: Status: In-Progress

Reference Long Term CSO Control Plan p. 2-14 – 2-15.

Phase III will eliminate all CSO discharge from occurring at S_01T and has been combined with Phase II for contract development and bid purposes. See Above.

2.0 Watershed Management Planning

The following sections describe the progress that has been made in advancing the Schuylkill Watershed Initiative. Detailed information on documenting the minutes of partnership meetings, reports produced, and other accomplishments are posted on the partnership web page at www.phillyriverinfo.org/.

2.1 Preliminary Reconnaissance Survey

A comprehensive, watershed-based, Source Water Assessment was complete by PWD in conjunction with PADEP and other watershed stakeholders for the Schuylkill River Basin above Fairmount Dam. The information generated satisfies the elements of the Step 1 - Preliminary Reconnaissance Survey outline. Even though Step 2 Watershed Planning and Assessment is not specifically called for in the CSO long term control plan, the integrated programs philosophy allowed for progress to be made towards a comprehensive watershed plan through the Source Water Assessment program efforts. The following elements of the Step 2 process were included in the Source Water Assessment for the Schuylkill River:

- Monitoring, sampling and bioassessment
- QA/QC and data evaluation
- Watershed modeling
- Problem definition and water quality goal setting
- Technology evaluation
- Public Involvement

The Source Water Assessment Program reports, information, and updates, as well as information pertaining the Schuylkill Action Network (SAN) and RiverCast can be obtained from www.phillyriverinfo.org/.

2.2 Watershed Work Planning & Assessment

Protocol Development Support - Biologic Assessments in Tidal Waters
During spring and summer months of calendar year 2003, PWD scientists continued biological assessments along tidal and non-tidal portions of the Schuylkill River. Studies were focused on assessing the biotic integrity of migratory and resident fish species and to provide qualitative information on the efficiency of the existing fish passage structure located at Fairmount Dam. Using a boat electrofisher, biologists collected fish species during 20-minute interval passes (4 passes per assessment). Lengths, weights, presence of DELTA (i.e., deformities, lesions, tumors and anomalies), and catch-per-unit-effort (CPUE) were recorded. A total of 20 days were recorded over the course of the two seasons. Results from the continued bioassessment will serve as a baseline for future monitoring projects along the tidal and non-tidal portions of the Schuylkill and other waterways.

2.2.1 Watershed Partnership
NOT APPLICABLE

2.2.2 Define Preliminary Goals and Objectives
NOT APPLICABLE

2.2.3 Data Analysis and Indicator Development
NOT APPLICABLE

2.2.4 Development and Screening of Management Options
NOT APPLICABLE

2.2.5 Monitoring and Field Data Collection

From 3/1/05 to present, PWD staff biologists have been conducting various water quality monitoring activities in the tidal and non-tidal portions of the Schuylkill River to characterize water quality during periods of dry and wet weather. The following is an abbreviated activity description of work that is currently being conducting in this locality.

Wet Weather Water Sampling
In an effort to measure the effect of wet weather events on water quality, PWD staff collected samples from four locations in the lower Schuylkill River prior to and subsequent to wet weather events. Monitoring documented changes from the baseline along both a spatial and temporal scale. This project is on-going and samples will continue to be collected throughout 2007.

Water samples were collected from three sites in the tidal portion of the Schuylkill River and one site at the Belmont Intake (**Figure 23**). These sites were chosen to correspond to already established EPA STORET sites. Sampling sites were named according to the river mile at which they are located (eg. SCH982 is 9.82 miles upstream of the Delaware confluence).

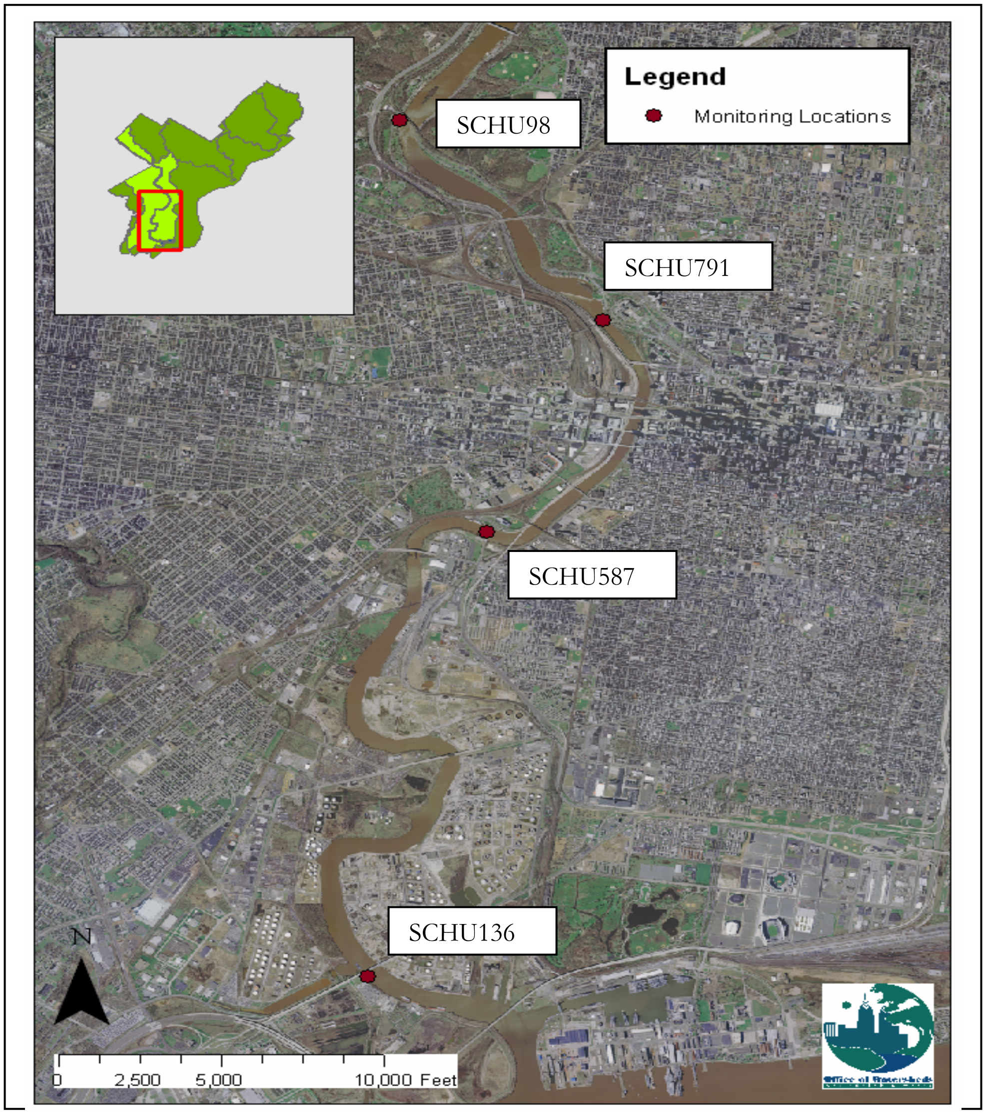


Figure 23 - Lower Schuylkill monitoring site locations

Monitoring took place prior to and up to three consecutive days following a wet weather event (**Table 17**). Sites were sampled after a dry period of at least 72 hours in order to establish a baseline of water quality. A wet weather event was defined as receiving at least 0.5" of rain (in 24 hr period), a dry period for at least 72 hours prior to the event, and a dry period at least 72 hours following the event. All sampling occurred during the outgoing tide to ensure that water quality was not influenced by the Delaware River.

Table 17 - Wet weather sampling dates

Date	Baseline/Days post rain
4/20/2005	Baseline
8/25/2005	Baseline
2/2/2006	Baseline
11/28/2006	Baseline
6/7/2005	1 Day Post Rain
11/17/2005	1 Day Post Rain
1/4/2006	1 Day Post Rain
5/2/2005	2 Days Post Rain
6/8/2005	2 Days Post Rain
11/18/2005	2 Days Post Rain
1/5/2006	2 Days Post Rain
5/3/2005	3 Days Post Rain
1/6/2006	3 Days Post Rain

Samples were collected with a horizontal sampler. The sampler was lowered by rope into the river from either a bridge or pier. The water sample was collected subsurface and as close to the center of the river as possible

Dissolved oxygen concentration, dissolved oxygen saturation, specific conductivity, pH, and temperature were measured on-site using a YSI 85 DO probe and a YSI 60 pH/Temp probe. Other parameters analyzed by the Bureau of Laboratory Services include:

- Fecal Coliform and E. Coli
- Nitrate, Nitrite, Ammonia, and TKN
- Orthophosphate and TP
- Dissolved Cu, Zn, Cr, Cd,
- Total Cd, Cr, Cu, Pb, Mg, Zn, Al
- Hardness

Additionally, organic compounds were sent to Lancaster Laboratory for analysis.

Continuous Water Quality Monitoring

During the reporting period, PWD staff biologists continued deployments of automated water quality monitors at two locations in the tidal Schuylkill River (**Figure 24**). Self-contained, data-logging continuous water quality monitoring Sondes (YSI Inc. Models 6600, 600XLM) were installed to measure various physiochemical properties and to identify spatial (i.e., upstream versus downstream) and temporal (i.e., seasonal) changes in the tidal reach during wet and dry weather. To date, a total 2950 hours of data comprising four chemical attributes (i.e., dissolved oxygen, pH, conductivity and temperature) have been recorded. Due to probe fouling in the lower tidal site, relocation of the station has been planned with continuous monitoring scheduled for the spring and summer months of 2007.

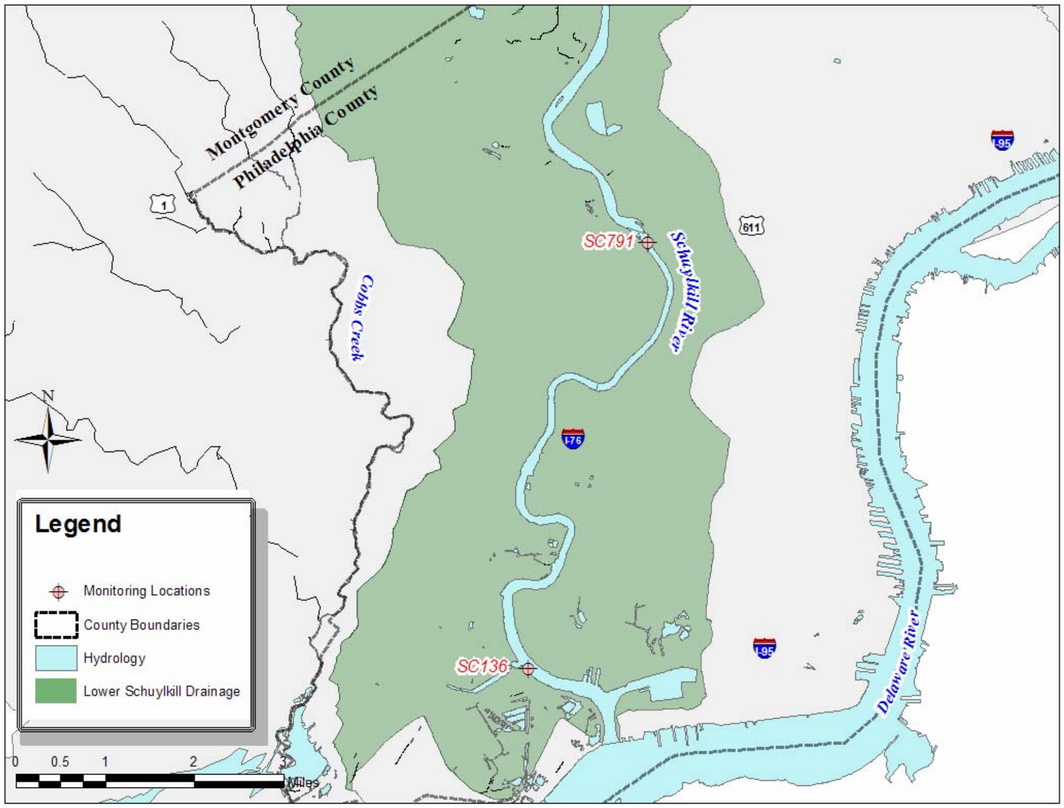


Figure 24 - Continuous water quality monitoring stations in the tidal Schuylkill River

Biological Monitoring

During 2006, PWD scientists performed multiple electrofishing surveys on the Schuylkill River from Flatrock Dam downstream to the confluence with the Delaware River (**Figure 25**). The overall objectives of this program are to assess the relative health of the resident and migratory fish assemblage in the lower Schuylkill River and to relate the utilization of the Fairmount fish ladder by migratory fish species with their presence in the river. During the 2006 sampling season, a total of 5133 fish, representing 40 different species, were identified and assessed for individual health. Statistical data from the 2006 electrofishing surveys is currently being analyzed and will be available in the next permit cycle. In addition, under water video survey from the Fairmount fish ladder was used to determine relative abundance of migratory species. During the three month monitoring season, a total of 16850 fish, representing 28 species, were identified in 2006.

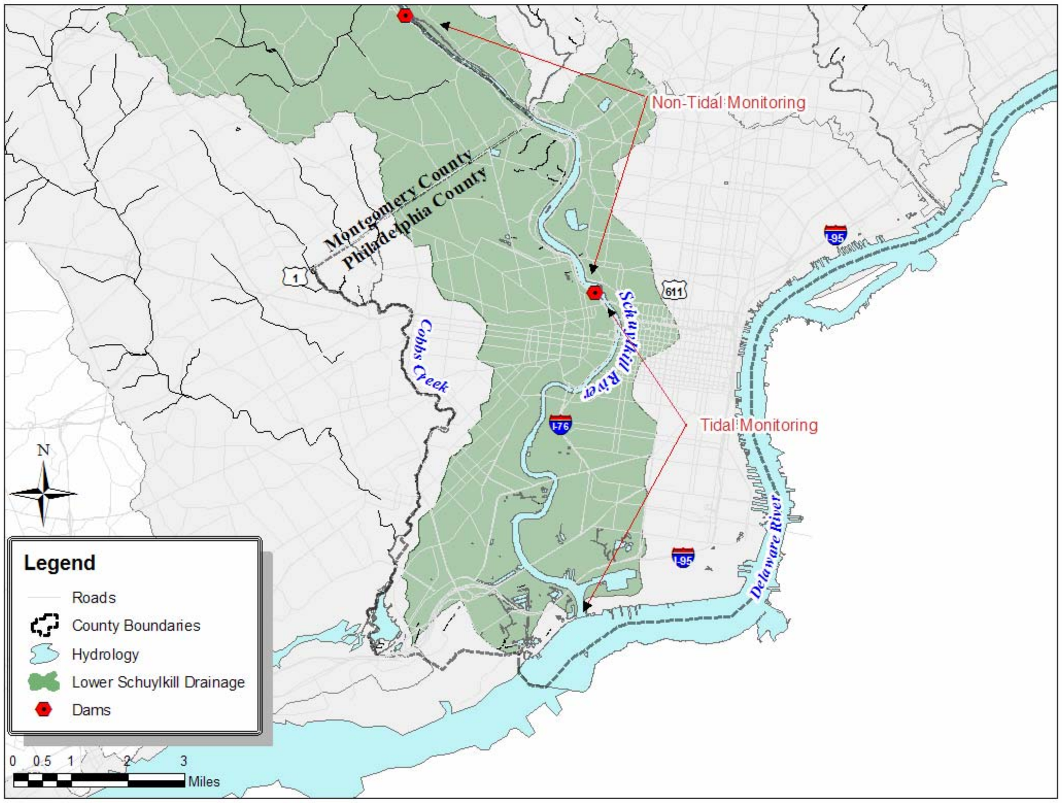


Figure 25 - Tidal and non-tidal fish monitoring locations in the lower Schuylkill River

2.2.6 Modeling

NOT APPLICABLE

2.2.7 Development and Evaluation of Management Alternatives

NOT APPLICABLE

2.3 Public Involvement and Education

Watershed Tours:
The City continues to conduct watershed tours in Philadelphia's nine (9) watersheds (Tacony, Frankford, Poquessing, Pennypack, Wissahickon, Cobbs, Darby, Schuylkill, and Delaware) to further enhance the public's understanding and appreciation of watershed issues. Tour guides describe the watershed concept, point out natural and manmade stormwater features and infrastructure, anthropogenic impacts on receiving water quality, benthic and ichthyfaunal assessments, and watershed protection practices.

Refer to section 1.7 – Pollution Prevention of Section 2 for additional public outreach in this watershed.

3.0 Annual CSO Statistics

Table 18 - SCHUYLKILL RIVER 2006 CSO Statistics

Interceptor	# of point sources	# of structures	Frequency				CSO Volume (MG)			CSO Capture (%)			CSO Duration (hrs)		
			Range per subsystem			Avg per subsystem	Range per subsystem			Range per subsystem			Range per subsystem		
Central Schuylkill East Side	20	26	0	-	82	34	1414	-	1466	54%	-	54%	0	-	419
Central Schuylkill West Side	10	10	0	-	71	44	743	-	773	45%	-	46%	0	-	350
Lower Schuylkill East Side	7	9	7	-	65	46	861	-	895	49%	-	50%	10	-	324
Lower Schuylkill West Side	4	4	10	-	67	50	1306	-	1359	19%	-	19%	15	-	274
Southwest Main Gravity	2	2	5	-	64	35	2213	-	2306	59%	-	59%	6	-	283

Section 10 - Watershed Information Center

During FY 2006, the Philadelphia Water Department (PWD) performed a series of extensive updates to both the organizational structure and content housed on the existing Watershed Technology Center. These updates have been designed to further enhance the navigability of the site and improve the user experience. The Center functions as a regional resource of Southeastern Pennsylvania watershed-related information centrally locating technical, management, and administrative tools and capabilities to support those involved in watershed planning. The Watershed Information Center is located at www.PhillyRiverInfo.org and www.SoutheastPaRiverInfo.org. Information on the site is organized by watershed and by the Philadelphia Water Department program that generated the information so that users can approach site navigation from either direction. PWD is consistently developing and adding content to the website in order to keep the content up-to-date. The Department has also spent time refining the homepage and will continue to develop more interactive capabilities and discussion boards.

Appendix A – Flow Control CSO Maintenance Summaries

PART 1 | PHILADELPHIA WATER DEPARTMENT | Section 1

DRY WEATHER STATUS | WASTE AND STORM WATER COLLECTION

REPORT | FLOW CONTROL UNIT | June 2006

COLLECTOR	Jul-05	Aug-05	Sep-05	Oct-05	Nov-05	Dec-05	Jan-06	Feb-06	Mar-06	Apr-06	May-06	Jun-06	Totals
UPPER PENNYPACK - 5 UNITS													
INSPECTIONS	14	5	10	10	10	11	10	11	11	6	11	7	116
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	2	0	2	5	2	2	0	2	1	2	1	2	21
UPPER DELAWARE LOW LEVEL - 12 UNITS													
INSPECTIONS	22	15	40	32	30	33	26	26	21	20	27	20	312
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	2	2	6	4	5	4	1	6	1	2	5	6	44
LOWER FRANKFORD CREEK - 6 UNITS													
INSPECTIONS	12	17	12	14	12	14	12	12	6	14	15	12	152
DISCHARGES	0	1	0	0	0	0	0	0	0	2	1	0	4
BLOCKS CLEARED	1	0	0	1	1	2	1	1	0	1	2	2	12
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
INSPECTIONS	14	26	13	24	22	26	23	13	16	22	17	14	230
DISCHARGES	0	2	0	0	1	0	1	0	0	0	0	0	4
BLOCKS CLEARED	2	5	1	3	1	0	3	2	2	2	0	3	24
FRANKFORD HIGH LEVEL - 14 UNITS													
INSPECTIONS	37	18	19	18	23	37	20	17	20	22	24	30	285
DISCHARGES	0	0	0	0	0	0	0	1	0	0	0	0	1
BLOCKS CLEARED	0	2	2	0	0	2	0	0	0	1	0	0	7
SOMERSET - 9 UNITS													
INSPECTIONS	14	21	29	22	22	32	26	34	35	25	39	27	326
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	1	0	0	0	0	0	0	0	0	0	0	1	2
LOWER DELAWARE LOW LEVEL - 33 UNITS													
INSPECTIONS	83	73	74	95	106	102	88	79	87	77	68	103	1035
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	5	3	0	3	0	0	1	0	0	0	1	0	13
CENTRAL SCHUYLKILL EAST - 18 UNITS													
INSPECTIONS	114	54	57	72	88	96	96	95	84	69	97	91	1013
DISCHARGES	1	0	0	0	0	0	0	0	0	0	0	0	1
BLOCKS CLEARED	6	0	2	5	5	1	0	0	1	1	1	2	24
LOWER SCHUYLKILL EAST - 9 UNITS													
INSPECTIONS	22	42	30	36	16	36	44	26	25	29	26	25	357
DISCHARGES	1	1	0	0	0	0	0	0	0	0	0	0	2
BLOCKS CLEARED	3	2	7	7	6	0	5	1	2	3	4	6	46
CENTRAL SCHUYLKILL WEST - 9 UNITS													
INSPECTIONS	17	26	25	31	44	32	41	39	38	22	28	37	380
DISCHARGES	0	0	0	0	2	0	0	0	0	0	0	0	2
BLOCKS CLEARED	0	0	0	1	1	1	0	0	5	0	0	0	8
SOUTHWEST MAIN GRAVITY - 10 UNITS													
INSPECTIONS	32	52	34	60	27	48	46	44	48	38	47	58	534
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	4	7	3	0	3	3	5	4	4	8	41
LOWER SCHUYLKILL WEST - 4 UNITS													
INSPECTIONS	27	12	23	25	11	25	16	13	19	21	23	30	245
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	2	4	2	5	6	5	1	0	5	12	3	6	51
COBBS CREEK HIGH LEVEL - 23 UNITS													
INSPECTIONS	67	60	60	88	74	77	71	78	72	69	63	51	830
DISCHARGES	0	0	0	0	0	1	0	1	0	0	0	0	2
BLOCKS CLEARED	0	0	0	15	10	14	2	0	4	6	6	6	63
COBBS CREEK LOW LEVEL - 13 UNITS													
INSPECTIONS	28	26	43	32	39	40	27	36	36	24	31	30	392
DISCHARGES	1	0	0	0	0	0	0	0	0	0	0	0	1
BLOCKS CLEARED	1	0	1	5	10	7	2	1	9	4	4	2	46
RELIEF SEWERS - 26 UNITS													
INSPECTIONS	49	30	47	41	39	67	54	58	47	35	69	44	580
DISCHARGES	1	0	0	0	0	0	0	0	0	0	0	0	1
BLOCKS CLEARED	1	0	0	3	4	0	0	0	4	0	1	1	14
TOTALS / MONTH for 201 REGULATOR UNITS													Totals
TOTAL INSPECTIONS	552	477	516	600	563	676	600	581	565	493	585	579	6787
TOTAL DISCHARGES	4	4	0	0	3	1	1	2	0	2	1	0	18
TOTAL BLOCKS CLEARED	26	18	27	64	54	38	19	16	39	38	32	45	416
AVER. # of INSP. / BC	21	27	19	9	10	18	32	36	14	13	18	13	19
DISC / 100 INSPECTIONS	0.7	0.8	0.0	0.0	0.5	0.1	0.2	0.3	0.0	0.4	0.2	0.0	0.3

PART 1	PHILADELPHIA WATER DEPARTMENT	Section 1
DRY WEATHER STATUS	WASTE AND STORM WATER COLLECTION	
REPORT	FLOW CONTROL UNIT	January 2007

COLLECTOR	Jul-06	Aug-06	Sep-06	Oct-06	Nov-06	Dec-06	Jan-07	Feb-07	Mar-07	Apr-07	May-07	Jun-07	Totals
UPPER PENNYPACK - 5 UNITS													
INSPECTIONS	10	10	11	6	15	16	16	0	0	0	0	0	84
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	3	5	1	2	4	0	0	0	0	0	0	0	15
UPPER DELAWARE LOW LEVEL - 12 UNITS													
INSPECTIONS	33	16	26	31	35	33	38	0	0	0	0	0	212
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	8	3	6	15	10	14	8	0	0	0	0	0	64
LOWER FRANKFORD CREEK - 6 UNITS													
INSPECTIONS	13	12	9	11	13	14	22	0	0	0	0	0	94
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	4	0	2	1	6	3	3	0	0	0	0	0	19
LOWER FRANKFORD LOW LEVEL - 10 UNITS													
INSPECTIONS	20	14	13	15	22	24	38	0	0	0	0	0	146
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	4	3	3	3	5	1	3	0	0	0	0	0	22
FRANKFORD HIGH LEVEL - 14 UNITS													
INSPECTIONS	19	19	48	43	54	32	60	0	0	0	0	0	275
DISCHARGES	0	0	0	1	1	0	0	0	0	0	0	0	2
BLOCKS CLEARED	1	3	7	6	10	2	8	0	0	0	0	0	37
SOMERSET - 9 UNITS													
INSPECTIONS	19	28	18	27	19	33	23	0	0	0	0	0	167
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	3	0	0	2	0	1	0	0	0	0	0	0	6
LOWER DELAWARE LOW LEVEL - 33 UNITS													
INSPECTIONS	104	141	108	79	95	84	92	0	0	0	0	0	703
DISCHARGES	0	0	1	0	0	0	0	0	0	0	0	0	1
BLOCKS CLEARED	2	0	4	2	3	1	2	0	0	0	0	0	14
CENTRAL SCHUYLKILL EAST - 18 UNITS													
INSPECTIONS	84	102	75	97	72	87	80	0	0	0	0	0	597
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	0	4	2	2	0	1	5	0	0	0	0	0	14
LOWER SCHUYLKILL EAST - 9 UNITS													
INSPECTIONS	25	36	29	33	25	32	42	0	0	0	0	0	222
DISCHARGES	1	0	0	0	0	0	0	0	0	0	0	0	1
BLOCKS CLEARED	6	5	6	9	4	3	3	0	0	0	0	0	36
CENTRAL SCHUYLKILL WEST - 9 UNITS													
INSPECTIONS	23	29	37	36	28	38	29	0	0	0	0	0	220
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	1	1	2	1	1	1	0	0	0	0	0	0	7
SOUTHWEST MAIN GRAVITY - 10 UNITS													
INSPECTIONS	48	57	56	56	50	53	0	0	0	0	0	0	320
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	0	6	3	7	11	5	0	0	0	0	0	0	32
LOWER SCHUYLKILL WEST - 4 UNITS													
INSPECTIONS	32	32	29	29	26	22	24	0	0	0	0	0	194
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	9	11	11	5	5	2	2	0	0	0	0	0	45
COBBS CREEK HIGH LEVEL - 23 UNITS													
INSPECTIONS	48	85	69	69	81	81	67	0	0	0	0	0	500
DISCHARGES	0	0	0	0	1	0	0	0	0	0	0	0	1
BLOCKS CLEARED	0	0	0	0	1	0	2	0	0	0	0	0	3
COBBS CREEK LOW LEVEL - 13 UNITS													
INSPECTIONS	25	42	42	32	31	28	23	0	0	0	0	0	223
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	0	0	0	0	0	0	0	0	0	0	0	0	0
RELIEF SEWERS - 26 UNITS													
INSPECTIONS	37	76	65	80	66	112	92	0	0	0	0	0	528
DISCHARGES	0	0	0	0	0	0	0	0	0	0	0	0	0
BLOCKS CLEARED	3	9	0	0	0	1	1	0	0	0	0	0	14
TOTALS / MONTH for 201 REGULATOR UNITS													Totals
TOTAL INSPECTIONS	540	699	635	644	632	689	646	0	0	0	0	0	4485
TOTAL DISCHARGES	1	0	1	1	2	0	0	0	0	0	0	0	5
TOTAL BLOCKS CLEARED	44	50	47	55	60	35	37	0	0	0	0	0	328
AVER. # of INSP. / BC	12	14	14	12	11	20	17	n/a	n/a	n/a	n/a	n/a	14
DISC / 100 INSPECTIONS	0.2	0.0	0.2	0.2	0.3	0.0	0.0						0.1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
UPPER PENNYPACK 5 NEWPC UNITS															
P01	3	1	2	2	2	2	2	2	1	1	2	1	21	1.8	17.4
P02	3	1	2	2	2	2	2	2	2	1	2	1	22	1.8	16.6
P03	3	1	2	2	2	2	2	2	1	1	2	2	22	1.8	16.6
P04	3	1	2	2	2	3	2	3	5	2	3	2	30	2.5	12.2
P05	2	1	2	2	2	2	2	2	2	1	2	1	21	1.8	17.4
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS															
D02	3	1	3	2	3	4	3	4	3	3	3	3	35	2.9	10.4
D03	3	1	3	4	3	3	3	2	2	2	2	2	30	2.5	12.2
D04	2	3	4	2	2	6	2	2	3	3	4	2	35	2.9	10.4
D05	2	1	4	4	3	4	2	2	2	1	2	1	28	2.3	13.0
D06	2	1	6	2	2	2	2	2	2	1	2	1	25	2.1	14.6
D07	2	1	3	4	5	2	2	2	1	1	2	1	26	2.2	14.0
D08	2	2	3	2	2	2	2	2	1	1	2	2	23	1.9	15.9
D09	2	1	3	2	2	2	2	2	1	2	2	1	22	1.8	16.6
D11	1	1	4	4	2	2	2	2	1	3	2	2	26	2.2	14.0
D12	1	1	2	2	2	2	2	2	1	1	2	2	20	1.7	18.2
D13	1	1	2	2	2	2	2	2	3	1	2	1	21	1.8	17.4
D15	1	1	3	2	2	2	2	2	1	1	2	2	21	1.8	17.4
LOWER FRANKFORD CREEK 6 NEWPC UNITS															
F13	2	2	2	2	2	2	2	2	1	1	2	1	21	1.8	17.4
F14	2	2	2	2	1	2	2	2	1	1	2	1	20	1.7	18.2
F21	2	3	3	2	3	3	2	2	1	4	2	1	28	2.3	13.0
F23	2	4	2	3	2	3	2	2	1	2	5	5	33	2.8	11.1
F24	2	2	2	3	2	2	2	2	1	5	2	3	28	2.3	13.0
F25	2	4	1	2	2	2	2	2	1	1	2	1	22	1.8	16.6
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS															
F03	2	2	2	2	2	2	2	3	1	2	2	1	23	1.9	15.9
F04	1	2	1	2	2	2	2	1	1	2	2	1	19	1.6	19.2
F05	1	3	2	2	2	2	2	1	1	2	3	1	22	1.8	16.6
F06	2	2	1	2	2	4	3	1	2	2	2	2	25	2.1	14.6
F07	1	2	1	2	2	2	1	1	1	2	1	1	17	1.4	21.5
F08	1	2	1	2	2	2	1	1	1	2	1	2	18	1.5	20.3
F09	2	4	2	5	2	4	7	2	2	3	2	2	37	3.1	9.9
F10	2	2	1	2	2	2	1	1	3	2	1	1	20	1.7	18.2
F11	1	2	1	2	2	2	1	1	1	2	1	1	17	1.4	21.5
F12	1	5	1	3	4	4	3	1	3	3	2	2	32	2.7	11.4
FRANKFORD HIGH LEVEL 14 NEWPC UNITS															
T01	3	1	1	1	2	2	2	1	1	1	1	2	18	1.5	20.3
T03	2	1	1	1	3	2	2	1	3	3	2	3	24	2.0	15.2
T04	2	1	3	3	3	3	1	1	2	2	1	5	27	2.3	13.5
T05	2	1	1	1	2	2	1	1	1	2	1	2	17	1.4	21.5
T06	2	1	1	1	2	2	1	1	1	2	1	2	17	1.4	21.5
T07	2	1	1	1	2	2	1	1	1	2	1	2	17	1.4	21.5
T08	3	2	2	1	2	3	1	1	1	2	2	2	22	1.8	16.6
T09	3	2	2	2	1	2	1	1	1	2	3	2	22	1.8	16.6
T10	3	2	2	1	1	5	2	2	2	1	4	1	26	2.2	14.0
T11	3	2	1	1	1	3	3	1	1	1	4	2	23	1.9	15.9
T12	3	1	1	1	1	3	1	1	1	1	1	2	17	1.4	21.5
T13	3	1	1	1	1	3	2	3	2	1	1	3	22	1.8	16.6
T14	3	1	1	1	1	3	1	1	1	1	1	1	16	1.3	22.8
T15	3	1	1	2	1	2	1	1	2	1	1	1	17	1.4	21.5

9 TOTAL DISCHARGES FOR NE & SE DISTRICTS

0.8 AVERAGE DISCHARGES PER MONTH

15.9 AVER. DAYS BEFORE RETURNING TO SITE

3.4 AVER. INSPECTIONS PER DAY PER CREW

DTR = DAYS TO RETURN TO SITE

I/D/C = INSPECTIONS PER DAY PER CREW

I/D = INSPECTIONS PER DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
SOMERSET LOW LEVEL 9 NEWPC UNITS															
D17	2	3	3	3	2	4	2	3	3	3	4	3	35	2.9	10.4
D18	2	2	3	2	2	4	2	3	3	3	4	3	33	2.8	11.1
D19	2	3	3	2	3	5	2	3	3	3	4	3	36	3.0	10.1
D20	2	2	4	2	2	3	2	3	3	3	4	2	32	2.7	11.4
D21	1	2	3	2	2	3	2	3	3	3	3	2	29	2.4	12.6
D22	1	3	4	2	3	3	2	3	3	2	3	2	31	2.6	11.8
D23	1	2	3	2	2	3	2	3	3	2	6	2	31	2.6	11.8
D24	1	2	2	2	2	3	2	3	3	2	4	1	27	2.3	13.5
D25	2	2	4	5	4	4	10	10	11	4	7	9	72	6.0	5.1
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS															
D37	1	2	3	2	5	3	3	3	4	2	2	1	31	2.6	11.8
D38	1	2	2	4	5	3	3	3	4	2	2	2	33	2.8	11.1
D39	1	2	4	4	4	3	3	3	7	3	3	3	40	3.3	9.1
D40	3	2	2	2	3	3	3	3	3	2	2	4	32	2.7	11.4
D41	3	2	2	4	3	3	3	3	3	1	2	2	31	2.6	11.8
D42	1	2	3	2	3	3	3	3	3	2	2	2	29	2.4	12.6
D43	1	2	3	2	3	3	3	3	4	2	2	2	30	2.5	12.2
D44	2	3	3	3	4	3	3	4	5	2	2	4	38	3.2	9.6
D45	4	2	2	11	4	4	5	3	3	6	3	15	62	5.2	5.9
D46	3	1	4	3	3	4	3	3	3	3	2	4	36	3.0	10.1
D47	4	2	3	2	3	4	3	3	3	3	2	3	35	2.9	10.4
D48	5	2	2	5	3	4	4	3	3	3	2	4	40	3.3	9.1
D49	3	2	2	2	3	4	3	3	2	2	2	3	31	2.6	11.8
D50	4	3	2	4	4	4	4	3	2	2	2	4	38	3.2	9.6
D51	3	2	2	2	3	5	5	4	2	2	3	5	38	3.2	9.6
D52	4	2	2	2	3	3	3	3	2	2	2	2	30	2.5	12.2
D53	4	2	2	3	3	3	2	3	2	2	2	2	30	2.5	12.2
D54	5	2	2	3	3	3	2	2	2	2	2	2	30	2.5	12.2
D58	4	2	2	2	4	6	2	2	3	3	3	2	35	2.9	10.4
D61	2	2	2	2	3	3	2	2	2	2	2	2	26	2.2	14.0
D62	2	2	2	2	3	3	2	2	2	2	2	2	26	2.2	14.0
D63	4	2	2	2	3	3	3	2	2	2	2	2	29	2.4	12.6
D64	5	2	2	2	3	3	2	2	2	2	2	1	28	2.3	13.0
D65	1	3	2	2	3	4	2	2	2	2	2	1	26	2.2	14.0
D66	2	2	2	2	3	3	2	2	2	4	2	1	27	2.3	13.5
D67	2	2	2	2	4	2	2	1	2	2	3	1	25	2.1	14.6
D68	2	2	1	7	4	2	2	1	2	3	2	12	40	3.3	9.1
D69	2	3	3	3	3	2	2	1	2	3	2	1	27	2.3	13.5
D70	1	5	2	2	3	3	3	1	2	3	1	6	32	2.7	11.4
D71	1	5	2	3	2	2	2	2	2	2	2	3	28	2.3	13.0
D72	1	1	2	2	3	2	2	2	3	2	2	3	25	2.1	14.6
D73	1	3	2	2	3	2	2	2	2	2	2	2	25	2.1	14.6
D75	1	0	1	0	0	0	0	0	0	0	0	0	2	0.2	181.5
TOTAL	196	175	197	215	225	255	205	192	196	186	201	213	2456		
I/D/C	3.2	2.9	3.2	3.5	3.7	4.2	3.4	3.2	3.2	3.1	3.3	3.5			
UP	14	5	10	10	10	11	10	11	11	6	11	7	116	1.9	16.0
UDLL	22	15	40	32	30	33	26	26	21	20	27	20	312	2.2	14.5
LFC	12	17	12	14	12	14	12	12	6	14	15	12	152	2.1	14.9
LFLL	14	26	13	24	22	26	23	13	16	22	17	14	230	1.9	16.9
FHL	37	18	19	18	23	37	20	17	20	22	24	30	285	1.7	18.5
SLL	14	21	29	22	22	32	26	34	35	25	39	27	326	3.0	10.9
LDLL	83	73	74	95	106	102	88	79	87	77	68	103	1035	2.6	16.9

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
UPPER PENNYPACK 5 NEWPC UNITS															
P01	2	2	2	1	3	3	3						16	2.3	13.3
P02	2	2	2	1	3	3	3						16	2.3	13.3
P03	2	2	2	1	2	3	3						15	2.1	14.2
P04	2	2	3	2	3	4	4						20	2.9	10.6
P05	2	2	2	1	4	3	3						17	2.4	12.5
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS															
D02	4	2	3	2	2	3	4						20	2.9	10.6
D03	3	1	2	1	2	4	3						16	2.3	13.3
D04	4	2	3	3	4	3	4						23	3.3	9.3
D05	2	1	2	7	9	5	3						29	4.1	7.3
D06	2	2	2	2	2	2	3						15	2.1	14.2
D07	2	1	2	4	3	3	3						18	2.6	11.8
D08	2	1	2	2	3	2	3						15	2.1	14.2
D09	3	1	2	2	2	2	3						15	2.1	14.2
D11	4	2	2	2	2	2	3						17	2.4	12.5
D12	2	1	2	2	2	3	3						15	2.1	14.2
D13	2	1	2	2	2	2	3						14	2.0	15.2
D15	3	1	2	2	2	2	3						15	2.1	14.2
LOWER FRANKFORD CREEK 6 NEWPC UNITS															
F13	3	1	4	2	3	3	4						20	2.9	10.6
F14	2	1	1	2	3	3	4						16	2.3	13.3
F21	2	1	1	2	2	2	3						13	1.9	16.4
F23	2	5	1	2	2	2	4						18	2.6	11.8
F24	3	3	1	2	2	2	4						17	2.4	12.5
F25	1	1	1	1	1	2	3						10	1.4	21.3
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS															
F03	1	1	1	1	2	2	5						13	1.9	16.4
F04	1	1	1	1	2	2	4						12	1.7	17.7
F05	1	1	2	1	2	2	5						14	2.0	15.2
F06	2	1	1	2	2	2	4						14	2.0	15.2
F07	1	1	1	1	2	2	3						11	1.6	19.3
F08	2	1	1	1	2	2	3						12	1.7	17.7
F09	7	4	2	3	3	5	4						28	4.0	7.6
F10	3	1	1	3	2	2	3						15	2.1	14.2
F11	1	1	1	1	2	2	3						11	1.6	19.3
F12	1	2	2	1	3	3	4						16	2.3	13.3
FRANKFORD HIGH LEVEL 14 NEWPC UNITS															
T01	1	1	3	4	3	2	4						18	2.6	11.8
T03	2	2	4	5	4	3	5						25	3.6	8.5
T04	2	2	4	4	6	3	5						26	3.7	8.2
T05	1	1	3	3	6	3	4						21	3.0	10.1
T06	1	1	3	3	3	2	4						17	2.4	12.5
T07	1	1	3	3	3	2	4						17	2.4	12.5
T08	1	1	4	3	3	2	4						18	2.6	11.8
T09	1	1	3	2	3	2	4						16	2.3	13.3
T10	2	2	4	4	5	2	5						24	3.4	8.9
T11	2	2	4	3	4	2	5						22	3.1	9.7
T12	1	1	3	2	3	2	4						16	2.3	13.3
T13	2	2	4	3	4	3	4						22	3.1	9.7
T14	1	1	3	2	4	2	4						17	2.4	12.5
T15	1	1	3	2	3	2	4						16	2.3	13.3

3 TOTAL DISCHARGES FOR NE & SE DISTRICTS

0.4 AVERAGE DISCHARGES PER MONTH

#DIV/0! AVER. DAYS BEFORE RETURNING TO SITE

3.9 AVER. INSPECTIONS PER DAY PER CREW

DTR = DAYS TO RETURN TO SITE

I/D/C = INSPECTIONS PER DAY PER CREW

I/D = INSPECTIONS PER DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
SOMERSET LOW LEVEL 9 NEWPC UNITS															
D17	3	3	2	5	2	4	3						22	3.1	9.7
D18	1	4	2	2	2	4	2						17	2.4	12.5
D19	1	2	2	2	2	4	3						16	2.3	13.3
D20	1	3	2	3	2	4	3						18	2.6	11.8
D21	1	3	2	2	2	3	2						15	2.1	14.2
D22	1	3	2	2	2	4	2						16	2.3	13.3
D23	1	3	1	5	3	3	3						19	2.7	11.2
D24	2	4	2	3	2	4	2						19	2.7	11.2
D25	8	3	3	3	2	3	3						25	3.6	8.5
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS															
D37	4	4	3	3	3	5	4						26	3.7	8.2
D38	3	4	3	4	2	5	3						24	3.4	8.9
D39	3	3	8	2	2	5	4						27	3.9	7.9
D40	1	3	2	1	2	2	1						12	1.7	17.7
D41	1	4	2	5	3	2	2						19	2.7	11.2
D42	1	3	3	2	2	2	1						14	2.0	15.2
D43	1	4	2	2	2	2	1						14	2.0	15.2
D44	2	4	2	2	3	2	3						18	2.6	11.8
D45	14	10	11	5	9	5	7						61	8.7	3.5
D46	1	8	7	4	6	3	3						32	4.6	6.7
D47	2	6	4	4	8	2	3						29	4.1	7.3
D48	5	4	3	5	9	2	4						32	4.6	6.7
D49	1	4	3	5	4	2	3						22	3.1	9.7
D50	1	3	3	4	2	2	3						18	2.6	11.8
D51	5	4	4	3	3	3	3						25	3.6	8.5
D52	1	3	3	2	1	2	3						15	2.1	14.2
D53	1	4	3	2	1	2	3						16	2.3	13.3
D54	1	4	3	2	1	2	4						17	2.4	12.5
D58	2	4	8	3	4	3	3						27	3.9	7.9
D61	1	4	2	1	1	2	4						15	2.1	14.2
D62	1	2	2	1	1	2	3						12	1.7	17.7
D63	1	4	3	1	1	2	4						16	2.3	13.3
D64	1	2	3	1	1	2	3						13	1.9	16.4
D65	1	2	2	1	1	2	2						11	1.6	19.3
D66	1	2	3	1	1	2	3						13	1.9	16.4
D67	3	4	2	3	1	3	2						18	2.6	11.8
D68	26	11	5	3	9	4	4						62	8.9	3.4
D69	5	8	4	2	4	3	1						27	3.9	7.9
D70	7	5	2	2	3	3	4						26	3.7	8.2
D71	3	3	1	1	2	2	2						14	2.0	15.2
D72	3	9	1	1	2	2	1						19	2.7	11.2
D73	1	2	1	1	1	2	1						9	1.3	23.6
D75	0	0	0	0	0	0	0						0	0.0	#####
TOTAL	218	240	233	212	253	236	289	0	0	0	0	0	1681		
I/D/C	3.6	3.9	3.8	3.5	4.2	3.9	4.8	0.0	0.0	0.0	0.0	0.0			
UP	10	10	11	6	15	16	16	0	0	0	0	0	84	2.4	12.8
UDLL	33	16	26	31	35	33	38	0	0	0	0	0	212	2.5	12.6
LFC	13	12	9	11	13	14	22	0	0	0	0	0	94	2.2	14.3
LFLL	20	14	13	15	22	24	38	0	0	0	0	0	146	2.1	15.6
FHL	19	19	48	43	54	32	60	0	0	0	0	0	275	2.8	11.2
SLL	19	28	18	27	19	33	23	0	0	0	0	0	167	2.7	11.7
LDLL	104	141	108	79	95	84	92	0	0	0	0	0	703	3.0	#####

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 NEWPC UNITS													
P01	0	0	0	0	0	0	0						0
P02	0	0	0	0	0	0	0						0
P03	0	0	0	0	0	0	0						0
P04	0	0	0	0	0	0	0						0
P05	0	0	0	0	0	0	0						0
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS													
D02	0	0	0	0	0	0	0						0
D03	0	0	0	0	0	0	0						0
D04	0	0	0	0	0	0	0						0
D05	0	0	0	0	0	0	0						0
D06	0	0	0	0	0	0	0						0
D07	0	0	0	0	0	0	0						0
D08	0	0	0	0	0	0	0						0
D09	0	0	0	0	0	0	0						0
D11	0	0	0	0	0	0	0						0
D12	0	0	0	0	0	0	0						0
D13	0	0	0	0	0	0	0						0
D15	0	0	0	0	0	0	0						0
LOWER FRANKFORD CREEK 6 NEWPC UNITS													
F13	0	0	0	0	0	0	0						0
F14	0	0	0	0	0	0	0						0
F21	0	0	0	0	0	0	0			1			1
F23	0	1	0	0	0	0	0				1		2
F24	0	0	0	0	0	0	0			1			1
F25	0	0	0	0	0	0	0						0
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS													
F03	0	0	0	0	0	0	0						0
F04	0	1	0	0	0	0	0						1
F05	0	0	0	0	0	0	0						0
F06	0	0	0	0	0	0	0						0
F07	0	0	0	0	1	0	0						1
F08	0	0	0	0	0	0	0						0
F09	0	1	0	0	0	0	1						2
F10	0	0	0	0	0	0	0						0
F11	0	0	0	0	0	0	0						0
F12	0	0	0	0	0	0	0						0
FRANKFORD HIGH LEVEL 14 NEWPC UNITS													
T01	0	0	0	0	0	0	0						0
T03	0	0	0	0	0	0	0						0
T04	0	0	0	0	0	0	0						0
T05	0	0	0	0	0	0	0						0
T06	0	0	0	0	0	0	0						0
T07	0	0	0	0	0	0	0						0
T08	0	0	0	0	0	0	0						0
T09	0	0	0	0	0	0	0						0
T10	0	0	0	0	0	0	0						0
T11	0	0	0	0	0	0	0						0
T12	0	0	0	0	0	0	0						0
T13	0	0	0	0	0	0	0	1					1
T14	0	0	0	0	0	0	0						0
T15	0	0	0	0	0	0	0						0

													TOTAL
UP	0	0	0	0	0	0	0	0	0	0	0	0	0
UDLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LFC	0	1	0	0	0	0	0	0	0	2	1	0	4
LFLL	0	2	0	0	1	0	1	0	0	0	0	0	4
FHL	0	0	0	0	0	0	0	1	0	0	0	0	1
SLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LDLL	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 NEWPC UNITS													
D17	0	0	0	0	0	0	0						0
D18	0	0	0	0	0	0	0						0
D19	0	0	0	0	0	0	0						0
D20	0	0	0	0	0	0	0						0
D21	0	0	0	0	0	0	0						0
D22	0	0	0	0	0	0	0						0
D23	0	0	0	0	0	0	0						0
D24	0	0	0	0	0	0	0						0
D25	0	0	0	0	0	0	0						0
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS													
D37	0	0	0	0	0	0	0						0
D38	0	0	0	0	0	0	0						0
D39	0	0	0	0	0	0	0						0
D40	0	0	0	0	0	0	0						0
D41	0	0	0	0	0	0	0						0
D42	0	0	0	0	0	0	0						0
D43	0	0	0	0	0	0	0						0
D44	0	0	0	0	0	0	0						0
D45	0	0	0	0	0	0	0						0
D46	0	0	0	0	0	0	0						0
D47	0	0	0	0	0	0	0						0
D48	0	0	0	0	0	0	0						0
D49	0	0	0	0	0	0	0						0
D50	0	0	0	0	0	0	0						0
D51	0	0	0	0	0	0	0						0
D52	0	0	0	0	0	0	0						0
D53	0	0	0	0	0	0	0						0
D54	0	0	0	0	0	0	0						0
D58	0	0	0	0	0	0	0						0
D61	0	0	0	0	0	0	0						0
D62	0	0	0	0	0	0	0						0
D63	0	0	0	0	0	0	0						0
D64	0	0	0	0	0	0	0						0
D65	0	0	0	0	0	0	0						0
D66	0	0	0	0	0	0	0						0
D67	0	0	0	0	0	0	0						0
D68	0	0	0	0	0	0	0						0
D69	0	0	0	0	0	0	0						0
D70	0	0	0	0	0	0	0						0
D71	0	0	0	0	0	0	0						0
D72	0	0	0	0	0	0	0						0
D73	0	0	0	0	0	0	0						0
D75	0	0	0	0	0	0	0						0
													TOTAL DISC
	0	3	0	0	1	0	1	1	0	2	1	0	9

NO OF UNITS IN DISTRICT BLOCKED													TOTAL
UP	0	0	0	0	0	0	0	0	0	0	0	0	0
UDLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LFC	0	1	0	0	0	0	0	0	0	2	1	0	4
LFLL	0	2	0	0	1	0	1	0	0	0	0	0	4
FHL	0	0	0	0	0	0	0	1	0	0	0	0	1
SLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LDLL	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 NEWPC UNITS													
P01													0
P02													0
P03													0
P04													0
P05													0
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS													
D02													0
D03													0
D04													0
D05													0
D06													0
D07													0
D08													0
D09													0
D11													0
D12													0
D13													0
D15													0
LOWER FRANKFORD CREEK 6 NEWPC UNITS													
F13													0
F14													0
F21													0
F23													0
F24													0
F25													0
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS													
F03													0
F04													0
F05													0
F06													0
F07													0
F08													0
F09													0
F10													0
F11													0
F12													0
FRANKFORD HIGH LEVEL 14 NEWPC UNITS													
T01													0
T03													0
T04													0
T05					1								1
T06													0
T07													0
T08													0
T09													0
T10				1									1
T11													0
T12													0
T13													0
T14													0
T15													0
													TOTAL
UP	0	0	0	0	0	0	0	0	0	0	0	0	0
UDLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LFC	0	0	0	0	0	0	0	0	0	0	0	0	0
LFLL	0	0	0	0	0	0	0	0	0	0	0	0	0
FHL	0	0	0	1	1	0	0	0	0	0	0	0	2
SLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LDLL	0	0	1	0	0	0	0	0	0	0	0	0	1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 NEWPC UNITS													
D17													0
D18													0
D19													0
D20													0
D21													0
D22													0
D23													0
D24													0
D25													0
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS													
D37													0
D38													0
D39			1										1
D40													0
D41													0
D42													0
D43													0
D44													0
D45													0
D46													0
D47													0
D48													0
D49													0
D50													0
D51													0
D52													0
D53													0
D54													0
D58													0
D61													0
D62													0
D63													0
D64													0
D65													0
D66													0
D67													0
D68													0
D69													0
D70													0
D71													0
D72													0
D73													0
D75													0
													TOTAL DISC
	0	0	1	1	1	0	0	0	0	0	0	0	3
NO OF UNITS IN DISTRICT BLOCKED													TOTAL
UP	0	0	0	0	0	0	0	0	0	0	0	0	0
UDLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LFC	0	0	0	0	0	0	0	0	0	0	0	0	0
LFLL	0	0	0	0	0	0	0	0	0	0	0	0	0
FHL	0	0	0	1	1	0	0	0	0	0	0	0	2
SLL	0	0	0	0	0	0	0	0	0	0	0	0	0
LDLL	0	0	1	0	0	0	0	0	0	0	0	0	1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 NEWPC UNITS													
P01	0	0	0	1		0	0						1
P02	0	0	0	0	0	0	0						0
P03	0	0	0	2	0	1	0			1	1	1	6
P04	2	0	2	2	2	1	0	2	1	1		1	14
P05	0	0											0
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS													
D02	1	0	0	0	0	0	0						1
D03	0	0	1	2	2	0	1	1				1	8
D04	0	0	1	0	1	3	0	1			1	1	8
D05	0	0	0	0	0	0	0						0
D06	1	0	0	1	1	0	0						3
D07	0	0	0	0	0	0	0						0
D08	0	0	2	0	0	0	0	1					3
D09	0	0	0	0	0	0	0						0
D11	0	0	0	0	1	0	0	1		2	2	1	7
D12	0	1	0	1	0	1	0	1	1		1	2	8
D13	0	1	0	0	0	0	0						1
D15	0	0	2	0	0	0	0	1			1	1	5
LOWER FRANKFORD CREEK 6 NEWPC UNITS													
F13	0	0	0	0	0	0	0						0
F14	1	0	0	0	0	0	1				1		3
F21	0	0	0	0	0	1	0			1			2
F23	0	0	0	1	1	1	0					1	4
F24	0	0	0	0	0	0	0	1			1	1	3
F25	0	0	0	0	0	0	0						0
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS													
F03	0	0	0	0	0	0	0	1				1	2
F04	0	0	0	0	0	0	1						1
F05	0	0	0	1	0	0	0						1
F06	1	0	0	0	0	0	0						1
F07	0	0	0	1	0	0	0			1		1	3
F08	0	1	0	0	0	0	0		1				2
F09	0	3	1	1	1	0	1			1		1	9
F10	1	1	0	0	0	0	0	1	1				4
F11	0	0	0	0	0	0	0						0
F12	0	0	0	0	0	0	1						1
FRANKFORD HIGH LEVEL 14 NEWPC UNITS													
T01	0	0	0	0	0	0	0						0
T03	0	0	0	0	0	0	0						0
T04	0	0	0	0	0	0	0						0
T05	0	0	0	0	0	0	0						0
T06	0	0	0	0	0	0	0						0
T07	0	0	0	0	0	0	0						0
T08	0	0	0	0	0	0	0						0
T09	0	1	2	0	0	0	0			1			4
T10	0	0	0	0	0	0	0						0
T11	0	1	0	0	0	0	0						1
T12	0	0	0	0	0	0	0						0
T13	0	0	0	0	0	2	0						2
T14	0	0	0	0	0	0	0						0
T15	0	0	0	0	0	0	0						0

10.25 AVERAGE BLOCKAGES PER MONTH

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 NEWPC UNITS													
D17	0	0	0	0	0	0	0						0
D18	1	0	0	0	0	0	0					1	2
D19	0	0	0	0	0	0	0						0
D20	0	0	0	0	0	0	0						0
D21	0	0	0	0	0	0	0						0
D22	0	0	0	0	0	0	0						0
D23	0	0	0	0	0	0	0						0
D24	0	0	0	0	0	0	0						0
D25	0	0	0	0	0	0	0						0
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS													
D37	0	0	0	0	0	0	0						0
D38	0	0	0	0	0	0	0						0
D39	0	0	0	0	0	0	0				1		1
D40	1	0	0	0	0	0	0						1
D41	0	0	0	0	0	0	0						0
D42	0	0	0	0	0	0	0						0
D43	0	0	0	0	0	0	0						0
D44	1	2	0	0	0	0	0						3
D45	0	0	0	1	0	0	0						1
D46	0	0	0	0	0	0	0						0
D47	0	0	0	1	0	0	0						1
D48	1	0	0	0	0	0	0						1
D49	0	0	0	0	0	0	0						0
D50	0	0	0	0	0	0	0						0
D51	0	0	0	0	0	0	1						1
D52	0	0	0	0	0	0	0						0
D53	0	0	0	0	0	0	0						0
D54	0	0	0	0	0	0	0						0
D58	0	0	0	0	0	0	0						0
D61	0	0	0	0	0	0	0						0
D62	0	0	0	0	0	0	0						0
D63	1	0	0	0	0	0	0						1
D64	0	0	0	0	0	0	0						0
D65	0	0	0	0	0	0	0						0
D66	0	0	0	0	0	0	0						0
D67	0	0	0	0	0	0	0						0
D68	0	0	0	0	0	0	0						0
D69	0	0	0	0	0	0	0						0
D70	0	0	0	0	0	0	0						0
D71	0	1	0	1	0	0	0						2
D72	1	0	0	0	0	0	0						1
D73	0	0	0	0	0	0	0						0
D75	0	0	0	0	0	0	0						0
													TOTAL
	13	12	11	16	9	10	6	11	4	8	9	14	123

UP	2	0	2	5	2	2	0	2	1	2	1	2	21
UDLL	2	2	6	4	5	4	1	6	1	2	5	6	44
LFC	1	0	0	1	1	2	1	1	0	1	2	2	12
LFLL	2	5	1	3	1	0	3	2	2	2	0	3	24
FHL	0	2	2	0	0	2	0	0	0	1	0	0	7
SLL	1	0	0	0	0	0	0	0	0	0	0	1	2
LDLL	5	3	0	3	0	0	1	0	0	0	1	0	13

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
UPPER PENNYPACK 5 NEWPC UNITS													
P01		1											1
P02													0
P03	2	2		1	1								6
P04	1	2	1	1	2								7
P05					1								1
UPPER DELAWARE LOW LEVEL 12 NEWPC UNITS													
D02				1		1							2
D03	1		1	1	1	3	1						8
D04	1	1	1	2	2	1	1						9
D05				4	3	1	1						9
D06	1		1	1		1	1						5
D07				1	1	2	1						5
D08		1	1		1								3
D09													0
D11	1	1	1				1						4
D12	2			2		1	1						6
D13	1			2	1	2							6
D15	1		1	1	1	2	1						7
LOWER FRANKFORD CREEK 6 NEWPC UNITS													
F13			2		2	1	1						6
F14	1			1	3	1	2						8
F21													0
F23	2				1								3
F24	1					1							2
F25													0
LOWER FRANKFORD LOW LEVEL 10 NEWPC UNITS													
F03	1												1
F04							1						1
F05		1			1		1						3
F06	1			1									2
F07		1		1									2
F08					1								1
F09	2	1	1	1	1								6
F10					1								1
F11			1		1		1						3
F12			1			1							2
FRANKFORD HIGH LEVEL 14 NEWPC UNITS													
T01			1	1	1								3
T03			1	1	2								4
T04													0
T05					1								1
T06				1									1
T07				1	1								2
T08													0
T09	1		1		2	2	2						8
T10		2			2		1						5
T11			1				1						2
T12			2										2
T13		1	1	2			3						7
T14													0
T15					1		1						2

25.29 AVERAGE BLOCKAGES PER MONTH

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
SOMERSET LOW LEVEL 9 NEWPC UNITS													
D17													0
D18													0
D19													0
D20	1												1
D21	1												1
D22	1					1							2
D23				2									2
D24													0
D25													0
LOWER DELAWARE LOW LEVEL 33 SEWPC UNITS													
D37	1				1								2
D38			1	1		1							3
D39			2										2
D40													0
D41													0
D42													0
D43													0
D44			1										1
D45													0
D46					1								1
D47				1	1								2
D48													0
D49													0
D50													0
D51													0
D52													0
D53													0
D54													0
D58													0
D61													0
D62													0
D63							1						1
D64													0
D65													0
D66													0
D67													0
D68							1						1
D69													0
D70	1												1
D71													0
D72													0
D73													0
D75													0
													TOTAL
	25	14	23	31	38	22	24	0	0	0	0	0	177

UP	3	5	1	2	4	0	0	0	0	0	0	0	15
UDLL	8	3	6	15	10	14	8	0	0	0	0	0	64
LFC	4	0	2	1	6	3	3	0	0	0	0	0	19
LFLL	4	3	3	3	5	1	3	0	0	0	0	0	22
FHL	1	3	7	6	10	2	8	0	0	0	0	0	37
SLL	3	0	0	2	0	1	0	0	0	0	0	0	6
LDLL	2	0	4	2	3	1	2	0	0	0	0	0	14

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS															
S05	8	3	3	4	5	6	5	5	4	6	8	6	63	5.3	5.8
S06	7	3	3	4	5	6	5	5	4	5	6	6	59	4.9	6.2
S07	6	3	3	4	5	6	5	4	4	6	6	6	58	4.8	6.3
S08	6	3	3	4	6	6	4	4	5	4	5	5	55	4.6	6.6
S09	6	3	2	4	5	5	5	5	4	4	6	5	54	4.5	6.8
S10	7	3	4	4	5	6	5	5	4	3	5	4	55	4.6	6.6
S12	7	3	4	5	6	5	6	6	7	4	5	6	64	5.3	5.7
S12A	7	3	4	5	6	5	6	6	7	4	5	6	64	5.3	5.7
S13	7	3	3	6	6	5	6	6	4	4	5	3	58	4.8	6.3
S15	9	3	3	6	5	5	6	6	5	3	5	4	60	5.0	6.1
S16	6	3	3	5	5	5	5	5	5	3	5	5	55	4.6	6.6
S17	6	3	3	3	4	5	5	5	4	3	5	4	50	4.2	7.3
S18	5	3	3	3	4	5	5	5	4	3	5	4	49	4.1	7.4
S19	5	3	4	3	4	5	6	5	5	4	5	6	55	4.6	6.6
S21	6	3	3	3	5	6	5	6	5	4	6	6	58	4.8	6.3
S23	6	3	3	3	4	5	7	6	5	3	5	5	55	4.6	6.6
S25	5	3	3	3	4	5	5	6	4	3	5	6	52	4.3	7.0
S26	5	3	3	3	4	5	5	5	4	3	5	4	49	4.1	7.4
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS															
S31	3	7	6	6	1	5	4	2	4	4	3	6	51	4.3	7.2
S35	2	4	5	3	1	5	4	2	3	4	4	1	38	3.2	9.6
S36	1	4	3	3	1	3	2	2	2	2	2	1	26	2.2	14.0
S36A	3	4	1	3	1	6	2	3	2	3	3	3	34	2.8	10.7
S37	3	6	3	3	1	3	2	3	1	2	2	1	30	2.5	12.2
S42	5	4	3	6	4	3	20	5	4	4	2	5	65	5.4	5.6
S42A	1	4	3	5	3	3	6	3	4	4	5	4	45	3.8	8.1
S44	2	4	3	3	1	3	2	3	1	2	2	1	27	2.3	13.5
S46	2	5	3	4	3	5	2	3	4	4	3	3	41	3.4	8.9
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS															
S01	2	3	3	4	2	3	6	5	7	2	2	4	43	3.6	8.5
S02	2	3	3	4	2	3	5	6	4	2	2	4	40	3.3	9.1
S03	2	3	2	4	2	3	5	4	3	2	2	3	35	2.9	10.4
S04	2	3	3	3	1	3	4	4	4	2	3	4	36	3.0	10.1
S11	1	3	3	4	1	3	4	4	4	3	3	5	38	3.2	9.6
S14	2	2	3	3	1	3	4	4	4	2	3	4	35	2.9	10.4
S20	2	3	2	3	6	2	4	4	4	3	4	3	40	3.3	9.1
S22	2	3	3	3	23	8	5	4	4	3	4	6	68	5.7	5.4
S24	2	3	3	3	6	4	4	4	4	3	5	4	45	3.8	8.1
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS															
S27	2	3	3	4	2	5	4	4	4	3	4	5	43	3.6	8.5
S28	1	3	2	4	2	3	4	4	4	3	3	5	38	3.2	9.6
S30	1	3	3	4	2	3	4	4	3	3	3	4	37	3.1	9.9
S34	1	3	2	3	2	3	4	4	3	3	3	4	35	2.9	10.4
S39	2	3	2	4	2	3	4	3	3	3	3	4	36	3.0	10.1
S40	2	2	2	4	1	3	3	3	2	3	3	2	30	2.5	12.2
S43	2	3	2	4	2	3	3	3	3	3	3	3	34	2.8	10.7
S47	2	3	2	4	2	3	3	4	5	3	3	3	37	3.1	9.9
S50	10	15	8	17	7	13	10	8	12	7	12	16	135	11.3	2.7
S51	9	14	8	12	5	9	7	7	9	7	10	12	109	9.1	3.3
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS															
S32	8	5	5	5	3	7	5	4	5	5	6	8	66	5.5	5.5
S33	7	5	5	7	3	8	5	4	5	5	5	10	69	5.8	5.3
S38	6	2	8	7	3	5	3	3	5	5	5	9	61	5.1	6.0
S45	6	0	5	6	2	5	3	2	4	6	7	3	49	4.1	7.4

8 TOTAL DISCHARGES IN SW DISTRICT

0.7 AVERAGE DISCHARGES PER MONTH

9.0 AVER. DAYS BEFORE RETURNING TO SITE

3.4 AVER. INSPECTIONS PER DAY PER CREW

DTR = DAYS TO RETURN TO SITE

I/D/C = INSPECTIONS PER DAY PER CREW

I/D = INSPECTIONS PER DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS															
C01	3	3	2	4	3	4	3	3	3	3	3	2	36	3.0	10.1
C02	3	3	2	4	3	4	3	3	3	3	3	2	36	3.0	10.1
C04	2	3	2	4	3	3	3	3	3	3	3	1	33	2.8	11.1
C04A	2	3	2	4	3	3	3	3	3	3	3	1	33	2.8	11.1
C05	3	3	2	4	3	3	3	3	3	3	3	1	34	2.8	10.7
C06	3	3	3	4	3	4	4	3	4	3	2	3	39	3.3	9.4
C07	3	3	3	5	3	3	2	4	3	3	2	1	35	2.9	10.4
C09	3	3	3	4	3	3	5	4	3	3	2	2	38	3.2	9.6
C10	3	3	4	4	3	3	3	3	3	4	2	1	36	3.0	10.1
C11	3	3	2	4	3	3	2	3	3	3	2	2	33	2.8	11.1
C12	2	2	2	4	3	3	3	3	3	3	2	1	31	2.6	11.8
C13	2	2	2	3	3	2	2	3	3	3	2	1	28	2.3	13.0
C14	2	2	3	3	3	3	3	3	3	3	3	3	34	2.8	10.7
C15	2	2	4	3	3	3	2	3	3	3	3	4	35	2.9	10.4
C16	2	2	3	3	3	3	2	3	3	3	3	3	33	2.8	11.1
C17	2	2	3	3	3	3	2	3	3	2	3	3	32	2.7	11.4
C31	4	3	3	4	4	4	4	4	5	3	3	4	45	3.8	8.1
C32	3	3	2	4	3	4	3	4	3	3	4	2	38	3.2	9.6
C33	4	3	3	4	4	4	4	4	3	3	3	4	43	3.6	8.5
C34	4	3	3	4	4	4	4	4	3	3	3	3	42	3.5	8.7
C35	4	3	3	4	4	4	4	4	3	3	3	3	42	3.5	8.7
C36	4	3	2	4	4	3	4	4	3	3	3	2	39	3.3	9.4
C37	4		2	4	3	4	3	4	3	3	3	2	35	3.2	10.4
COBBS CREEK LOW LEVEL 13 SWWPC UNITS															
C18	2	2	3	3	3	3	2	3	3	2	2	4	32	2.7	11.4
C19	4	2	3	3	3	3	2	3	3	2	2	3	33	2.8	11.1
C20	2	2	3	3	3	3	2	3	3	3	2	4	33	2.8	11.1
C21	2	2	3	2	3	3	3	3	3	2	2	2	30	2.5	12.2
C22	2	2	3	4	3	3	2	3	3	3	2	2	32	2.7	11.4
C23	2	2	4	2	3	3	2	3	3	1	2	2	29	2.4	12.6
C24	2	2	3	3	3	3	2	3	3	2	4	3	33	2.8	11.1
C25	2	2	3	2	3	4	2	3	3	2	3	2	31	2.6	11.8
C26	2	2	3	2	3	3	2	3	3	1	2	2	28	2.3	13.0
C27	2	2	4	2	3	3	2	3	2	3	2	3	31	2.6	11.8
C28A	2	2	5	2	3	3	2	2	3	1	3	1	29	2.4	12.6
C29	2	2	3	2	3	3	2	2	2	1	3	1	26	2.2	14.0
C30	2	2	3	2	3	3	2	2	2	1	2	1	25	2.1	14.6
TOTAL	307	272	272	344	299	354	341	331	322	272	315	322	3751		
I/D/C	3.4	3.0	3.0	3.8	3.3	3.9	3.7	3.6	3.5	3.0	3.5	3.5			
CSES	114	54	57	72	88	96	96	95	84	69	97	91	1013	4.7	6.5
LSES	22	42	30	36	16	36	44	26	25	29	26	25	357	3.3	10.0
CSW	17	26	25	31	44	32	41	39	38	22	28	37	380	3.5	9.0
SWMG	32	52	34	60	27	48	46	44	48	38	47	58	534	4.5	8.7
LSW	27	12	23	25	11	25	16	13	19	21	23	30	245	5.1	6.1
CCHL	67	60	60	88	74	77	71	78	72	69	63	51	830	3.0	10.2
CCLL	28	26	43	32	39	40	27	36	36	24	31	30	392	2.5	12.2

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS															
S05	7	7	4	8	4	5	5						40	5.7	5.3
S06	5	6	4	5	4	6	5						35	5.0	6.1
S07	9	6	4	5	4	5	5						38	5.4	5.6
S08	6	7	4	4	4	5	4						34	4.9	6.3
S09	5	6	4	5	4	5	4						33	4.7	6.4
S10	3	6	4	5	4	5	4						31	4.4	6.9
S12	6	7	5	6	5	6	5						40	5.7	5.3
S12A	6	7	5	6	5	6	5						40	5.7	5.3
S13	3	6	5	6	3	5	5						33	4.7	6.4
S15	4	7	5	6	4	5	3						34	4.9	6.3
S16	5	5	4	4	4	4	4						30	4.3	7.1
S17	6	4	4	5	4	4	4						31	4.4	6.9
S18	4	4	4	5	3	4	4						28	4.0	7.6
S19	3	5	4	6	5	5	5						33	4.7	6.4
S21	4	6	4	6	5	5	5						35	5.0	6.1
S23	2	4	5	5	4	4	6						30	4.3	7.1
S25	3	5	3	5	3	4	4						27	3.9	7.9
S26	3	4	3	5	3	4	3						25	3.6	8.5
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS															
S31	4	6	4	5	4	3	6						32	4.6	6.7
S35	4	4	4	4	4	4	6						30	4.3	7.1
S36	3	3	3	3	1	4	4						21	3.0	10.1
S36A	1	4	2	4	4	4	5						24	3.4	8.9
S37	4	3	4	3	1	4	4						23	3.3	9.3
S42	3	5	5	3	3	3	5						27	3.9	7.9
S42A	1	4	3	4	4	3	5						24	3.4	8.9
S44	2	3	2	3	1	4	4						19	2.7	11.2
S46	3	4	2	4	3	3	3						22	3.1	9.7
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS															
S01	3	3	5	4	3	4	4						26	3.7	8.2
S02	3	3	5	4	3	4	4						26	3.7	8.2
S03	3	2	4	4	1	4	3						21	3.0	10.1
S04	3	4	4	3	3	4	3						24	3.4	8.9
S11	2	3	5	4	2	4	3						23	3.3	9.3
S14	2	3	3	4	3	4	3						22	3.1	9.7
S20	2	3	4	5	3	4	3						24	3.4	8.9
S22	2	4	3	4	5	5	3						26	3.7	8.2
S24	3	4	4	4	5	5	3						28	4.0	7.6
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS															
S27	3	4	4	4	4	5							24	4.0	8.9
S28	3	4	4	4	4	5							24	4.0	8.9
S30	3	5	4	4	4	5							25	4.2	8.5
S34	3	5	3	4	4	4							23	3.8	9.3
S39	3	4	3	4	3	4							21	3.5	10.1
S40	2	3	3	4	3	3							18	3.0	11.8
S43	1	3	3	4	3	5							19	3.2	11.2
S47	1	4	4	3	3	4							19	3.2	11.2
S50	20	15	17	13	11	9							85	14.2	2.5
S51	9	10	11	12	11	9							62	10.3	3.4
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS															
S32	5	9	7	7	6	6	6						46	6.6	4.6
S33	9	8	7	7	6	7	6						50	7.1	4.3
S38	10	8	10	10	8	6	5						57	8.1	3.7
S45	8	7	5	5	6	3	7						41	5.9	5.2

2 TOTAL DISCHARGES IN SW DISTRICT

0.3 AVERAGE DISCHARGES PER MONTH

8.5 AVER. DAYS BEFORE RETURNING TO SITE

3.6 AVER. INSPECTIONS PER DAY PER CREW

DTR = DAYS TO RETURN TO SITE

I/D/C = INSPECTIONS PER DAY PER CREW

I/D = INSPECTIONS PER DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL	AVER	DTR
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS															
C01	2	4	3	3	3	4	3						22	3.1	9.7
C02	2	3	3	3	3	4	3						21	3.0	10.1
C04	2	3	3	3	3	4	3						21	3.0	10.1
C04A	2	3	3	3	3	4	3						21	3.0	10.1
C05	2	3	3	3	2	3	3						19	2.7	11.2
C06	3	5	3	5	4	3	4						27	3.9	7.9
C07	2	4	2	3	3	5	3						22	3.1	9.7
C09	3	4	3	2	3	2	3						20	2.9	10.6
C10	2	2	3	2	3	3	3						18	2.6	11.8
C11	2	3	3	2	3	3	3						19	2.7	11.2
C12	2	3	3	2	3	3	3						19	2.7	11.2
C13	2	2	3	2	3	3	3						18	2.6	11.8
C14	2	4	3	4	4	3	2						22	3.1	9.7
C15	2	3	3	3	4	3	2						20	2.9	10.6
C16	2	3	3	3	2	3	2						18	2.6	11.8
C17	2	3	3	3	2	3	2						18	2.6	11.8
C31	2	6	4	4	5	4	3						28	4.0	7.6
C32	2	4	3	3	4	4	3						23	3.3	9.3
C33	2	4	3	4	4	4	3						24	3.4	8.9
C34	2	5	3	3	5	4	3						25	3.6	8.5
C35	2	4	3	3	4	4	4						24	3.4	8.9
C36	2	5	3	3	7	4	3						27	3.9	7.9
C37	2	5	3	3	4	4	3						24	3.4	8.9
COBBS CREEK LOW LEVEL 13 SWWPC UNITS															
C18	2	3	3	4	2	2	2						18	2.6	11.8
C19	2	3	3	3	4	2	2						19	2.7	11.2
C20	2	3	3	3	2	2	2						17	2.4	12.5
C21	2	3	3	3	2	2	2						17	2.4	12.5
C22	2	4	3	4	2	2	2						19	2.7	11.2
C23	3	2	4	3	2	2	2						18	2.6	11.8
C24	2	4	3	4	2	2	2						19	2.7	11.2
C25	2	3	4	2	3	3	3						20	2.9	10.6
C26	2	4	3	1	2	2	1						15	2.1	14.2
C27	2	4	4	2	3	3	2						20	2.9	10.6
C28A	1	3	3	1	2	2	1						13	1.9	16.4
C29	1	3	3	1	3	2	1						14	2.0	15.2
C30	2	3	3	1	2	2	1						14	2.0	15.2
TOTAL	285	383	337	352	313	341	265	0	0	0	0	0	2276		
I/D/C	3.1	4.2	3.7	3.9	3.4	3.7	2.9	0.0	0.0	0.0	0.0	0.0			
CSES	84	102	75	97	72	87	80	0	0	0	0	0	597	4.7	6.5
LSES	25	36	29	33	25	32	42	0	0	0	0	0	222	3.5	8.8
CSW	23	29	37	36	28	38	29	0	0	0	0	0	220	3.5	8.8
SWMG	48	57	56	56	50	53	0	0	0	0	0	0	320	5.3	8.6
LSW	32	32	29	29	26	22	24	0	0	0	0	0	194	6.9	4.5
CCHL	48	85	69	69	81	81	67	0	0	0	0	0	500	3.1	10.0
CCLL	25	42	42	32	31	28	23	0	0	0	0	0	223	2.5	12.7

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS													
S05	0	0	0	0	0	0	0						0
S06	0	0	0	0	0	0	0						0
S07	0	0	0	0	0	0	0						0
S08	0	0	0	0	0	0	0						0
S09	0	0	0	0	0	0	0						0
S10	0	0	0	0	0	0	0						0
S12	0	0	0	0	0	0	0						0
S12A	0	0	0	0	0	0	0						0
S13	0	0	0	0	0	0	0						0
S15	1	0	0	0	0	0	0						1
S16	0	0	0	0	0	0	0						0
S17	0	0	0	0	0	0	0						0
S18	0	0	0	0	0	0	0						0
S19	0	0	0	0	0	0	0						0
S21	0	0	0	0	0	0	0						0
S23	0	0	0	0	0	0	0						0
S25	0	0	0	0	0	0	0						0
S26	0	0	0	0	0	0	0						0
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS													
S31	0	0	0	0	0	0	0						0
S35	0	0	0	0	0	0	0						0
S36	0	0	0	0	0	0	0						0
S36A	0	0	0	0	0	0	0						0
S37	0	1	0	0	0	0	0						1
S42	1	0	0	0	0	0	0						1
S42A	0	0	0	0	0	0	0						0
S44	0	0	0	0	0	0	0						0
S46	0	0	0	0	0	0	0						0
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS													
S01	0	0	0	0	0	0	0						0
S02	0	0	0	0	0	0	0						0
S03	0	0	0	0	0	0	0						0
S04	0	0	0	0	0	0	0						0
S11	0	0	0	0	0	0	0						0
S14	0	0	0	0	0	0	0						0
S20	0	0	0	0	1	0	0						1
S22	0	0	0	0	1	0	0						1
S24	0	0	0	0	0	0	0						0
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS													
S27	0	0	0	0	0	0	0						0
S28	0	0	0	0	0	0	0						0
S30	0	0	0	0	0	0	0						0
S34	0	0	0	0	0	0	0						0
S39	0	0	0	0	0	0	0						0
S40	0	0	0	0	0	0	0						0
S43	0	0	0	0	0	0	0						0
S47	0	0	0	0	0	0	0						0
S50	0	0	0	0	0	0	0						0
S51	0	0	0	0	0	0	0						0
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS													
S32	0	0	0	0	0	0	0						0
S33	0	0	0	0	0	0	0						0
S38	0	0	0	0	0	0	0						0
S45	0	0	0	0	0	0	0						0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS													
C01	0	0	0	0	0	0	0						0
C02	0	0	0	0	0	0	0						0
C04	0	0	0	0	0	0	0						0
C04A	0	0	0	0	0	0	0						0
C05	0	0	0	0	0	0	0						0
C06	0	0	0	0	0	0	0						0
C07	0	0	0	0	0	1	0	1					2
C09	0	0	0	0	0	0	0						0
C10	0	0	0	0	0	0	0						0
C11	0	0	0	0	0	0	0						0
C12	0	0	0	0	0	0	0						0
C13	0	0	0	0	0	0	0						0
C14	0	0	0	0	0	0	0						0
C15	0	0	0	0	0	0	0						0
C16	0	0	0	0	0	0	0						0
C17	0	0	0	0	0	0	0						0
C31	0	0	0	0	0	0	0						0
C32	0	0	0	0	0	0	0						0
C33	0	0	0	0	0	0	0						0
C34	0	0	0	0	0	0	0						0
C35	0	0	0	0	0	0	0						0
C36	0	0	0	0	0	0	0						0
C37	0			0	0	0	0						0
COBBS CREEK LOW LEVEL 13 SWWPC UNITS													
C18	0	0	0	0	0	0	0						0
C19	1	0	0	0	0	0	0						1
C20	0	0	0	0	0	0	0						0
C21	0	0	0	0	0	0	0						0
C22	0	0	0	0	0	0	0						0
C23	0	0	0	0	0	0	0						0
C24	0	0	0	0	0	0	0						0
C25	0	0	0	0	0	0	0						0
C26	0	0	0	0	0	0	0						0
C27	0	0	0	0	0	0	0						0
C28A	0	0	0	0	0	0	0						0
C29	0	0	0	0	0	0	0						0
C30	0	0	0	0	0	0	0						0
													TOTAL DISC
	3	1	0	0	2	1	0	1	0	0	0	0	8

NO OF UNITS IN DISTRICT BLOCKED													TOTAL
CSE	1	0	0	0	0	0	0	0	0	0	0	0	1
LSE	1	1	0	0	0	0	0	0	0	0	0	0	2
CSW	0	0	0	0	2	0	0	0	0	0	0	0	2
SWG	0	0	0	0	0	0	0	0	0	0	0	0	0
LSW	0	0	0	0	0	0	0	0	0	0	0	0	0
CCHL	0	0	0	0	0	1	0	1	0	0	0	0	2
CCLL	1	0	0	0	0	0	0	0	0	0	0	0	1

NO OF DISCHARGES IN DISTRICT													TOTAL
CSE	1	0	0	0	0	0	0	0	0	0	0	0	1
LSE	1	1	0	0	0	0	0	0	0	0	0	0	2
CSW	0	0	0	0	2	0	0	0	0	0	0	0	2
SWG	0	0	0	0	0	0	0	0	0	0	0	0	0
LSW	0	0	0	0	0	0	0	0	0	0	0	0	0
CCHL	0	0	0	0	0	1	0	1	0	0	0	0	2
CCLL	1	0	0	0	0	0	0	0	0	0	0	0	1

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS													
S05													0
S06													0
S07													0
S08													0
S09													0
S10													0
S12													0
S12A													0
S13													0
S15													0
S16													0
S17													0
S18													0
S19													0
S21													0
S23													0
S25													0
S26													0
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS													
S31													0
S35													0
S36													0
S36A													0
S37	1												1
S42													0
S42A													0
S44													0
S46													0
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS													
S01													0
S02													0
S03													0
S04													0
S11													0
S14													0
S20													0
S22													0
S24													0
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS													
S27													0
S28													0
S30													0
S34													0
S39													0
S40													0
S43													0
S47													0
S50													0
S51													0
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS													
S32													0
S33													0
S38													0
S45													0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS													
C01													0
C02													0
C04													0
C04A													0
C05													0
C06													0
C07													0
C09													0
C10													0
C11													0
C12													0
C13													0
C14													0
C15													0
C16													0
C17													0
C31													0
C32													0
C33													0
C34													0
C35													0
C36					1								1
C37													0
COBBS CREEK LOW LEVEL 13 SWWPC UNITS													
C18													0
C19													0
C20													0
C21													0
C22													0
C23													0
C24													0
C25													0
C26													0
C27													0
C28A													0
C29													0
C30													0
													TOTAL DISC
	1	0	0	0	1	0	0	0	0	0	0	0	2

	NO OF UNITS IN DISTRICT BLOCKED												TOTAL
CSE	0	0	0	0	0	0	0	0	0	0	0	0	0
LSE	1	0	0	0	0	0	0	0	0	0	0	0	1
CSW	0	0	0	0	0	0	0	0	0	0	0	0	0
SWG	0	0	0	0	0	0	0	0	0	0	0	0	0
LSW	0	0	0	0	0	0	0	0	0	0	0	0	0
CCHL	0	0	0	0	1	0	0	0	0	0	0	0	1
CCLL	0	0	0	0	0	0	0	0	0	0	0	0	0

	NO OF DISCHARGES IN DISTRICT												TOTAL
CSE	0	0	0	0	0	0	0	0	0	0	0	0	0
LSE	1	0	0	0	0	0	0	0	0	0	0	0	1
CSW	0	0	0	0	0	0	0	0	0	0	0	0	0
SWG	0	0	0	0	0	0	0	0	0	0	0	0	0
LSW	0	0	0	0	0	0	0	0	0	0	0	0	0
CCHL	0	0	0	0	1	0	0	0	0	0	0	0	1
CCLL	0	0	0	0	0	0	0	0	0	0	0	0	0

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS													
S05	0	0	0	0	0	0	0						0
S06	0	0	0	0	0	0	0						0
S07	0	0	0	0	0	0	0			1			1
S08	1	0	1	0	0	0	0				1	1	4
S09	0	0	0	0	0	0	0						0
S10	0	0	0	0	0	0	0						0
S12	0	0	0	1	1	0	0						2
S12A	0	0	0	1	1	0	0						2
S13	0	0	0	1	1	0	0						2
S15	3	0	0	1	1	0	0						5
S16	0	0	0	0	0	0	0						0
S17	0	0	0	0	0	0	0						0
S18	0	0	0	0	0	0	0						0
S19	0	0	0	0	0	0	0						0
S21	1	0	0	0	0	0	0						1
S23	1	0	0	0	0	1	0		1				3
S25	0	0	1	1	1	0	0					1	4
S26	0	0	0	0	0	0	0						0
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS													
S31	0	0	0	1	1	0	0			1		3	6
S35	0	0	3	1	1	0	1	1	1		2	1	11
S36	0	0	0	0	0	0	0						0
S36A	0	0	1	0	1	0	0						2
S37	1	1	0	1	1	0	0						4
S42	2	1	0	0	0	0	4						7
S42A	0	0	1	2	2	0	0			2	1	2	10
S44	0	0	0	0	0	0	0						0
S46	0	0	2	2	0	0	0		1		1		6
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS													
S01	0	0	0	0	0	0	0		3				3
S02	0	0	0	0	0	0	0						0
S03	0	0	0	0	0	0	0						0
S04	0	0	0	0	0	0	0						0
S11	0	0	0	0	0	0	0		1				1
S14	0	0	0	1	1	0	0		1				3
S20	0	0	0	0	0	0	0						0
S22	0	0	0	0	0	1	0						1
S24	0	0	0	0	0	0	0						0
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS													
S27	0	0	0	0	0	0	0						0
S28	0	0	0	1	1	0	0						2
S30	0	0	0	0	0	0	0						0
S34	0	0	0	0	0	0	0						0
S39	0	0	0	0	0	0	0						0
S40	0	0	0	0	0	0	0						0
S43	0	0	0	0	0	0	0						0
S47	0	0	0	0	0	0	0						0
S50	0	0	2	1	1	0	2	1	2	1	2	2	14
S51	0	0	2	5	1	0	1	2	3	3	2	6	25
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS													
S32	0	0	1	1	1	2	1		3	4	2	2	17
S33	0	0	0	2	1	1	0		1	1			6
S38	2	0	0	1	2	1	0		1	2		3	12
S45	0	4	1	1	2	1	0			5	1	1	16

23.25 AVERAGE BLOCKAGES PER MONTH

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS													
C01	0	0	0	0	1	2	0				1		4
C02	0	0	0	0	0	2	0			1	1		4
C04	0	0	0	1	0	0	0			1	1	1	4
C04A	0	0	0	0	0	0	0						0
C05	0	0	0	0	1	0	0			2	1		4
C06	0	0	0	1	1	0	0						2
C07	0	0	0	3	0	0	0						3
C09	0	0	0	0	0	2	0						2
C10	0	0	0	1	0	0	0						1
C11	0	0	0	1	1	0	1		1		1		5
C12	0	0	0	2	0	0	0		1	1		1	5
C13	0	0	0	0	0	0	0		1				1
C14	0	0	0	1	2	1	1						5
C15	0	0	0	0	0	0	0		1			1	2
C16	0	0	0	1	0	0	0						1
C17	0	0	0	0	0	0	0						0
C31	0	0	0	1	2	1	0					1	5
C32	0	0	0	0	0	0	0						0
C33	0	0	0	1	0	1	0			1		1	4
C34	0	0	0	2	1	2	0						5
C35	0	0	0	0	0	1	0						1
C36	0	0	0	0	1	1	0				1		3
C37	0		0	0	0	1	0					1	2
COBBS CREEK LOW LEVEL 13 SWWPC UNITS													
C18	0	0	0	0	0	0	0		1	1			2
C19	1	0	0	1	1	1	1		3		1	1	10
C20	0	0	0	1	1	0	0		1		1	1	5
C21	0	0	0	0	0	0	0						0
C22	0	0	0	0	2	2	1		1				6
C23	0	0	0	0	0	0	0			1			1
C24	0	0	0	0	2	1	0		2		2		7
C25	0	0	0	0	1	0	0			1			2
C26	0	0	1	0	0	1	0						2
C27	0	0	0	1	0	1	0		1				3
C28A	0	0	0	0	1	0	0						1
C29	0	0	0	1	2	0	0	1		1			5
C30	0	0	0	1	0	1	0						2
													TOTAL
	12	6	16	45	41	28	13	5	31	30	22	30	279
CSE	6	0	2	5	5	1	0	0	1	1	1	2	24
LSE	3	2	7	7	6	0	5	1	2	3	4	6	46
CSW	0	0	0	1	1	1	0	0	5	0	0	0	8
SWG	0	0	4	7	3	0	3	3	5	4	4	8	41
LSW	2	4	2	5	6	5	1	0	5	12	3	6	51
CCHL	0	0	0	15	10	14	2	0	4	6	6	6	63
CCLL	1	0	1	5	10	7	2	1	9	4	4	2	46

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CENTRAL SCHUYLKILL EAST SIDE 18 SWWPC UNITS													
S05													0
S06													0
S07													0
S08							1						1
S09													0
S10													0
S12													0
S12A			1										1
S13													0
S15							1						1
S16							1						1
S17													0
S18							1						1
S19													0
S21		1											1
S23		2		1		1	1						5
S25		1	1	1									3
S26													0
LOWER SCHUYLKILL EAST SIDE 9 SWWPC UNITS													
S31	1			1	1		1						4
S35	2	3	2	1	1	1							10
S36			2	2									4
S36A		1		2	1	2	1						7
S37	1		1										2
S42	1												1
S42A		1		2			1						4
S44													0
S46	1		1	1	1								4
CENTRAL SCHUYLKILL WEST 9 SWWPC UNITS													
S01													0
S02													0
S03													0
S04			1										1
S11													0
S14				1									1
S20													0
S22						1							1
S24	1	1	1		1								4
SOUTHWEST MAIN GRAVITY 10 SWWPC UNITS													
S27													0
S28					1	1							2
S30		1		1	1	1							4
S34													0
S39													0
S40				1									1
S43						1							1
S47		1											1
S50		2	1	2	2	1							8
S51		2	2	3	7	1							15
LOWER SCHUYLKILL WEST SIDE 4 SWWPC UNITS													
S32	1	2		1	2	1	1						8
S33	3	1	2	1	1								8
S38	3	3	6	3	1	1							17
S45	2	5	3		1		1						12

19.57 AVERAGE BLOCKAGES PER MONTH

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
COBBS CREEK HIGH LEVEL 23 SWWPC UNITS													
C01							1						1
C02													0
C04													0
C04A													0
C05													0
C06													0
C07													0
C09													0
C10													0
C11					1								1
C12													0
C13													0
C14													0
C15													0
C16													0
C17													0
C31													0
C32													0
C33													0
C34													0
C35							1						1
C36													0
C37													0
COBBS CREEK LOW LEVEL 13 SWWPC UNITS													
C18													0
C19													0
C20													0
C21													0
C22													0
C23													0
C24													0
C25													0
C26													0
C27													0
C28A													0
C29													0
C30													0
													TOTAL
	16	27	24	24	22	12	12	0	0	0	0	0	137

CSE	0	4	2	2	0	1	5	0	0	0	0	0	14
LSE	6	5	6	9	4	3	3	0	0	0	0	0	36
CSW	1	1	2	1	1	1	0	0	0	0	0	0	7
SWG	0	6	3	7	11	5	0	0	0	0	0	0	32
LSW	9	11	11	5	5	2	2	0	0	0	0	0	45
CCHL	0	0	0	0	1	0	2	0	0	0	0	0	3
CCLL	0	0	0	0	0	0	0	0	0	0	0	0	0

June 2006 RELIEF SEWER MONTHLY INSPECTION

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01	4	1	2	3	2	3	4	2	2	2	3	3	31
R02	4	1	2	3	2	3	4	2	2	2	3	3	31
R03	4	1	2	3	2	3	4	2	2	2	3	3	31
R04	3	1	2	2	2	3	3	2	2	2	3	3	28
R05	3	1	2	2	2	3	3	2	2	1	3	2	26
R06	3	1	2	2	2	3	3	2	2	1	3	2	26
MAIN RELIEF SEWER													
R07	2	2	3	2	2	3	8	11	3	1	3	3	43
R08	2	2	4	2	1	3	7	10	4	1	3	1	40
R09	2	1	3	2	1	3	1	2	3	1	3	1	23
R10	2	1	3	2	1	3	1	2	3	1	3	1	23
R11	2	1	3	1	2	3	1	2	2	1	3	2	23
R11A	2	1	2	1	2	3	1	2	2	1	3	2	22
R12	2	1	2	1	3	3	1	2	2	1	3	2	23
WAKLING RELIEF SEWER													
R13	1	1	1	1	1	2	1	1	1	2	3	1	16
R14	1	1	1	1	1	2	1	1	1	2	2	1	15
ROCK RUN STORM FLOOD RELIEF SEWER													
R15	1	1	1	1	1	2	1	1	1	1	2	1	14
OREGON AVE RELIEF SEWER													
R16	1	1	1	1	2	2	1	1	1	2	2	1	16
R17	1	1	1	1	2	2	1	1	1	2	2	1	16
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18	1	1	1	1	1	2	1	1	1	1	2	1	14
32ND ST RELIEF SEWER													
R19	1	1	1	1	1	2	1	1	1	1	2	1	14
MAIN STREET RELIEF SEWER													
R20	1	1	1	1	1	2	1	1	1	1	2	1	14
SOMERSET SYSTEM DIVERSION CHAMBER													
R21	1	1	1	2	1	2	1	1	2	1	2	2	17
TEMPORARY REGULATOR CHAMBER													
R22													
R23	1	2	1	1	1	2	1	1	1	1	2	1	15
ARCH ST RELIEF SEWER													
R24	1	2	2	1	1	3	1	2	2	1	3	3	22
16TH & SNYDER													
R25	2	1	2	2	1	3	1	2	2	1	3	1	21
GRANT & STATE RD. RELIEF													
R26	1	1	1	1	1	2	1	1	1	2	3	1	16
TOTAL	49	30	47	41	39	67	54	58	47	35	69	44	580
AVER	1.8	1.1	1.7	1.5	1.4	2.5	2.0	2.1	1.7	1.3	2.6	1.6	1.8

RELIEF SEWER MONTHLY DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01	1	0	0	0	0	0	0						1
R02	0	0	0	0	0	0	0						0
R03	0	0	0	0	0	0	0						0
R04	0	0	0	0	0	0	0						0
R05	0	0	0	0	0	0	0						0
R06	0	0	0	0	0	0	0						0
MAIN RELIEF SEWER													
R07	0	0	0	0	0	0	0						0
R08	0	0	0	0	0	0	0						0
R09	0	0	0	0	0	0	0						0
R10	0	0	0	0	0	0	0						0
R11	0	0	0	0	0	0	0						0
R11A	0	0	0	0	0	0	0						0
R12	0	0	0	0	0	0	0						0
WAKLING RELIEF SEWER													
R13	0	0	0	0	0	0	0						0
R14	0	0	0	0	0	0	0						0
ROCK RUN STORM FLOOD RELIEF SEWER													
R15	0	0	0	0	0	0	0						0
OREGON AVE RELIEF SEWER													
R16	0	0	0	0	0	0	0						0
R17	0	0	0	0	0	0	0						0
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18	0	0	0	0	0	0	0						0
32ND ST RELIEF SEWER													
R19	0	0	0	0	0	0	0						0
MAIN STREET RELIEF SEWER													
R20	0	0	0	0	0	0	0						0
SOMERSET SYSTEM DIVERSION CHAMBER													
R21	0	0	0	0	0	0	0						0
TEMPORARY REGULATOR CHAMBER													
R22													0
R23	0	0	0	0	0	0	0						0
ARCH ST RELIEF SEWER													
R24	0	0	0	0	0	0	0						0
16TH & SNYDER													
R25	0	0	0	0	0	0	0						0
GRANT & STATE RD. RELIEF													
R26	0	0	0	0	0	0	0						0
TOTAL	1	0	0	0	0	0	0	0	0	0	0	0	1
UNITS	1	0	0	0	0	0	0	0	0	0	0	0	

June 2006 RELIEF SEWER MONTHLY BLOCKS CLEARED

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01	1	0	0	1	1	0	0		1				4
R02	0	0	0	1	1	0	0		1				3
R03	0	0	0	0	0	0	0						0
R04	0	0	0	1	1	0	0						2
R05	0	0	0	0	0	0	0						0
R06	0	0	0	0	0	0	0						0
MAIN RELIEF SEWER													
R07	0	0	0	0	0	0	0						0
R08	0	0	0	0	0	0	0						0
R09	0	0	0	0	0	0	0						0
R10	0	0	0	0	0	0	0						0
R11	0	0	0	0	1	0	0				1		2
R11A	0	0	0	0	0	0	0		1				1
R12	0	0	0	0	0	0	0						0
WAKLING RELIEF SEWER													
R13	0	0	0	0	0	0	0						0
R14	0	0	0	0	0	0	0						0
ROCK RUN STORM FLOOD RELIEF SEWER													
R15	0	0	0	0	0	0	0						0
OREGON AVE RELIEF SEWER													
R16	0	0	0	0	0	0	0						0
R17	0	0	0	0	0	0	0						0
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18	0	0	0	0	0	0	0						0
32ND ST RELIEF SEWER													
R19	0	0	0	0	0	0	0						0
MAIN STREET RELIEF SEWER													
R20	0	0	0	0	0	0	0						0
SOMERSET SYSTEM DIVERSION CHAMBER													
R21	0	0	0	0	0	0	0						0
TEMPORARY REGULATOR CHAMBER													
R22													0
R23	0	0	0	0	0	0	0						0
ARCH ST RELIEF SEWER													
R24	0	0	0	0	0	0	0					1	1
16TH & SNYDER													
R25	0	0	0	0	0	0	0		1				1
GRANT & STATE RD. RELIEF													
R26	0	0	0	0	0	0	0						0
TOTAL	1	0	0	3	4	0	0	0	4	0	1	1	14
AVER	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0

January 2007 RELIEF SEWER MONTHLY INSPECTION

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01	1	4	4	5	3	4	5						26
R02	1	4	4	5	3	4	4						25
R03	1	4	4	5	3	4	4						25
R04	1	4	4	4	3	4	4						24
R05	1	4	4	4	2	4	4						23
R06	1	4	4	4	2	4	4						23
MAIN RELIEF SEWER													
R07	2	5	4	3	2	5	4						25
R08	1	5	4	3	3	4	4						24
R09	1	4	2	3	2	5	4						21
R10	1	4	3	3	2	5	4						22
R11	1	3	3	3	2	5	4						21
R11A	1	3	3	3	2	4	3						19
R12	1	3	3	3	2	4	3						19
WAKLING RELIEF SEWER													
R13	2	2	3	2	3	4	3						19
R14	2	2	1	2	3	4	3						17
ROCK RUN STORM FLOOD RELIEF SEWER													
R15	2	1	1	4	3	4	4						19
OREGON AVE RELIEF SEWER													
R16	1	2	1	1	3	5	2						15
R17	1	2	1	1	3	5	2						15
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18	3	1	1	3	3	5	4						20
32ND ST RELIEF SEWER													
R19	2	2	1	3	2	5	4						19
MAIN STREET RELIEF SEWER													
R20	2	2	1	3	3	4	4						19
SOMERSET SYSTEM DIVERSION CHAMBER													
R21	2	1	2	2	3	4	3						17
TEMPORARY REGULATOR CHAMBER													
R22													
R23	2	2	1	2	3	4	3						17
ARCH ST RELIEF SEWER													
R24	1	3	2	4	2	4	3						19
16TH & SNYDER													
R25	1	3	3	4	2	4	3						20
GRANT & STATE RD. RELIEF													
R26	2	2	1	1	2	4	3						15
TOTAL	37	76	65	80	66	112	92	0	0	0	0	0	528
AVER	1.4	2.8	2.4	3.0	2.4	4.1	3.4	0.0	0.0	0.0	0.0	0.0	1.6

RELIEF SEWER MONTHLY DISCHARGE

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01													0
R02													0
R03													0
R04													0
R05													0
R06													0
MAIN RELIEF SEWER													
R07													0
R08													0
R09													0
R10													0
R11													0
R11A													0
R12													0
WAKLING RELIEF SEWER													
R13													0
R14													0
ROCK RUN STORM FLOOD RELIEF SEWER													
R15													0
OREGON AVE RELIEF SEWER													
R16													0
R17													0
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18													0
32ND ST RELIEF SEWER													
R19													0
MAIN STREET RELIEF SEWER													
R20													0
SOMERSET SYSTEM DIVERSION CHAMBER													
R21													0
TEMPORARY REGULATOR CHAMBER													
R22													0
R23													0
ARCH ST RELIEF SEWER													
R24													0
16TH & SNYDER													
R25													0
GRANT & STATE RD. RELIEF													
R26													0
TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0
UNITS	0	0	0	0	0	0	0	0	0	0	0	0	

January 2007 RELIEF SEWER MONTHLY BLOCKS CLEARED

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
THOMAS RUN RELIEF SEWER													
R01	1	1					1						3
R02	1	1											2
R03	1	1											2
R04		1											1
R05		1											1
R06													0
MAIN RELIEF SEWER													
R07													0
R08													0
R09													0
R10													0
R11		1				1							2
R11A		1											1
R12													0
WAKLING RELIEF SEWER													
R13													0
R14													0
ROCK RUN STORM FLOOD RELIEF SEWER													
R15													0
OREGON AVE RELIEF SEWER													
R16													0
R17													0
FRANKFORD HIGH LEVEL RELIEF SEWER													
R18													0
32ND ST RELIEF SEWER													
R19													0
MAIN STREET RELIEF SEWER													
R20													0
SOMERSET SYSTEM DIVERSION CHAMBER													
R21													0
TEMPORARY REGULATOR CHAMBER													
R22													0
R23													0
ARCH ST RELIEF SEWER													
R24		1											1
16TH & SNYDER													
R25		1											1
GRANT & STATE RD. RELIEF													
R26													0
TOTAL	3	9	0	0	0	1	1	0	0	0	0	0	14
AVER	0.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

June 2006 — MISCELLANEOUS SITE INSPECTIONS

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST	1	1											2
SOMERSET GRIT LEVEL	2	2											4
(H-20) 70th & Dicks	2	1											3
CCLL CONTROL PIPE @ ISLAND AVE.	2	2											4
RHOM & HAAS FLAP GATE	1	1											2
DROP SWIRL ON CSE COLLECTOR	1	3											4
UPPER DARBY OVERFLOW	2												2
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR	3	5	2	5	7	4	1	7	11				45
O & ERIE DIVERSION GATE	1	1											2
T-04 NET REPLACEMENTS	July 20,05	1/0											2
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE	2	3	1	2	2	3	2	2	6				23
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.	2	4	1	2	2	3	2	1	7				24
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.	2	3	1	2	2	3	2	2	3				20
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.	2	2	1	2	2	3	2	2	3				19
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.	2	3	1	2	2	3	3	4	3				23
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.	2	2	1	2	2	4	2	1	3				19
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.	2	3	1	2	2	3	2	2	3				20
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.	2	3	1	2	2	3	2	2	3				20

June 2006 — MISCELLANEOUS SITE DISCHARGES

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST													
SOMERSET GRIT LEVEL													
(H-20) 70th & Dicks													
CCLL CONTROL PIPE @ ISLAND AVE.	0	0											0
RHOM & HAAS FLAP GATE													
DROP SWIRL ON CSE COLLECTOR	0	0											0
UPPER DARBY OVERFLOW													
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR	0	1	0	1	2	0	0	1	2				7
O & ERIE DIVERSION GATE													
T-04 NET WEIGHT	175lbs.												
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE	0	0	0	0	0	0	0	0	1				1
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.	0	1	0	0	0	0	0	0	1				2
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.	0	0	0	0	0	0	0	0	0				0
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.	0	0	0	0	0	0	0	0	0				0
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.	0	1	0	0	0	0	1	0	0				2
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.	0	0	0	0	0	0	0	0	0				0
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.	0	0	0	0	0	0	0	0	0				0
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.	0	0	0	0	0	0	0	0	0				0

June 2006 — MISCELLANEOUS SITE BLOCKAGES CLEARED

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST	0	0											
SOMERSET GRIT LEVEL													
(H-20) 70th & Dicks	0	0											
CCLL CONTROL PIPE @ ISLAND AVE.	0	0											0
RHOM & HAAS FLAP GATE													
DROP SWIRL ON CSE COLLECTOR	0	0											0
UPPER DARBY OVERFLOW													
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR	0	0	0	0	0	1	0	0	0				1
O & ERIE DIVERSION GATE	0	0											
T-04 NET ****													
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE	0	0	1	0	0	1	0	2	0				4
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.	0	1	0	1	0	1	2	0	2				7
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.	0	0	1	0	0	1	1	0	0				3
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.	1	0	0	0	0	2	0	1	1				5
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.	0	0	1	0	0	2	0	2	1				6
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.	0	0	0	0	0	0	0	0	0				0
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.	0	0	0	1	0	1	0	0	1				3
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.	0	0	1	1	0	0	0	0	1				3

January 2007 — MISCELLANEOUS SITE INSPECTIONS

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST													0
SOMERSET GRIT LEVEL													0
(H-20) 70th & Dicks													0
CCLL CONTROL PIPE @ ISLAND AVE.													0
RHOM & HAAS FLAP GATE													0
DROP SWIRL ON CSE COLLECTOR													0
UPPER DARBY OVERFLOW													0
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR	1	9	7	8	6	5							36
O & ERIE DIVERSION GATE													0
T-04 NET REPLACEMENTS													0
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE	2	4	4	5	6	6							27
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.	2	8	4	5	4	5							28
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.	2	6	4	5	5	6							28
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.	2	5	4	4	5	4							24
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.	2	7	4	5	5	6							29
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.	2	6	5	5	5	6							29
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.	2	4	3	5	4	5							23
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.	2	4	3	4	4	5							22

January 2007 — MISCELLANEOUS SITE DISCHARGES

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST													
SOMERSET GRIT LEVEL													
(H-20) 70th & Dicks													
CCLL CONTROL PIPE @ ISLAND AVE.													0
RHOM & HAAS FLAP GATE													
DROP SWIRL ON CSE COLLECTOR													0
UPPER DARBY OVERFLOW													
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR	1			2	1								4
O & ERIE DIVERSION GATE													
T-04 NET WEIGHT													
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE													0
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.	2												2
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.	1												1
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.													0
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.													0
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.													0
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.													0
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.													0

January 2007 — MISCELLANEOUS SITE BLOCKAGES CLEARED

SITE	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	TOTAL
CASMIER ST													
SOMERSET GRIT LEVEL													
(H-20) 70th & Dicks													
CCLL CONTROL PIPE @ ISLAND AVE.													0
RHOM & HAAS FLAP GATE													
DROP SWIRL ON CSE COLLECTOR													0
UPPER DARBY OVERFLOW													
P-090-02-PFD-01 SANDY RUN CREEK DIVERSION REGULATOR					1								1
O & ERIE DIVERSION GATE													
T-04 NET ****													
T-088-01-CFD-01 PLYMOUTH ST. WEST OF PITTVILLE	1		1		1	3							6
T-088-01-CFD-02 PITTVILLE ST. SOUTH OF PLYMOUTH ST.		1	1	2	3	1							8
T-088-01-CFD-03 ELSTON ST. E. OF BOUVIER ST.		2	2	2	2								8
T-088-01-CFD-04 ASHLEY ST. W. OF BOUVIER ST.	1	1		3	1	2							8
T-088-01-CFD-05 CHELTENHAM AVE. E. OF 19TH ST.	1	1	1	1		5							9
T-088-01-CFD-06 VERBENA ST. S. OF CHELTENHAM AVE.					1	1							2
W-060-01-MFD-01 JANNETTE ST. WEST OF MONASTERY AVE.					2	1							3
W-060-01-MFD-02 GREEN LANE NORTH OF LAWNTON ST.				1		2							3

FY2006 Dry Weather Discharges

Discharge Observed		Discharge Stopped		Last Inspection						
DateDO	TimeDO	DateDS	TimeDS	DateLI	TimeLI	SiteID	Collector	TypeUnit	Location	Comment
07/01/05	09:10 AM	07/01/05	10:30 AM	06/30/05	09:10 AM	S-42	LSES	B & B	Passyunk Ave. & 29th St.	HIGH SEWER FLOWS FROM TIGE GATE INFLOW AND A PATIAL REGULATOR BLOCK CAUSED A DISCHARGE.
07/15/05	11:15 AM	07/15/05	11:30 AM	07/07/05	01:45 PM	C-19	CCLL	SLOT	Mount Moriah Cemetery & 62nd St.	Grit and trash blocked dwo causing blockage
07/26/05	09:40 AM	07/26/05	09:55 AM	07/21/05	11:10 AM	R-01	--------	DAM	56th St. & Locust St.	Bricks blocked the DWO connecting pipe
07/26/05	01:55 PM	07/26/05	02:00 PM	07/18/05	01:38 PM	S-15	CSES	B & B	Walnut St. W of 24th St.	Dwo was blocked with grit, rags & debris
08/05/05	11:30 AM	08/05/05	12:20 PM	07/13/05	09:30 AM	F-04	LFLL	WH-S	Wingohocking St. E of Adams Ave.	Bricks and bottles blocking connecting pipe
08/08/05	10:30 AM	08/08/05	11:00 AM	07/19/05	12:00 PM	F-23	LFC	WH-S	Bridge St. NW of Creek Basin	Regulator blocked with bottles, cans and grit. bottles and cans in tide gate
08/08/05	11:10 AM	08/10/05	11:00 AM	07/22/05	09:00 AM	S-37	LSES	B & B	Vare Ave. & Jackson St.	Unit was block behind shuttergate on trunk side with rock and debris. Sunco would not allow entry for two days while waiting on a security clearance permit.
08/15/05	02:50 PM	08/15/05	03:20 PM	08/09/05	01:40 PM	F-09	LFLL	WH-S	Frankford Ave. N or Frankford Creek	Plastic milk jug got caught in regulator
11/04/05	09:00 AM	11/04/05	10:40 AM	11/03/05	09:30 AM	S-22	CSW	B & B	660' S of South St E of Penn Field	DEBRIS STUCK IN SHUTTER GATE
11/04/05	09:00 AM	11/05/05	08:10 AM	11/03/05	10:30 AM	S-20	CSW	B & B	NNW of South St. (Behind Penn Stad.)	SOCCERBALL AND BASKETBALL STUCK IN SHUTTERGATE
11/10/05	09:30 AM	11/10/05	10:40 AM	10/27/05	01:20 PM	F-07	LFLL	WH-S	Worrell St. W of Frankford Creek.	HALF AUTO TIRE, SKATEBOARD AND TRASH IN DWO. SEPTA DELAYED SITE ENTRY.
12/22/05	10:40 AM	12/22/05	11:20 AM	12/14/05	10:00 AM	C-07	CCHL	SLOT	Lansdowne Ave. & 69th St.	UNKOWN DEBRIS BLOCKING SLOT OPENING
01/21/06	08:40 AM	01/21/06	06:00 PM	01/11/06	10:10 AM	F-09	LFLL	WH-S	Frankford Ave. N or Frankford Creek	A FRESH WATER LEAK FROM A HYDRANT REPAIR AT TORRESDALE AND FRANKFORD AVES. WAS NOT ISOLATED COMPLETELY AND WATER RAN INTO INLET OVERTAXING THE REGULATOR.
02/09/06	01:10 PM	02/09/06	02:00 PM	02/03/06	09:50 AM	C-07	CCHL	SLOT	Lansdowne Ave. & 69th St.	TRASH AND DEBRIS IN SLOT BOX
02/15/06	11:50 AM	02/15/06	02:10 PM	01/27/06	01:30 PM	T-13	FHL	SLOT	Whitaker Ave. W of Tacony Creek	ROCKS,LEAVES AND GRIT BLOCKED DWO PIPE BETWEEN SLOT AND CLEANOUT
04/03/06	11:10 AM	04/03/06	12:00 PM	03/09/06	11:30 AM	F-24	LFC	WH-S	Bridge St. SE of Creek Basin	TRASH AND BOTTLES WERE BLOCKING REGULATOR OPENING
04/17/06	10:40 AM	04/17/06	02:30 PM	04/12/06	11:00 AM	F-21	LFC	B & B	Wakling St. NW of Creek Basin	ORIFACE PLATE OPENING PARTIALY BLOCKED BY WOOD AND OTHER DEBRIS
05/26/06	09:10 AM	05/26/06	10:00 AM	05/11/06	08:40 AM	F-23	LFC	WH-S	Bridge St. NW of Creek Basin	BOTTLES AND TRASH STUCK IN SHUTTER GATE

FY2007 Dry Weather Discharges To Date

Discharge Observed		Discharge Stopped		Last Inspection						
DateDO	TimeDO	DateDS	TimeDS	DateLI	TimeLI	SiteID	Collector	TypeUnit	Location	Comment
07/26/06	01:30 PM	07/26/06	02:00 PM	07/21/06	10:20 AM	S-37	LSES	B & B	Vare Ave. & Jackson St.	SHUTTER GATE BLOCKED WITH GRIT
09/07/06	09:30 AM	09/07/06	11:10 AM	09/05/06	10:50 AM	D-39	LDLL	B & B	Susquehanna Ave. E of Beach St.	CONSTRUCTION LUMBER BLOCKAGE IN TRUNK SEWER, REGULATOR CHAMBER AND TIDE GATES
10/11/06	12:50 PM	10/11/06	02:10 PM	10/06/06	09:30 AM	T-10	FHL	SLOT	Roosevelt Blvd. E of Tacony Creek	ROCKS & DEBRIS BLOCKED THE DWO PIPE.
11/01/06	01:30 PM	11/01/06	02:30 PM	10/25/06	01:10 PM	C-36	CCHL	SLOT	69th St. & Woodbine Ave S of Brentwoo	LEAVES AND DEBRIS IN SLOT.
11/28/06	11:10 AM	11/28/06	01:20 PM	11/15/06	12:10 PM	T-05	FHL	SLOT	Rising Sun Ave. W of Tacony Creek	GRIT AND GREASE BLOCKAGE IN DWO.

Collector System - Flow Control Unit - Miscellaneous Major Maintenance - 2002 TO 2006

CSPS GRIT POCKET GRIT REMOVAL

DATE	CU. YRDS.
4/24/2002	15
7/30/2002	15
11/4/2002	15
2/25/2003	20
7/7/2003	20
10/1/2003	20
1/21/2004	30
2/28/2004	20
9/16/2004	40
3/16/2005	13
7/15/2005	20
1/17/2006	20

SOMERSET GRIT CHAMBER - GRIT REMOVAL REMOVAL

DATE	TONS
4/15/2002	70.70
6/22/2002	13.13
6/29/2002	30.36
7/1/2002	72.09
7/6/2002	13.38
7/13/2002	6.77
7/18/2002	51.94
9/23/2002	64.46
1/6/2003	56.82
3/18/2003	45.52
7/2/2003	75.56
9/9/2003	94.00
11/19/2003	53.20
1/7/2004	73.46
2/24/2004	33.89
5/19/2004	62.08
7/22/2004	81.69
9/17/2004	78.45
3/6/2005	62.77
5/18/2005	62.00
7/27/2005	57.48
9/30/2005	81.69
11/10/2005	95.90
1/12/2006	53.00
3/10/2006	19.00
7/20/2006	79.00
10/26/2006	25.00
12/14/2006	76.53

CSO B&B REGULATOR PREVENTATIVE MAINTENANCE

SITE	DATE
D-38	1/2/2002
D-40	1/2/2002
D-45	1/2/2002
D-58	1/2/2002
D-61	1/2/2002
D-62	1/2/2002
S-15	1/2/2002
S-16	1/2/2002
S-31	1/2/2002
S-45	1/2/2002
S-33	6/2/2002
D-17	7/2/2002
D-19	7/2/2002
D-37	7/2/2002
D-38	7/2/2002
S-22	7/2/2002
S-15	7/2/2002
S-5	9/2/2002
D-62	10/2/2002
S-26	10/2/2002
D-19	11/13/2003
D-61	7/22/2003
S-34	7/22/2003
S-38	7/22/2003
S-19	10/11/2003
S-18	11/1/2003
S-18	11/1/2003
S-8	11/4/2003
S-9	11/8/2003
D-18	12/4/2003
D-20	12/4/2003
D-48	12/27/2003
D-50	12/27/2003
D-37	1/6/2004
S-5	1/6/2004
D-21	1/12/2004
D-45	6/19/2004
S-50	6/18/2004
D-19	7/22/2004
D-61	7/22/2004
S-34	7/22/2004
S-38	7/22/2004
S-50	12/11/2004
D-58	12/18/2004
S-23	12/18/2004
S-47	12/18/2004
D-58	3/17/2005
D-38	3/17/2005
D-37	3/17/2005
D-65	4/15/2005
F-14	4/20/2005
D-50	4/25/2005
D-26	4/26/2005
D-51	5/4/2005
S-33	7/16/2005
D-65	8/8/2005
S-07	8/17/2005
F-14	8/24/2005
F-13	8/24/2005
D-68	9/14/2005
D-58	9/12/2005
S-15	10/28/2005
D-20	9/21/2005
S-33	10/17/2005
D-04	12/7/2005
S-01	3/25/2006
S-19	3/28/2006
D-72	3/28/2006
S-47	3/28/2006
F-14	3/8/2006
S-08	3/10/2006
S-9	7/22/2006
D-63	9/23/2006
S-38	12/8/2006
S-33	12/8/2006
D-67	12/8/2006
F-14	12/8/2006
S-43	12/9/2006
S-42	12/11/2006
S-15	12/12/2006
D-51	12/16/2006

CSO TIDE GATE PREVENTATIVE MAINTENANCE

SITE	DATE
D-37	1/1/2002
D-39	1/1/2002
D-40	1/1/2002
D-45	1/1/2002
D-68	1/1/2002
D-31	1/1/2002
S-45	1/1/2002
D-62	10/1/2002
S-16	7/31/2003
D-38	7/30/2003
S-38	7/30/2003
D-37	7/29/2003
D-44	9/27/2003
D-25	9/27/2003
D-19	11/13/2003
D-18	2/3/2003
D-40	7/19/2004
D-37	7/29/2004
D-20	7/30/2004
D-38	7/30/2004
S-16	7/31/2004
D-25	8/18/2004
F-24	12/29/2004
S-38	10/1/2005
D-11	10/6/2005
D-71	10/17/2005
F-09	9/3/2005
D-68	10/18/2005
D-45	10/13/2005
S-50	12/17/2005
D-20	12/20/2005
S-50	7/8/2006
S-7	7/11/2006
D-11	7/11/2006
S-15	7/12/2006
D-72	7/12/2006
D-63	9/23/2006

COMPUTER CONTROL CHAMBER PREVENTATIVE MAINTENANCE

SITE	DATE	SITE	DATE
D-02	6/10/2002	D-5	1/20/2005
D-02	9/26/2002	D-2	2/7/2005
D-03	9/26/2002	D-3	2/9/2005
D-05	6/10/2002	D-5	2/7/2005
D-05	9/25/2002	D-7	2/11/2005
D-07	9/30/2002	D-9	2/11/2005
D-09	9/30/2002	D-11	2/11/2005
D-11	9/30/2002	D-15	2/11/2005
D-15	6/10/2002	D-2	6/9/2005
D-15	9/30/2002	D-3	6/9/2005
D-2	2/25/2003	D-5	6/9/2005
D-3	2/25/2003	D-7	6/10/2005
D-5	2/26/2003	D-9	6/10/2005
D-7	2/25/2003	D-11	6/10/2005
D-9	2/25/2003	D-15	6/9/2005
D-11	2/24/2003	F-25	6/10/2005
D-15	2/26/2003	D-2	8/24/2005
F-25	2/24/2003	D-3	8/23/2005
D-2	7/16/2003	D-5	8/24/2005
D-3	7/16/2003	D-9	8/23/2005
D-5	7/16/2003	D-11	8/23/2005
D-7	7/16/2003	D-15	8/24/2005
D-9	7/17/2003	D-2	10/12/2005
D-11	7/17/2003	D-3	10/12/2005
D-15	7/17/2003	D-2	11/7/2005
F-25	7/17/2003	D-3	11/7/2005
D-2	9/25/2003	D-9	11/18/2005
D-3	9/25/2003	D-11	11/10/2005
D-5	9/25/2003	D-15	11/18/2005
D-7	9/25/2003	F-25	11/21/2005
D-9	9/26/2003	D-2	12/8/2005
D-11	9/26/2003	D-3	12/8/2005
D-15	9/29/2003	D-5	12/8/2005
F-25	9/26/2003	D-7	12/8/2005
D-2	11/19/2003	D-9	12/7/2005
D-3	12/8/2003	D-11	12/7/2005
D-5	11/17/2003	D-15	12/7/2005
D-7	11/18/2003	F-25	12/7/2005
D-9	11/19/2003	D-2	1/10/2006
D-11	11/19/2003	D-3	1/10/2006
D-15	12/8/2003	D-5	1/12/2006
F-25	12/8/2003	D-7	1/12/2006
D-2	1/14/2004	D-9	1/12/2006
D-3	1/16/2004	D-11	1/15/2006
D-5	1/15/2004	D-15	1/15/2006
D-7	1/15/2004	F-25	1/15/2006
D-9	1/13/2004	D-2	2/21/2006
D-11	1/13/2004	D-3	2/21/2006
D-15	1/13/2004	D-5	2/21/2006
F-25	1/14/2004	D-7	2/21/2006
D-2	4/12/2004	D-9	2/16/2006
D-3	4/12/2004	D-11	2/16/2006
D-5	4/2/2004	D-15	2/16/2006
D-7	4/12/2004	F-25	2/16/2006
D-9	4/12/2004		
D-11	4/14/2004		
D-15	6/18/2004		
F-25	4/24/2004		
D-2	6/17/2004		
D-3	6/18/2004		
D-5	6/17/2004		
D-7	6/22/2004		
D-9	6/22/2004		
D-11	6/22/2004		
D-15	8/23/2004		
F-25	6/24/2004		
D-2	8/19/2004		
D-3	8/19/2004		
D-5	8/19/2004		
D-7	8/19/2004		
D-9	8/23/2004		
D-11	8/23/2004		
D-15	11/4/2004		
F-25	8/23/2004		
D-2	10/6/2004		
D-3	10/6/2004		
D-5	11/1/2004		
D-7	11/1/2004		
D-9	11/4/2004		
D-11	11/4/2004		
F-25	11/4/2004		

CSO OUTFALL - DEBRIS GRILL PREVENTATIVE MAINTENANCE

SITE	DATE
F-05	3/1/2002
F-05	5/1/2002
F-05	6/1/2002
F-05	8/1/2002
F-05	9/1/2002
F-05	10/1/2002
F-05	12/1/2002
D-05	5/1/2002
D-02	7/17/2003
D-02	12/20/2003
D-03	12/19/2003
F-05	1/21/2003
F-05	5/19/2003
F-05	6/6/2003
F-05	6/27/2003
F-05	7/21/2003
F-05	9/25/2003
F-05	11/21/2003
F-05	12/20/2003
T-08	12/20/2003
Sandv Ru	12/22/2003
F-05	2/27/2004
T-04	2/13/2004
T-08	2/5/2004
T-08	2/27/2004
Sandv Ru	2/27/2004
F-05	3/22/2004
T-04	3/22/2004
T-08	3/22/2004
T-14	3/22/2004
Sandv Ru	3/23/2004
F-05	3/31/2004
T-08	4/16/2004
Sandv Ru	4/16/2004
T-15	5/14/2004
T-04	5/17/2004
T-08	5/17/2004
F-05	5/27/2004
F-05	6/8/2004
T-08	6/8/2004
T-11	6/8/2004
T-15	6/9/2004
Sandv Ru	6/9/2004
T-08	6/22/2004
T-15	6/23/2004
F-05	6/25/2004
F-05	7/21/2004
T-08	7/26/2004
F-05	8/10/2004
T-08	8/24/2004
T-15	8/24/2004
Sandv Ru	8/24/2004
T-08	9/16/2004
T-08	10/6/2004
T-08	11/22/2004
F-05	1/7/2005
T-08	1/12/2005
T-15	1/12/2005
T-08	2/23/2005
T-15	2/23/2005
F-05	3/22/2005
T-08	3/14/2005
T-15	3/16/2005
F-05	4/12/2005
T-08	4/15/2005
T-15	4/19/2005
Sandv Ru	4/19/2005
F-05	5/17/2005
T-08	5/3/2005
T-15	5/5/2005
F-05	6/20/2005
Sandv Ru	6/6/2005
T-08	8/1/2005
F-05	8/1/2005
F-05	8/9/2005
F-05	8/29/2005
Sandv Ru	8/2/2005
Sandv Ru	9/19/2005
F-05	9/29/2005
Sandv Ru	9/29/2005
F-05	10/11/2005
T-08	10/14/2005
F-05	10/27/2005
T-08	10/31/2005
T-08	11/29/2005
F-05	12/14/2005
F-05	1/9/2006
F-05	2/9/2006
T-08	2/15/2006
Sandv Ru	2/16/2006
Sandv Ru	3/7/2006
F-05	3/10/2006
Sandv Ru	3/13/2006
T-08	3/20/2006
F-05	4/13/2006
F-05	4/26/2006
F-05	5/10/2006
Sandv Ru	5/30/2006
F-05	5/30/2006
T-08	5/30/2006
Sandv Ru	6/15/2006
T-08	7/19/2006
F-05	8/15/2006
T-08	8/21/2006
Sandv Ru	8/22/2006
F-05	9/20/2006
F-05	10/26/2006
T-08	10/27/2006
F-05	11/10/2006
F-05	11/28/2006
T-08	12/6/2006
Sandv Ru	12/7/2006
F-05	12/12/2006
Sandv Ru	12/14/2006

T-04 DEBRIS NET FLOATABLES REMOVAL

DATE	TOTAL WEIGHT
4/24/1997	75
5/8/1997	150
6/6/1997	200
7/18/1997	200
8/19/1997	150
10/2/1997	75
11/19/1997	75
12/27/1997	90
3/6/1998	100
7/8/1998	125
8/13/1998	150
9/4/1998	150
11/18/1998	150
1/20/1999	225
4/7/1999	175
6/2/1999	100
6/15/1999	75
3/8/2000	150
4/6/2000	250
6/9/2000	130
7/5/2000	Net lost
8/10/2000	265
9/11/2000	115
10/12/2000	160
11/1/2000	100
2/21/2001	275
3/13/2001	Net lost
4/5/2001	135
6/5/2001	235
7/20/2001	105
8/23/2001	185
10/4/2001	155
1/3/2002	240
2/13/2002	140
4/18/2002	150
5/17/2002	325
6/21/2002	375
9/5/2002	210
12/18/2002	235
3/11/2003	240
6/11/2003	275
7/31/2003	282
9/10/2003	190
9/26/2003	250
10/17/2003	175
12/19/2003	175
2/13/2004	135
5/7/2004	210
6/21/2004	260
7/23/2004	215
8/25/2004	375
10/5/2004	175
12/28/2004	395
4/4/2005	430
6/2/2005	304
7/20/2005	175
9/8/2005	242
12/21/2005	285
3/28/2006	400
6/22/2006	256
7/20/2006	300
8/21/2006	310
9/8/2006	
10/24/2006	115
11/7/2006	165
11/28/2006	170
12/22/2006	70

MONITORING NETWORK - MONTHLY OPERATIONAL STATUS REPORT

Month of: January-06

381 TOTAL of ALL NETWORK MONITORING SITES

20 SITES NOT INSTALLED

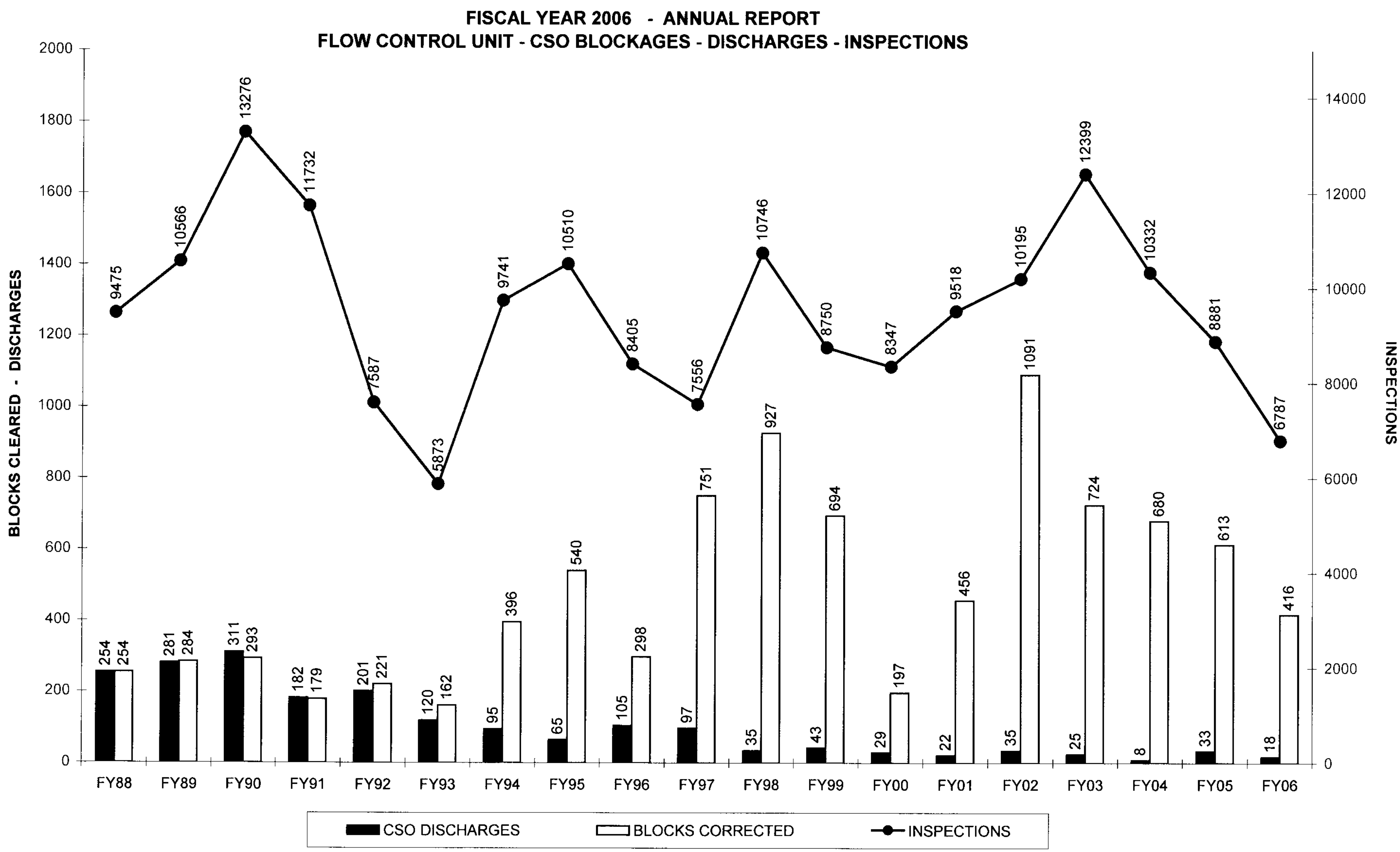
361 SITES INSTALLED

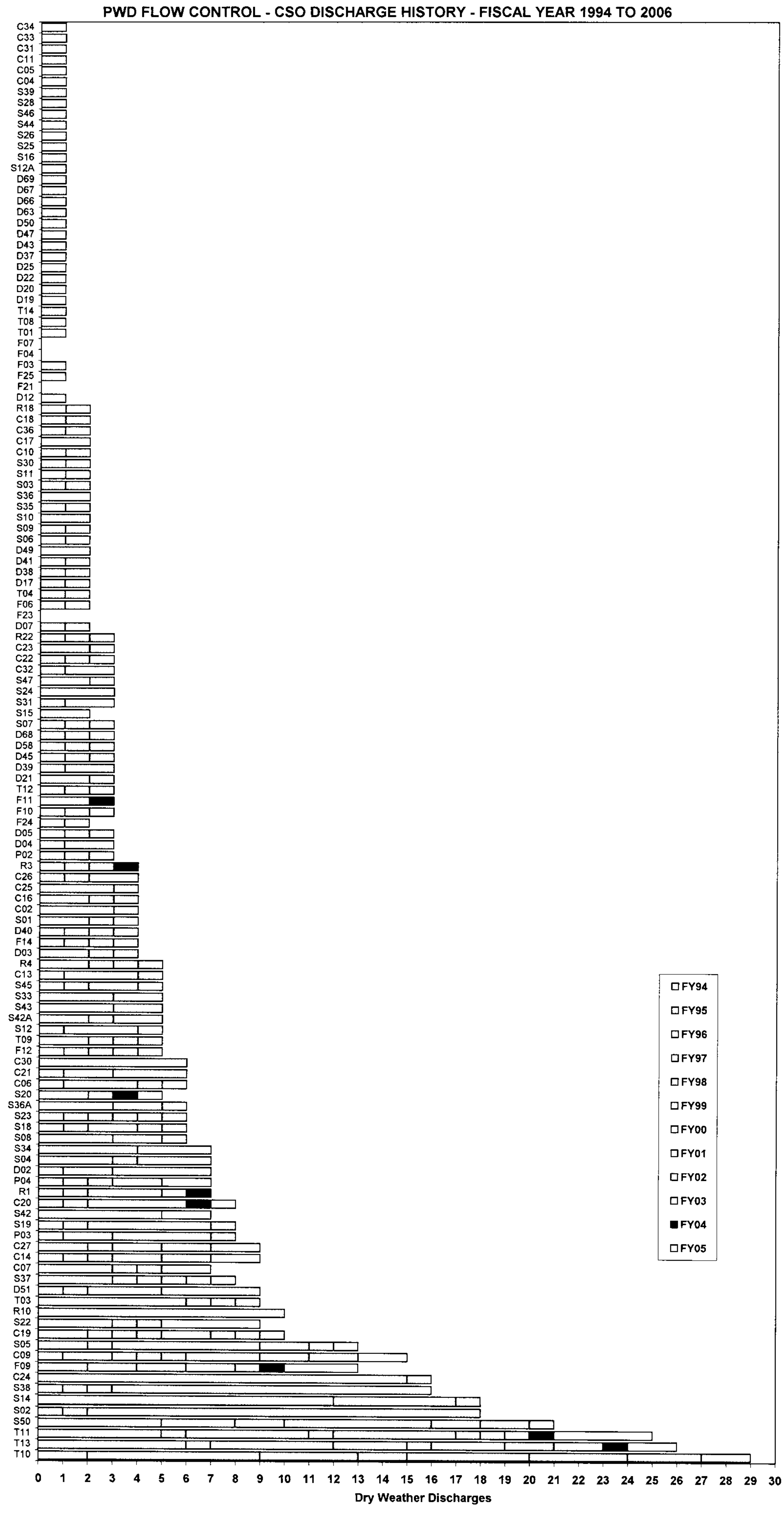
26 of 26 METERING CHAMBERS INSTALLED
98.0% Operational

24 of 24 RAIN GAUGE SITES INSTALLED
95.7% Operational

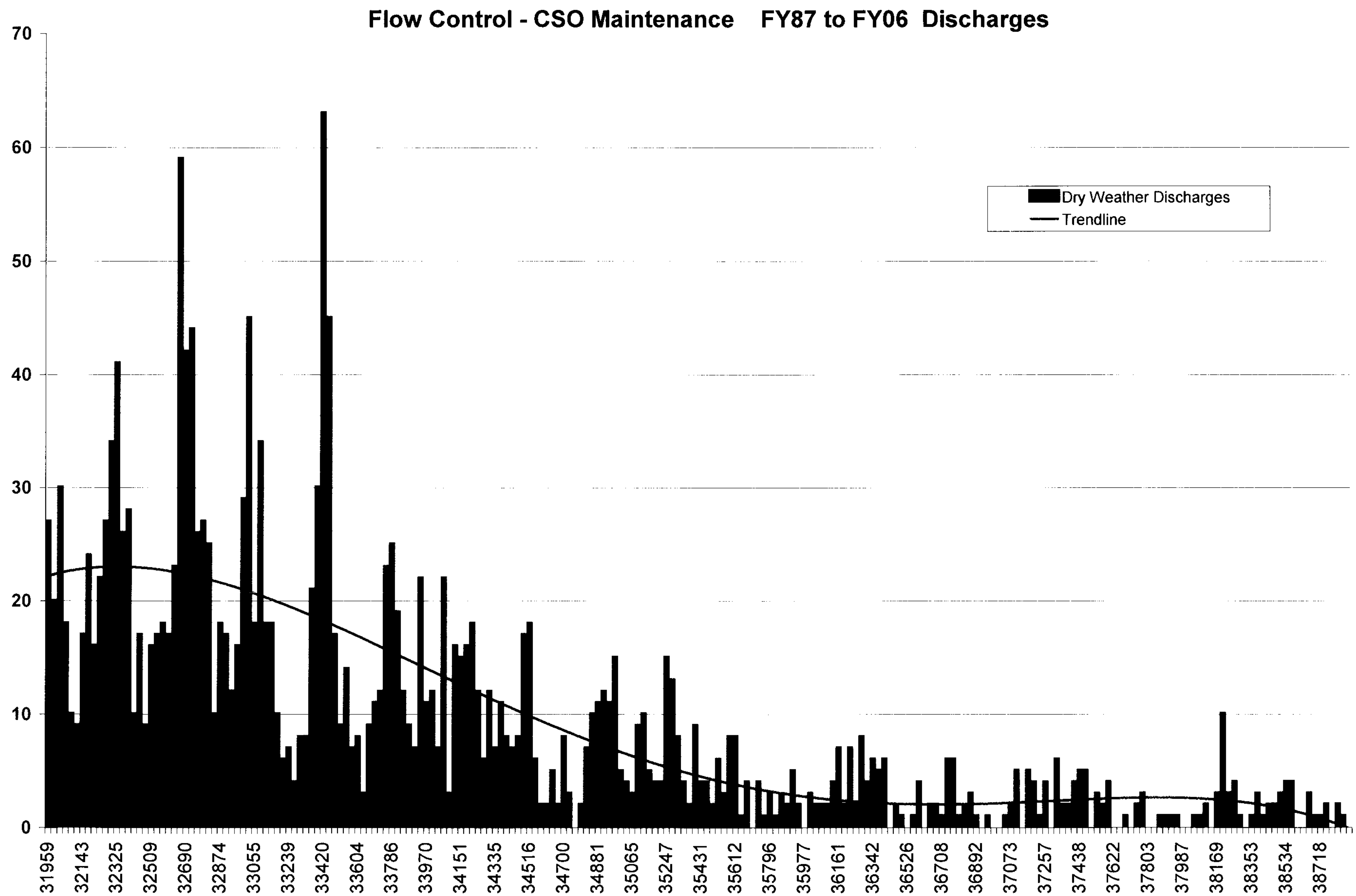
141 of 200 CSO SITES INSTALLED
78.2% Operational

* Operational - The site data from all sensors is available on the server and is reasonably accurate


FISCAL YEAR 2006 - ANNUAL REPORT
FLOW CONTROL UNIT - CSO BLOCKAGES - DISCHARGES - INSPECTIONS
BLOCKS CLEARED - DISCHARGES
INSPECTIONS
2000
1800
1600
1400
1200
1000
800
600
400
200
0
14000
12000
10000
8000
6000
4000
2000
0
9475
10566
13276
11732
7587
5873
9741
10510
8405
7556
10746
8750
8347
9518
10195
12399
10332
8881
6787
254 254
281 284
311 293
182 179
201 221
120 162
95 396
65 540
105 298
97 751
35 927
43 694
29 197
22 456
35 1091
25 724
8 680
33 613
18 416
FY88
FY89
FY90
FY91
FY92
FY93
FY94
FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05
FY06
CSO DISCHARGES
BLOCKS CORRECTED
INSPECTIONS

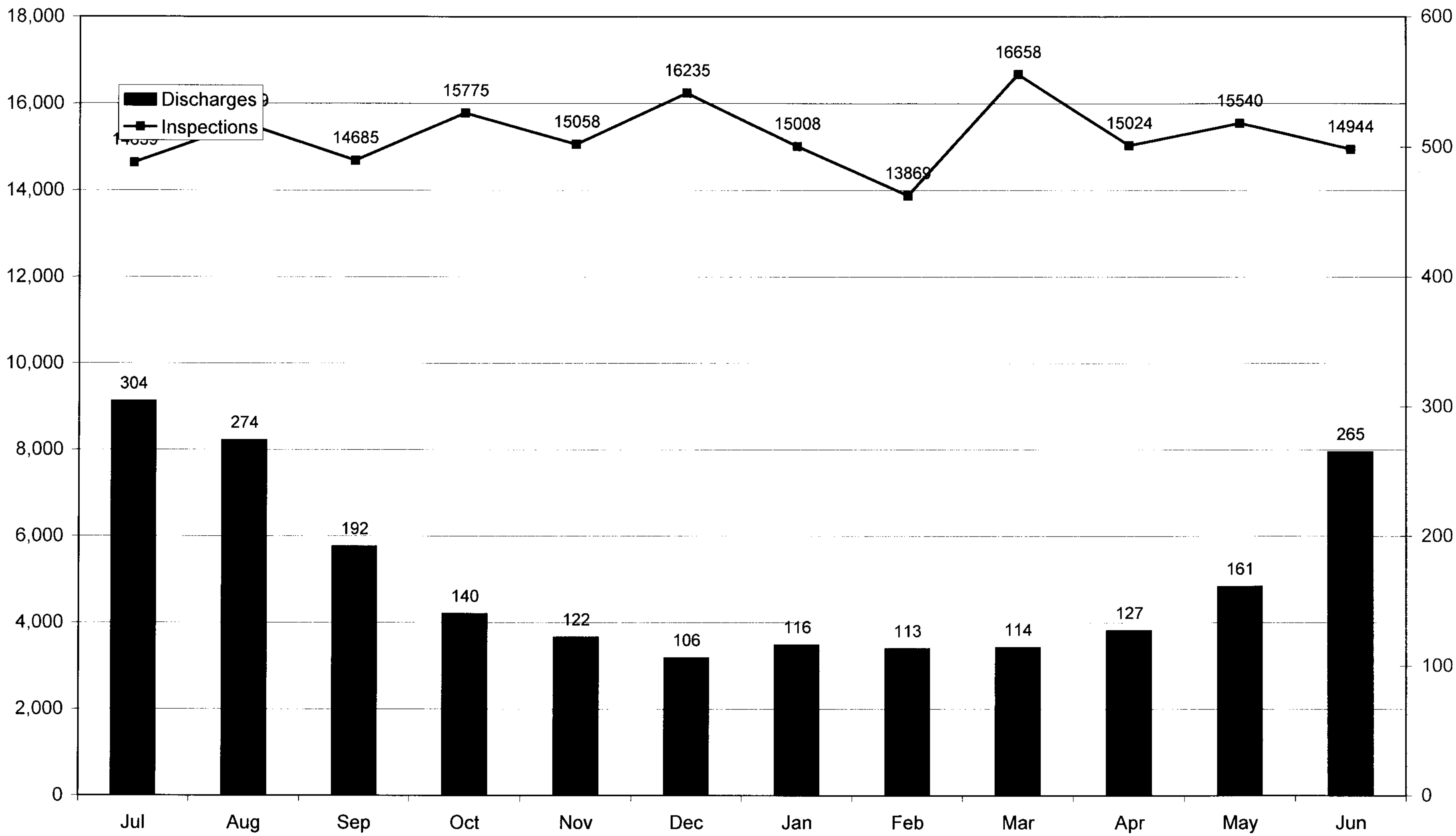


PWD FLOW CONTROL - CSO DISCHARGE HISTORY - FISCAL YEAR 1994 TO 2006
Dry Weather Discharges
FY94
FY95
FY96
FY97
FY98
FY99
FY00
FY01
FY02
FY03
FY04
FY05



Flow Control - CSO Maintenance FY87 to FY06 Discharges
Dry Weather Discharges
Trendline
70
60
50
40
30
20
10
0
31959
32143
32325
32509
32690
32874
33055
33239
33420
33604
33786
33970
34151
34335
34516
34700
34881
35065
35247
35431
35612
35796
35977
36161
36342
36526
36708
36892
37073
37257
37438
37622
37803
37987
38169
38353
38534
38718

Flow Control - CSO Maintenance FY87 to FY06 Inspections / Discharges By Month



Appendix B – Flow Control Pumping Station Maintenance Summaries

CALENDAR YEAR 2006
MUNICIPAL WASTELOAD MANAGEMENT REPORT
FLOW CONTROL - WASTEWATER PUMPING UNIT

OUTLYING PUMPING STATION - CAPACITIES

There are sixteen outlying wastewater pumping stations that pump to the three Water Pollution Control Plants. Listed below are the station capacities, maximum flows and general condition.

WASTEWATER PUMPING STATION LOCATION	NO. PUMPS IN STATION	RATED CAPACITY PER PUMP GPM	ACTUAL STATION CAPACITY GPM	MAXIMUM INFLOW PERIOD GPM	WPC PLANT FLOW DESTINATION	GENERAL CONDITION
BANK STREET	2	250	496	49	SEWPC	Good, new pumps, controls and electric gear installed in 1994
BELFRY DRIVE	2	150	389	71	SWWPC	Good, built 1978 One pump rebuilt in 2005 One pump rebuilt in 2005
C.S.P.S. VARIABLE SPEED UNIT CONSTANT SPEED UNIT	 4 2	 29,000 29,000	 135,417	 135,417	 SWWPC	Good, station was fully automated in oct. 1996. One pump rebuilt in 2002 Two pumps rebuilt in 2005 One pump rebuilt in 2003 Two pumps rebuilt in 1999
FORD ROAD	2	900	1,467	148	SWWPC	Excellent, station completely One pump rebuilt in 2005 One pump rebuilt in 2005
HOG ISLAND ROAD	2	500	927	450	SWWPC	Excellent, new facility in 1989 One pump rebuilt in 2000 One pump rebuilt in 2005
LINDEN AVENUE	2	1,400	2,378	179	NEWPC	Good, built in 1967 One pump rebuilt in 2001 One pump rebuilt in 2000
LOCKART STREET	2	600	1,243	148	NEWPC	Good, built in 1967 One pump rebuilt in 2005 One pump rebuilt in 2005
MILNOR STREET	3	300	1,096	479	NEWPC	Good, built in 1947 One pump rebuilt in 2000 One in 1998, one in 2005
NEILL DRIVE	3	1,800	5,568	3,712	SWWPC	Good, completely rehabilitated in 2002
POLICE ACADEMY	2	100	53	22	NEWPC	Good, new pumps, controls and electric gear installed in 1993
PHILA NAVAL BUSINESS CTR PS796	3	2,250	6,750	1,110	SEWPC	Good, new pumps, controls and electric gear installed in 2000
PHILA NAVAL BUSINESS CTR PS120	2	700	1,400	939	SEWPC	Good, built in 2000
PHILA NAVAL BUSINESS CTR PS542	2	300	600	113	SEWPC	Good, built in 2000
RENNARD STREET	2	400	329	49	NEWPC	Good, built in 1968 One pump rebuilt in 1999 One pump rebuilt in 2002
SPRING LANE	2	122	242	20	SWWPC	Good, built in 2000
42ND STREET	3	2,000	5,953	5,953	SWWPC	Good, complete rehab in 2002

COLLECTOR SYSTEMS - FLOW CONTROL - MAIN PUMP UNIT MAJOR OVERHAULS 2006

DATEOUT	TIMEOUT	DATEIN	TIMEIN	UNIT	STATION	REASON
28-Nov-05	10:00:00 AM	30-Nov-05	2:00:00 PM	1	FORD ROAD	COMPLETE OVERHAUL
14-Nov-05	11:00:00 AM	19-Nov-05	12:00:00 PM	2	LOCKART ST	COMPLETE OVERHAUL
02-Nov-05	10:00:00 AM	04-Nov-05	3:00:00 PM	1	LOCKART ST	COMPLETE OVERHAUL
08-Aug-05	10:00:00 AM	17-Aug-05	1:00:00 PM	1	MILNOR ST	COMPLETE OVERHAUL
22-Jul-05	9:00:00 AM	05-Aug-05	11:00:00 AM	1	HOG ISLAND	COMPLETE OVERHAUL
06-Jun-05	10:00:00 AM	24-Jun-05	10:00:00 AM	4	CENTRAL SCH	COMPLETE OVERHAUL
04-May-05	9:30:00 AM	06-May-05	1:00:00 PM	2	FORD ROAD	COMPLETE OVERHAUL
23-Feb-05	12:00:00 PM	26-Feb-05	1:00:00 PM	2	BELFRY DRIVE	COMPLETE OVERHAUL
16-Feb-05	9:00:00 AM	18-Feb-05	11:30:00 AM	1	BELFRY DRIVE	COMPLETE OVERHAUL
03-Jan-05	9:00:00 AM	14-Feb-05	9:45:00 AM	2	CENTRAL SCH	COMPLETE OVERHAUL

FLOW CONTROL UNIT
2006 PUMP STATION YEARLY FLOW REPORT

WASTEWATER PUMP STATIONS	PUMP #1	PUMP #2	PUMP #3	PUMP #4	PUMP #5	PUMP #6	STATION FLOW (MG)
BANK STREET	3.89	3.63					7.51
BELFRY DRIVE	4.31	4.02					8.34
CENTRAL SCHUYLKILL	3,457.13	5,296.39	1,300.30	546.20	6,033.45	6,076.97	22,710.45
FORD ROAD	75.00	44.28					119.28
HOG ISLAND	14.60	11.07					25.67
LINDEN AVENUE	32.32	26.64					58.96
LOCKHART STREET	34.33	30.87					65.20
MILNOR STREET	3.61	3.49	3.96				7.57
NEILL DRIVE	140.48	164.00	161.56				466.05
POLICE ACADEMY	0.48	0.49					0.98
RENNARD STREET	4.81	4.75					9.56
SPRING LANE	3.53	3.47					7.00
42ND STREET	547.97	383.44	367.60				1,299.02
STORMWATER PUMP STATIONS							
BROAD & BOULEVARD	49.12	34.41	2.56	1.00			87.10
MINGO CREEK	13.51	0.00	958.68	606.01	249.97	827.61	2,655.78
26TH & VARE	0.790	0.940					1.720

Flow Control Service Level Goals
07/01/2005 - to - 12/31/2006

Month Goal -->	CSO Discharges per 100 Inspections 0	% Metering Chambers Operational 95% or Higher	% CSO Level Meters Operational 90% or Higher	CCTV Inspections 30 Miles	Main Pump Availability 95% or Higher
July - 2005	0.5	76.4%	30.6%	5.25	98.6%
August - 2005	0.8	71.2%	25.2%	5.38	97.6%
September - 2005	0.0	65.5%	23.9%	5.67	100.0%
October - 2005	0.0	75.0%	27.1%	5.19	99.5%
November - 2005	0.5	75.4%	21.2%	4.95	99.5%
December - 2005	0.1	81.0%	21.0%	4.72	98.7%
January - 2006	0.2	86.8%	22.2%	4.73	97.8%
February - 2006	0.3	61.4%	24.0%	4.13	98.4%
March - 2006	0.0	94.9%	52.0%	5.16	98.6%
April - 2006	0.4	84.1%	51.1%	4.08	99.6%
May - 2006	0.2	85.0%	58.1%	5.51	98.7%
June - 2006	0.0	88.5%	59.0%	4.52	98.6%
July - 2006	0.2	81.1%	51.5%	3.35	99.9%
August - 2006	0.0	89.8%	54.0%	5.35	99.9%
September - 2006	0.2	89.2%	58.4%	5.30	99.3%
October - 2006	0.2	89.9%	69.5%	5.07	99.5%
November - 2006	0.3	93.6%	74.6%	4.20	99.3%
December - 2006	0.0	94.5%	77.6%	4.28	100.0%

WASTEWATER PUMPING - MAIN PUMPING UNITS OUT OF SERVICE REPORT 2006

DATE/TIME OUT	DATE/TIME IN	STATION	UNIT	TYPE	REASON
Fri - 11/17/06 - 3:00 PM	Mon - 11/27/06 - 3:00 PM	MINGO CREEK	5	BD	BURNT WIRE ON BRUSH RIGGING CRT.
Tue - 11/14/06 - 3:00 PM	Wed - 11/15/06 - 7:00 PM	LOCKART ST	1	BD	HIGH AMP DRAW, POSSIBLE CLOGGED PUMP.
Tue - 10/31/06 - 12:00 PM	Wed - 11/1/06 - 3:00 PM	42ND ST	1	BD	CHECK VALVE PROBLEM
Thu - 10/26/06 - 11:00 AM	Fri - 10/27/06 - 3:00 PM	PNBC-796	3	PM	OIL CHANGE
Sat - 10/7/06 - 10:00 AM	Sat - 10/7/06 - 3:00 PM	MINGO CREEK	2	BD	BAD UNION IN THE SEALWATER SYSTEM
Fri - 10/6/06 - 2:00 PM	Thu - 10/12/06 - 2:00 PM	MINGO CREEK	6	BD	CRACKED FITTING IN THE SEALWATER SYSTEM
Mon - 9/18/06 - 11:00 AM	Thu - 9/21/06 - 3:00 PM	PNBC-796	1	BD	ROTOVALVE REPAIR
Wed - 9/13/06 - 3:00 PM	Thu - 9/14/06 - 12:00 PM	BROAD & BLVD	1	BD	NOT PUMPING
Wed - 9/6/06 - 3:00 PM	Tue - 9/12/06 - 1:00 PM	PNBC-542	2	BD	O.O.S. FOR REPAIR
Wed - 9/6/06 - 5:00 PM	Thu - 9/7/06 - 2:00 PM	CENTRAL SCH	5	BD	ROTOVALVE FAILURE.
Wed - 8/30/06 - 9:00 AM	Thu - 8/31/06 - 11:00 AM	BROAD & BLVD	2	BD	PVC CAP JAMMED IMPELLOR
Fri - 7/21/06 - 4:00 PM	Sat - 7/22/06 - 1:00 PM	PNBC-120	2	BD	MOISTURE FAULT
Wed - 7/19/06 - 9:00 AM	Wed - 7/19/06 - 3:00 PM	NEILL DRIVE	1	OV	CHANGE OUT PUMP
Tue - 6/20/06 - 10:00 AM	Tue - 6/20/06 - 3:00 PM	BANK ST	1	BD	BAD RELAY
Wed - 6/7/06 - 12:00 PM	Fri - 6/30/06 - 12:00 PM	CENTRAL SCH	3	BD	INSPECT TOP PUMP BEARING
Fri - 6/2/06 - 9:00 AM	Fri - 6/2/06 - 3:00 PM	NEILL DRIVE	2	BD	INSTALL SPARE PUMP SENT OLD OUT FOR EVALUATION @ FLYGT
Fri - 5/26/06 - 9:00 AM	Fri - 5/26/06 - 3:00 PM	NEILL DRIVE	2	PM	OIL CHANGE & INVESTIGATE NOISE
Wed - 5/24/06 - 10:00 AM	Thu - 5/25/06 - 11:00 AM	NEILL DRIVE	3	PM	NEW WEAR RINGS & OIL CHANGE
Wed - 5/24/06 - 4:00 PM	Thu - 5/25/06 - 2:00 PM	NEILL DRIVE	1	BD	LEAK SENSOR FAILURE.
Tue - 5/23/06 - 10:00 AM	Wed - 5/24/06 - 12:00 PM	NEILL DRIVE	1	PM	NEW WEAR RINGS & OIL CHANGE
Wed - 5/3/06 - 1:00 PM	Fri - 5/5/06 - 12:00 PM	BANK ST	2	BD	BAD MOTOR
Mon - 5/1/06 - 9:00 AM	Fri - 5/19/06 - 2:00 PM	CENTRAL SCH	3	OV	OVERHAUL
Sat - 4/8/06 - 5:00 PM	Tue - 4/11/06 - 12:00 PM	CENTRAL SCH	5	BD	IMPELLER JAMMED
Tue - 3/28/06 - 12:00 PM	Tue - 4/4/06 - 2:00 PM	BROAD & BLVD	1	OV	OVERHAUL
Tue - 3/21/06 - 11:00 AM	Wed - 3/22/06 - 2:00 PM	POLICE ACADEMY	1	BD	HIGH AMPS, POSSIBLY CLOGGED PUMP
Mon - 3/20/06 - 9:00 AM	Thu - 3/23/06 - 2:00 PM	MILNOR ST	2	OV	COMPLETE OVERHAUL
Tue - 2/28/06 - 11:00 AM	Fri - 3/17/06 - 3:00 PM	CENTRAL SCH	4	BD	MOTOR NOISE
Tue - 1/24/06 - 11:00 AM	Thu - 1/26/06 - 10:00 AM	NEILL DRIVE	2	BD	BAD MOTOR LEAK DETECTION ALARM SENSOR
Wed - 1/11/06 - 10:00 AM	Tue - 1/17/06 - 12:00 PM	BANK ST	1	OV	COMPLETE OVERHAUL
Thu - 12/15/05 - 10:00 AM	Sat - 2/25/06 - 1:00 PM	CENTRAL SCH	6	BD	HOLE IN DISCHARGE PIPE BELOW THE VENTURI